

R·S·G·B VOLUME 23 · No. 7 · COPYRIGHT · PRICE 1/6 JANUARY, 1948

BULLETIN

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN



- ① MAN-MAL-STATIC
- ② AMATEUR BANDS RECEIVER
- ③ THE TWO-METER BAND
- ④ N.F.D. RULES—1948
- ⑤ CONTEST REPORTS



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MAN-MADE STATIC

PROMINENCE is given in this issue to a letter from the Radio Industry Council announcing the launching of a campaign to secure the co-operation of the Motor Industry, and the users of motor vehicles, in the suppression of ignition noise. Although the primary purpose of the campaign is to bring some relief to those whose reception of television programmes is being spoilt by passing motor cars, we, as radio amateurs, will benefit quite as much if it succeeds. For many years the transmitting amateur and short-wave enthusiast has been at the mercy of those who create man-made static, in fact it is safe to say that far more DX contacts have been lost as the result of this type of interference than that caused by other amateur stations. This is particularly true of the 28 and 60 Mc/s. bands where the pick-up appears to be considerably greater than on lower frequencies.

The Radio Branch of the G.P.O. can usually be depended upon to investigate complaints of persistent interference to the reception of the medium-wave B.B.C. programmes, but for some reason, which has never been made clear, they decline to investigate complaints of interference to short-wave reception. This one-sided arrangement will no doubt cease as more and more television receivers go into service, and again we shall benefit.

We hope we are right in thinking that the R.I.C. campaign is but the forerunner of many similar campaigns, the purpose of which will be to show other industries that they too are responsible for marketing machinery capable of causing widespread electrical interference to the users of radio sets. There are, however, three features of the present campaign which should not be lost sight of by the promoters. First we suggest that the R.I.C. should take steps to ensure that the suppression device which they recommend (an eighteen-penny resistor)

is readily available at all garages. The point may be considered trivial to those of us who are closely associated with radio in one form or another, but knowing something of the frailties of human nature and being aware of the *laissez faire* attitude of the general public towards the introduction of "gadgets" we quite seriously suggest that the campaign may lose ground if the motorist is compelled to "hunt around" for a 10,000 or 15,000 ohm resistor. Our second point concerns the "gadget" itself—for that is the phrase by which it will be known in non-radio circles. The R.I.C. must, we suggest, give the widest possible publicity to the assurances they have received from the "highest engineering authority" that the suppressor in no way impairs engine performance. Again we, as radio-minded people, know this to be true, but the average motorist is not radio-minded and he will be suspicious of any modification to the engine of his car.

The co-operation of the B.B.C. itself will ensure wide publicity but isolated announcements will be ineffective. Steady and well conceived propaganda with a few sound recordings of actual car noise thrown in to attract interest will do more than a volume of advertising in the National Press.

Next month one of our members, whose home is in the County of Broad Acres, will bring to the I.E.E. for his lecture on "Interference—its Cause, Effects and Cure" a number of records illustrating various types of man-made static. The R.I.C. would do well to enlist the support of Mr. Hartley and other amateurs who have made a close study of this subject and invite them to demonstrate to the manufacturers of noise-producing devices just how much radio listeners suffer as a result of their failure to suppress noise.

Finally we urge the R.I.C. to get the motor manufacturers interested now so that every new vehicle is automatically fitted with a suppressor. The most important result of this would be that garage personnel and service engineers would gain a large measure of confidence. If a new car is supplied with a suppressor already fitted, obviously existing cars of the same make can safely be modified.

It is perhaps pertinent to inquire how many of our own members who are motorists have fitted one of those eighteen-penny suppressors. As a guess we should say very few, if the noise which heralds the approach of most of the amateurs who drive round to see us can be used as a criterion. The exceptions are those who own a car radio or run a portable mobile transmitter. For them suppression is essential. For the rest it is probably a question of laziness—can't be bothered. If we are wrong we apologise, if we are right we hope the hint will be taken.

We should be interested to learn, as would no doubt the R.I.C., which makes of car cause the greatest amount of ignition noise.

The problem of car noise whilst serious is secondary in our view to the noise caused by domestic machinery. Probably complaints of interference to television from such sources are fewer than from cars for the reason that very few housewives operate vacuum sweepers and the like during the evening hours. The radio amateur however—especially he who is respecting "closed hours"—is perforce compelled to work on Sunday mornings—a time when domestic machinery is in full throttle. The man up the street with his electric dry shaver goes on merrily morning after morning without realising that his innocent little razor is compelling a neighbouring transmitting amateur to say to DX "sorry OM local QRM."

Authentic technical information on methods of suppressing interference caused by domestic machinery is in short supply. Here is a golden opportunity

(Continued on page 134)

A RECEIVER FOR THE AMATEUR BANDS

By L. F. WORSSAM (BRS9265)*

ANY receiver which covers such a wide range of frequencies as 1,700 kc/s. to 30 Mc/s. must, of necessity, be a compromise. One form which this compromise may take is the common superhet with one R.F. and two I.F. stages at 460 kc/s., but as anyone who has experience of this type of set will know, it has several marked disadvantages on the higher frequency ranges, although entirely adequate on the others. These disadvantages are: (1) The formation of images which may be extremely troublesome on 28 and 14 Mc/s.; (2) the high noise level due to the preponderance of mixer noise; and (3) the poor sensitivity on 28 Mc/s. The receiver described here was designed to have as much freedom from these defects as possible and with that end in view it was designed to give as high a performance as possible on 30 Mc/s. and a reasonable coverage on 60 Mc/s., though no attempt has so far been made to give full spread on this band.

The circuit incorporates all features usually found in amateur receivers and several which, although they may be found on individual receivers, are not usually found together. The whole set including the power supply and speaker is built in an aluminium cabinet measuring 19 in. wide by 12 in. deep by 9 in. high. The R.F. stages, mixer, first I.F. stages and R.F. oscillator are contained in separate boxes mounted on a common base, while all the other stages except the voltage stabilizer, V12, are mounted on the main chassis as can be seen in Fig. 1. No doubt some readers will not like the idea of using plug-in coils and separate tuning for the R.F. oscillator and signal frequency circuits, but plug-in coils are usually acknowledged to be the most efficient and are certainly the easiest to adjust while the tuning arrangement has other advantages apart from ease of construction.

The Circuit

The circuit, Fig. 2, consists of two R.F. stages, a two valve frequency changer, three I.F. stages at 1,600 kc/s., second detector, B.F.O., noise limiter, two A.F. stages, power supply and voltage stabilizer.

R.F. Stages

Two R.F. stages are used in order to give complete image suppression throughout the tuning range and to provide sufficient gain ahead of the mixer so that the signal-to-noise ratio is as high as possible. Low-noise, high-gain television pentodes are used, and the first stage is run at fixed bias and at full gain on 5 and 10 metres, while the second is connected to the R.F. gain control. As the frequency is decreased the efficiency of these stages increases and it is necessary to reduce the gain to prevent overloading. This is done by fitting the cathode bias resistor, R1, inside the plug-in coil former so that for each coil range a different amount of bias may be applied to V1 and the gain varied accordingly. On the 5 and 10 metre ranges the cathode of V1 is at zero potential to give maximum gain. This works quite well but for those who are dubious of over-running the valve it is suggested that a small value of R1, such as 50 ohms be used. The screens of V1 and V2 are supplied through dropping resistors from the H.T. instead of from the 130 volt supply as this gives the 6AC7's a variable- μ characteristic.

* 11 Rothamsted Ave., Harpenden, Herts.

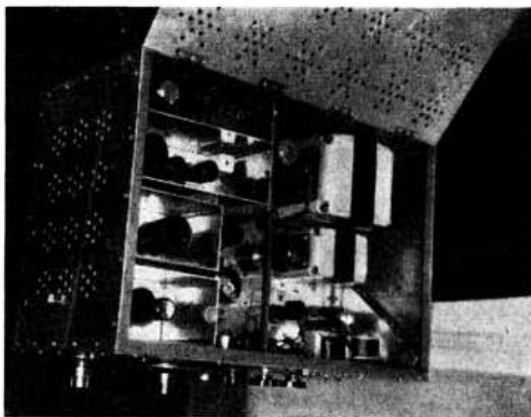


Fig. 1.

View of the interior of the receiver showing the general layout and method of construction.

Frequency Changer

The frequency changer is a two valve arrangement using a pentode mixer, V3, and a triode oscillator, V11. The use of control grid injection into a pentode mixer was finally decided upon in view of its extremely low noise level and high conversion gain. A 6SA7 pentagrid was tried originally but the noise level was high on 10 metres and prohibitive on 5. The circuit used is a slight variation of that normally used for control injection into a pentode anode detector in that the bias is obtained through the grid leak, R16. This means that the bias is automatically controlled so that there is no danger of oscillation due to the sum of the signal and oscillator voltages exceeding the grid bias. The usual cathode bias arrangement gives somewhat greater gain, but the oscillator injection voltage is very critical. If it is too small it will not convert whilst if the sum of the voltages on the grid exceeds the bias, oscillation sets in. It might be thought that the method of coupling would result in oscillator pulling, especially as the tuning is not ganged, but this is not so, except on 5 metres where due to its flatness the R.F. tuning very seldom has to be altered and consequently the pulling is not troublesome.

The R.F. oscillator uses a 6J5 triode (V11), in a straightforward circuit, the output being taken from the anode to minimise the risk of pulling. The oscillator is fed from the 130 volt stabilised supply through two R.F. chokes in series and suitably decoupled to prevent leakage of the output.

Tuning System

As mentioned above, the tuning of the signal circuits is separate from that of the R.F. oscillator. This is done partly for ease of construction and adjustment and partly for efficiency. The R.F. oscillator, or main tuning, is controlled through a National NPW-O type drive unit (manufactured in this country by Muirhead) which has a 20:1 gear ratio and a scale of 500 divisions about a quarter of an inch apart, giving an effective scale length of 10 feet. This drives an Eddystone 18 μ F double-spaced variable condenser. The coil data given should afford adequate bandspreading, but due to

variations from receiver to receiver slight modifications may be necessary and the trimmer should permit a variation of about 15 $\mu\mu\text{F}$ on each side of the value of C48 given. If the bandspreading is not sufficient, the coil inductance needs to be decreased slightly, such as by increasing the spacing between the turns of the coil, consequently the capacity will have to be increased and *vice versa*. The easiest way to make these adjustments is to listen for the oscillator output on a calibrated receiver.

This bandspreading means that on most ranges the oscillator circuit has a low L/C ratio and consequently a high degree of stability. The drift of the oscillator

after a warming-up period of about fifteen minutes is negligible—a very necessary feature with so much bandspread. In this connection, however, there is a disadvantage in the use of plug-in coils because when they are changed there is some drift while the new coil warms up.

The signal circuits are tuned by three 18 $\mu\mu\text{F}$ variable condensers ganged together and driven through a small 3:1 reduction drive. The coils for the R.F. stages and the mixer are identical and would be interchangeable if it were not that one contained the bias resistor, R1. The tuning capacities have been kept as low as possible so as to keep the L/C

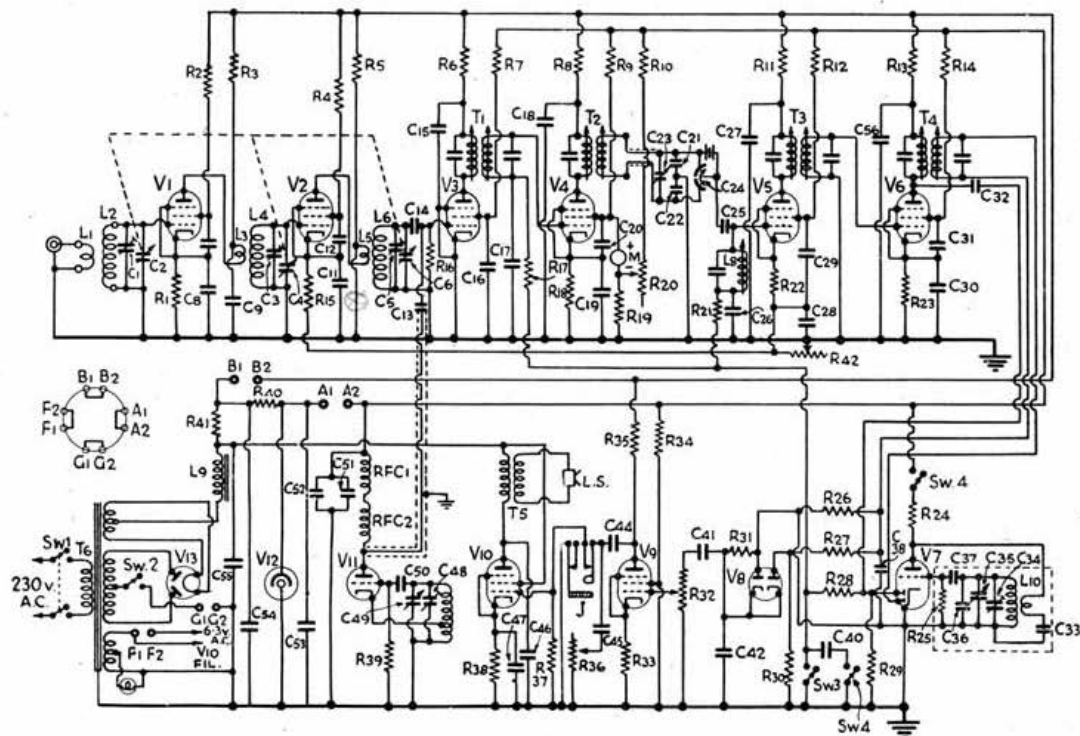


Fig. 2.

Circuit diagram of receiver.

RESISTORS.

R1	See Coil Data.
R2, 4, 25, 39	56,000 ohms.
R3, 5, 6, 7, 8, 11, 13, 14	1,000 ohms.
R9	12,000 ohms.
R10	23,000 ohms.
R12	10,000 ohms.
R15	150 ohms.
R16, 29, 34	2 megohms.
R17, 21, 27, 30	100,000 ohms.
R18, 22	300 ohms.
R19	60,000 ohms.
R20	1,000 ohms pre-set, meter zeroing.
R23	200 ohms.
R24	3,000 ohms.
R26, 28, 35, 37	560,000 ohms.
R31	1 megohm.
R32	1 megohm pot. A.F. gain.
R33	1,300 ohms.
R36	50,000 ohms pot. tone control.
R38	500 ohms 2 watt.
R40	2,500 ohms 50 watt.
R41	500 ohms 50 watt.
R42	10,000 ohms. pot. R.F. gain.

CAPACITORS.

C1, 3, 5	15 $\mu\mu\text{F}$ air trimmers.
C2, 4, 6	18 $\mu\mu\text{F}$ variable, ganged.
C7, 8, 9, 10, 11, 12, 15, 16, 17, 18, 19, 20, 26, 27, 28, 29, 30, 31, 33, 44, 46, 51, 56	0.1 μF .
C13	3 $\mu\mu\text{F}$.
C14	.001 μF .
C21, 22	50 μF .
C23	100 μF variable, selectivity control.
C24	15 μF —see text.
C25	20 μF .
C32, 37, 38, 42, 50	100 μF .
C34	40 μF trimmer.
C35	15 μF variable, B.F.O. pitch.
C36, 52	300 μF .
C39	.5 μF .
C40	.2 μF .
C41	.02 μF .
C43	.05 μF .
C45	.002 μF .
C47	4 μF 50 v.w.
C48	See Coil Data.
C49	18 μF main tuning.
C53	8 μF 450 v.w.
C54, 55	16 μF 450 v.w.
SW1	DPST mains on/off.
SW2	SPST standby.
SW3	SPST A.V.C. on/off.

SW4	DPST B.F.O. on/off.
RFC1	Short wave R.F. choke.
RFC2	VHF R.F. choke.
T1, 2, 3, 4	Miniature I.F. transformers, 1,600 kc/s. Loudspeaker transformer.
T5	Mains transformer (Woden), 425-0-425 150 mA. 5 V. 3 A., 6.3 V. 4 A.
T6	3 in. moving coil speaker.
L.S.	0-1 mA. moving coil. See Coil Data.
M	Half of 1,600 kc/s. I.F. transformer.
L9	Smoother choke (Woden) 12 H. 150 mas.
L10	B.F.O. coil (Wearite "P" type superhet oscillator).
V1, 2	6AC7/1852.
V3, 6	6SG7.
V7	6SQ7.
V8	6H6.
V9	6SJ7.
V10	6F6.
V11	6I5.
V12	S-130.
V13	5U4G.

In the above diagram condenser C39 should be shown in the lead running from the plate of the left-hand section of V8 to the cathode of V7

ratio high and thus provide maximum gain. This also means that the tuning range is considerably wider than that of the oscillator with the result that the value of the coil inductance is not particularly critical. Small air-spaced trimmers are mounted in each stage to compensate for the variations in stray capacity, and once these have been adjusted for one band, they should need no further adjustment. The use of separate trimmers on each coil has not been found to be necessary. On the higher frequency bands, the signal circuit tuning is not razor sharp but on the other hand the circuits can be accurately peaked when needed for a weak signal.

I.F. Amplifier

This consists of three stages at 1,600 kc/s. This frequency was chosen in order further to diminish the possibility of image interference and to help reduce any tendency to oscillator pulling. Three stages are used in order to provide sufficient gain, the gain per stage at this frequency being considerably less than that obtainable at 450-465 kc/s. The first two valves, V4 and V5, are variable- μ types which are A.V.C.-controlled. In order to get maximum effect from the A.V.C. the screens are supplied from the 130 volt stabilised line. In addition the gain of V5 may also be controlled by the R.F. gain control, R42. The last stage, V6, is run at full gain the whole time so as to give amplified A.V.C. and prevent modulation rise which is a form of distortion present if the last I.F. valve is connected to the A.V.C. line.

Variations in the screen current taken by V4 when its gain is varied by A.V.C. are used to activate the signal strength meter, M, which is connected in a bridge circuit so that an increase in signal strength causes an increase in meter deflection. The values of the resistors in the bridge circuit are rather critical, due to the small voltage drop and if a pre-set wire-wound resistor of 5,000 ohms can be obtained it would permit of more adjustment than the present value of R20.

The second stage, V5, is fed from the first through the crystal filter which remains in circuit the whole time as the wide selectivity position is fully adequate for all speech. At 1,600 kc/s. the phasing condenser, C24, must be of the differential phasing type so constructed that the capacity between the stators is completely independent of the position of the rotor.

If this is not so, rotation will vary the tuning of T2 in the same way as is done by the selectivity control, C23, and with the same effect. As difficulty was experienced in obtaining a suitable component a differential split-stator condenser was pruned so that the rotor came completely out of mesh with one set of stators before beginning to engage with the others, in this way there is no capacity from one set of stators to the other by way of the rotor. The crystal is a high impedance type made by Q.C.C., Ltd., which does away with the necessity of step-down and step-up I.F. transformers. The coupling condenser, C25, is satisfactory in the present receiver, but in other layouts it might profitably be replaced by a 30 μ F trimmer so that it could be adjusted to give optimum results from the filter.

It will be seen that the bias resistor, R22, of V5 is not by-passed, this has been done to reduce the Miller effect which might otherwise have varied the input capacity and hence the tuning of L8 when the bias is changed.

2nd Detector, B.F.O., A.V.C. and A.N.L.

These functions are performed by V7 and V8. V7 has one diode as second detector, one for A.V.C. and the triode section as beat frequency oscillator. V8 is used as a two stage noise limiter.

By mounting the B.F.O. components in a separate shielded compartment and by making connections to it from the valve base by screened wire, it has been possible to prevent the output from being picked up by the I.F. amplifier. The coupling between the B.F.O. and signal diode is chiefly by stray capacities but as these are rather small it is necessary to augment them by taking an insulated lead from the signal diode and wrapping a turn or two around the triode grid pin. Due to the screening, the small voltage introduced and the A.V.C. connection to the primary of T4, the A.V.C. may be used with the B.F.O. on with a barely perceptible loss of sensitivity. So that the noise level does not rise between C.W. characters the normally short A.V.C. time constant is automatically lengthened by bringing an additional decoupling condenser, C40, into circuit.

The second detector diode is connected in a noise limiting circuit of the Dickert type employing one-half of V8 to shunt the load resistor on noise peaks. The other half of V8 acts as a series limiter which is

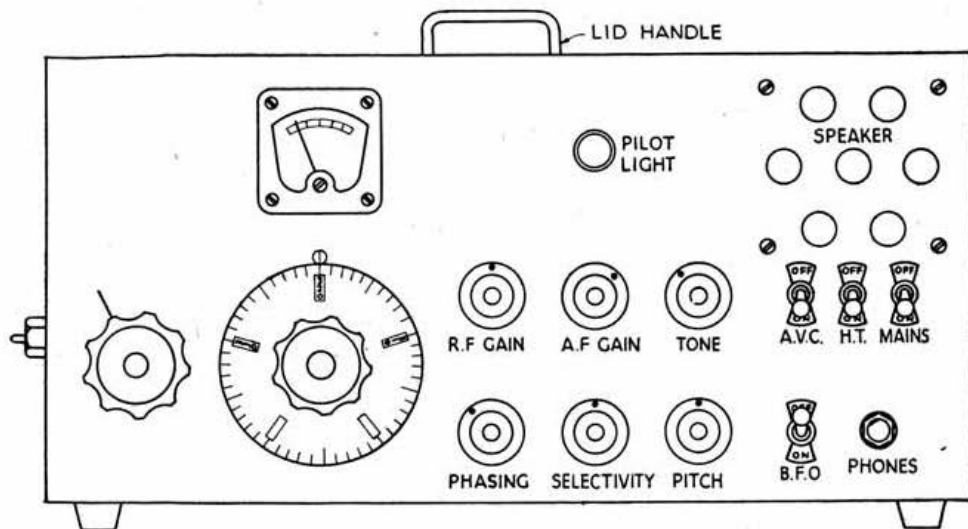


Fig. 3.

The front panel of the receiver. The two knobs at left, are signal circuits tuning and main tuning.

non-conducting on those noise peaks which have not been completely suppressed. This device is very simple and quite effective. There is no provision for switching the noise limiter out of circuit as it does not cause any noticeable distortion and the losses across it are easily taken care of by the A.F. amplifier. However, for those who prefer it, switching may be provided by replacing R27 by two 50,000 ohm resistors in series and fitting a SPDT switch to disconnect the cathodes from the junction of C41, C42 and R31 and connecting them to the mid-point of the new R27.

A.F. Stages

The A.F. amplifier, V9 and V10, is orthodox except possibly for the omission of a by-pass condenser across R33. This was omitted in order to reduce the bass response, but is a matter of taste. The output stage is fed with H.T. at 315 volts from the junction of L9 and R41 to reduce the load across R41 and the filament supply is taken from the point F1.

Power Supply

The power supply consists of a full wave rectifier, V13, the output of which is smoothed by a choke input filter, L9 C55, and a resistance-capacity filter, R41 C54. This arrangement was used as the voltage has to be reduced to about 250 (actually 260) for the H.T. supply. The output is completely free from hum even when the receiver is running at full gain. It will probably be noticed that C55 is being run very near to its maximum rating and although it has given no trouble a condenser having a high voltage rating would have been used if it had been available at the time.

V12 is used to stabilise a supply at 130 volts for the R.F. oscillator and several other stages. The dropping resistor, R40, has a somewhat lower value

than would normally be used, but as the mains voltage is liable to drop down to 200 from 230 at peak periods it is necessary to make allowances so that there is always at least 10 mA. passing through V12. When the mains do again settle down to a steady voltage R40 will be increased to 3,000 ohms. R40 and R41 should have a generous rating and adequate ventilation to keep them cool and they should be mounted well clear of other components which might be adversely affected by their heat.

An octal base is mounted at the back of the chassis to which all the connections A1, A2, B1, B2, F1, F2, G1, G2 are taken, one to each pin. For normal mains use a shorting plug is used to connect the power supply outputs to the correct loads, but if it is ever necessary to run the receiver from an external supply or batteries or if ever power is wanted for running an external item of equipment, such as a converter, the necessary connections are easily and neatly made. It will be seen that if the unit is powered from an external source, the output stage and voltage stabiliser are automatically disconnected.

Construction

The cabinet, chassis and shielding are all made from 16 S.W.G. sheet aluminium held together by angle brass or square brass rod, as can be seen in Fig. 1. The bolts used are mostly 6BA, whilst the use of nuts has been reduced to a minimum by tapping the brass—this makes a neater job and is far easier to assemble.

The boxes housing the R.F. stages measure $4\frac{1}{2}$ in. by $2\frac{3}{4}$ in. by 8 in. high, with their internal chassis 4 in. high. The sides are held together by $\frac{1}{4}$ in. square brass rod below the chassis and $\frac{1}{2}$ in. by $\frac{1}{4}$ in. angle brass above. Both ends of the brass rod are drilled and tapped, one end being used to hold the chassis while the other enables the whole box to be bolted down to a base plate. This base plate, which

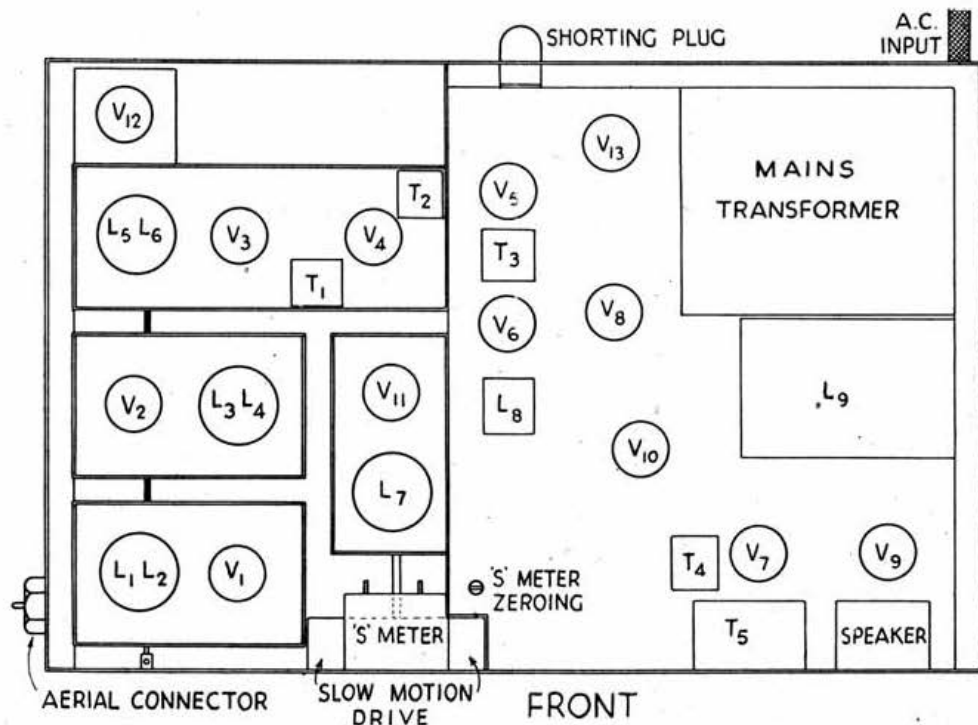


Fig 4.

Sketch showing layout of main components. The speaker transformer, T5, is mounted on the front panel beside the speaker. For sake of clarity the controls on the front panel have been omitted.

also carries the other boxes, measures 11½ in. by 7 in. and is strengthened underneath by two 11 in. lengths of ½ in. angle brass running from back to front, while it is secured to the front panel by ½ in. by ½ in. angle brass. The spacing between the boxes is ½ in., and the R.F. connections between them are made by short lengths of coaxial cable. The tuning condensers, C2, C4, C6, are all mounted on the front panels of their boxes and are ganged together by flexible couplers fixed to the rear shafts of C2 and C4 and inside their own boxes.

The mixer and first I.F. stage are mounted together in a box of the same general pattern as the R.F. stages but 7 in. long. The box housing the R.F. oscillator does not extend above the chassis and measures 2½ in. by 4½ in. by 4 in. high. This box originally had a top half but had to be removed to increase ventilation and stability. The brass rod which can be seen in Fig. 1 running above the chassis from back to front and to which the top of the mixer box is attached is used to give additional bracing to the back panel.

The main chassis is 11½ in. by 9½ in. long and 2½ in. deep and the layout of the components can be seen in Fig. 4, while there are two screened compartments underneath—for the B.F.O. and the crystal filter. The latter is mounted just behind its control knobs and this means that the R.F. leads to and from it have to be made in screened wire. The filter could have been mounted at the back of the chassis with shorter leads but this would have meant long control shafts. In this connection it should be noted that the rotor of the phasing condenser, C24, is not at chassis potential so that it is necessary to mount the condenser on an insulating bracket and to drive it through an insulating coupling. The filter input transformer, T2, is a Wearite miniature type from which the condenser has been removed.

The smoothing condensers are mounted horizontally on a small bracket below the mains transformer.

When the receiver was first operated the temperature inside the cabinet soon became excessive, and as a result it was necessary to drill ventilation holes. Although over 950 quarter-inch holes were put in the cabinet it is not suggested that this number is necessary, but on the other hand the better the ventilation the better the stability.

The values of the components given are those actually used but the majority are not critical. Regarding the valves, American single ended metal types were used, partly because they need shorter grid leads, provide greater shielding and give a neater appearance than most of the glass

types, but chiefly because they were already on hand. However, any other comparable types, for example, the EF50, or better still, the EF54, for V1, V2 and V3 could be used with any necessary changes in screen and cathode resistors.

Conclusion

Although no measurements of the performance have been made the receiver is excellent, especially on 10 and 20 metres where the low noise level, high sensitivity and complete absence of second channel interference give the greatest benefit. However, being a compromise, the receiver is not perfect on the low frequency bands as it has too much gain and if continued operation was ever contemplated on these bands 6SK7's would be used instead of the 6AC7's as R.F. amplifiers. Like all items of home-built equipment, however, the design is liable to be modified now and then, not because of any inherent faults but rather because having built it the builder knows what is what and is not afraid to try out new circuits as he might be if he had said goodbye to the best part of £100 in exchange for a commercially built job. The possible modifications at present contemplated are the conversion to audio modulated detection of C.W. in place of the B.F.O. (D. A. Griffin and L. C. Waller, QST July, August, 1946), the provision of a more elaborate tone control and, later, the installation of a band-pass crystal filter.

Coil Data

Band	5	10	20	40	80	160 metres
L2, L4, L6	1½	3½	8	23	37	1½ turns
L1, L3, L5	1½	3	4½	9	9	10 turns
Spacing						
L1, L2,						
etc.	close	1 turn	1 turn	4"	4"	4"
R1	short	short	200	500	700	1,500 ohms.
L7	1½	2	3½	24		24 turns
Tapped						
(from						
bottom)	½	½	1½	9		8 turns
C48	—	70	200	50		60 µF
Osc. range	Gen. 26-4	12-4		5-1		3-35
Coverage	29-1	12-8		5-7		3-65 Mc/s.

All coils are wound on 1½ in. six-pin formers, plain for 5, 80 and 160 metres, ribbed at 16 t.p.i. for the others. L2, L4, L6 are wound at 16 t.p.i. except for 80 metres being 30 S.W.G. close wound and 160 metres being 34 S.W.G. close wound. The 10 metre coils allow coverage of the 11 metre band by tuning the oscillator on the low side for 10 metres and on the high frequency side for 11 metres. The same oscillator coil covers both 40 and 80 metres. L7 is wound at 16 t.p.i. on 5, 10 and 40 metres, spaced 1 turn on 20 and 24 S.W.G. close wound on 160 metres.

EDITORIAL (Continued from page 129)

for "sufferers" to carry out some practical experiments. The results of their labours will be studied with more than passing interest by us all.

In an early issue we shall publish an article on the suppression of interference to television sets caused by amateur transmitters. That problem, as we wrote in a recent issue, is assuming some importance but there is an aspect of it which calls for comment. Frequently we hear of amateurs who have been accused of causing interference yet are unable to make a cure because the complainant refuses to have his set "tampered with."

This attitude of mind, which applies equally to certain people who complain of interference to ordinary broadcasting, cannot be tolerated. Any amateur who falls a victim to this form of awkwardness should advise the G.P.O. and ask them to investigate the complaint. We have yet to hear of an amateur who has refused to co-operate with a neighbour when he is proved to be causing interference,

but we often wonder what the same neighbour would say—or do—if he was asked to refrain from using his electric razor or stop his wife using her vacuum sweeper because the noise is spoiling a choice DX contact for the radio "ham" next door.

Interference, whether it be due to electrical machinery, motor cars, or amateur transmitters, will never be overcome unless a full measure of co-operation exists between those who make the noise and those who are its victims. The R.I.C. are making a grand gesture. Let us back them up to the hilt.

J. C.

Trans Jordan

As a number of recent claims for B.E.R.T.A. and W.B.E. certificates have included cards from Trans Jordan the Society has approached the Colonial Office for a ruling as to the status of this country. The Colonial Office states: "Trans Jordan became an independent Kingdom in 1945."

In view of this fact contacts with stations in that country cannot be accepted for R.S.G.B. certificates.

THE TWO-METRE BAND

By W. H. Allen, M.B.E. (G2UJ)

BY the conditions of the Treaty signed at the International Tele-communications Conference in Atlantic City, amateurs in this country may be allocated frequencies between 144 and 146 Mc/s. when the provisions of the Treaty are applied here, thereby giving us a two-metre band for the first time.

The Americans have already had two years' experience of this territory, for it was on November 15, 1945, that their VHF allocation in the neighbourhood of 112 Mc/s. was replaced by one between 144 and 148 Mc/s., and in view of our possible occupation of what, to many people, is a totally unexplored part of the spectrum, it will be interesting to see what has been done to date in the U.S.A. Apart from the interest attaching to the achievements of American amateurs it will be prudent to examine the trend of design which has been evolved by them, with a view to saving needless repetition of their mistakes, and so minimise the time it will take us to get where our American friends are to-day.

The Progress of the American 144 Mc/s. Record.

100 miles: W6OIN/6—W6UID, Jan. 10th, 1946.
200 miles: W3HWN—W2BRV, May 15th, 1946.
310 miles: W3HWN—W1KOE, July 5th, 1946.
390 miles: W3HWN—W1MNF, Sept. 29th, 1946.
575 miles: W3EKK/1—W3KUX, Aug. 7th, 1947.
660 miles: W3GV—W0WGZ, Sept. 18th, 1947.

As a matter of interest, the record for the 112 Mc/s. band was held by W1BJE and W3FYB with a two-way contact over 355 miles on Sept. 6th, 1945.

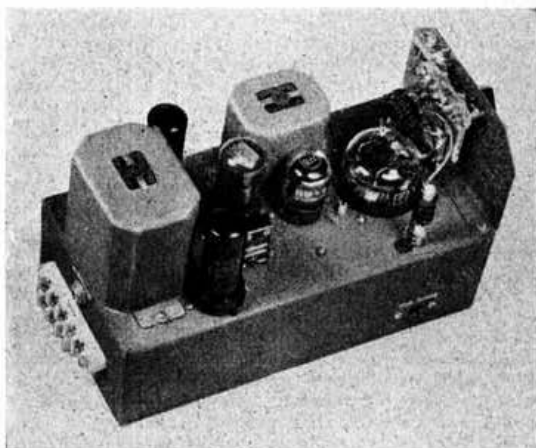
The American Position

Reading between the lines in the American amateur press, it was not difficult to see that the move from 112 Mc/s. was not viewed with any particular enthusiasm at the outset by the VHF fraternity generally. Amateurs are a resilient lot, however, and with the knowledge of the historical "200 metres and below" days in mind they soon set about the possibilities of other than purely local contacts on two metres, much as an earlier generation of amateurs had tackled the problem of DX on 100 metres before them.

First efforts, mostly with rather simple gear, produced more or less the sort of results one would expect; ranges of optical distance plus a little more, due to refraction, scatter, etc., and not differing to any marked extent from local working on five metres.

Much of the apparatus used had been hurriedly improvised from that used on 112 Mc/s., and in most cases modulated oscillators were used with super-regenerative receivers. It was soon found that the four megacycle allocation of this band was insufficient for this somewhat antiquated technique when more than half a dozen or so stations were operating within range of one another. Amateurs were urged to use a better design of gear, examples of which, both receivers and transmitters, appeared in the pages of *QST* and other periodicals.

Foremost in this drive for stabilised transmitters and superhet. receivers was the VHF Editor of



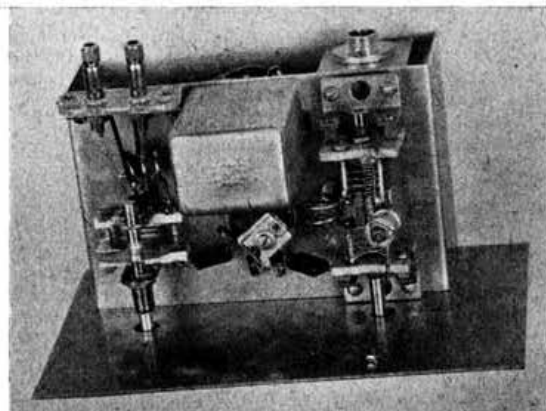
Photo, Courtesy QST.

A 144 Mc/s. crystal controlled mobile transmitter and modulator.

QST, Mr. E. P. Tilton, W1HDQ, who right from the start advocated strongly the general employment of crystal control or at least MOPA transmitters in place of inefficient single-stage gear, and superhet. technique for receivers. Credit must be given W1HDQ for his foresight and determination in this respect. From the evidence it would not be too much to say that from his efforts in the columns of *QST* has resulted as large an improvement in the all-round efficiency of two-metre working in a few months as would have required a much longer period if left to natural development.

Transmitters and Receivers

As previously remarked, many amateurs employed modulated oscillators for the transmitter, although to be fair, it must be recorded that here and there was to be found apparatus of a type well up to the most modern standards. With these transmitters went their companions, the super-regen. receivers whose broad selectivity curve enabled the often violent frequency modulation to be deciphered, and



Photo, Courtesy QST.

An example of modern 2-metre equipment: a converter using a single type 7F8 valve.

thus the vicious circle was complete. The unstabilised transmitters, using 'phone or MCW, could only be received on the unselective receivers, while the employment of a selective superhet. capable of useful range on CW, was useless in the face of the inevitable unstable FM produced by the average transmitter.

Several times we read of tests which establish the undoubted superiority of the communications type of superhet. receiver, with gains running around 5 to 6db. over the best super regen. with RF stage, and workers were urged to use CW from crystal controlled transmitters to increase their range and make more economical use of their input power.

Aerials

Much attention was given to beams of various degrees of complexity, and as would be expected a move in this direction paid excellent dividends as witness the progress of the DX record and other, although less spectacular, achievements related elsewhere in this article.

As all workers on five-metres will agree, beams are not only the answer for out-of-the-ordinary DX, but even more important for ordinary day-to-day contacts over other than purely local distances, and it is hardly necessary to point out that if a beam can be erected for five-metre working, then the same size and weight of structure will, on two-metres, contain an array of far greater gain and directivity.

Propagation on Two-Metres

Normal range for transmission and reception is naturally, to a large extent, a function of the location, although details have been published of really outstanding performances being put up by stations which by all ordinary standards were not well situated for VHF work. In all such cases the use of CW and better-than-average aerial systems and receivers proved to be the determining factor in success.

No evidence of sporadic-E propagation of two-metre waves has so far been recorded, and there is reason to believe that the upper frequency limit for such reflections is in the region of 90 Mc/s.

Temperature inversion, prevalent in Spring and Summer, and "atmospheric ducting" can account for the majority of the long-distance records so far set up, and in this respect the present record of 660 miles is a wonderful achievement, and compares favourably with the results obtained on five-metres during the past Summer, when contacts were established with stations in the more remote parts of Europe from the British Isles.

Auroral reflection, when all signals from other than comparatively short distances appear to emanate from a Northerly direction, accompanied by a rapid flutter, has so far not been observed in America. This phenomenon cannot be entirely ruled out as a possibility on this higher frequency, as after all, its presence was not noted here until the use of CW, superhets, and beams became widespread on five-metres.

An interesting point when dealing with the topic of propagation, is that conditions on two-metres appear to be less dependent upon those appertaining in the 25-40 Mc/s. range than is the case on five, and it would appear that here is an opportunity for two-metre enthusiasts to discover a method whereby the DX possibilities of the band may be related to propagational conditions on other frequencies.

However, as recorded in *QST* for October, 1947, there are times when exceptional conditions on 50 Mc/s. have their counterpart on 144 Mc/s. as witness VE1QZ's achievement in working W108Q over a distance of 520 miles in the evening of August 27

last, following the all-time record for 50 Mc/s. set up by W7ACS/KH6 (Pearl Harbour) over the 5,350 miles path to VK5KL (Darwin), on the 25th of the month, and the two-way contact between XE1KE and LU6DO on 50 Mc/s. on the same day.

Forecast for Britain

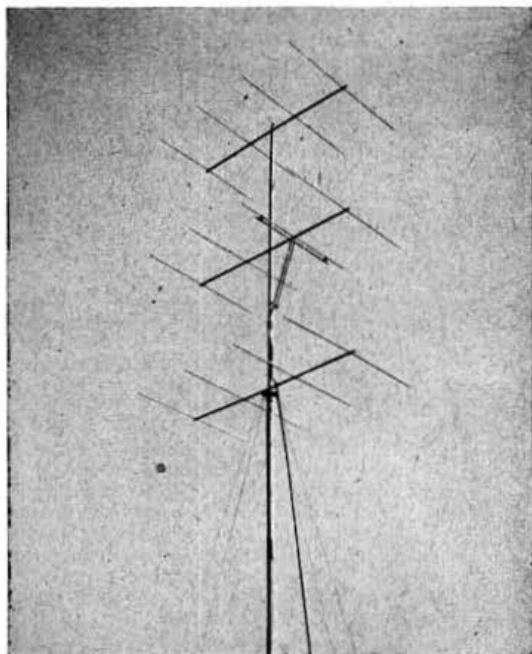
There is no definite information obtainable at the time of writing regarding the date when the 144 Mc/s. band will be opened up to the British amateur. It is unlikely, however, to be singled out for special treatment, and in that event will probably come into force with certain other provisions of the Treaty in January, 1949.

This assumption leaves us with a fair amount of time in which to plan the uses to which the new band may be put, and a few thoughts on this subject may not be out of place here.

In the absence of any official ruling on the question of power it is not easy to attempt even tentative designs, but it is reasonable to suppose that the limit will conform to one or other of those in force at the present time for other frequencies, i.e. 25 or 150 watts. If we consider the former will be the official view, then a transmitter designed for that input should make an admirable driver stage for a high power final should our view have proved too pessimistic.

Sheer power has not up to the present time accounted for the outstanding performances set up by American amateurs, and time and again one reads the same story; 15 to 25 watts, and a high-gain beam.

Obviously beam aerials will be used to a very large extent and some sort of agreement ought to be reached in advance on the question which was so hotly debated before the war with reference to the five-metre band—horizontal versus vertical polarisation. Both have their adherents across the Atlantic and many instances have been recorded of a change in the plane of polarisation over a non-visual path.



Photo, Courtesy QST.

A record breaking aerial: the 12-element array at W3GV, the holder of the American 660 mile 144 Mc/s. record.

Where aerial arrays consisting of a large number of elements have to be considered, it is sometimes simpler from the constructional standpoint when vertical polarisation is adopted, but it is thought that many of our members having had war-time experience of aerial design in connection with radar and VHF communication systems, may be able to offer valuable advice on this question. To sum up, the points at issue are:—

- (1) Does vertical show any marked advantages in a propagational sense over horizontal polarisation or *vice versa*?
- (2) Is it thought that the constructional advantages of one outweigh anything that might be gained from the other?

What is even more important, in many respects, than the question of power, or the type of waves radiated, is the actual policy we adopt for the band, and it is to be hoped that at all costs the near-chaos which was engulfing two-metres in centres of high activity in America during the first year or so of operation should be avoided here. Reference has been made in earlier paragraphs to the "vicious circle" effect produced by the employment of the super-regenerative receiver and the modulated oscillator transmitter. The super-regen. is a remarkable circuit, and during its long life has had such a multi-

tude of uses that a very interesting paper should result if these were collected together, but it has, inherently, an extremely broad acceptance band, it can cause interference, and it is incapable, in an easily handled form, of receiving CW.

Now it is upon CW communication that much of the preliminary work on two-metres will depend, for no matter how hardened a 'phone man one may be, there is no denying the fact that with a given transmitter, aerial system and receiver, reliable CW may be exchanged under less favourable conditions than with telephony. The transmitter should, therefore, be either crystal controlled, through a frequency multiplying chain, or employ a really stable master oscillator with the necessary buffer stages to ensure that its stability is maintained under load conditions.

The receiver should, as previously indicated, be a superheterodyne, either built specially for the band, or, as the majority of amateurs already possess a receiver covering the lower frequencies, in the form of a converter to be fed into such receiver.

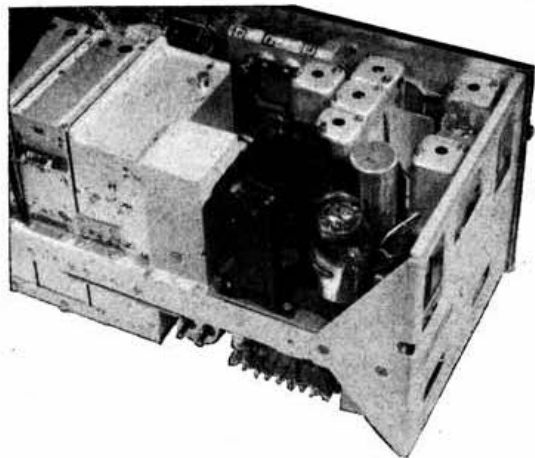
Conclusion

The author hopes that this article will inspire some correspondence regarding the proposed two-metre band, and looks forward to having the views of members on the subject.

MORE ABOUT THE B.C. 348

By G. L. BENBOW

THE photograph reproduced herein shows the rear view of a modified B.C. 348 R. communications receiver. The mains transformer was specially wound, and designed to have the smallest possible physical dimensions consistent with efficient operation. The L.T. winding supplies 28 volts at 1 ampere and so avoids the necessity for rewiring the heaters of the valves in parallel. By the use of a small choke and a $8+16\mu\text{F}$ smoothing condenser, it is just possible to fit the complete power supply into the space originally occupied by the rotary transformer.



Rear view of B.C. 348, showing location of power supply.

The eight way plug at the rear has been replaced by a 2-pin mains input plug, and the centre position of the AVC-off-MVC switch is used as the mains on-off switch.

The author would like to correct two small errors in his previous article on the B.C. 348 (November, 1947 issue). The model referred to as the "N" should have read "R" whilst in the paragraph headed

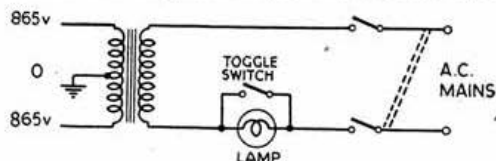
"Valve Substitutes," it should have been stated that the 6J7 mixer for the R and M models may be replaced by a 6K7, and in the third I.F. stage the 6B8 may be replaced by a 6K7 plus two type WX6 Westectors for second detection and A.V.C.

Simple 'Reduced Power' Control

By J. N. ROE (G2VV)

THE November Editorial drew attention to the desirability of "some form of switched power reduction" as an essential feature in the design and operation of every amateur transmitter.

A simple, and quite effective, method of variable power control has been in use at the writer's station for the past two years and the basic idea is shown in the accompanying diagram. An ordinary 230v gas-filled electric lamp is inserted in series with the AC



supply to the high voltage transformer. The wattage rating of the lamp determines the amount of power reduction. A transformer, having a secondary voltage of 865-0-865 and with a 100 watt lamp in series with the primary feed gives an output of about 300 volts. A toggle switch wired across the lamp enables instantaneous control of low, or full, power. Two lamps, with individual switching can be employed as a "three position" power control.

While appreciating that this idea may not be quite ideal in certain aspects it has proved quite satisfactory for tuning-up on low power, and contacts have been carried out in the low power position without detrimental effects on the signals.

**WATCH THE
PLATE METER!**

The Station Behind the Call

PA0TOM



SINCE the war British amateurs have operated with a variety of prefixes: PA0TOM is the current call-sign of Captain T. O. Cadell—G6ND and formerly VU2EB and VK3EE—now located in The Hague, Netherlands. That the present station has been designed along neat simple lines with ease and comfort of operation as the primary objectives may be gathered from the accompanying photograph.

Transmitter

The four-tier rack contains two power supplies for the transmitter (700 and 1400 volts), a modulator and power supply, a three stage transmitter, and an aerial matching unit giving high or low impedance output.

A switch in the 6L6 CO stage allows any one of four crystals to be selected at will, with a tapped oscillator coil to facilitate band-switching. An 807 buffer stage, keyed in the cathode, drives a TZ40 final up to the licensed power of 50 watts on the LF bands and 100 watts on 28 Mc/s.

Power Control

By employing a "Variac" in the primary of the main H.T. transformer the power can be varied from zero upwards. Use of reduced power for local contacts has proved very successful and PA0TOM is strongly biased against stations using high inputs when working the amateur next door.

A thermal delay switch, also incorporated in the main H.T., prevents the full voltage from being switched on before the heaters have had time to warm up.

Panoramic Reception

Above the receiver—an SX17—may be seen a PCA-2T-200, which is an adaptor for panoramic reception, permitting band activity to be viewed at a glance on the screen of a cathode ray tube.

Aerials

Two yacht masts, series mounted, give a 45 foot high support to one end of a 7 Mc/s. half-wave dipole and to the two legs of a 138 foot Vee beam placed to give maximum radiation at 50° and 230° north.

Operation is mostly on the key, and normal frequencies are 7021 and 14042 kc/s.

AC4YN

Mr. Reg. Fox, AC4YN, who is operating the only amateur station as far as is known in Zone 23, asks us to mention that his address is now *Indian Mission, Lhasa Gyantse P.O., Tibet (Via Calcutta)*.

Mr. Fox has acquired two SCR522 (1143) V.H.F. equipments and is urgently in need of the necessary connecting harness, junction boxes and tuning sets. He will be glad to hear from any member who can provide him with these items, together with a complete set of instructions and diagrams.

Six Metre Permits

Just before this issue closed for press, the G.P.O. advised the Society that its request for the extension of Six Metre facilities had been granted. This means that every U.K. amateur may now obtain a Six Metre licence provided he states in his application that the facility is required for the purpose of conducting technical investigations. The permits will remain valid until April 30, 1948.

It had been anticipated that the G.P.O. would accept from the Society a preliminary list of names, addresses and call signs of those requiring the facility which had been obtained from the R.R.'s and C.R.'s in accordance with the terms of a circular issued on December 17 last, but they were unable to agree to this arrangement. In view of this decision all members who wish to obtain the facility must make *direct application* to the Engineer-in-Chief, Radio Branch, W5/5, Brent Buildings, North Circular Road, London, N.W.5.

The terms and conditions governing the issue of these permits are identical with those published in the November, 1947 issue of the BULLETIN (page 88). Messages sent on Six Metres must be in connection with technical investigations and the input power must be limited to 25 watts. The Society is endeavouring to obtain the removal of the restriction which limits the hours of operation of stations located within a radius of 50 miles of London.

The 42 amateurs who were granted permission last November to operate on Six Metres have had their permits extended.

The G.P.O. will make a charge of 10s. for each permit issued in order to cover their expenses, and this fee should be sent with the application.

Radio Club of Uruguay

Dr. Fernando J. Riet, CX4CT, of Montevideo, Uruguay, recently called at H.Q. and presented the Society with the club pennant of the R.C.U. Dr. Riet has contacted many British stations on 28 Mc/s. telephony and hopes to be able to meet a number of them in person when he returns to this country during February. He is serving on an official Urugaylan Delegation visiting Europe.

MICROWAVE TECHNIQUE

NOW ON SALE PRICE 2/3 Post Free
FULLY ILLUSTRATED 68 PAGES

NATIONAL FIELD DAY, 1948

WILL BE LOW POWER DRY BATTERY EVENT

It seems most probable that petrol rationing will still be in force next summer, and as a consequence the rules have been somewhat modified in an endeavour to avoid the transport of bulky apparatus. The maximum power has been reduced to five watts on all bands. The problem of heavy large-capacity accumulators or other bulky sources of power supply has been overcome by making the use of dry batteries for H.T. and L.T. supply compulsory. This will necessitate the judicious selection of valves with low heater current for the transmitter and receivers. The combined ingenuity of Town or Area groups should be used to produce efficient stations, complete with all auxiliary gear, which are easily portable when the day arrives.

Empire and Foreign Portable Stations

As an inducement to co-operation from portable stations within the Empire and overseas, an award is again offered to the British Empire or foreign station giving the most points to British entrants.

Rules

1. The event will commence at 5 p.m., Saturday, June 5, 1948 and conclude at 5 p.m., Sunday, June 6, 1948.
2. The event will be confined to properly constituted R.S.G.B. Town or Area Groups within the British Isles, which, for the purpose of the event, constitute the prefix zones G, GC, GD, GI, GM and GW.
3. Each Town or Area Group taking part will be permitted to place two stations ("A" and "B") into operation. Station "A" will operate on the 1.75 Mc/s. and 3.5 Mc/s. bands and Station "B" will operate on the 7 Mc/s. and 14 Mc/s. bands. Both stations may operate from the same site or from different sites, provided they are located within the agreed limits of the area covered by their County Representative. It will be permissible for two or more towns or areas within a single county to amalgamate for the purpose of this event.
4. Equipment at any "A" or "B" station must not exceed one transmitter and two receivers. (If desired one receiver may be used for searching one wave-band while the transmitter is operating on the other band.)
5. All transmissions must be signed off with the band in use; the numerals 1, 3, 7 and 14 signifying the four bands (e.g. "14R7K").
6. Each station must be licensed to use a different call sign. T.R.'s are responsible for forwarding to Headquarters applications for N.F.D. permits. Such applications should be set out as follows:—

NATIONAL FIELD DAY, 1948

On behalf of the members in _____ (Town or Area)
I submit this application for permission to operate portable stations
for the duration of the above event, as follows:—
"A" Station Call sign _____ /P Licensee _____
Site _____
"B" Station Call sign _____ /P Licensee _____
Site _____
(If applicable). I desire to combine with _____
(Town or Area) for the purpose of scoring.
Signed _____ (T.R. or A.R.)
Call Sign _____ Address _____

The above application, which is necessary to obtain the permission of the G.P.O., will also be regarded as an entry for the event. Permission is normally sent to the licensee direct by the G.P.O.

Applications, duly signed, must be in the hands of the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, W.C.1, not later than April 12, 1948. A list of portable stations and their locations will be published in the May issue of the *Bulletin*.

7. Power—

- (a) All power supplied to receivers and transmitters must be derived from dry batteries.
 - (b) The total heater or filament consumption of the transmitter or receivers in use must not exceed 6 watts.
 - (c) The total D.C. power input to the anode circuit of the valve or valves energising the aerial shall not exceed 5 watts.
8. The height of the aerial at any point must not exceed 45 feet above ground level, nor may the point of suspension exceed 45 feet from ground level.
9. Stations must be operated from tents.
10. No apparatus may be erected on the site prior to 12 noon on June 5, 1948. This rule includes aerial and aerial fittings as well as tented accommodation.
11. The event is restricted to the use of C.W. only. Any station receiving consistent tone reports lower than T8 will automatically be disqualified.
12. Points will be scored for established contacts on the following basis:

A.—Between all Town or Area Portable Stations and Fixed Stations:—

- | | |
|--|----------|
| (a) Outside the Town or Area (or Town or Area Group), but within the British Isles | 1 point |
| (b) In the rest of Europe (including Eire) | 2 points |
| (c) Outside Europe | 3 points |
| (d) In the British Empire | 6 points |

B.—Between G, GC, GD and GW portable stations on the one hand, and:

- | | |
|--|-----------|
| (a) Portable stations outside their Town or Area (or Town or Area Group), but within the prefix zones G, GC, GD and GW | 3 points |
| (b) Portable stations in the prefix zones GI and GM | 4 points |
| (c) Portable stations in Europe (including Eire) | 4 points |
| (d) Portable stations outside Europe | 6 points |
| (e) Portable stations in the British Empire | 12 points |

C.—Between GI and GM portable stations on the one hand, and:

- | | |
|---|-----------|
| (a) Portable stations outside their Town or Area (or Town or Area Group), but within the prefix zones GI and GM | 3 points |
| (b) Portable stations outside the prefix zones GI and GM, but within the British Isles and Eire | 4 points |
| (c) Portable stations in Europe | 5 points |
| (d) Portable stations outside Europe | 6 points |
| (e) Portable stations in the British Empire | 12 points |

13. In addition to the National Field Day Trophy and miniature replica which will be awarded to the Town or Area Group obtaining the highest combined score, miniature replicas will be awarded to the Town or Area Groups with the leading "A" and "B" stations. Should the winning Town or Area Group also lead with the highest "A" or "B" station score, it will only be eligible for one replica, the other would not then be awarded. A certificate will be awarded to the chief operator of the British Empire or foreign portable station contributing the largest number of points to stations taking part in the event.

14. An exchange of reports (RST) must be made before points can be claimed: proof of contact may be required.

15. Contacts with ships, or unlicensed stations located in countries where licences are obtainable, will not be permitted to count for points. The decision as to whether a station is to be classed as unlicensed will rest with the Council of the Society.

16. All entries must be submitted and signed by the T.R. or A.R. who will be solely responsible for the conduct of the event in his town or area.

17. The official entry form must be signed in full by the station operator at the time of each contact.

18. Entries must be made on the approved log sheets which will be issued to all competitors by Headquarters. Log sheets must reach the Hon. Secretary, R.S.G.B. Contests Committee, New Ruskin House, Little Russell Street, W.C.1, postmarked not later than Monday, June 21, 1948.

19. The N.F.D. Trophy will be held by the winning Town or Area Group for one year and will be handed to the T.R. or A.R. who will be held responsible for its custody during the year.

20. Operators of portable stations competing in the event must be holders of a G.P.O. Amateur Transmitting Licence and must be fully paid-up members of the Society.

21. The Council of the Society reserves the right to amend or alter these rules at any time prior to the commencement of the event and their decision will be final in all cases of dispute.

FIVE METRE FIELD DAY

SEPTEMBER 7TH, 1947

SUPPORT for this event was much the same as for the previous Five Metre Field Day held in July, although a number of the stations taking part were not participants in the previous event. Some 30 portable and 100 fixed stations were active.

Conditions were fair throughout the day with marked improvement in the afternoon. The rather inclement weather in some parts of the country did not damp the enthusiasm of those who took part, for it was apparent from the letters received that the event was thoroughly enjoyed. It would appear that the Rules met with general approval as no criticism on this account was received.

A letter sent by the Contests Committee to certain Continental Societies regarding the event brought a reply from OZ21Z who stated that he intended to operate a portable station (using the call sign OZ3EDR) in Jutland with rotatable beam and an input of 50 watts. No further news has come to hand from OZ21Z neither have any reports of the reception of his signals been received. A feature of the event was the number of stations located in the North and Midlands who reported consistently good reception of certain southern stations they were unable to raise.

Leading Stations

Heading the list of entrants is Mr. R. Joss (G2AJ) with a score of 339 points, but because he is a member of the Contests Committee he is not eligible for an award. G2AJ/P, located at Firle Beacon, Sussex, ably assisted by G6SB and G2AHP made 12 contacts over 100 miles—his best being with G5MQ of Liverpool. The transmitter consisted of a 6N7 CO/FD; 6V6 FD; RK34 push-push doubler and 832 P.A. modulated by a pair of 6L6's. The input was 23 watts obtained from generators and the aerial was a 3-element close spaced beam 25 feet high. A *Hallcrafters* 8.27 receiver was used.

Mr. J. Spragg operating under his portable callign G3APY/P, and located at Flagg village, Derbyshire, obtained 315 points and is, in effect, the winner of the event. Mr. Spragg is to be congratulated on pulling off the "double," as he also won the July event. Eleven stations were worked over 100 miles distant, including G3HW/P (206 miles). The crystal-controlled transmitter, as for the July event, consisted of 5 stages with 832 P.A. and a rotary converter for power supply. The aerial was a 3-element rotary beam 15 feet high. The receiver was a home-built battery superhet.

The runner-up, Mr. L. W. Dymond, G3HW/P, with 301 points operated from a site near Teignmouth with a 6L6 triode C.O., 807 quadrupler and 832 P.A. A 4-element close-spaced rotary beam was used and the receiver was an H.R.O. with converter. Of his 20 contacts, all but 3 were over 100 miles. His best contact was with G2HQ/P (210 miles).

Useful check logs were submitted by G5MR and BRS12875.

Scores

A list of entrants in order of merit follows:—

Psn.	Callign.	Points.	Situation.
*	G2AJ/P	339	4 miles S.E. of Lewes.
1	G3APY/P	315	Flagg, Derbyshire.
2	G3HW/P	301	2 miles N. of Teignmouth.
3	G4AP/P	257	5 miles S.E. of Swindon.
4	G5MA/P	246	1 mile S. of Storrington.
5	G6LX/P	219	4 miles E. of Caterham.
6	G4NT/P	211	2 miles N.E. of High Wycombe.
7	G3MY/P	211	10 miles S.W. of Sheffield.
8	G4OS/P	206	5 miles S.W. of Mold.
9	G3ABA/P	204	2 miles S. of Welford.
10	GW4LU/P	201	6 miles N.W. of Oswestry.
11	G2CKR/P	197	Malvern Hills.
12	G3PZ/P	187	3 miles S.E. of Cheltenham.
13	G6NB/P	168	7 miles E. of Aylesbury.
14	G5RP/P	165	4 miles W. of Wantage.
15	G2AK/P	163	Barr Beacon.
16	G5BM/P	161	3 miles N.E. of Cheltenham.
17	G2BJY/P	143	14 miles N.E. of W. Bromwich.
18	G2HO/P	140	Near Fox House, Derbyshire.
19	G2ATK/P	137	3 miles E. of Henley.
20	G5PI/P	134	3 miles S.E. of Cambridge.
21	G3CQ/P	128	3 miles N. of Romford.
22	G3BW/P	125	2 miles S.W. of Chatham.
23	G5JU/P	118	15 miles S.W. of Birmingham.
24	G8SK/P	105	3 miles N. of Cuffley.
25	G2BJW/P	96	2 miles S.W. of Chatham.
26	G3BY/P	74	3 miles E. of Ashton-u-Lyne.
27	G2WS/P	52	3 miles S. of East Grinstead.
28	G5QK/P	19	Rayleigh.

* Not eligible for award—Contests Committee member.

LOW POWER CONTEST, 1947

THE contest which took place in September last originated from a combination of ideas put forward by several members who suggested that a really low power contest should be arranged in conjunction with some form of inter-county event. In that respect it was new and novel. Although the number of actual entries was not great the long list of always-appreciated check logs seems to indicate that there were many who, because they did not make a high score, felt that it was not worth while making an official entry. The Contests Committee reiterate that logs are always much appreciated as they are used for checking purposes.

It was the unanimous opinion of all competitors that conditions on 3-5 Mc/s. were good, except during the mid-week period when sun-spot activity had a bad effect. However, as the contest was of an inter-G nature the logs did not show any exceptional results.

Several entrants wrote in caustic vein about telephony stations who used excessive power and indulged in long "rambling" transmissions. Others suggested that a little co-operation from the operators of those stations would have been welcome. Unfortunately means of advising them of the contest seemed difficult as few of them appear to be able to read anything—including Morse! Many competitors wrote in appreciation of the co-operation given by non-competing telephony and C. W. operators, especially those in remote counties who came on during the contest to "put their county on the map."

H.T. Supplies

The limitation of the H.T. supply to a single 120 volt standard dry battery caused a certain amount of comment both for and against. The arguments put forward can be summed up briefly as follows:—

In favour:—

The supply was of necessity limited to a pure D.C. source. There was an automatic imposition of a power/time handicap.

The dry battery supply encouraged the development of battery type transmitters.

The contest was made fair for all.

Against:—

Batteries are expensive.

Capacities can vary over fairly wide limits.

Batteries are wasteful.

All these points together with others that members may like to raise will be considered when drawing up the rules for any future event of the same type.

Equipment Used

It is perhaps interesting to note that the transmitters in use employed valves ranging from midgets to 807's. Several stations employed crystal control but it would appear that the best results were obtained by those who used two small valves in a V.F.O.—P.A. arrangement. The average power input was about ONE watt and very few stations exceeded 1.5 watts. Long aeriels were popular and many seem to be fortunate in being able to accommodate them. On the receiving side many competitors used a superheterodyne receiver, although it must be recorded that several home-built simple and multi-stage receivers were also in operation.

Check Logs

Check logs were received from G2CVA, DHV, DHU, 3AAR, ARG, ACC, G13CHX, 5HS, 6CT, UT, SPI, GW8WJ, as well as from the German receiving stations DE2098 and 6203 in Berlin, and DES200 in Oberhausen. The DE logs were very comprehensive. Logs submitted by G4QD and G8SMJ (which were posted late) were used for checking purposes.

The Leaders

Mr. T. F. Herdson, G6ZN, of 55 Gervase Road, Horbury, Nr. Wakefield, placed first with a score of 7,752 points, is to be congratulated on a very excellent performance. He worked 152 stations in 51 different counties with his Hartley transmitter, using a small two volts battery valve and an input of 1.5 watts. The aerial was 135 ft. end-fed, and the receiver a 6 valve single signal superhet with its own 66 ft. aerial.

An analysis of G6ZN's log answers several points commented upon by other contestants. His total operating time was only about 48 hours, made up by late evening operation on the first Saturday and an all day spell on the Sunday. During the evenings of Monday to Friday his operating hours were 4, 4, 3, 5 and 6 respectively, winding up on the last day with 8 hours activity. Four contacts were made in the early morning. An examination of his log shows that on only 26 occasions were his signals below R5 and on less than 16 occasions under S5.

Second place was taken by Mr. J. B. Roscoe, G4QK, of 39 Manor Way, South Croydon, Surrey, who scored 6,820 points by working 155 stations in 44 different counties. His transmitter used an 807 E.C.O., the grid of which was on 1.75 Mc/s.

(Continued on page 141)

Position	Call Sign	Points	Position	Call Sign	Points
1	G6ZN	7,752	19	G6UR	1,710
2	G4QK	6,820	20	G3ALC	1,650
3	G5JP	6,762	21	G6WR	1,575
4	G8JR	5,453	22	GM2CGY	1,440
5	G6JJ	5,084	23	G4AL	1,404
6	G5KT	4,141	24	G6GH	1,350
7	G2GN	3,744	25	G5DZ	1,300
8	G3BGG	3,686	26	G2SO	1,200
9	G5LP	3,686	27	G2ABK	1,175
10	G2WQ	3,649	28	G5HH	1,152
11	G5ZX	3,496	29	G2DRW	1,144
12	G3HS/A	3,420	30	G6MH	1,100
13	G6GM	3,382	31	G6LH	740
14	G3ATU	3,280	32	G6PR	580
15	G2JN/A	3,128	33	GM4GK	532
16	G4FN	2,822	34	G2AAU	459
17	G2VV	2,112	35	G3FN	252
18	G2CWY	2,108	36	G3YH	204
			*	G4QD	
			*	G8SMJ	

* Disqualified—Entries posted after closing date.

THE MONTH ON THE AIR

By A. O. MILNE (G2MI)*

Greetings

THE writer would like to take this opportunity of thanking all the many kind folk who sent him and the QSL Bureau Staff Christmas cards and letters of appreciation. To acknowledge personally all this volume of goodwill is such a big job that we are asking you to accept this as an expression of thanks from us all.

The CW End

We have been startled at the amount of correspondence which has resulted from our remarks about 'phone at the C.W. end of the bands. Whatever else may be thought, there is strong evidence that a large number of people are in favour of leaving a clear space for C.W. at the L.F. end of most bands, and some extremely strong words have been said about the 'phones who persist in using these frequencies. Of course, there is no law against it but is not the "done thing." In our opinion stations which work 'phone between 3.5 and 3.6, 14-14.1 and 28-28.2 Mc/s. label themselves as selfish and inconsiderate people (the author used a stronger word—we toned it down, Ed.). One three letter G2 was recently heard to ask "Is there much C.W. QRM on me?" Hearing that only four C.W. stations were trying to battle with his 89 'phone, he expressed himself as satisfied and carried blithely on. Remember, many of these C.W. stations are beginners using low power—so have a heart! It is about time we started a little "Cads Column" and published the call signs of some of these "breakers of the spirit"!

Now to another kind of gent. There is some evidence to suggest that at least one G station is sending out cards for contacts which never took place in the hope that the recipients will not trouble to look them up in the log, and a QSL will result! A well-known W8 has recently been summarily dealt with by the A.R.R.L. largely on evidence supplied by the R.S.G.B. QSL Bureau. Take warning anyone who thinks of emulating this smart lad, that such conduct will not be tolerated. Anyone having evidence of such "jiggery-pokery" is asked to forward it in confidence to HQ.

3.5 Mc/s. DX

This band has been giving some excellent results in recent weeks. G5CR of Hayes, Kent, worked ZL4GA on December 2, and also heard ZL3GQ on November 25. G2ATF says VE1RF is regularly active on the band between 3.510 and 3.550 kc/s. from 04.00 to 08.00 G.M.T. and is looking for some of his pre-war friends. G8VB is the star performer and offers to fix schedules with VE or W Europeans. VO6J is another regular on 3.5 and has worked many Europeans with only 25 watts input. OX3GC worked on 'phone 3.990 kc/s. Using 80 watts G8VB has worked VO6J, 3.815, VO3X, 3.820, as well as numerous VE1's, 2's and 3's and W1, 2, 3, 4, 5, 8, 9 and 0. There is also a VE8 active. XE1TA is a good signal on 'phone around 5 a.m.

General Notes and News

7 Mc/s. has also produced some excellent results during the past month. G8OJ has worked LA8AA who is north of Narvik. NY4CM, VO2R, ZC6SM (QSL via Box 360, Cairo), OX3RC and OX3MG have been heard. G5RM of Bromley comes up with UA, VE1, PY, W1, 2, 3, 4, 6 and 8 between 22.00 and 02.00 G.M.T. Inputs ranged from 25 to 150 watts and in fact dropping power seemed to make little difference.

Remember! 7 Mc/s. is a DX band. W2PG has worked FE8RV in the French Cameroons at 23.00 G.M.T. GM6MS recently contacted CM9AA portable mobile in a car running round the streets of Havana. Another nice one was YN1HB, Box 272, Managua, Nicaragua. VS2AR, using 15 watts, recently worked YV2AY, using 300 watts. Reports in both directions R5, S7. It makes you fink!

Tommy Lott, G2CIN, has been heard from several VE stations and pays tribute to the wonderful hospitality of the Canadian amateurs. G2PA has gone to Z85 and hopes to be active soon. GM3ASM, whose address is 127 Green Road (not Grove Road), Paisley, has worked OX3MG on 7. QTH Kangerdlugssuaq, East Greenland. KM6AA on 14.128 is G. E. Dillon, Box 314, Kealakekua, Kalaheo, Midway Is. He will not reply to anyone calling him within 5 kc/s. of his own frequency. From G6PJ comes the information that G2FDY/YI is now signing YI2FDY. I6ZJ is now Box 247, Asmara. He has two new crystals on 14.060 and 14.122 kc/s. MD3AB is still under construction.

G3CNE wants information on CR48S. Using 5 watts on 7 Mc/s., he has worked UO5AE at 22.30 G.M.T.

BR510811 tells us that VS9AA on the HF end of 14 claims to be in the Maldives. He would also like to know something about EA1FO who calls CQ in so many different languages.

BR57594 has heard C8KY, Box 73, Lanchow, Kansu Province, on 28. Another one for Zone 23. Says M1A is active on 14, 'phone and QSL's. Full QTH is Dr. Corrado Francini, Republic of San Marino. G6BW passes a request from WIPPPZ who wants to QSO Derby.

BR510909, ex VU2BQ, has lost all his own QSL cards in transit but will QSL 100 per cent. as soon as a further supply comes to hand. VU2LR now back in this country will also be sending out cards for all contacts.

The QSL Bureau at Box 360, Cairo, has cards on file for many stations which have operated in Arabia, Libya, Iraq, Dodecanese, Ethiopia, Turkey and Iran. Will the owners or operators please claim their cards from Mr. H. H. Frost, SU1HF, Box 360, Cairo. ZC6JG holds cards for ZC6BS, DD, DM, DN, FK, RG, TN, WP, WS and WW. Please claim them from Palestine Comms. Committee, "X" Branch, H.Q., Palestine.

Mr. G. Turner, VS7IT, 9 Merryhills Drive, Enfield, Middlesex, who holds a number of QSL cards for VS7FF, VS7MB and VS7IS, will be pleased to forward them to the rightful owners on receipt of a stamped addressed envelope.

QRP

GW2DDX is collecting information on real QRP for this column. This means under 5 watts. Here is some to start off with. G6ZN, using 3.5 watts has worked 62 countries and won the R.S.G.B. QRP Contest. Best contact to date is OK2 with one watt. Report 499 confirmed. G6YN, using 5 watts from batteries, on 7 Mc/s. is making excellent inter-G contacts through the QRM. G3BVN, G3CME and G3AAN all use under 3 watts and GW2DDX himself has been working inter-G contacts with 0.7 watt. Come along you miniwattors, let's hear from you.

Recently G6ZN worked G3PU at Weymouth, 315 miles away, on 1.8 Mc/s. using 3 watts. He then reduced power until finally he was using only 9 volts H.T. and -0.18 watt. Report 349. He changed frequency and G3PU succeeded in finding him again. Surely this would be hard to beat!

A Visit to W.

GW3ZV just back from U.S.A. is another one to comment on the grand hospitality to be found in North America. He visited a number of stations, in particular W2JB who has built a 300 watt transmitter and power pack into a steel box 18 in. x 9 in. x 8 in. It is so compact it would be difficult to get a screwdriver between components. W4BPD was another visited. With 155 countries confirmed post-war, this station has to be seen to be believed! Nine Rhombics, several verticals and a ten element Sterba with separate 1 kW transmitter for each band. "I could not think of a single piece of equipment which was not to be found in this station," says 3ZV. This amazing man has a wife and 4 children, runs a business at which he works from 9 a.m. to 6 p.m., six days a week, takes his family out at least twice a week, yet every scrap of his gear he built himself, including the three receivers. He even built his own final tank condensers! GW3ZV offers to sked anyone wanting GW on 14 Mc/s.

Strange but True

From GM2UU and BR511494 comes a queer report that KA stations, by the terms of their licences, may work only local stations and US Nationals. What sort of democracy and new found freedom is this?

BR511494 also tells us that Australian amateurs are being re-permitted to use the band 550-1,500 kc/s. subject to a power limitation of 25 watts and only when local broadcast stations are not on the air and the selected channel is free from any other broadcasting station. This is most interesting. What about 45 Mc/s. when Alexandra Palace is off the air?

Finally, a queer coincidence from G3BGX. He recently worked W2001 who commented that he was the third "Dave" he had worked in consecutive QSO's, the others being G2MA and G8QW. Fifteen minutes later G3BGX called CQ and worked W21VW who made exactly the same remark, his other two being W8RTV and G8QW. Surely a most extraordinary coincidence!

LOW POWER CONTEST (Continued from page 140)

The anode was link-coupled to a simple aerial-tuner, and the aerial was made up of two half waves centre-fed. Input power was 1.4 watts and the receiver an H.R.O.

Mr. Roscoe appears to have been radiating a good quality signal as all stations worked gave T9, whilst several gave T9X. G4KQ seems to have been one of the fortunate competitors as he was able to effect contacts at most hours of the day and night! A highly accurate and clear log deserves special praise.

Third place was taken by Mr. J. Peach G5JP, of Stanley House, Hawkinge, Kent, who scored 6,762 points by working 147 stations in 46 different countries. His transmitter was an E.C.O. followed by a P.A. employing two VT501 valves with an input of 3.5 watts. Full and half wave aerials were employed. The receiver was a 1-V-2.

Conclusions

The success of this event makes it practically certain that there will be another in 1948. The scoring system worked very well. Specially-built low-powered transmitters using small valves are very efficient and capable of great things. There will possibly be a pilgrimage, by some stations, to the "rare and exclusive" counties!

Station Descriptions

The Editor will be glad to consider, for publication, descriptions of all the transmitters used by the leading competitors in this contest.

* 29 Keehill Gardens, Hayes, Bromley, Kent.

The Month on Five—and Six

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

AS stated last month, this feature has now become the responsibility of a new author, and I should like—lapsing for once into the first person—to say thanks on behalf of all readers to Mr. W. A. "Bill" Scarr, G2WS, for his work in the past, and to wish him all success in his new position.

While the change in authorship entails no alteration in the basis upon which this column is written—we are still dependent upon contributions, of course—it is felt that readers might have some good ideas for improving the style of presentation. If so suggestions will be most welcome. The ever-pressing question of space precludes as detailed a treatment of VHF happenings as we would wish, so that it may be necessary at times to adopt the somewhat staccato style suggested by the term "notes." However, that rests with our contributors, so please send your news by the 23rd of the month, and we will do our best to present it in as readable a form as possible.

G5ZT (Plymouth) reports considerable difficulty in working on 6 owing to the presence of a 1000 kW. pulsed navigational aid on 25 Mc/s. only a few miles away, working 24 hours a day. If this weren't sufficient, there is also an over-modulated commercial 'phone station on the band, putting in an overload signal on the back of the beam, and rendering a good part of the band useless. Despite all this, ZT managed to make 24 W, and 2 VE cross-band contacts, all on 'phone, and nearly all 88/9, between October 30 and November 4, followed by 32 QSO's with W (1, 2, 3, 5, 8, 9) 02 with VE1, and one each SU and MD5 between the 6th and the end of November, after getting his 50 Mc/s. permit. A very fine show indeed, O.M., even if you hadn't had the QRM. He enjoys the band very much, and thanks R.S.G.B. for its efforts.

G3YH (Bristol), says that he is on 5 metre CW nearly every day, and for those looking for a contact down in the West, here is his sked.: 19.30–20.00, beam S.W. & W.; 20.30–21.00, S.E. & E.; 22.00–22.30, N.; 22.30, N.E. & E. Conditions have been poor with him, and during December he heard only 4AP at 45 miles. W1, 2 and 5 were received on November 22, but nothing on that band since. G5MQ (Liverpool), got smartly off the mark by working W1CGY on 6 just 20 minutes after receiving his permit! He "got across" on 8 days between November 7 and 29, using a dipole until near the end of the period, when a 3-element went up. He has heard WQR 89 on 48 Mc/s. on many occasions when no 50 Mc/s. signals were received. G8SM (East Molesey) has found 5 very quiet except for the Contest week-end, and asks for more of the latter. "Six is a very good time-waster, but not much else," says G2NH of New Malden, but admits to having managed a few W's and VE's on November 23.

The Second Five Metre Contest

Conditions were not particularly favourable for this event, and from that aspect, it is a pity that it did not take place a week later. From what we have been able to gather, some 70 odd stations participated, and a number produced pretty useful scores. Final comment must, however, await the official report.

Well, that's the lot for this month, and how about dropping us a line about what you have done as soon as you have read this?

* 32 Earls Road, Tunbridge Wells, Kent.

SAY YOU SAW IT IN THE BULLETIN

Around the Trade

International Electronic Corporation, Ltd., Electron House, 655, Fulham Road, London, S.W.6, are now producing a range of transmitting and audio equipment of interest to amateurs. Of special note is a volume compression unit for use in conjunction with any A.C. amplifier or modulator. It is claimed that this unit cuts over-modulation peaks and permits an increase of up to 15 per cent. average R.F. output of a telephony transmitter. For gramophone reproduction work, it may be employed to give contrast expansion.

A display of transmitters, modulators with volume compression, several oscillographs working on audio and R.F. subjects, and communication receivers may be inspected at Electron House. A technical manual is available to members price 6d., post free.

R. Martin & Co., Ltd. (G6MN), Bridge Street, Worksop, Notts, have recently published a Prefix Card intended for the shack wall. Over 250 post-war International Amateur Prefixes are listed in alphabetical order of call sign. Dominion districts and Service MD prefixes are included. The price is 6d., plus postage.

Members who have recently erected Rotary Beams will be interested in the specialised graphited lubricants marketed by Victor Ronce Products, 624 Old Kent Road, London, S.E.15. A range of graphite cup grease is available in tins of 1 lb. and upwards. VRP Natural Flake Graphite No. 1 is also suitable for heavy bearings and in cases where friction is severe.

Mail Order Supply Co., 24 New Road, London, E.1, are the distributing agents for the Burgoyne Co-axial Connector, a device designed to provide a means of making efficient watertight co-axial cable connections for aerials.

Made of aluminium with steatite insulation the connector has two forged steel eyebolts equipped with convenient soldering connections. The assembled connector weighs 12 ozs. which appears to be a little on the heavy side bearing in mind the stresses and strains of the average amateur aerial system. Ignoring this feature the connector will eliminate the necessity for crude and inefficient co-axial cable connections and as such is recommended.

Assembly instructions are given with each connector.

Penwortham Radio Services, 11 Priory Crescent, Penwortham Hill, Preston, specialise in the repair and re-alignment of communication receivers and frequency meters. The proprietor is Mr. Adams, G5AD.

Price increases, effective immediately, are advised by Taylor Electrical Instruments, Ltd., 419/424 Montrose Avenue, Slough, Bucks. The Model 70A Multi-range Universal Meter (1000 ohms per volt) is now priced at eleven guineas (delivery 7 days) and the Model 75A at fourteen guineas (delivery 7 days). The popular Taylor Junior Universal Meter is listed at eight guineas. A copy of the revised schedule of prices can be obtained from the above address.

Home members will be interested, and no doubt pleased, to learn that Stratton & Co., Ltd., are now receiving orders for their new 640 Communications Receiver from the U.S.A. The first batch was exported in December.

Suppression of Electrical Interference with Television Reception

To the Editor.

Dear Sir,

The Radio Industry has for several years been disturbed by the interference with television reception caused by various kinds of electrical equipment, and particularly to a very large extent, by motor vehicles. With the widening interest in television and the spreading of reception to additional fringe areas, this matter is becoming of ever increasing importance.

The Radio Industry Council has, therefore, decided to launch a campaign aimed at securing the co-operation in this matter of all users of motor vehicles.

The suppression campaign takes the form of a request that all motor vehicles should have a simple 10,000 or 15,000 ohm resistor fitted into the high tension lead from the high tension coil to the distributor.

The cost of this resistor is in the neighbourhood of 1s. 6d. and it can be fitted in a matter of minutes. We have it on the highest engineering authority that the fitting of this simple device, which is in line with the B.S.I. Code of Practice, in no way impairs engine performance.

This appeal for co-operation is being directed to the widest circle of car users, including all in our own industry, and we are much encouraged by the sympathetic response already received.

It is the intention of the Government at a future date to introduce legislation to compel those who own or operate apparatus which causes interference to take such steps as may be necessary to give relief. We believe that there exists sufficient evidence of a co-operative spirit for our request to be sympathetically taken up without waiting for Government instruction.

My Committee charged with progressing this matter asks, therefore, the assistance of your Society by endeavouring to secure the practical co-operation of any of your members owning motor vehicles.

Yours faithfully,

R. P. BROWNE,
Secretary, The Radio Industry Council.

ANNUAL GENERAL MEETING

Minutes of the Twenty-First Annual General Meeting of the Incorporated Radio Society of Great Britain, held at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2, on Friday, December 19, 1947, at 6.30 p.m.

Present.—The President (Mr. S. K. Lewer in the Chair), Messrs. A. J. H. Watson (Hon. Treasurer), H. A. M. Clark (Hon. Secretary), A. O. Milne (Hon. Editor), E. L. Gardiner (Immediate Past President), E. Dawson Ostermeyer (Past President), H. V. Wilkins (Vice-President), I. D. Auchterlonie, G. F. Bloomfield, C. H. L. Edwards, K. Morton Evans, J. W. Mathews, W. A. Scarr (Members of Council), John Clarricoats (General Secretary), Miss A. M. Gadsden (Assistant Secretary) and about 100 members.

Apologies.—Apologies for absence were presented on behalf of Messrs. V. M. Desmond (President-Elect) and A. E. Watts (Past President).

Notice Convening the Meeting

The Honorary Secretary read the notice convening the meeting.

Greetings

The President read a message of greetings from Mr. H. C. L. Barnett, SVIWE, of Athens, Greece.

Minutes of Previous Meeting

Mr. Gardiner proposed, Mr. Pope seconded, and it was Resolved that the Minutes of the Twentieth Annual General Meeting, as published in the January, 1947, issue of the Society's Journal, be taken as read, confirmed and signed as a correct record.

Audited Annual Accounts

The Treasurer expressed regret that due to current printing difficulties it had not been possible to publish the December issue of the Society's Journal, containing a copy of the Audited Accounts, sufficiently early to permit members to receive the Accounts seven clear days prior to the meeting. If the members so wished the meeting could be adjourned until the date fixed for the next London (I.E.E.) meeting. Mr. Watson pointed out that during the past year the Council had received a number of suggestions but the adoption of some of them would have involved the Society in considerable expense either directly on the proposals themselves or would have necessitated increasing the staff at Headquarters. He therefore recommended members to consider the matter carefully before putting forward a suggestion which would involve additional expenditure.

The Accounts showed that the Society made a profit of £500 on the year's operations (excluding the expense of sending delegates to the Atlantic City Conference, which expense had been partly met out of the Society's Reserves) but this figure was considerably less than in recent years. Revenue from the sale of Society publications had fallen, whilst the cost of printing the BULLETIN had again increased very considerably. Office expenses had risen due to the engagement of additional staff and this item would be further increased during the year 1947-8.

Mr. Watson reiterated the opinion expressed in the report that an increase in subscription rates must take place if the Society is to maintain and extend its present services to the membership. At the present time members are paying a pre-war subscription for a post-war service. As an example of the very considerable increases that have taken place he mentioned that in 1939 the cost of producing 3,500 copies of a 64 page BULLETIN was approximately £100 a month. Last year the cost was nearly £500 a month for 15,000 copies of a 16 page issue. In other words it was now costing as much per member to print a 16 page issue as it cost to print a 64 page issue in 1939.

Mr. Watson also referred to the cost of sending delegates to Official Regional Meetings, and to the new expense which had been incurred as the result of the decision to purchase the Copyright of technical articles for publication in the BULLETIN.

Mr. Spencer enquired why a sum of £80 for the Headquarters Station had been "written off." Mr. Watson explained that as this expenditure represented only a very small proportion of the total value of the equipment held by the Society—most of which had been donated—it was considered desirable to write-off this item against Revenue.

In reply to an enquiry regarding the increased audit fee, Mr. Watson explained that this was due to the fact that in the previous year the auditors made a reserve of only £63 whereas it was found later that the actual cost of auditing the accounts and Income Tax work was greater. The figure shown (£111) represents a reserve of 75 guineas for the year 1947-8, and the balance due for the previous year.

In reply to a suggestion that in order to effect a saving members should be required to purchase the BULLETIN from booksellers, Mr. Watson considered that such a suggestion would be unlikely to appeal, as the total cost of the BULLETIN and the subscription to the Society would be greater than the amount of an increased subscription.

Mr. Watson gave an assurance that members would be given an opportunity to express their views regarding any proposal to increase subscription rates at a Special General Meeting called to consider proposed changes to the Articles of Association, and that the new rates would have to be approved by a General Meeting of the members.

In reply to an enquiry regarding QSL Bureau expenses Mr. Watson explained that the figure of £318 represented a full year's working, while the charge in the 1946-7 accounts was for

a few months only. Postages (£121), Salaries (£90), and Honoraria (£80) accounted for £291 of the total expenditure.

In reply to a question regarding Atlantic City Conference expenses, Mr. Watson pointed out that on the basis of 14,000 members the cost per member was approximately 2/-. Mr. Auchterlonie, speaking on behalf of Lancashire members, expressed the view that the success achieved by the Society's representatives in retaining the "top band" was in itself well worth the expense involved. Mr. Auchterlonie's comment was received with acclamation. The President gave some actual cost-of-living figures which he had noted during his stay in the U.S.A.

At the conclusion of the discussion Mr. Watson moved, Mr. Spencer seconded, and it was Resolved unanimously that the Report of the Honorary Treasurer, together with the Audited Accounts for the year ended 30th September, 1947, as circulated among the members, be and are hereby approved and adopted.

Annual Report of the Council

The President expressed regret that, due to printing difficulties, it had not been possible to publish the December issue of the BULLETIN—containing a copy of the Annual Report—sufficiently early to permit members to receive the Report seven clear days prior to the meeting.

There being no discussion the President moved, and it was Resolved unanimously, to approve and adopt the Annual Report of the Council for the year ended 30th September, 1947.

Election of the Council for the Year 1948

The President announced that the following Corporate Members had been duly elected to serve on the Council for the year 1948:—

Officers

President: Mr. V. M. Desmond, G5VM

Acting Vice-President:

Mr. W. A. Scarr, M.A., G2WS

Hon. Treasurer: Mr. A. J. H. Watson, G2YD

Hon. Secretary: Mr. K. Morton Evans, G5KJ

Hon. Editor: Mr. A. O. Milne, G2MI

Returned
unopposed

Members

Mr. I. D. Auchterlonie, G6OM	1,983 votes
Dr. G. F. Bloomfield, G2NR	1,817 "
Mr. F. Charnan, G6CJ	1,797 "
Mr. C. H. L. Edwards, G8TL	1,786 "
Mr. D. N. Corfield, G5CD	1,724 "
Mr. R. H. Hamman, G2IG	1,629 "
Mr. J. W. Mathews, G6LL	1,349 "

The President announced that 2,914 Ballot Forms (compared with 3,286 last year) had been accepted, and 13 rejected by the Scrutineers. He also announced that the following Corporate Members had been unsuccessful in the Ballot:—

Mr. J. N. Walker, G5JU	1,336 votes
Mr. D. A. G. Edwards, G3DO	1,082 "
Mr. P. A. Thorogood, G4KD	993 "
Mr. A. P. G. Amos, G3AGM	957 "
Mr. A. C. Williams, GWSVX	845 "
Mr. A. E. Clifton, G8DZ	811 "
Mr. H. G. Spencer, G6NA	757 "
Mr. F. G. Hoare, G2DP	669 "

The President thanked the unsuccessful candidates for allowing themselves to be nominated, and on behalf of the retiring Council thanked the Scrutineers, Group Capt. H. W. Evans, G6CH, F. Barnard, G4FB, and Mr. T. L. Delvin, G2FLK, for their services.

The President recorded that the election had resulted in every nominee of the retiring Council being returned—a unique experience in the annals of the Society.

The President paid a warm tribute to the retiring members of Council and thanked them for the support which they had given him during his year of office. He reminded the meeting of the very heavy load that fell upon the individual members of the Council and especially upon Mr. Desmond during his absence in America with the General Secretary.

Election of Auditors

Mr. Watson moved, Mr. Wilkins seconded, and it was Resolved unanimously to re-appoint Edward Moore & Sons, Auditors for the current year, at a fee of *seventy-five guineas*.

Vote of Thanks to the I.E.E.

In the absence of Mr. H. Bevan Swift, G2TI (Past President), Mr. H. A. M. Clark moved, and it was Resolved unanimously that a cordial vote of thanks be recorded to the President and Council of the Institution of Electrical Engineers for allowing the Society to continue to use the building for its meetings.

Thanks to Headquarters' Staff

The President requested that his thanks be recorded in the Minutes to Headquarters' Staff for the efficient manner in which they have continued to deal with the day to day work of the Society. Mr. Lewer paid a special tribute to Miss May Gadsden, whom he said had been the mainstay of the Society during the General Secretary's absence abroad.

Other Business

The following matters were raised under "Other Business":

- The future of the Social Committee.
- The apathy of members towards elections.
- The desirability of setting up small unofficial groups in large cities working under the direction of the elected T.R.
- The scope of the Headquarters' Station.
- The desirability of operating an amateur station at future Amateur Radio Exhibitions organised by the Society.
- Technical contributions to the BULLETIN.
- BULLETIN front cover advertisements.
- The desirability of preparing a panel of speakers to address Affiliated Societies.

The Secretary announced that the Articles of Association Committee would shortly be considering matters relating to Affiliated Societies.

The scope of the Social Committee would be clearly defined by the new Council who would also draw up terms of reference for all Committees of the Council.

Mr. Watson agreed that many members would probably prefer to see a different type of front cover to that now being offered, but on the other hand the revenue received from front advertisements amounted to nearly £200 per annum—an amount that could not lightly be disregarded.

The other matters raised in the discussion were dealt with either by the Officers of the Society or by the General Secretary. The meeting terminated at 7.45 p.m.

Presentation of Trophies and Awards

At the conclusion of the Annual General Meeting the President presented Trophies and Awards to the following members:—

Mr. J. M. Kirk, G6ZO (ROTAB and Braaten Trophies); Mr. D. W. Heightman, G6DH (Wortley-Talbot Trophy and

Norman Keith Adams Prize); Messrs. J. M. Kirk, G6ZO, and P. G. Solder, G5FA (N.F.D. Shield); Mr. E. J. Williams, G2XC (Norman Keith Adams Prize); Messrs. P. Pennell, G2PL, J. M. Kirk, G6ZO, A. O. Milne, G2MI, and C. G. Allen, G8IG (Empire DX Certificate).

Messrs. S. E. Martingell, G2MV (Mitchell Milling Trophy); T. F. Herdson, G6ZN (1930 Committee Cup); D. S. Mitchell, GW6AA (1.7 Mc/s. Contest Miniature); W. F. Holdaway, BR515028 (D/F Field Day Miniature); G. F. Peck (D/F Field Day Miniature); J. Spragg, G3APY (Five Metre Field Day Miniatures), and R. H. Holmes, G6RH (Empire DX Certificate), were not present.

Certificates of Merit were also presented to the runners-up in Society Contests who were in attendance.

Those who were not present have now received their awards either direct from Headquarters or from the hands of an accredited representative who was entrusted by the President to make the presentation publicly.

Honorary Members' Certificate

The President then handed to Mr. E. L. Gardiner, G6GR (President 1944-46), a certificate on vellum testifying that he has been elected an Honorary Member of the Society.

Presentations to Retiring President and Retiring Honorary Secretary

Mr. A. J. H. Watson, on behalf of his colleagues on the Council and the senior members of the Staff, handed gramophone record tokens to Mr. S. K. Lewer, and a cheque to Mr. H. A. M. Clark. Mr. Watson also handed to Mr. Clark a cheque for twenty guineas from the Society in appreciation of his past services. The presentations were warmly acclaimed.

Mr. Lewer and Mr. Clark thanked Mr. Watson and those associated with him in the presentations.

LETTERS TO THE EDITOR

General Purpose Power Supply Unit

DEAR SIR,—With reference to Mr. Matthews' article in the October issue, I am surprised to notice that the author contemplates obtaining a higher output from his power pack by modifying the conventional choke input filter to a condenser input filter of the type normally used only with high-vacuum rectifiers. With mercury vapour rectifiers in circuit, as most authorities hasten to point out, the effect of a condenser of 8 μ f connected as shown is to impose a load on the rectifiers in which the peak diode current is high (being limited mostly by the transformer winding resistance) enough to strip the cathode of its very necessary coatings in a short space of time, after which the rectifier becomes useless.

Also, what is wrong with the quoted output figures? The maximum theoretical output from the given choke input filter should be about $0.9 \times (500 - 15) = 437$ volts. On the other hand if the author risks his rectifiers with a condenser input filter the output should be $\sqrt{2} (500 - 15) \sqrt{2} = 687$ volts. Both of these results would in practice be reduced by about 20 volts due to transformer winding resistance and this leaves values of output volts about 100 volts higher or lower than the quoted figure of 520 (which is what the output would be if normal high voltage rectifiers were used with a condenser input filter).

Yours faithfully,

D. P. C. THACKERAY (BRS13321).

5 Belsize Park Gardens, N.W.3.

DEAR SIR,—With reference to the G.P. Power Supply Unit, I would point out a mistake in the circuit details of the EF50 delay "hook-up." As shown, no delay could occur since the grid and screen potentials are mutually opposing and RA/3 would energise immediately the control valve started conducting—a point in time certainly not controlled by the grid resistor. It does seem obvious that the valve should be transitron connected when the action will be as follows:—

On switching on, and assuming EF50 cathode heated, the screen will tend to become negative, causing the suppressor also to go negative and further reducing whatever anode current may be flowing instantaneously; this, of course, causes the screen to tend more negative and the effect is cumulative. The anode is now cut off due to V_g and the screen is conducting heavily, C now commences to discharge through R and the cathode/screen circuit, the time of discharge obviously being controlled by R. When the suppressor has moved sufficiently positive the valve will conduct to the anode, causing the screen to tend positive, the suppressor moves still more positive and once again the effect is cumulative. The circuit is now conducting heavily to the anode and RA/3 will actuate its "holding-in" contact, thus stopping the transitron action.

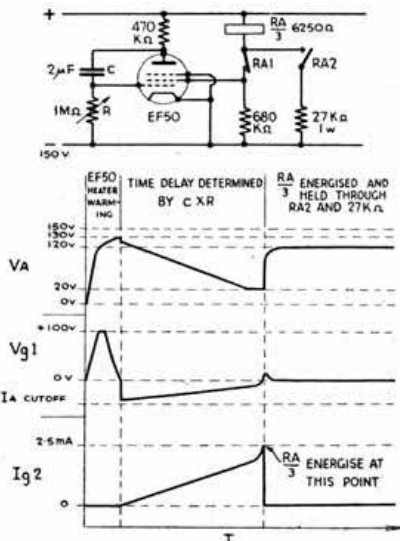
Yours faithfully,

L. G. CLARK (BRS6294).

Baillieu Barracks, Arborfield, Nr. Reading, Berks.

DEAR SIR,—With reference to my article in the October BULLETIN, I should like to point out that the circuit of the delay valve is incorrect and should be as shown below.

Included are a set of wave-forms relating to the operation of the circuit. These did not form part of the original diagram.



As BRS13321 mentions in his letter, in theory the calculated output differs from my figures, but the voltages given were the actual measured voltages, and some discrepancy may be due to the fact that the transformer in use is producing more than 500V-0-500V, although so marked.

I should like to thank BRS6294 and 13321 for their comments.

Yours faithfully,

P. J. H. MATTHEWS (G3BPM).

Radio History in the Making

The General Secretary would be glad to hear from any member who is interested in purchasing 35 bound volumes of the *Wireless World*, commencing with Vol 10 (1927). A pre-war member—who at one time served on the Council—offers the volumes to the highest bidder above £10.

Side Slip

The last sentence of the caption under Fig. 2 of Mr. Jeapes' Article—"A Ten-Twenty Rotary Beam"—published in our last issue should have appeared under Fig. 1.

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, G5CL.

November Council Meeting

Resume of the Minutes of a Meeting of the Council of the Inc. Radio Society of Great Britain, held at New Ruskin House, Little Russell Street, London, W.C.1, on Monday, November 17, 1947, at 6 p.m.

Present.—The President (Mr. S. K. Lewer in the Chair), Messrs. Auchterlonie, Bloomfield, Clark, Desmond, Edwards, Evans, Hammans, Mathews, Milne, Scarr, Watson, Watts and John Clarricoats (General Secretary).

Apology.—An apology was presented for the absence of Mr. E. L. Gardiner.

Annual Report

The Annual Report of the Council was approved for publication.

Annual Accounts

The Hon. Treasurer (Mr. A. J. H. Watson, F.S.A.A.) presented the Audited Accounts and Balance Sheet for the year ended 30th September, 1947. In explanation of the Accounts and Balance Sheet, Mr. Watson read his Annual Report to the Members.

Resolved to accept and adopt the Audited Accounts and Balance Sheet for the year ended September 30, 1947, and to approve same for publication.

The Balance Sheets were then signed by the President, Acting Vice-President, Hon. Treasurer and General Secretary.

The Council recorded its thanks to Mr. Watson for his lucid explanation of the accounts.

Articles of Association

Resolved to accept a Recommendation of the Articles of Association Committee that subscription rates be increased and to instruct the Society's solicitors to take steps to carry the changes into effect with the least possible delay.

B.E.R.U. Contest, 1948

Resolved to accept a Recommendation of the Contests Committee that the 1948 B.E.R.U. Contests be held during the month of April.

To avoid future clashing of dates the Contests Committee was requested to endeavour to obtain from I.A.R.U. Societies a list of the international contests which they propose to organise during 1949 and later years.

B.E.R.U. Receiving Contest, 1947

Resolved on a Recommendation of the Contests Committee to declare Mr. E. Treblecock, BERS195, the winner of the 1947 B.E.R.U. Receiving Contest and to award him a Miniature Trophy.

Low Power Contest

Resolved on a Recommendation of the Contest Committee to declare Mr. T. F. Herdman, G6ZN, the winner of the Low Power Contest and to award him the 1930 Committee Cup. Messrs. Roscoe, G4QK, and Peach, G5JP, were named as runners-up.

Contest Operation

The view was expressed that certain competitors in recent Society contests had shown marked carelessness in computing their scores.

Resolved to request the Contests Committee (a) to record in future reports of contests the claimed and allowed scores of all competitors, (b) to consider whether any other appropriate action can be taken.

Empire DX Certificate

Resolved to approve the award of a distinctive lapel badge to holders of the Empire DX Certificate.

Regional Representation

No nominations having been received for the offices of Region 12 and Region 13 Representative, the Secretary was instructed to write to the retiring R.R.'s inviting them to nominate their successors.

Radio Amateurs' Examination

It was reported that the City & Guilds of London Institute is unable to agree to the Society's request that two examinations be held each year.

Resolved to enquire from the G.P.O. whether they can suggest how it will be possible to arrange for two examinations to be held each year.

Six-Metre Licences

It was reported that the G.P.O. had, as the result of representations made by the Society, agreed to issue 6-metre licences to about 30 amateurs. In actual fact a total of 42 names had been submitted to the G.P.O. (See statement in December issue of BULLETIN.—ED.)

The Council recorded its thanks to Mr. Watts for his assistance in connection with the issue of the licences.

Appreciations to Conference Delegates

The Worthing (Sussex) group forwarded a resolution expressing its thanks to the Amateur Radio delegates to the recent Atlantic City Conference.

The same group pressed for the revival of Regional notes, but in view of the decision reached at the previous meeting it was agreed to take no action at present.

New W/T Bill

The Worthing group requested the Council to press for the inclusion in the new W/T Bill of clauses which will prohibit the use of unsuppressed electrical equipment.

Resolved to institute further enquiries regarding the progress of the draft of the new W/T Bill.

Royal Society

It was reported that the Royal Society had approached the Society with a request that it should co-operate with the National Committee for Scientific Radio. (The latter body is the U.K. Representative of the International Union for Scientific Radio.)

A preliminary meeting had taken place between representatives of the Society and Dr. Smith Rose (a member of the National Committee) with a view to considering how best the Society can co-operate in scientific observations.

Resolved to set up a small committee (to be known as the Scientific Observations Committee) and to request the committee to draw up a programme of study.

It was agreed that the committee shall invite selected members to participate in the investigations.

Resolved to appoint Messrs. H. A. M. Clark, D. W. Heightman, W. A. Scarr and E. J. Williams to serve as members of the committee and to give the committee power to co-opt.

Affiliated Society

Resolved to grant affiliation to the Sutton and Cheam Radio Society.

Membership

Resolved to elect 269 Corporate Members, 45 Associates and 18 Junior Associates.

Resolved to grant Life Membership to Mr. R. C. Fishlock.

Resolved to grant Corporate Membership to eight Associates.

O.R.M.'s

Messrs. Mathews, Bloomfield and Edwards reported upon matters discussed at recent O.R.M.'s.

The meeting terminated at 9.35 p.m.

Annual Report of Council

The G.P.O. Liaison Committee (Chairman, Mr. A. E. Watts, G6UN) was omitted from the list of Committees of the Council. The venue for the London Members' Ladies Nights was given as the Royal Hotel instead of the Victoria Halls, Bloomsbury.

Contest Operation

The Contest Committee regret that they have found it necessary to draw the attention of Council to the many errors which have occurred in the submission of Contest logs in recent events.

The Council will, in future, reserve the right to disqualify Contest entrants who show marked carelessness in the computation of points, recording of times, or other factors which render difficult the checking of their logs. If necessary the publication of results will indicate the scores claimed by contestants as well as their corrected scores.

Region 13 (East Scotland)

In the absence of any nomination from the members resident in Region 13 (East Scotland) the Council has, on the recommendation of the retiring R.R., appointed Mr. P. H. Hardie, GM6JH, of Crossford, Linlithgow, as Regional Representative for the years 1948 and 1949. Mr. Hardie was the C.R. for the Lothian Counties during 1947.

Thanks

The General Secretary and Miss Gadsden warmly appreciated the many expressions of goodwill received from their friends at home and abroad during the Christmas season.

Mr. Arthur C. Williams, GW5VX, wishes to thank those members who voted for him in the recent Council elections.

Stray

Mr. C. Watts, BRS15703, Hylton House, St. Mary's Road, Liss, Hampshire, wishes to contact members living in his neighbourhood with a view to forming a local group.

RADIO DATA CHARTS. By R. T. Beatty, M.A., B.E., D.Sc., revised by J. McG. Sowerby, B.A., Grad.I.E.E. Fourth edition, Second Impression. Published for *Wireless World* by Hiffe & Sons, Ltd. Size 8½ ins. (wide) by 11 ins. 93 pages, 44 Abacs. Paper Boards. Obtainable from all booksellers. Price 7/6 (postage 5d.).

First published in 1930, this collection of nomograms is a standard work of reference for radio receiver designers—professional and amateur. It reduces the labour of calculation in upwards of forty routine design problems and obviates possibilities of error in the interpretation and application of formulae.

The subjects covered range from the design of RF coils and transformers to the calculation of loudspeaker dividing networks and include problems relating to parallel-wire co-axial and quarter-wavelength transmission lines.

Each chart is accompanied by an explanatory introduction and worked examples, and the student will find the charts an invaluable adjunct to the ordinary textbooks on radio engineering.

BRANS VALVE VADE MECUM. Published by P. H. Brans, 28 Prins Leopoldstraat Borgerhout, Antwerp.

The 1948 (Seventh) edition of this most valuable publication has reached Headquarters, but no indication is given as to where copies can be purchased in the U.K. Furthermore the retail price is not stated.

The new edition, which comes in two volumes, lists more than 10,000 different valve types according to Dr. Lee de Forest who contributes a brief note to the preface. The first volume contains a multi-language introduction which explains how the second volume (detailed tabulated lists) is to be used. Readers should thus have no difficulty in locating the type of valve (irrespective of make) which is most suitable for their requirements. Volume I also contains a comprehensive set of valve base connection diagrams.

To attempt to describe this monumental work in a few words is impossible. We can only recommend members who are interested to write to the publishers and enquire from whom copies can be obtained.

THE RADIO HANDBOOK (11th Edit.). Published by Editors & Engineers, Ltd., 1300 Kenwood Road, Santa Barbara, California (available through R.S.G.B.). Price 21/-, Delivery about two months.

There has never, to our knowledge, been anything quite like the Eleventh edition of this well-known text book. In the first place it is bound in a stiff artificial cloth cover which makes it very attractive. Second it has assumed a format which is so large (11½ in. x 8½ in.) that no normal bookcase will be able to contain it! The text occupies 448 pages to which must be added a 64-page Buyer's Guide, printed on art paper.

The large page-size possesses the great advantage that it enables full justice to be done to the many excellent photographs used to illustrate the text. The innumerable circuit diagrams also show up to good advantage, whilst the style of type face and general set up are excellent.

Many new chapters have been added and a wide range of subjects treated in great detail. The chapter on H.F. Directive Aerial Arrays is one of the most comprehensive we have yet seen, whilst the chapter on V.H.F. Aerial Systems deals with such well-known arrangements as the Ground Plane and Corner Reflector systems.

Space limitations will not permit a detailed review to be published but we can guarantee that no one who spends a guinea on this book will be disappointed. It is in every sense "just what the doctor ordered." J.C.

ARRL DX Contests 1947

Results of the 13th ARRL International DX Contest held during February and March, 1947, show that the highest scores in both the C.W. and Telephony tests were achieved by XE1A. This station had 2357 C.W. contacts—an average of 41 per hour—and 1548 telephony contacts. Leading American C.W. entrant was W2GWE who worked 92 different countries over the two week-ends. On telephony W2SAI had 397 contacts with 77 countries. More than 1,400 entries were submitted. Section winners included:

C.W.		Points.	Contacts.
N. Ireland	G16TK	69,264	449
England	G6ZO	50,248	384
Scotland	G8SMN	36,975	425
Wales	GW3JI	19,368	269
Telephony.			
England	G6LK	39,616	416
Scotland	GM2UU	23,340	264

Airborne Transatlantic VHF Link

Air liners now form their own chain of flying radio relay stations across the North Atlantic under plans drafted in Montreal by the *International Air Transport Association*.

The relay system operates on VHF during periods when normal HF transmissions are interrupted by magnetic disturbances. It is expected to increase regularity over one of the world's most important air routes.

The range of the VHF links is expected to prove sufficient to allow aircraft to pass messages on from one to another until they come within range of a ground station.

Can you Help?

Mr. B. Pashley, G6PJ, 124. Nicholson Road, Sheffield, 8 Yorks., seeks details of the R.A.F. 1147B receiver.

Mr. W. Sillito, BR811755, 8 Ellesmere Gardens, Stokeford, Choppington, Northumberland, would appreciate information on the C.R. Indicator Unit 1D-6, A/APN-4.

Mr. D. Hetherington, GM3BRF, Ambleside, Carberry Road, Leven, Fifeshire, requires information on the Naval Transmitter serial MC159—control panel—transmitter-receiver.

Mr. H. J. Smith, G3ARU, 69 Lord Avenue, Ilford, Essex, is in need of the circuit diagram and operating data of the A.M. Wavemeter Type W1191A.

Mr. J. Kean, GM2FKG, 47 Crow Road, Glasgow, W.1, wishes to convert an American ASB-4 V.H.F. receiver for amateur use and would welcome suggestions.

Mr. S. B. Spencer, BR815549, 157 Fortuneswell, Portland, Dorset, requires technical information on the Air Ministry Radar Test Set, number 165.

Mr. R. Cowen, BR88810, 16 Robinson Road, Londwater, High Wycombe, Bucks., seeks a circuit diagram and operating details of the U.S. AN/APA-1 Repeater Indicator equipment.

Dr. B. C. Christian, G5XD, 8 Woodkind Hey, Bebbington, Cheshire, requires information on the circuit and I.F. of the German Army Welfare Receiver.

Mr. S. F. Tarrant, BR815556, 10 Dryden Grove, Acocks Green, Birmingham, B7, would appreciate circuit details of the U.S. Army Receiver BC-455-B.

Mr. W. S. M. Gadsby, BR816440, Berrydale, Tamworth Road, Keresley, Nr. Coventry, seeks information on the CKP-46159-A receiver which forms part of U.S. Navy TCS-6 equipment.

Mr. H. M. Blaber, 9 Stanton Road, London, S.W.20, requires details of a circuit diagram of the R.A.F. R.F. Unit Type 25 Ref.10D/1016.

Mr. F. W. Hardstone (Associate) 43 Shrubbery Road, Streatham, London, S.W.16, urgently requires a copy of the instructional manual and circuit of the ex Army R208 receiver.

Offers

Mr. A. J. White, BR814856 (ex 2FCD), Little Pleasance, Western Road, Ashburton, S. Devon, offers to assist members requiring circuit diagrams of the following sets: AR88, HRO, R201, 836, Army Nos. 18, 19, 21, 22 and 38.

G3CIB, 25 Fontayne Avenue, Grange Hill, Chigwell, has circuit diagrams of the TR5043, TR1196, T1115, RCA-AVT-15, TR9D, SCR536, and CB7-46145. Information can also be given on American and British Service valve types including C.R. tubes and airborne equipment used by the R.A.F. and F.A.A. Members are asked to include postage with enquiries.

New Recording Developments

At a recent meeting of the Royal Society of Arts, Sir Ernest Fisk read a paper on "The Development of Sound Recording and Reproduction," in which he stressed the importance of transient pulses in achieving high fidelity reproduction. He revealed that for the first time in the history of Sound Science, frequencies up to 20,000 cycles per second were now being recorded.

Pen Friends Wanted

M. Henri Gadoin, F3BK, requires two pen friends for his children—a boy and a girl aged 16 years—to help them in their study of the English language. He is also anxious to arrange, if possible next summer, an exchange of visits between similarly aged members of an English family. His address is: Gérard Crêdit Lyonnais, Saint Amand-Montrond (Cher), France.

Congrats

● To Mr. A. S. Rieves, BR88054, and his wife, of Perivale, Middlesex, on the birth of a daughter, Linda Edwina, November 28.

BULLETIN CONTRIBUTIONS

THE BULLETIN invites contributions on a wide variety of technical subjects and will purchase the copyright of all such contributions published at the rate of **Three Guineas per 1,000 words for leading articles, and Two Guineas per 1,000 words for other articles.** Drawings and photographs will be taken into account when assessing the copyright fee to be paid to a contributor.

Prospective contributors are requested to submit a precis of their article before proceeding with the preparation of the manuscript.

Manuscripts should, whenever possible, be typed, using double spacing, and all drawings must be submitted on separate sheets with the name of the author and the title of the article written on the back. Hints to Contributors can be obtained upon application to Headquarters.

FORTHCOMING EVENTS

REGION 2.

Barnsley.—Jan. 23, Feb. 13, King George Hotel, Peel Street.
Bradford (Amateur Radio Society).—Jan. 20, Feb. 3, Feb. 17, 7.30 p.m., Cambridge House, 66 Little Horton Lane.
Bradford (Short Wave Club).—Mondays, 7 p.m., Temperance Rooms, Harewood Street, Barkerend Road.
Catterick.—Tuesdays, 7 p.m., S.T.C., H.Q. Block, Vimy Lines.
Doncaster.—Wednesdays, 7 p.m., 73 Hexthorpe Road.
Halifax.—Jan. 26, Feb. 9, 7.30 p.m., Toc H Rooms, 32 Clare Road.
Harrogate.—Wednesdays, 7.30 p.m., rear of 31 Park Parade.
Huddersfield.—Jan. 28, Feb. 11, 7.30 p.m., Plough Hotel, Westgate.
Hull.—Jan. 28, 7.30 p.m., Imperial Hotel, Paragon Street.
Leeds.—Fridays, 7 p.m., Swathmore Settlement, Woodhouse Square.
Middlesbrough.—Jan. 19, Feb. 16, 7.30 p.m., Cleveland Scientific and Technical Institute, Corporation Road.
Sheffield.—Jan. 28, 8 p.m., "Dog and Partridge," Trippet Lane. Feb. 11, 8 p.m., Albreda Works, Lydgate Lane.
South Shields.—Fridays, 7 p.m., and Monday, Jan. 26, 8 p.m. (N.E.A.T.S.), St. Paul's School, Westoe.
Spennorth.—Jan. 21, Feb. 4, Feb. 18, 7.30 p.m., Temperance Hall, Cleckheaton.
Sunderland.—Jan. 28, Feb. 11, 7.30 p.m., 16 North Bridge Street.
York.—Wednesdays, 8 p.m., 29 Victor Street.

REGION 5.

Cambridge.—Jan. 30, 7.30 p.m., "The Jolly Waterman."
Chelmsford.—Feb. 3, 7.30 p.m., 184 Moulsham Street.

REGION 7.

London.—Feb. 13, 6.30 p.m., Institution of Electrical Engineers, Savoy Place. Tea at 5.30. Lecture by Mr. W. Hartley, G8UY, on "Interference—Its Cause, Effects and Cure."

Burnham and Highbridge Radio Society

The above Society is now in course of formation. Members in the Burnham area of Somerset are invited to communicate with the Acting Hon. Secretary, Mr. A. D. Taylor, G8FG, c/o P.O. Radio Station, Highbridge.

N.W. Middlesex Radio Club

Members living in the vicinity of Ruislip, Northwood and Pinner, will be warmly welcomed at the meetings of this newly-formed club which are held every Thursday evening at the Oddfellows Hall, Waxwell Lane, Pinner. The Hon. Secretary is Mr. R. W. Ward, G3CYV, 16 School Lane, Pinner, Middlesex.

Slade Radio Society

Six radio direction finding tests, 22 lectures and demonstrations, two outside visits and a membership now totalling 61 were among the points recorded in the report—given at the 13th Annual General Meeting—of the Society's activities during the past year. Dr. W. Wilson, D.Sc., was elected President, and a presentation was made to Mr. L. A. Griffiths who served for several years as Honorary Secretary. The coming year marks the 21st anniversary of the founding of the Society. The present Honorary Secretary is Mr. C. N. Smart, 110, Woolmore Road, Erdington, Birmingham, 23.

Spenn Valley Radio and Television Society

This new Society will be glad of the support of local members. Meetings are held fortnightly at the Temperance Hall, Cleckheaton (see Forthcoming Events) and the Secretary is Mr. R. Ellis (G3BKM), 34 Booth Street, Cleckheaton. The Society has a full programme of lectures for the next few months.

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

After a lapse of nine years the Thames Valley Amateur Transmitters Society revived their Annual Dinner and Social Evening on December 6 last. With Mr. Leslie Cooper, G5LC (President of the Society) in the Chair, some 50 members and their friends enjoyed an excellent repast provided by Mr. Chambers, Mine Host of the Carnarvon Castle Hotel, Hampton Court, and headquarters of the Society. During the evening a dressing table set was presented to Mrs. Chambers in appreciation of her services to the Society.

A toast to the T.V.A.R.T.S. was proposed by the President and responded to by Vice-President John Clarricoats, G6CL (General Secretary, R.S.G.B.) who, on behalf of the Society, extended a cordial welcome to the many younger members who had joined since the war. Dancing and games followed the dinner. At the November meeting Mr. E. Chairman, G6CJ, delivered a most interesting lecture on aerial systems. A 10 cms transmitter-receiver was used for demonstrations.

Barnet.—Jan. 17, Feb. 14, 7.30 p.m., Millicent Cafe, Lytton Road, New Barnet.
Croydon (Surrey R.C.C.).—Feb. 10, 7.30 p.m. "Blacksmith's Arms," South End.
East London.—Jan. 18, Feb. 22, 2.30 p.m., Lambourne Room, Ilford Town Hall (Films). Jan. 18 (Lecture). Feb. 22, "Plastics," by G2NR.
Enfield.—Jan. 18, Feb. 15, 3 p.m., A. & B. Cafe, Southbury Road (junction with Ladysmith Road), "Oscilloscopes," G3BFB.
Edgware and District Radio Society.—Jan. 21, 28, Feb. 4, 11, 18, Orchard Cafe, Broadway, Mill Hill.
Finsbury Park.—Feb. 3, 7.30 p.m., 164 Albion Road, Stoke Newington, N.16.
Ruislip.—Jan. 22, 29, Feb. 5, 12, 19, 7.30 p.m., Oddfellows Hall, Waxwell Lane, Pinner.
Hampstead.—Jan. 23, 8 p.m., Eton Hotel, Adelaide Road (Belsize Park Station).
Peckham.—Feb. 2, 7.30 p.m., "The Kentish Drover," Rye Lane (next Jones & Higgins).
Southgate.—Feb. 6, 7.30 p.m., Merryhills Hotel (near Oakwood Station).
Welwyn Garden City.—Feb. 3, 8 p.m., Council Offices, Welwyn Garden City.

REGION 8.

Eastbourne.—Feb. 6, 7.30 p.m., Friends Meeting House, Wish Road.
Worthing.—Feb. 5, 7.30 p.m., Oliver's Cafe, Southfarm Road.

REGION 11.

Rhyl.—Jan. 18, 3 p.m., Crown Hotel.

REGION 14.

Glasgow.—Jan. 28, 7 p.m., Institute of Engineers and Shipbuilders, 39 Elmbank Crescent.
Stirling (including Falkirk, Alloa and Larbert).—Feb. 12, 7.30 p.m., Plough Hotel, Stenhousemuir.

Town Representatives

The following Town Representatives have been elected since the previous list was prepared:—

Region.	
1 Accrington	A. Wahmsley, G2HIO, 65 Grange Street, Clayton-le-Moors.
Bolton	L. Green, G3AOW, 28 Daffodil Road, Farnworth (in place of Mr. G. Openshaw).
2 Hull	E. C. Grafton, G2CGL, 37 Parkfield Drive.
Newcastle-on-Tyne	W. Tweddle, BRS11542, 17 Langley Road, East Denton.
3 Sheffield	J. Petty, G4JW, 344 Carterknowle Rd.
3 Worcester	J. Morris Casey, G8CO, c/o Brookhill Farm, Ladywood.
4 Daventry	D. E. Pasfield, G5NH, Hazelmere, St. Johns Square.
7 Barnet and Elstree	R. Walker, G6QI, 7 Potters Lane, New Barnet.
Brentwood	J. F. Moseley, G2CIW, 23 Tower Hill.
Cheam	B. J. Blount, BRS7605, 5 Priory Crescent.
Southgate	P. J. H. Matthews, G3BPM, 119 Lakenheath, N.14.
8 Reading	R. G. Nash, BRS4573, 9 Holybrook Rd.
Heathfield	R. J. Lee, G2HLE, 9 Theobalds Green.
9 Stroud	A. Barber, G5WA, Nanpantan, Windmill Road, Minchinhampton.
10 Swansea	E. W. Nield, GW3ARP, 6 Hazel Road, Uplands.

A complete list of the names, addresses and call-signs of all Representatives will be published in loose-leaf form next month.

OUR FRONT COVER

OUR cover illustration shows a Variable Frequency Oscillator incorporating three Mullard QVO4-7's, one being used as an Electron-Coupled Oscillator and the other two being used as untuned Class "A" Amplifiers. Such an Oscillator could be usefully employed to drive a Band-Switched Exciter of 25-watt power input which likewise uses Mullard QVO4-7's throughout; thus enabling one valve type to be used for a complete "25-watter" ham rig.

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A bargain. "Q-Max" U.H.F. converter with 5, 10 metre coils. Condition as new, excellent performance, £9 10s.—Box 691, PARRS, 121 Kingsway, London, W.C.2.

AMPLIFIER.—Baker Selhurst 7v. W.W. quality Amplifier, 4 FX4's in push/pull with 12 inch triple cone speaker. Condition as new, £15.—Fox, 66 Sandybank Avenue, Rothwell, Leeds. [706]

VOMETER, Model 40. Hardly used, £10.—Box 707, PARRS, 121 Kingsway, London, W.C.2. [707]

BARGAIN. 4 R/F 0-2 ammeters, 5" dial, 10s. each. 4 extra R.F. 33-ft. tubular masts, complete with stainless guys, anchors, Coax connector, etc., in carrying bag, £4. Ideal for beams. 80 yards new 72 ohm Coaxial cable, 35s.—MORTIMER, Dore, Sheffield. [676]

BC348 receiver with commercial power pack, speaker, also R.C.A. AR77E. Both working. Offers. Would consider exchanging for equipment. Wanted 600-0-600v. transformer, H.R.O. or SX28A receiver.—NUNN (G2DT), 8 Blinco Grove, Cambridge, Tel. 87024. [687]

B2 Transmitter-Receiver, less power pack. Perfect condition, with valves, £6. Offers.—22 Arundel Road, Eastbourne. [716]

COMPLETE 10 watt Amplifier Kit, except chassis; nearly new, 5 valve, P/P output. Worth £10, accept £5. Offers, also R & A 8" energised speaker, with trans., 1000 ohm field, 15s.—BR516114, 8 Avenue Gardens, Alwoodley, Leeds. [718]

CRYSTALS, well known make. Complete with holders. 7038 kc/s, and 7067 kc/s. 17s. 6d. each. First offer secures.—G2ATD, 101 Hurst Road, North Heath, Erith, Kent. [703]

EDDYSTONE 358X, all coils, 90 kc/s, to 30 Mc/s., power pack, little used, electrically and mechanically perfect, £55 or nearest offer, buyer collect. QRA, North of England.—Box 686, PARRS, 121 Kingsway, London, W.C.2. [686]

EDDYSTONE 358X, 90 kc/s. to 31 Mc/s., coils, power pack, spare IFT's and xtal, nearly new, £28. National H.R.O. and power pack, rack mounting, all Ham band coils, £50. Set new HRO IFT's, £5. 832's, new, 30s. New 9003's, 7s. 6d. S.A.E. for list to Birmingham Road, Chadderton, Eastleigh, Hants. [690]

EDDYSTONE communications Receiver 504, very little used. To clear, £40, including matched speaker.—PERROS, 27 Causewayhead, Penzance, Cornwall. [700]

EDDYSTONE 640 Receiver, boxed and brand new. Accept £50. Also 1155 Receiver, power pack, speaker. Offers? Exchange TR9 Rx-Tx and performance meter No. 2, including 230v. 6v. power pack, for B2 power pack.—BR515459, 15 Cumberland Street, S.W.1. (Victoria 7893.) [714]

"ELECTRONIC ENGINEERING", August, 1941, to April, 1946. Offers! Wanted: R208, BC348.—VERRINDER, 1 Werne Minster, Dorset. [708]

EXCHANGE BC348 (AC), LS, Book: Triplett Multi-meter: Valve tester (American): 805 (1), 807 (2), 616 (2), KT44 (2), 7193 (4), EF50 (4), 6SH7 (3), 12SH7 (2), 12SJ7 (2), 6AC7 (2), 717A (2), GU50 (2), 5U4G (2), CRT 3BP1 (1), for Leica, Contax. Offers considered.—Box 701, PARRS, 121 Kingsway, London, W.C.2. [702]

FERGUSON sv. PP.OP. 12-2000m. G.E.C. 6v. 14-550m. A.C. Bluespot 3 waveband AC/DC, 2 Philips 6v. chassis. R1155 6v6 OP. AC mains. Offers, exchanges. Used tested Rectifiers U50, U52, 2s. 6d. each. AC Eliminator, 20s.—Box 689, PARRS, 121 Kingsway, London, W.C.2. [689]

FIVE M.C. Meters, £2. Four 12 Mc/s. I.F. Transformers, 15s.—BARNLEY, 4 Granville Road, Old Hill, Staffs. [721]

FOR SALE.—Wolf i" Electric Drill, as new, £7. Denco 4 band coil turret type CT2A. M.W. to 30 Mc/s., 35s. (used but O.K.). Morse key, 7s. 6d.—BR56942, 106 The Mall, Southgate, N.14. [693]

G2CWU Emigrating; must sell.—A.R. 88D Receiver with speaker; offers over £40. 50 watt rack-mounted transmitter with modulator complete, Black crackle, £12. Marconi transmitter and receiver type 4.S, range 3-6 Mc/s., £4. Crystal microphone on chrome stand, £4. 5 watt amplifier, £5. Rola 8" loudspeaker, 25s.—30 Shipton Road, Sutton Coldfield, Warwickshire. [696]

HALLICRAFTERS S.40, new, £50. SX.28, £60. S20, £25. National 1-10 complete, £25. R.A.F. 1132, 60 Mc/s. with pack, £10. Modulator 75 watt complete, xtal mike, £30.—Stamp full particulars, GM30L, Westland, Pleasance Avenue, Duffries. [721]

HALLICRAFTERS, Skydrift defiant SX24, communication Receiver. Good condition, complete with servicing and alignment manual, £30.—G4KG, 28 Almorah Road, Heston, Middlesex. [698]

HALLICRAFTERS.—Transmitter-Receiver, model HT11A, complete with separate motor generator power unit in perfect condition. Price £25. CR100/B28 Receiver also for sale, in new condition. £40. No offers.—Box 712, PARRS, 121 Kingsway, London, W.C.2. [712]

NATIONAL 100X Receiver for sale, excellent condition. Best offer over £30.—G4GD, 35 Gilpin Avenue, East Sheen, London, S.W.14. [723]

NATIONAL NC.81.X. amateur bands 10-160 m., 10 valves with crystal gate. 110-230v. AC/DC, £20. Also McElroy automatic Morse sender, £20.—CLARK, 12 Offham Slope, N.12. Hillside 7244. [724]

NEW.—Three hours' use, M.C.R.1. complete with power-pack, headphones, four coil units covering the main bands from 150 kc/s. to 15 Mc/s. Best offer over £8 secures.—DIMMOCK, 74 Manor Road, London, N.17. BR511584. [711]

NEW Hytron 807's, 12s. 6d. Transformers 350-0-350 volts twice 200 m/A, 5 volts twice, 6-3 volts three times, will give 700 volts 200 m/A, 50s. 350-0-350 volts 280 m/A 6.3 volts twice, 5 volts, 35s. 300 m/A 20 Henry choke, 20s. Many other items. S.A.E. list.—Box 727, PARRS, 121 Kingsway, London, W.C.2. [727]

NEW Valves.—C6V (4) 12s. 6d., 954 (4), 955 (4), 5U4 (1) 10s., OZ4 (2), VE150/60 (2) 7s. 6d., 872 (2) £2, 6BSG (4) 6s. Fil Transformer 220 input, secondaries, 3 x 2-5v. at 5 amps., 1 x 2-5v. at 15 amps., all C.T., £2. Xtals in holders for regrounding, frequencies from 3885 to 4872 kc/s., 5s. each.—White House, Victoria Road, Freshwater, Isle of Wight. [709]

PERFECT National 1-10 Receivers with power pack at £16 each. Absolutely complete with all coils. Limited quantity going fast. Ask for lists, 24d. stamp.—RADIO CONSTRUCTORS, 28 Spital Hill, Sheffield. [717]

QSL cards. Distinctive and attractive designs. Samples and prices from—G5KT, 33 Howard Road, Westbury Park, Bristol, 6. [559]

R.C.A. A.R.88 for sale. Brand new, £50.—Box 688, PARRS, 121 Kingsway, London, W.C.2. [688]

R.C.A.—AR77 communications Receiver and 9" speaker. Aligned and perfect. Offers.—Box 713, PARRS, 121 Kingsway, London, W.C.2. [713]

REPAIRS, overhauls and alignment of any type of receiver, wavemeter, etc., by Bert Adams, G5AD, professional communications engineer 25 years. Collection and delivery in Lancashire, express passenger trains other parts. Rapid service.—PENWORTHAM RADIO SERVICES, 11 Priory Crescent, Penwortham Hill, Preston. [655]

RME70 Receiver, owned by advertiser since new. New valves throughout. Perfect, any trial. Complete with instruction book, £45.—G2DAF, 16 Hawarden Road, New Hall Lane, Preston, Lancashire. [697]

ROTARY Transformer, input 24 volts D.C., output 1230 volts 200 m/A., with choke suppressors and starting relays, 19s. Also Eddystone 5/10 converter complete, as new, £8. 10s. Carriage paid.—Box 705, PARRS, 121 Kingsway, London, W.C.2. [686]

SADLER 2XS now having mains, has for sale, made to order 1938, belt or motor driven Genny requiring 1 h.p. to produce 1200/1500 volts at 700 m/A. Heavy machine, excellent condition. Best offer. Can also supply resistances to cut down for early stages.—Burnham House, Nelson Street, King's Lynn. [704]

SALE.—Avomitor DC, 50s. Avomitor Universal (new), £6. New valves: TZ40's 35s.; 6L6's 12s. 6d.; 834, 30s.; 5T4, 7s. 6d.; 6J5, 7s. 6d.; 955's 12s. 6d.; PT15, 20s. 01-5 DC m/A meter, 0-150 m/A meters moving coil, 20s.—G8UO, 13 Chandos Street, Keighley. [699]

SALE.—H.R.O. bandspread coil range B. 30s. 35s coils ranges 5 and 6, 15s. each. QCC crystal holder, 5s.—TAYLOR, 134 High Street, Barnet, Herts. [692]

SOUTH London. O.M. G3ST for Eddystone, Raymart, Hamrad and Brooke's crystals, beam tubes and masts, beam frames. BCL, repair service.—PARK ELECTRIC CO., 3 New Park Road, London, S.W.2. Phone TUL 4663. [651]

SURPLUS Gear. New, boxed. TH30c, TH41, Pen DD4020, FC4, EBL1, 15s.; TP22, EBL31, TP2620, ACTH1, PX4, 6A8, VP13c, 12s. 6d.; VMP4G, AC5 Pen, Pen 383, EL33, CL33, DK32, DAC32, DL35, KT41, 10s.; 5Z4, 5U4, 6Q7, 6SL7, 6AK5, 6H6, 6V6, 6AG5, AT4, 6AG7, 7s. 6d. Others, stamp.—BR59139, 3 Kings Avenue, Kings Lynn. [719]

SX25 completely overhauled, 8 controls crystal. Bandspread 2RF, 3IF, 12 tubes, 43 Mc/s.—550 kc/s., almost unmarked, £38. 1852 RF5 Eddystone 504, as new, calibrated 30 Mc/s., 500 kc/s. Eddystone 5-10 converter chassis complete with tubes, coils, £10.—TAYLOR, Shoemaker, Lake, Isle of Wight. BR516205. [726]

TELEVISION Receiver at low cost (approx. £10). Testeo circuit and instructions for converting easily obtainable. Ex Government surplus radar, receiver and indicator units, into a highly satisfactory television receiver (sound and vision). Receiver I-F's require no alteration. Time of conversion approx. 12 hours; circuit and instructions, 5s.—B. W. STEVENS, 122 Bath Road, Hounslow, Middlesex. [695]

V55R communications Receiver with matching speaker, perfect condition. Offers over £25.—ANDERSON, 7 Bridge Street, Kirkcudbright, Scotland. [722]

WANTED.—Numbers 1 and 2, 3, Vol. 21 Bulletin. For sale.—Numbers 3 and 5, Vol. 20.—D. BLACKHURST, 21 Brookside Road, Sale, Cheshire. [732]

WANTED.—7.B.L. Tx/Rx. Will exchange B2. Tx/Rx or Tx 1154, both less power packs, or Tx/Rx 1196, or would buy.—Box 725, PARRS, 121 Kingsway, London, W.C.2. [725]

WANTED urgently.—Circuit Diagrams, etc., for ex A.M. type 73 oscilloscope. Copy of Messrs. J. Bull's I.F.F. Oscilloscope conversion leaflet. Circuit diagram of Cossor 3339 Oscilloscope. Buy or borrow any or all of above. Your price paid.—F. W. TAPLIN, BR512778, 77 Ellis Avenue, Stevenage, Herts. [720]

WANTED.—Vibronex or McElroy bug key. Particulars to GARDNER, G3CGE, "Coniston", Parkside Avenue, Millbrook, Southampton. [715]

WANTED.—Small quantities of Litz wire.—Box 710, PARRS, 121 Kingsway, London, W.C.2. [710]

8 Valve communication RX Chassis 1 RF 2 IF BFO, etc., covering 10-20-40 metres; good bandspread, £10.—G6GD, 2 Green Mount, Stamford Road, Bowdon (Cheshire). Phone: Altrincham 0875. [702]

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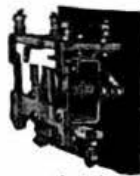
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WE are all familiar with shortages—material shortages—but there is one shortage that nothing on this earth can put right—and that is TIME. On every hand, one hears such remarks as "I haven't had the time."

Radio amateurs are no exception—in fact, it is true to say that radio amateurs lack time more than most—to build or modify equipment—erect new aerials—actually work "on the air"—and the host of other complications which attend a radio amateur's life.

In "the good old days," there was little option but to build one's own equipment. To-day, we say good luck to the man who still prefers to build his own gear—there is nothing like some practical experience. Many "hams" will have learnt that, whilst "straight" sets are not difficult to make, even then many snags crop up and it is not easy to obtain a good performance over the wide range of high frequencies allotted to amateurs.

Few will question the necessity of using a highly selective superheterodyne receiver in these days of congested bands. Those who have actually attempted to build one will know that a lot of time is taken up in the actual construction and usually even more in making adjustments, getting rid of the "bugs" and obtaining adequate performance on all the usual bands.

Some amateurs (usually those with a professional background) have the knowledge, and test equipment, to build an excellent receiver. To others we say, buy an Eddystone "640" Receiver. Commercial interests aside, we can assure you in all sincerity that you will be well satisfied with its performance—many receivers are now in use and by every post we receive testimonials to the excellent results obtained. You will get excellent value for your money—the receiver is a solid engineering job, entirely British made, and costs £42 0.0., (plus P.T.) which, judged by modern standards, is anything but dear.

Space does not permit the discussion of the finer points of the "640" and of their relative importance but we hope to do so in future advertisements. If you are not already familiar with the receiver, you are invited to get into touch with one of our agents, or with us direct.

With a first-class communications receiver sitting on your operating table, your problems on the receiving side will be at an end, and you will have more of that infinitely precious, if abstract, commodity—TIME—to devote to your many other interests.



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*First grade accuracy,
40 ranges, 1000 ohms per volt*

- 1 First Grade Accuracy.
- 2 40 Ranges.
- 3 1,000 ohms per volt.
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