R S G B

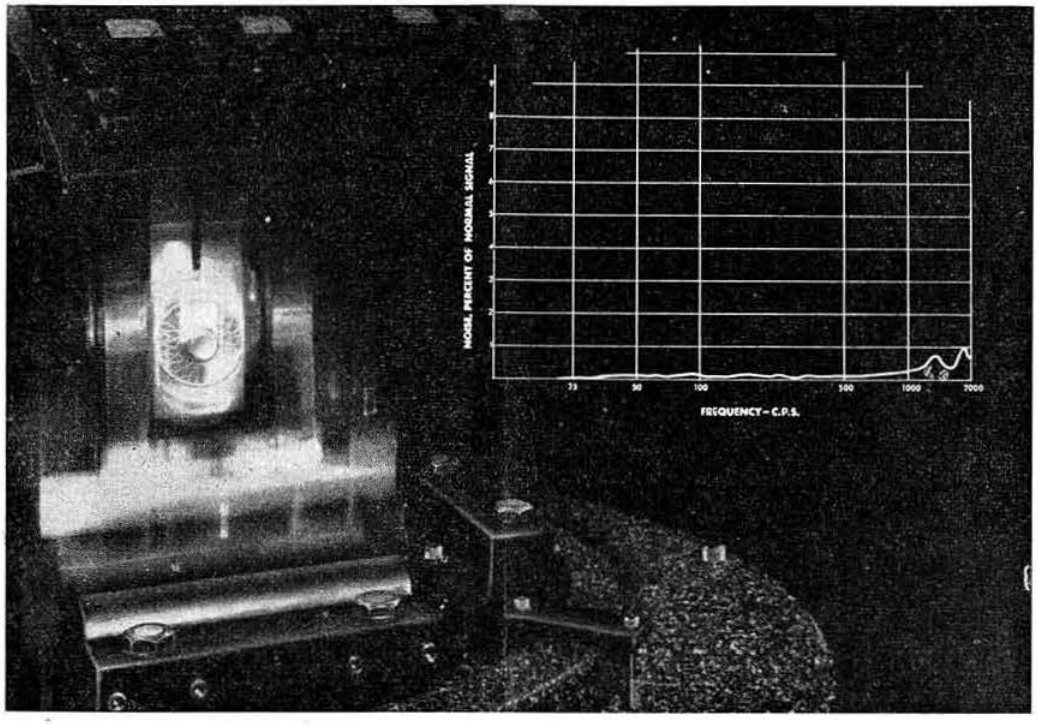
NOVEMBER, 1959

BULLETIN

2/6 Monthly

JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

VOL. 35, NO. 5



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Volume 35 No. 5
November 1959

R.S.G.B. BULLETIN

CONTENTS

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DEPUTY EDITOR:
John A. Rouse, G2AHL

EDITORIAL OFFICE:
R.S.G.B. Headquarters, New Ruskin House, Little Russell Street, London, W.C.1
Telephone: HOLborn 7373

ADVERTISEMENT MANAGER:
Horace Freeman, The National Publicity Co. Ltd., 20-21 Red Lion Court, Fleet Street, London, E.C.4
Telephone: FLEet Street 0473-6

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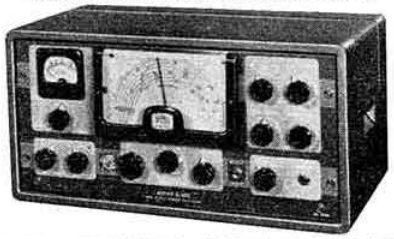

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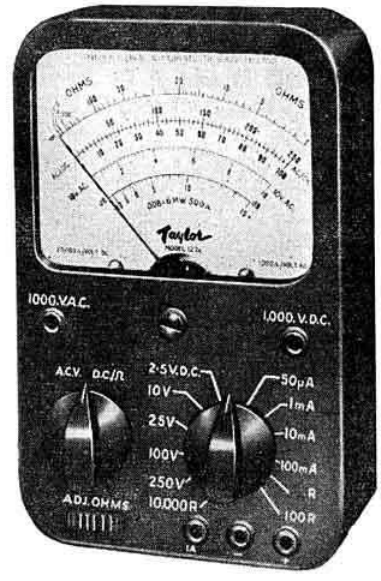

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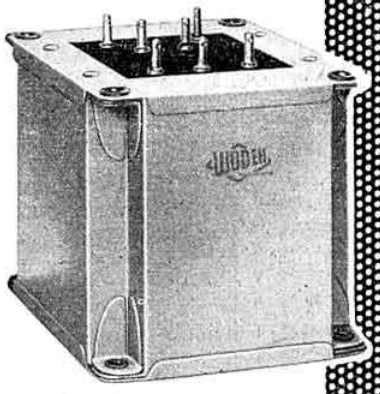

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Current Comment

discusses topics of the day

Wanted—More Members

IN his report to the membership circulated with the October issue of the R.S.G.B. BULLETIN, the Honorary Treasurer, Mr. Norman Caws (G3BVG), again drew attention to the need to obtain new members. We make no apology for returning to this theme, for at this time each year the opportunities are greatest for us all, each and everyone of us, to do something constructive towards raising the total number of members of our Society.

Thousands of people on the fringe of the Amateur Radio hobby visit the R.S.G.B. Radio Hobbies Exhibition, many thousands more buy their first hi-fi, electronic or radio kit. All of them are potential Society members. At radio clubs and R.S.G.B. Group meetings throughout the length and breadth of the land new faces appear at meetings and R.A.E. classes. All of them are potential Society members. From Top Band down, we all meet the amateur who has just received his licence or "doesn't get the BULLETIN." All are potential Society members, and the vast majority of them can be brought into membership if we will only make the effort and extend an invitation to join. A request to Headquarters will ensure that an explanatory leaflet and a complimentary copy of the BULLETIN are dispatched to a prospective member within a few hours.

Why should we try to increase the membership? Well, for one reason, it is in our own self interest to do so. It costs a great deal of money to provide the services the Society offers, particularly the BULLETIN, QSL Bureau and representation, but many charges remain more or less the same whether there are 5,000, 10,000 or 15,000 members—in other words, overheads per member go down as the numbers go up. And if basic expenses go down, there is more of everyone's subscription available to spend on services.

Of course, one way to have more money to pay for services would be to have higher subscriptions instead of higher membership. This is all very well in theory but if the subscription were higher, the total number of members might drop or remain static and this would tend to lessen the value of belonging to the R.S.G.B. Power today is increasingly in the hands of combines, groups of companies, trade unions, and associations of one kind or another. Even consumers, so long the whipping boys of modern commerce, are being organized for mutual protection. As in the work-a-day world so in the world of Amateur Radio. In many ways, the Society acts as a pressure group to defend Amateur Radio interests at home and abroad and the importance of the R.S.G.B.'s voice depends largely on the number of people it represents. The stronger and more united the Amateur Radio movement is, the better will the R.S.G.B. be able to defend our rights.

Every really active and enthusiastic radio amateur and shortwave listener in the country should be proud to wear the gold and black R.S.G.B. emblem in his button hole.

Let's invite them to do so. —J.A.R.

TVI/BCI

EVERY so often a new idea crops up which, in common parlance, pays off. Just such a case occurred when the Council decided to set up a Committee dealing specifically with problems relating to members' interference problems.

Most difficulties arise today principally as a result of the addiction of the great ad-mass for what one critic, perhaps a little uncharitably, calls the "idiot's magic lantern." Whether such a description of television today is justified or not, the fact remains that the vast majority of our fellow citizens spend a great deal of their leisure time viewing whatever is put before them. From the viewpoint of the radio amateur, viewers as a whole are all too ready to blame the local amateur transmitter for any interference, whether or not they consider the programmes good or bad. They cannot really be blamed: a television receiver is one of the rather more costly purchases in the average family. Unfortunately, they are very frequently prepared to make do with the latest 17 or 21 in. receiver, an inferior aerial and no high pass filter. The Post Office recommendations on adequate aerials are happily disregarded. Confronted with this situation, it behoves the amateur to make sure that his own equipment is as blameless as the state of the art permits but the whole problem all too often turns out to be a great deal more complex than merely technical, and requires specialist knowledge of all the many aspects. It was for that reason the Council set up the TVI/BCI Committee to deal exclusively with members' interference problems. Its terms of reference are wide to enable it to deal with each problem that arises.

The Committee almost immediately found itself in some difficulty with regard to the position of the transmitting amateur in relation to interference and the policy of the Post Office in such matters. The results of its investigations were published in the August BULLETIN with an official statement on interference investigations by the Post Office and will not be laboured here. Suffice to say that the discussions which led up to the August articles have also led to a

(*Continued on page* 222)

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The Real DX on Ten Metres

By Rev. P. H. SOLLOM, O.S.B., Ph.D., B.Sc., A.C.G.I., D.I.C. (G3BGL)*

A report of some of the unusual ways in which the 10m band has behaved during the peak of the sunspot cycle, which is of particular interest to members who operate on this band with a view to studying the propagation conditions, and knowledge of which may contribute considerably to success in acquiring achievement certificates.

THE abbreviation " DX " is becoming more and more widely used, even in the BULLETIN, to denote stations which are rare either by reason of the smallness of the amateur population, or the lack of activity on a particular frequency band. The real " DX," to be discussed here, is that which is the further away in distance, or rare because propagation conditions are seldom suitable and which from a scientific point of view is far more interesting than the " succulent " type as it indicates ionospheric phenomena which otherwise might remain unobserved.

A brief preliminary note about the station at G3BGL: it is very favourably situated from the radio point of view, and is equipped with a home made 150 watt transmitter and three element rotary beam at a height of 60 ft. which can be rotated from the operating position. The beam width at the half power points at frequencies between 28,300-28,500 kc/s is $\pm$ 24°, which deteriorates to about $\pm$ 30° at the extreme edges of the band. In the same frequency range the back-to-front ratio is better than 24db, the side-to-front ratio is better than 32db, and the maximum minor lobe level in any other direction is not greater than that of the lobe to the rear, all measurements being made in the horizontal plane. A standard signal generator with calibrated output attenuator was used to calibrate the field strength measurements. A receiver type AR-88D (without external preamplifier or internal " hotting-up ") completes the line-up for the 10m band. Operating time is only available generally for brief periods, but these are at useful times of day for this band. The log extracts quoted below are not really outstanding—probably other operators can show much more evidence of unusual conditions, but as so little of this information has appeared in print, it is hoped that these brief notes may be of interest. In all cases the contacts were made using A3 emission.

* *Douai Abbey, Woolhampton, nr. Reading, Berkshire.*

The Reliable Channel

Matt. Johnson (ZL3JO) of Timaru, often quotes his frequency of 28,494 kc/s as the reliable channel for com-

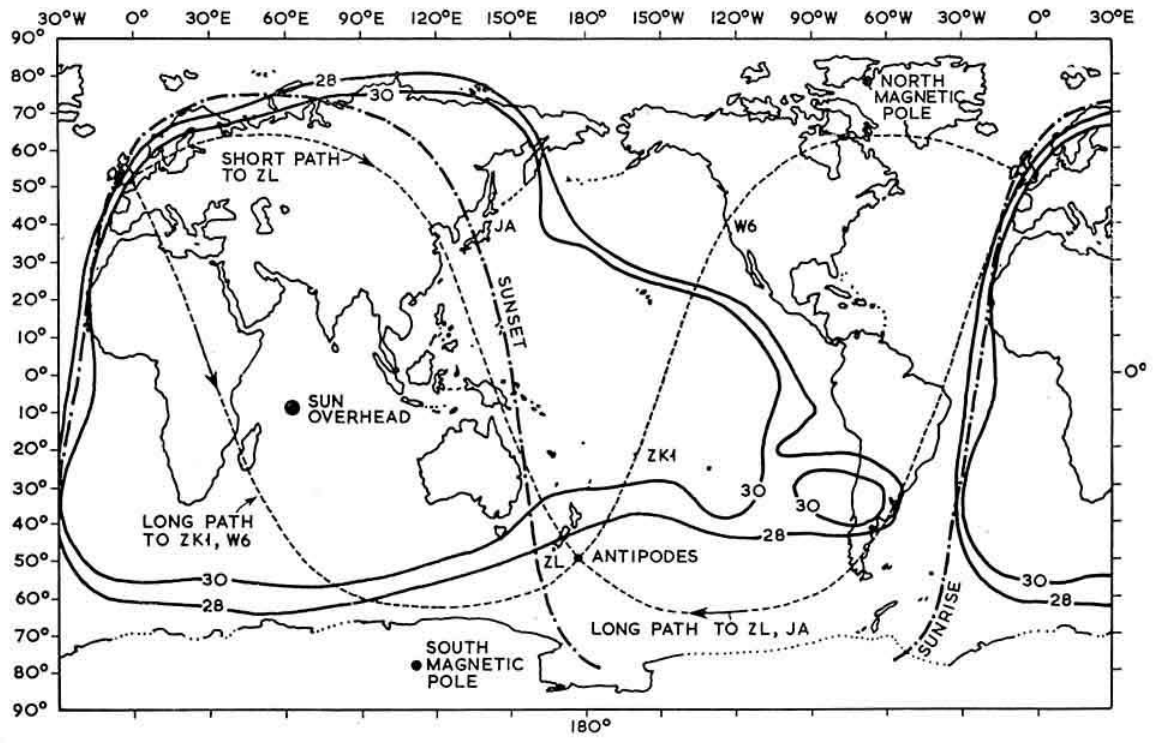


Fig. 1. Ten metre conditions predicted for 08.00 G.M.T., October 1958. Reflection points within the area enclosed by the m.u.f. contours will support propagation of low angle 28 Mc/s signals. The predicted short path opening to ZL was frequently verified during the month. The long path also opened at this time on a few occasions showing the extent of the 28 Mc/s contour over South America and the South Pacific to be then much greater than that predicted, or perhaps being evidence of Sporadic-E activity.

munication to the East coast of the South Island of New Zealand, and with good reason. Firstly, he is a very active operator on the band, and secondly because his location must be very near the antipodes of Southern England for radio purposes—much nearer than the usual great-circle maps suggest. The antipodes is the point to which all great circle paths converge at the opposite side of the earth, so if any path to ZL is open, Matt can usually be worked.

The usual times for 10m openings to New Zealand are the mornings and evenings, between 08.00-10.00 and 20.00-22.00 (say)—either G.M T or New Zealand time (twelve hours difference)—though, of course, the time limits vary somewhat. In general, the path may open over the sunlit hemisphere, i.e. the short path, over Japan, in the mornings G.M.T., and the long path over South America in the evenings G.M.T. Propagation conditions are therefore of interest particularly when the times of openings are very different from usual: e.g. midway between the usual periods.

The *Timaru Herald* of April 29, 1958, records Matt's conversation which " was probably an all-time record. He spoke to England from 11.25 a.m. to 4.10 p.m. (New Zealand time). The operator in England was Flight Lieutenant R. L. S. Hathaway, A.F.C. [G3JHI at Odiham, close to G3BGL] who was in the Royal New Zealand Air Force during the Second World War." A few days later, G3JHI reported to G3BGL how he had burnt the midnight oil with Matt on the long path.

Complementary conditions occurred on the short path exactly two months before this, when G3BGL worked a very sleepy Matt from 15.20-15.40 G.M.T., at a time when little activity could be heard from the Far East.

Ionospheric conditions predicted for October 1958 are shown in Figs. 1 and 2, for the usual times of opening of 10m to New Zealand, and are more or less typical of Spring and Autumn conditions. The predictions show that only the path over the sunlit hemisphere should support 10m propagation, but evidently on several days the ionization did not decline after sunset so rapidly as the predictions suggest, for ZL3JO was worked twice on the long path by G3BGL towards the end of October at about 08.30 G.M.T. The m.u.f. need not be above 28 Mc/s over the whole path, but only at the successive reflection points, and sporadic *E* may provide a reflection at just the right place to permit propagation by the F_2 layer to continue beyond its usual limits. The unusual times of working ZL3JO quoted above are probably evidence of sustained high level ionisation in other months.

The Radio Antipodes

In most contacts between England and New Zealand, the direction of propagation is along the general direction north-east and south-west, in accordance with the bearings that may be obtained from great circle maps. Propagation conditions are therefore of particular interest when communication is possible in very different directions to usual, e.g. at right angles to the usual directions. Both of these paths have been open to ZL3JO.

At 20.05 G.M.T. on October 14, 1958, G3BGL worked ZL3JO on the long path, and in course of conversation mentioned that an old friend, George Guy (G8TH) was on the band at the time working into Canada. Ten minutes later G3BGL joined in on the Canadian QSO to report Matt's hope of working G8TH again. Next morning Matt reported

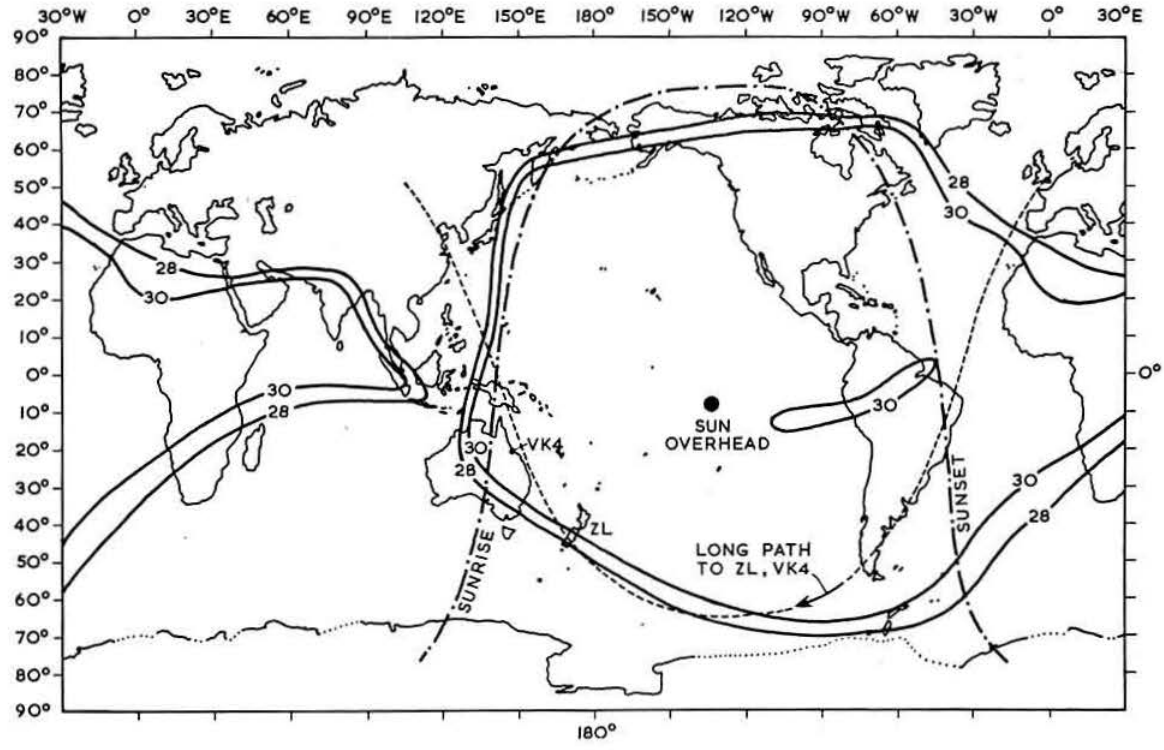


Fig. 2. Predictions for 21.00 G.M.T., October 1958, showing typical 10m conditions for the evening opening of the long path to ZL and VK. Approximately uniform ionization level all along the path resulted in high signal strengths. For the path to open, the first hop reflection point 1,250 miles to the south-west must lie within the area of sufficient m.u.f., and simultaneously the reflection points in the South Pacific must be sufficiently ionized even though part of the great circle path there lies outside the contours.

to G3BGL on the short path that he had " read the mail " of the Canadian QSO (all stations taking part) but he had to direct his beam at the North Pole to receive the signals—neither long nor short path directions were satisfactory. He could not call in because of his being crystal controlled.

The complementary path over the South Pole opened on April 20, 1959, when G3BGL had a QSO with ZL3JO at 07.00 G.M.T.: it was necessary for both stations to direct their beams over South Africa to make and maintain communication. No other New Zealand stations were heard at the time from this direction, nor from the usual directions.

In both these cases it is not necessary to conclude that conditions were very extraordinary. The great circle map gives the impression that the transmission path must be turned through approximately a right angle as it passes near the pole, but in fact only a very slight departure from the true great circle route is necessary to give such effects when the receiving station is so close to the antipodes. This deviation could be caused by a slightly sloping ionospheric layer. It would be interesting to know whether such a gradient is a regular feature of the ionosphere in polar regions, giving a position of the radio antipodes effectively several hundred miles removed from its geographical position, and whether there is any evidence of this sort of phenomenon occurring on lower frequency bands. Such sloping of the layer must occur regularly at about sunrise and sunset at the reflection point since the height of the layer changes at these times, and this could give rise to small deviations from great circle paths.

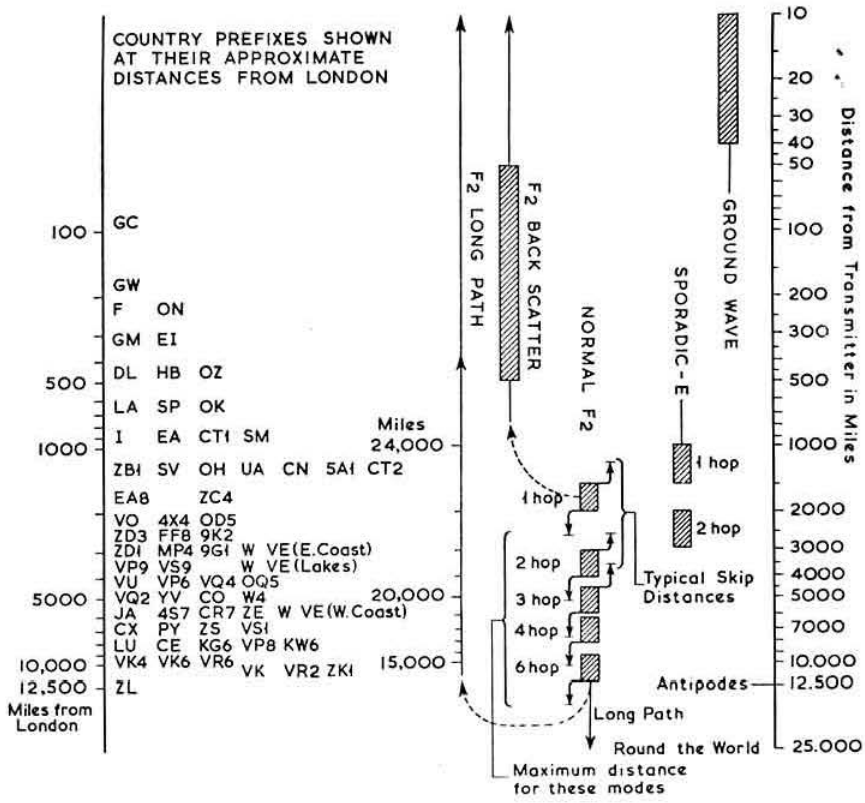


Fig. 3. Some of the possible modes of propagation of 10m signals. The shaded blocks show the distances for which each mode usually gives optimum amateur signals. Extension lines show approximately the distances which may be covered by each mode during normal variations in conditions. The maximum distances for reflected modes are governed by the layer height; the minimum or skip-distances depend upon the intensity of ionization. The operative mode may often be identified by observing the countries which can be heard strongly, and noting significant absences indicating the skip zones.

The south-easterly great-circle path shown on Fig. 1 would be approximately tangential to the 28 Mc/s contour at sunset in Antarctic regions. The small deviation necessary to move the effective antipodes into New Zealand is evident on this type of map. Sunset in the Arctic, Fig. 2, is probably not disconnected with the deviation of the north westerly path mentioned above, but it is notable that the deviation here must have been in the opposite sense to that near the South Magnetic Pole.

Back-scatter

The ionosphere is never sufficiently ionized for 10m signals to be reflected at vertical incidence, so there is always a skip zone between the far limit of ground wave range and the near limit of ionospheric propagation by sporadic *E* (which gives the shortest skip conditions), which is usually regarded as a region with which it is impossible to communicate on this band. There are, however, two modes of propagation which can permit such communication by way of the regular ionosphere: back-scatter and long path. The mode which occurs more frequently is that of back-scatter. Fig. 3 illustrates the distances covered by the various modes mentioned in this article, and shows the country prefixes which may help listeners to identify the mode or modes which are operative.

For the back-scatter mode, the two stations beam towards the same point in some direction in which the ionosphere supports propagation with very little attenuation, and the small signal which is scattered backwards by the rough ground or water surface at the extremity of the first hop of the transmission can be detected, very often with adequate coherence for full intelligibility.

It is justifiable to include this mode of propagation in an article dealing with " real DX " as it permits communication with amateur powers and facilities under conditions of low ionospheric attenuation, and requires transmitting and receiving aerials having efficient radiation at low wave angles as is necessary for long distance contacts. Stations in the range 100-500 miles have been frequently worked or heard at G3BGL, near Reading, Berkshire, in this way, and especially G8TH at Lynton, Devon, has exchanged S8 or S9 reports by back-scatter from north-easterly and north-westerly directions on several occasions, the Canadian contact mentioned above being a good example of this. In the case of stations at the further limit of this distance range, there is some evidence that strongest signals are obtained when the stations not only beam in the same direction, but when they are also situated

along a line in that direction. Thus G3BGL beaming towards Dublin has been received several times by Frank Halpin (EI4J), in that city with his beam north-west, and conversely when both stations beamed south-east. French, Dutch, Danish and Norwegian stations have been received best from the westerly reciprocal of their normal directions, and GC2RS was worked by back-scatter from the West Mediterranean area on February 20, 1958.

Back-scatter propagation is of course readily distinguished from sporadic *E*, which gives best reception when both transmitting and receiving aerials are turned towards each other, and also by the characteristic flutter type fading which may or may not mar the intelligibility in different instances. Short skip involves the use of high wave angles and hence the directivity of a three element beam is not good for such signals, but back-scatter is a low wave angle mode of propagation and full directivity of the beam is observed provided the other station is also using a beam. If this is not the case, it may be observed that conditions are favourable for back-scatter over a wide arc, in which case coherence may be better in one direction than another—but is best if both stations use sharp beams.

The Real DX

The second method of propagation by the regular ionosphere which permits communication with the region beyond ground wave but within the skip zone of sporadic *E* is one which involves a round-the-world path of 25,000 miles. Favourable conditions for this occur infrequently on 10m, and, unfortunately, stations in Scotland, Northern England, and Europe, though heard " the very long way round " have not yet been worked that way at G3BGL. Conditions looked favourable for this to be possible when ZL3JO could be worked on the long path at about 08.00 G.M.T. (itself a relatively unusual time for a long path opening on this band) and then on the short path an hour or so later. Matt reported that the long path would fade out suddenly and he would find the station he was working coming in on the back of his beam by the short path. A few days later the times during which the two paths were open overlapped for an hour or more. ZL2JR, for example, using a long wire aerial, could be received equally well from both directions on November 21, 1958. Stations in the British Isles and near-Europe were heard with the characteristic fading then affecting the ZL signals from one direction, but were also audible by back-scatter or weak ground wave from the opposite direction. The long echo due to the time delay between the two paths could also be heard if the aerial was adjusted to admit both modes of propagation to the receiver. It was possible to confirm these findings by listening to the ZL station being worked, and noting which path was in use for the contact. If the ZL station was using a beam aerial, the signal was only audible on one path.

There are two directions in which round-the-world propagation is likely on 10m at times of high sunspot activity: the north-east or south-west path, and the north-west or south-east path. This is because these great circle routes pass through points of approximately equal ionization intensity all along the path at certain times, but the former path, passing less near to the magnetic poles, is more likely to give openings.

The outstanding DX worked from G3BGL beyond the antipodes along the path to the south-east was ZK1BS at Rarotonga on October 25, 1957, at 08.50 G.M.T. and W6ZGC near Los Angeles (20,000 miles) on April 19, 1959 at 07.40 G.M.T. To the south-west: VK4CB on April 18, 1958 at 20.30 G.M.T.; VK4GD at Townsville on October 18 and 19, 1958, at 20.30-21.00 G.M.T.; and JA3IS (19,000 miles) on November 22, 1958, at 08.50 G.M.T. No contacts beyond the antipodes have yet been made along these paths starting in the northerly directions.

When conditions permit round-the-world propagation, the signals do not follow great circle paths with mathematical accuracy, and hence, if stations within a few hundred miles of each other wish to communicate, the transmissions should be beamed along the direction of the favourable path, and not necessarily towards or away from each other.

It is interesting to note that the south-easterly long path to W6 in Fig. 1 is almost exactly the reciprocal of the south-westerly long path to VK4 in Fig. 2, but is displaced about nine hours in time so as to follow roughly the same ionospheric track, i.e. it has the same position relative to the contours. In both cases the m.u.f. has fallen at the eastern end of the path and although it is well below 28 Mc/s at the terminal station, it is still sufficient for propagation of very low angle signals at a point 1,250 miles to the south-west—the reflection point of the first, or last, hop. If the long path is open to ZL at about 22.00 G.M.T., then from this consideration the south-easterly path to the Pacific may open the next morning at about 07.00 G.M.T. However, comparison of the contours of Figs. 1 and 2 shows that a considerable change occurs during the day in the shape of the area which will support propagation, so such deductions require correlation with up to date m.u.f. data.

It should be noted that the F_2 layer m.u.f. contours merely indicate the possibility of propagation by multiple reflections from this layer. Many other factors must be investigated to explain why such possibility is often not realized in practice, but these are beyond the scope of this article.

Conclusion

The 10m band is liable to extremes: when sunspot activity is at a high average level it can be " very good," whether interest is focused on the " succulent DX " or the peculiarities of propagation conditions; it can also be " very bad " when sunspot activity is temporarily too high or generally too low. The interesting propagation conditions described above have occurred usually a day or two after a " very bad " period due to excessive solar activity and are worth putting on record for reference as an indication of what may happen again when the next peak of the sunspot cycle approaches. Perhaps the 15m band will show some similar effects as the maximum usable frequencies decline a little.

The author wishes to thank the Director, D.S.I.R. Radio Research Station, Slough, for providing the data necessary for preparing Figs. 1 and 2, and also to acknowledge the help kindly given by G3IHG and G5DF with the measurements of the radiation pattern of the three-element beam.

Premiums Offered for Technical Articles

THE scheme for awarding annual premiums for articles on electronics, organized in the past by the Radio Industry Council (London), is now under the joint sponsorship of the Council and of the Electronic Engineering Association.

Articles published during 1959 will be considered by the panel of judges early in the New Year, and explanatory leaflets can be obtained from the Electronic Engineering Association, 11 Green Street, London, W.1, to whom also eligible articles should be submitted before the end of the year.

Six premiums of 25 guineas are offered to writers not earning their living wholly or mainly by writing. The judges, headed by Professor H. E. M. Barlow, Professor of Electrical Engineering, University College, London, are given the greatest possible freedom in allocating awards, but the main factors taken into consideration are the value of the article in making known British achievements in radio and electronics; originality of the subject; technical interest; and presentation and clarity.

Technical Topics

By Pat Hawker
(G3VA)

Frame-grid Valves – Positive Peak Expanders – Aerial Safeguards – Break-in Unit – Two-stage Grid Dipper – Citizens' Band

WITH semi-conductor devices constantly crowding the headlines, it may seem somewhat outmoded to open *Technical Topics* with news of a fifty-year-old device—the valve. But it seems likely that, in the coming months, we shall be hearing a good deal more about " frame-grid " valves, so it may be as well to brush up on the subject.

To do this we have to go right back to 1936 and the opening of the television service, when need arose for r.f. pentodes with a much higher slope than was then normal practice: this led to the development of the EF50 and similar short-base valves with slopes of the order of 7·5 mA/volt. Then, in the 'forties, further development brought forth a new form of control grid structure which has since become known as the " frame grid " and which was fitted mainly to special purpose valves. In the last year or so new frame-grid double-triode valves such as the PCC89 have been employed in the cascode stages of television receivers for " fringe areas." In the next few months further frame-grid valves for domestic use, including a vari-mu r.f. pentode (EF183) and mixer (PCF86) are likely to be released by Mullard. The EF183 has a slope of 12·5 mA/volt and the PCF86 a conversion conductance of 4·5 mA/volt.

To achieve the high degree of control necessary for such slopes, the grid is wound as a close mesh of extremely fine wire around two stout main rods and mounted very close to the cathode. Clearly, if inter-electrode short-circuits are to be avoided, a high order of precision is needed during assembly.

Such a grid will naturally have increased capacitive loading on the input circuit, and this will be of more importance for narrow-band communication work than for television. Nevertheless, these valves are likely to figure in many amateur applications.

Neutralization of I.F. Stages

The higher the slope, the more difficult it becomes to keep an amplifier stable, and increasing use is being made in both television and a.m./f.m. radio practice of a simple method of neutralizing i.f. amplifiers. Fig. 1 shows the essentials: the close-tolerance capacitor used for common anode and screen decoupling forms one arm of a bridge neutralizing network in which, for balance, $C_{a\text{-}g}/C_{g\text{-}s} = C_{a\text{-}e}/C_n$ and in which the valve inter-electrode capacitances form the other three arms, $C_{a\text{-}g}$ being anode-grid, $C_{g\text{-}s}$ being grid-screen and $C_{a\text{-}e}$ being anode-earth capacitances. This system could presumably be applied to power amplifiers.

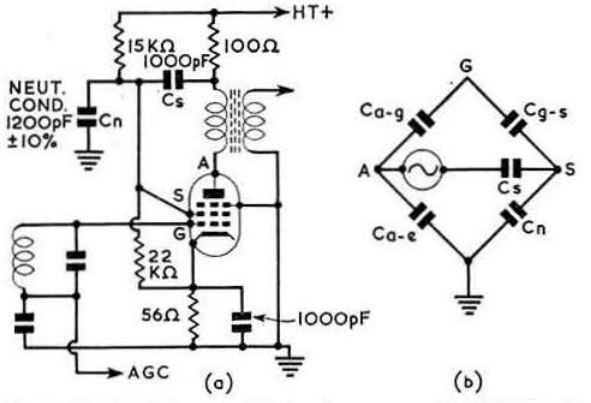


Fig. 1. (a) Television sound i.f. using a neutralized EF183. (b) Equivalent bridge circuit formed by the inter-electrode capacitance and common screen and anode decoupling capacitor.

More Modulation for Everyone

Ever since s.s.b. appeared on the scene, conventional a.m. adherents have smarted under the taunt that most of their power goes into the production of carriers whose only use is to cause heterodyne interference. Be that as it may, several schemes have come along which permit a lot more audio power to be put on to the carrier. For example, the Allen ultra modulation circuit (*QST* October, 1956; *CQ* April, 1959) permits an audio/carrier ratio of up to 2:1 instead of the usual 1:2. This is a high-level system calling for several high-voltage rectifiers and a high-wattage resistor to absorb the negative peaks of the a.f. waveform, permitting much greater positive peaks to be used without overmodulation occurring. Now a very simple low level positive peak expander has been described by W3BSA (*CQ* June, 1959): see Fig. 2. This simple two-rectifier network, in which the degree of negative peak clipping is controlled by the potentiometer, is inserted in an early stage of the speech amplifier. It is connected in either the polarity " sense " shown in Fig. 2 (*a*), where there is an even number of phase inversions between the network and the modulator anodes, or as in Fig. 2 (*b*) where there is an odd number.

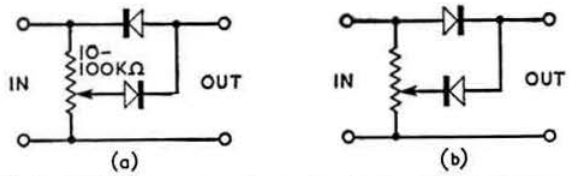


Fig. 2. W3BSA's simple positive peak expander for insertion in an early speech amplifier stage. Miniature copper oxide (e.g. Westectors) or crystal diodes should be suitable. Connections are as (a) where an even number of phase inversions follow the expander while (b) is for an odd number of inversions.

Several reports have come along suggesting that it is well worth looking into this simple device, particularly for relatively low-power transmitters such as those used for mobile work. It should be noted, however, that your modulator and p.a. must be capable of handling the expanded positive peaks.

Look to your Aerials

These notes are being written in the knowledge that the first equinoctial gale means that at least one aerial now needs re-erecting. But while most amateurs—especially those using trees as supports—accept this as a regular chore, there are some locations where aerial failures cannot be tolerated because of possible hazard to the public. This aspect of aerial rigging was much in the mind of W2BIV when he wrote "Apartment House Antenna Precautions "

(*QST* September, 1959) in which he lists a number of ways of counteracting the devastating effects of erosive soot as well as high winds. W2BIV points out that the strain of a long aerial can easily cause breakage of insulators and advocates bridging all insulators under strain with a braided length of several strands of 50-lb. test monofilament fishing line (available in the U.K.). To prevent halyard failure $\frac{1}{2}$ in. or $\frac{3}{4}$ in. manila or nylon rope is recommended. Where aerial supports are to be permanent and cannot easily be reached, he distrusts the conventional pulley and prefers instead to run the support wire over a 1 in. brass or copper pipe mounted in a Y-bracket atop the support: these can be re-threaded if necessary without lowering the mast.

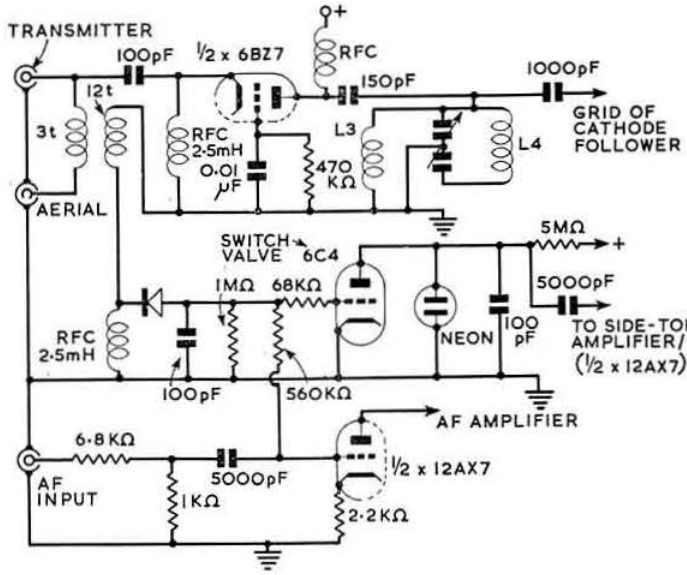


Fig. 3. Some details of W5ECP's break-in unit showing the T-R switch, side-tone generator and a.f. muting. L3/L4 form a multiband tuner. (L3, 23 turns ½ in. diameter 16 t.p.i.; L4, 19 turns 1 in. diameter 32 t.p.i.) A broadcast receiving type ganged tuning capacitor of about 450 + 450 pF would be suitable for the tuner. The crystal diode specified was a 1N34 but almost any r.f. diode could be used. Similarly the side tone neon (type NE-2 in the original article) is not critical. The three-turn aerial coupling coil should have a diameter of less than ½ in. with the 12 turn coil wound over it and with a sufficient diameter to give ¼ in. clearance.

BK . . . QSK . . . BK

Despite the many articles which have appeared on full break-in operation, this ideal A1 system remains the exception rather than the rule. W5ECP (*QST* September, 1959) takes away almost our last excuse. His " break-in at its best " unit—a combined T-R switch, a.f. muting device and monitor oscillator—has a number of ingenious features. Unlike the recent G2YS design (BULLETIN, September, 1959) no relays are used. The 6BZ7 T-R switch (based on a design by W3LYP) has the first half of the valve as a cathode-driven grounded grid arrangement, with the second half as a cathode follower output stage feeding the receiver. To tune the inter-valve circuit, there is a multi-band tuner covering 3·5 to 28 Mc/s without switching. Then there is a 12AX7 muting valve driving a 6AQ5 output stage: while this duplicates the receiver output it eliminates any need to make muting connections to the interior of the receiver (for example, by switching in an extra cathode bias resistor). To mute the valve, a small amount of r.f. is rectified by a crystal diode and the negative voltage so obtained is applied both to the grid of the muting triode and also to a 6C4 switch or control valve which in the non-biased condition prevents the neon side-tone oscillator from functioning. When bias is applied, the 6C4 anode current drops and the voltage across the neon rises, causing the oscillator to start. The output of the side-tone oscillator is amplified and electronically mixed to the a.f. by the second half of the 12AX7. It would appear possible to simplify the unit, if required, by using one of the simpler T-R switches. It would also seem feasible to omit the crystal diode altogether by using the voltage developed at the grid of the T-R valve to operate directly the muting and side-tone control valves. Another interesting relay-less BK system—with voltage-regulator tubes for both keying and receiver muting—was described by W3OFU in *QST*, February, 1959. This would seem to be a sure-fire system in conjunction with a T-R switch provided that there is a 350-volt negative voltage available.

Two-stage Grid Dipper

The usual recipe for a grid dip meter is " take one valve . . . and a 1 mA f.s.d. meter." Now even at surplus prices a good 1 mA meter tends to set one back more than, say, a 5 mA type (the movements in some common r.f. thermocouple ammeters are of about this value when shunted by a 5 ohm resistor and thermocouples are often accidentally burnt out). So the circuit in Fig. 4, spotted recently in one of the Continental journals, is not without interest. In this arrangement a second triode section is used in a valve voltmeter type circuit, permitting the use of a meter with an f.s.d. of from 2 to 6 mA.

Citizens' Band

When the American amateurs lost the use of their 27 Mc/s band, it became available as a " Citizens' band "

(*Continued on page 210*)

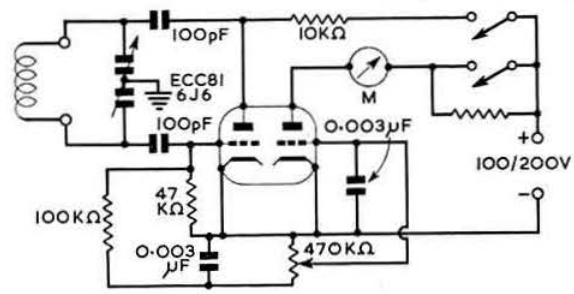


Fig. 4. Grid-dipper for use with a 2 to 6 mA f.s.d. meter. The sensitivity can be adjusted by varying the voltage dropper in the second stage.

A Halo Aerial for 144 Mc/s Mobile

By R. C. HILLS, B.Sc.(Eng.) (G3HRH)*

THE 145 Mc/s band is becoming increasingly popular with mobile enthusiasts but one of the particular difficulties encountered is the question of a suitable aerial. The convention in Europe is to use horizontal polarization, and this does not readily lend itself to an aerial possessing omni-directional properties. However, it is clear such an aerial is desirable for mobile work, where its orientation with respect to the distant station is constantly changing as the car proceeds. One of the simplest and most popular forms of horizontally polarized omni-directional aerials at present in use is the so-called " halo "; this consists of a simple half-wave dipole which is bent round to form a circle, with the ends of the elements separated by some suitable insulator. The electrical form of this aerial is very simple and the purpose of this article is to illustrate how a rigid mechanical aerial may be made without much difficulty.

The design is based on Amphenol coaxial plugs and sockets which are readily obtainable on the surplus market. It was decided that it would be convenient to mount the halo on a coaxial plug, so that the whole assembly could be screwed on

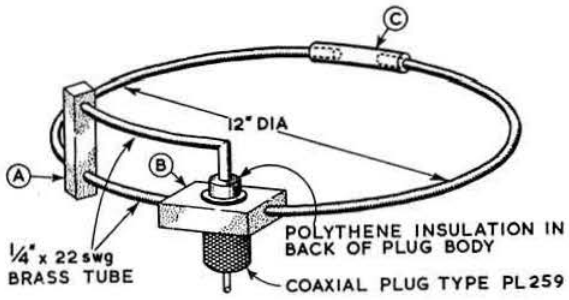


Fig. 1. The general construction of the 144 Mc/s halo aerial.

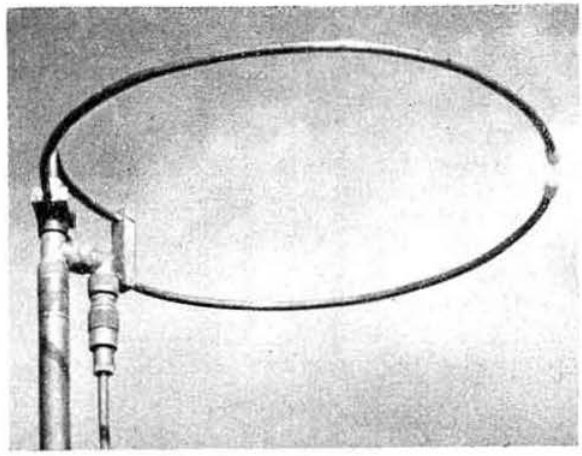
to a coaxial socket which would provide both the electrical connection and the mechanical support.

Construction

The general construction is illustrated in Fig. 1 and in the accompanying photograph. To preserve mechanical rigidity at the weakest point of the aerial, i.e. in the centre of the radiating element, use is made of the gamma match for 70 ohm impedance: this permits the radiating dipole to be made in one complete length. The conventional series capacitor in the arm of the matching stub has been omitted on the grounds of mechanical simplicity. Mobile aerials are usually fed by a comparatively short feeder from the transmitter, and the slight increase in s.w.r. resulting from the residual reactance of the matching stub, does not introduce any further appreciable loss in radiated signal level.

The dipole proper is formed from a 39 in. length of ¼ in. 22 s.w.g. brass tube. This is normally supplied hard drawn and should be annealed before bending as follows: heat the tube to a dull red with a blowlamp and quench it immediately in cold water. It is important to anneal the tube uniformly along its length, otherwise it will not be possible to obtain a smooth bend when the circle is formed. The annealed length of tube should be bent round a mandrel approximately 12 in. in diameter: a domestic bucket is satisfactory for this

* 73 Warren Way, Digswell, Welwyn, Herts.



A view of the halo aerial for 144 Mc/s built by G3HRH/M. This picture was taken at the Longleat Mobile Rally on June 14, 1959.
(Photo by G3GOZ)

purpose. When finished the ends of the tube are approximately 2 in. apart. The insulating spacer is formed from a 3 in. length of round polythene taken from a piece of ¼ in. diameter coaxial cable. The centre conductor is removed and the ends are drilled ½ in. deep with a ¼ in. diameter drill. The ends of the brass tube are pushed into these holes and, due to the elasticity of the polythene, are gripped firmly without the need for any further clamping.

The main support for the halo is provided by a brass block (Fig. 2) which has a hole drilled through its centre into which is brazed the back nut of a coaxial plug type PL259. The brass tube of the circle is cut diametrically opposite the polythene spacer and the ends are brazed into either side of this brass block. The shorting bar for the feed point is also made of a brass block and is brazed into position 4½ in. from the centre of the dipole. The position of this tap is not critical and the dimension of 4½ in. has been found to be quite satisfactory for a match to 70 ohm cable. The conductor for the live side of the gamma feed is also made of ¼ in. brass tube. A 4½ in. length has one end brazed into the shorting bar and at the other end a further short piece of ¼ in. tube is mitred and brazed so that it projects down into the centre of the coaxial plug. The end of this tube is stopped with a 1 in. 6 B.A. cheesehead bolt, brazed into it: this passes through the pin of the centre portion of the coaxial plug. A disk of ⅛ in. thick polythene is pushed over the ¼ in. tube to locate it

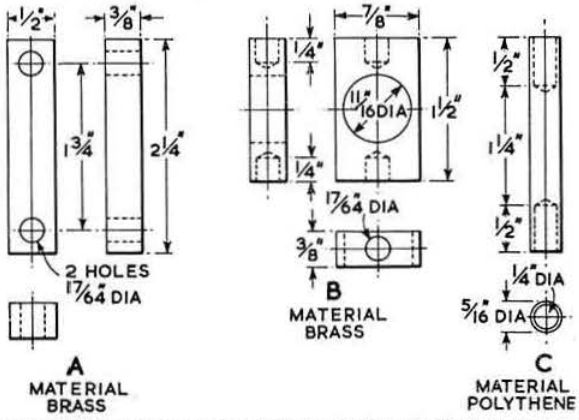


Fig. 2. Details of the brass supporting blocks and polythene spacers.

centrally in the free portion of the plug which is then screwed home into the back nut drawing the spacer up as it goes. The centre stud may then be soldered to the pin to complete the assembly (Fig. 3). The two locating pips on the free portion

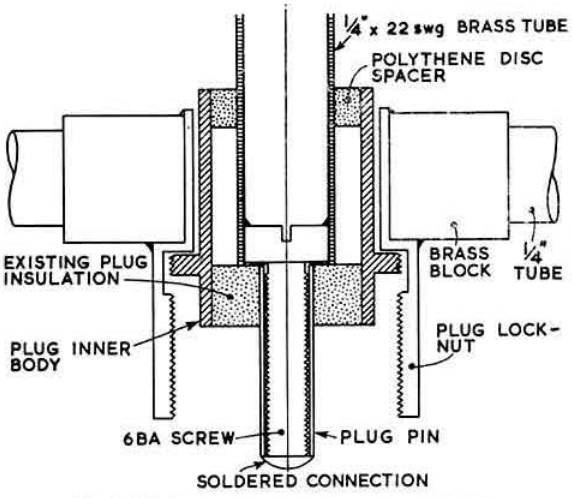


Fig. 3. Method of assembly of the supporting plug.

of the plug are filed flat so that when the plug is screwed on to a socket, the free portion of the plug (which carries the " hot " feed to the dipole) is also free to rotate.

Mounting on the Car

The mounting of the halo proper is detailed in Fig. 4. An Amphenol tee connector, type M358, is screwed on to the halo plug and the incoming coaxial cable, loaded into a plug (type PL259) with ¼ in. adaptor, is screwed into the side of the tee fitting to provide the electrical connection. The bottom section of the tee is supported mechanically by screwing it into the back nut of a further plug, type PL259. This back nut may be brazed to some convenient mounting to suit individual requirements. A $\frac{1}{16}$ in. thick disk of polythene should be pushed into the bottom of the nut to prevent any possibility of the inner conductor of the tee connector coming into contact with the supporting block to which the back nut is fixed.

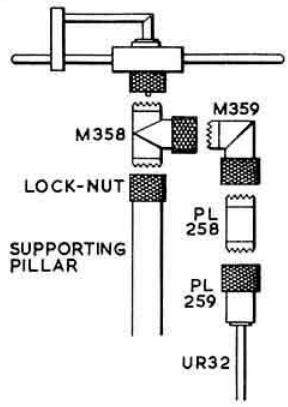


Fig. 4. Assembly of the coaxial fittings for the halo mobile aerial.

The author's mobile equipment operates on 1·8 Mc/s as well as 145 Mc/s and the centre-loaded whip for the l.f. band is constructed in three sections which screw together. The lower section is a ¾ in. 20 s.w.g. brass tube which has a ⅜ in. B.S.F. male bush brazed into the top end, on to which the loading coil is normally screwed. It was decided that this would make a convenient supporting mast for the halo, and a ¾ in. diameter cylinder of brass, 1 in. long, was tapped ⅜ in. B.S.F. along its length. The supporting back nut was brazed to one end of this bush and this assembly was screwed on to the ¾ in. tube. The halo and tee fitting were then screwed into the back nut as described above to complete the installation. The ¼ in. coaxial cable from the halo is attached to the tube in three or four places by means of a spring clip formed from two Terry clips bolted back to back as shown in Fig. 5.

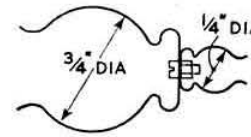


Fig. 5. Cable supporting clips.

The aerial described in this article has been subjected to speeds of 70 m.p.h. and has been driven over extremely rough roads without showing any signs of vibration or bending. The ability to quickly remove the halo by unscrewing a single plug has proved a great advantage when running into low garages, and it is hoped that v.h.f. mobile operators may find one or two suggestions to assist them in the design of their own aerial systems.

The author would like to acknowledge the assistance of Mr. T. H. A. Withers (G3HGE) in carrying out the trials of the prototype.

Technical Topics

(continued from page 208)

for the Class D Citizens' Radio Service for which a station but not an operator's licence is required. There are no examinations and home-constructed equipment may be used. The maximum input is 5 watts and aerials must be under 20 ft. in height. It would seem that when this facility was introduced some people looked on it as an easy way of getting into Amateur Radio. It has now been made clear in *Electronics World* (the new name for *Radio and TV News*) September, 1959, that these licences are not intended for amateur style operation, and that CQ calls and attempted DX operation are not legally permissible. Amateur stations can be contacted only in an emergency. The primary use of the licence is for private short-distance communications for personal or business purposes, with transmissions kept as short as possible.

Here and There

A two-part article on " Single sideband transmission " in *Electronics World* (September and October, 1959) reviews some of the current techniques for amateur and low power commercial applications . . . *QST* reports that some 6·36 per cent of American amateurs no longer rely on their carriers, with almost as many again in the s.s.b. " planning stage." . . . Both 50 Mc/s and 144 Mc/s are now open to American " technician " licensees and W1HDQ contributes a " Firing Up on 6 and 2 " article in *QST* (October, 1959). . . . A sneak preview of the already fabulous Hallicrafters FPM-200 transistorized s.s.b. transceiver appears in *CQ* (October, 1959): the only valves used in the entire rig, which operates from 12 volts d.c. on all bands from 3·5 to 28 Mc/s, are the 12BY7 driver and a pair of 6146 in the p.a. This miniature, but powerful rig—not yet on the market—is full of new s.s.b. and transistor techniques: for instance, all tuning is by variable capacitance diodes (see *Technical Topics*, April 1959) while the Zener diode regulated supply is said to enable the two v.f.o.'s to keep within 25 c/s for an input variation of from 10 to 14 volts! . . . And so at last to this month's new semi-conductor device—the *Tunnel Diode*. Originating in Japan, and now under development in the U.S.A., this two-terminal " diode " can show a negative resistance characteristic over part of its operating range, enabling it to amplify, oscillate or be used as a high-speed switch. It already works on frequencies up to 2000 Mc/s with noise figures comparable with travelling wave tubes. . . . What next?

The G2DAF S.S.B. Transmitter

Part 3.–Alignment

By G. R. B. THORNLEY (G2DAF)*

FOR the initial alignment the 100 volts negative muting and bias supply can be dispensed with and the 6146 p.a. valve fed from the exciter 300 volt supply (for the anode) and the 150 volt regulated line (for the screen). As there is no bias the cathode will require lifting from earth and returning through a 1 K ohm resistor to reduce the standing anode current to about 30 mA. The bottom end of the 100 K ohm bias potentiometer (VR7) should be temporarily connected to the chassis.

A BC221 frequency meter or a similar type is required for the alignment of the exciter. The procedure is as follows.

Turn all gain controls to zero and set the three balancing potentiometers (VR4, VR5 and VR6) in the mixer cathodes to the mid-way position. Check the audio amplifier by connecting a pair of headphones between the chassis and the 0·25 μF capacitor feeding the diode modulator. Speech into the microphone should be heard clearly in the 'phones. Return the volume control to zero. Remove the carrier crystal and the v.f.o. valve V8 and the conversion oscillator valve V11 from their holders. Connect a length of co-axial cable to the input terminals of the station receiver and terminate it with a two turn " pick-up " loop of connecting wire 1 in. in diameter. Select the lowest frequency sideband switching crystal with the panel control and place the pick-up loop against the appropriate anode coil. Tune the receiver to the crystal frequency (1613 kc/s). Adjust the coil slug for maximum S meter reading. Repeat for the 2538 kc/s crystal and coil.

Remove the loop and tuck it into the wiring close to the first balanced mixer anode and i.f.t. connections. Tune the receiver to 2075 kc/s. Connect the " hot " lead from the BC221 to the grid of the filter amplifier valve V4 and set the BC221 output to the exact mid-frequency of the filter (half way between the low and the high filter crystals). However much the circuits are off tune some carrier will be picked up by the receiver. Peak the primary of IFT6 and the primary and secondary of IFT5 for maximum S meter reading. Transfer the BC221 output lead to the junction of the two filter crystals and the primary of IFT4—peak the two cores for maximum S meter reading. Repeat for IFT3 with the BC221 lead connected to the primary. Transfer the BC221 output lead to the junction of the two diodes—peak IFT2 for maximum. Turn the carrier balance control, VR2, to one end of its track and connect the frequency meter output to the grid of the carrier oscillator V3A. Peak IFT1 for maximum meter reading. Turn VR2 towards its mid position until the receiver S meter reading is reduced to a S5 or S6 signal (this is to ensure that V4 is not being overloaded) and go over all the trimmers and readjust again to make quite sure that they are accurately set.

Disconnect the BC221 and replace the carrier crystal. Adjust the carrier balance control (VR2) to reduce the receiver S meter reading, at the same time adjusting the associated 3–30 pF trimmer to get the S meter reading as low as possible. If adjustment to the trimmer makes the position worse, it is on the wrong side of the potentiometer and will require changing over together with the 50 pF capacitor. It should be possible to reduce the carrier from an S9 signal to an S1 or even less.

When the carrier is balanced, check the netting control (VR3) by turning it up from its zero position; it should be possible to bring the S meter back to its S9 reading. Make sure the netting control is fully off, turn up the audio gain control (VR1) about half-way and speak or whistle into the microphone—the receiver S meter should flick up to S9 or thereabouts. At the end of the whistle it should drop back to S1. . . . Congratulations! Your new rig is producing its first single sideband suppressed carrier signal!

While the receiver pick up loop is still in position against the anode connections, the first mixer (V5) can be balanced. Turn the slider of the balancing potentiometer (VR4) to one end of its track and set the receiver tuning to pick up the " break through " of the sideband switching crystal in use. Adjust the balancing potentiometer for the lowest S meter reading. (During this operation make sure that the audio gain and the netting controls are at zero.)

Replace the v.f.o. valve (V8) in its holder and with the receiver pick-up loop or an absorption wavemeter check that the v.f.o. is oscillating. Swing the tuning capacitor to either end of its scale and check that it is tuning over the required range—2925 to 3425 kc/s with an overlap of approximately 25 kc/s at each end. It will probably be running a little high and can be pulled down in frequency by soldering a silver mica capacitor across the tuning capacitor. The correct value (around 10 to 30 pF) may be found by trial and error. Should the v.f.o. be tuning low, the end turn of the oscillator coil should be opened out until the correct range is obtained. Turn the netting control (VR3) to maximum and place the pick up loop close to the grid pins of the conversion mixer (V10) valveholder. Set the receiver to 5·25 Mc/s. Swing the v.f.o. tuning control around its centre position until the exciter output is being picked up by the receiver. Peak the secondary of IFT6 and both dust cores of the wideband coupler IFT7 for maximum S meter reading. Readjust the receiver tuning to 5·1 Mc/s and move the v.f.o. tuning until the exciter output is on this frequency—peak the *lower* core adjustment of the w.b.c. for maximum. Set the receiver tuning to 5·4 Mc/s—readjust the v.f.o. to put the exciter output into the receiver at this frequency, and peak the *top* core adjustment for maximum S meter reading. These two adjustments will interlock slightly—repeat until satisfied that each core is resonant at its correct frequency.

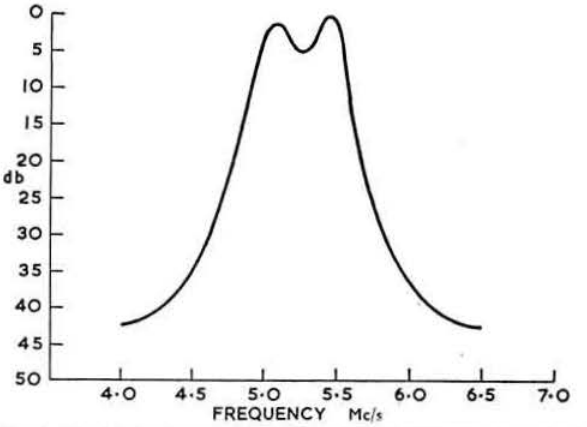
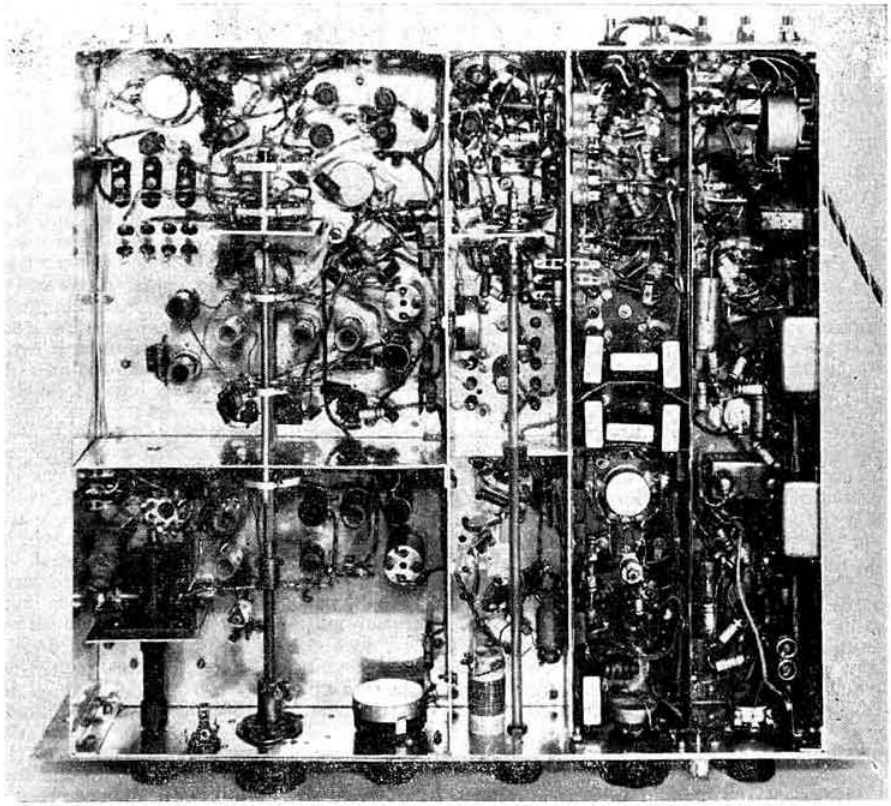


Fig. 1. Curve showing the response of the 500 kc/s-wide bandpass coupler.

* *5 Janice Drive, Fulwood, Preston, Lancashire.*

Before removing the pick-up loop turn the netting control to its off position and balance the mixer by setting the v.f.o. to 3·25 Mc/s and tuning the receiver to this frequency. Adjust the balancing potentiometer (VR5) to give a minimum S meter reading.

This completes the alignment up to the final conversion section. The exciter will now give a tunable s.s.b. output, but as yet on the neutral frequency of 5·0 to 5·5 Mc/s. Replace the oscillator valve V11 and with the pick-up loop or with an absorption wavemeter coupled to the appropriate anode coil select each range in turn with the bandchange switch and peak the dust core for maximum oscillator output. Turn up the netting control to maximum. Set the receiver or the wavemeter to 1·9 Mc/s and the band switch to 160m. Put the pick-up loop or the absorption wavemeter close to the 160m coil in the mixer (V10) anode circuit and adjust the v.f.o. tuning (capacitor almost fully meshed) until output is indicated, and peak the core for maximum output. Transfer the loop to the grid coil of the output valve V13, turn up the DRIVE control (VR8) to maximum and almost fully mesh the plates of the 50 pF tuning capacitor (VC2). Peak the core of the coil for maximum. The grid drive now available will increase the p.a. anode current reading. Select the 160m band on the pi-network loading control and check that the anode circuit tunes correctly by watching for the dip in anode current when the resonance point is reached.



An underside view of the chassis. The potentiometer mounted through the central screen is VR5. The relay control valve potentiometer VR11 can be seen at the lower left-hand side. This control is set so that V16B is just biased to cut-off. The anti-trip input transformer is next to VR11.

Set the bandchange switch and the pi-network loading for 80m. Set the v.f.o. tuning to the half way position and the grid tuning capacitor to two-thirds capacity. With the receiver or wavemeter set to 3·75 Mc/s, repeat the trimming procedure for the mixer anode and grid coils and finally check the pi output tuning. Repeat for 40m.

Repeat the above procedure for 20m with the grid tuning capacitor (VC2) at half capacity. When adjusting the core of the mixer anode tuned circuit on this range, make sure the coil is resonant in the 20m band on 14,250 kc/s and not on the spurious output frequency of 12,750 kc/s.

Repeat the procedure for 15m with the grid tuning at one-third capacity.

Repeat the procedure for 10m with VC2 at quarter capacity.

It now remains to balance the conversion mixer and this is most conveniently done on the 10m band. Turn the netting control to zero and the balancing potentiometer VR6 to one end of its track. Tightly couple the receiver pick-up loop or the wavemeter to the 10m coil in the mixer anode circuit. Adjust the receiver or the wavemeter tuning to pick up the 23 Mc/s heterodyning input and adjust the balancing potentiometer VR6 for the lowest possible S meter or wavemeter indication, at the same time adjusting the 3 to 30 pF trimmer. The two adjustments interlock but a combination of settings will be easily found that results in maximum attenuation of the heterodyning input (the correct setting of the trimmer will be found almost at its maximum capacity).

This completes the alignment procedure and the 1 K ohm resistor in the cathode circuit of the 6146 can be removed, together with the link from the bottom of the bias setting potentiometer VR7 to earth. If it is desired to run the output valve to its full ratings the 300 and 150 volt h.t. connections should also be disconnected.

Dial Calibration

The original scale on the Eddystone 898 drive is covered with glazed finish drawing paper and marked in with Indian ink with the 500 division logging scale in line with the centre opening. This leaves enough space for the seven scales—two for the two sections of 10m and one each for the remaining five bands. Each range can be individually calibrated by beating the transmitter against either the station receiver, 100 kc/s crystal calibrator or by using a BC221. Because the final conversion is arranged to give the correct sideband output (low for 160, 80 and 40 and high for 20, 15 and 10m) the calibration reverses and the low end of the band is on the left hand side of the scale for the three lower ranges and on the right hand side for the four higher ranges. This is not felt to be any operating disadvantage and provided the scales are individually marked in frequency there can be no possibility of setting error.

Modifications

The transmitter can be modified quite easily to suit indivi-

dual requirements while retaining the basic design features. The following are some suggestions:

(i) A single half lattice section sideband filter can be used.
(ii) One crystal can be used in the first mixing process and the sideband switching facility omitted.
(iii) If the 160m band is not required, the switch position can be used to select the second 10m band (11,750 kc/s) crystal.
(iv) If the intention is initially to use the equipment as an exciter to drive a linear amplifier in class AB1 a lower output of a few watts will be ample and the 6146 can be run from the 300 volt and 150 volt supplies.
(v) It is possible to eliminate the final stage and its circuitry altogether. To do so, replace the EF80 with a 6CH6 or similar valve and make the present grid coils tune the anode circuit with the addition of a low impedance switched link winding on each coil to the 75 ohm output socket. The writer is, however, of the opinion that it is not good practice to couple a driver stage directly to a mixer. The available grid input on 10 and 15m might not be sufficient fully to drive the valve and there is then the temptation to overrun the exciter. The better method would be to replace the 6146 with a 6CH6 or similar valve and feed it with anode and screen voltages from the common supply of 300 and 150 volts.

Conclusion

A3 operation is obtained by putting in a small amount of carrier with the aid of the netting control (VR3). The output is single sideband with carrier and not true A3.

For c.w. operation the transmitter is best controlled by a " press-to-talk " foot switch connected to the two terminals provided. Closing the switch will cause the control valve V16B to conduct and close the relay. If the VOX and AT circuitry has not been included in the construction the press-to-talk switch can be connected between the grid end of VR7 and earth. A key jack socket of the closed circuit type can conveniently be connected in the cathode return of the conversion mixer V10 (between the slider of VR6 and earth). The keying characteristic is clean and free from chirp. The audio and VOX gain controls should be tuned to zero and the netting control advanced until the required amount of carrier is available at the transmitter output.

VALVE VOLTMETER CHECK VOLTAGES

Audio	Cathode of V2B	Whistle into mike.	**R.M.S. Volts**
		Gain control at maximum	3·0
		Gain control at normal	0·2
R.F.	Junction of diode and carrier balance potentiometer (VR2)	Ratio of values will depend on setting of VR2	0·5 1·25
	Anode of V3A		10·0
	Cathode V3B		6·0
	Oscillator input to IFT5	IFT5 and IFT7 measured at transformer side of coupling capacitor	5·4
	V.f.o. input to IFT6		6·8
	Oscillator input into IFT7.		10 to 15 depending on band in use.
S.S.B.	These measurements are made with tone input and the level set to give maximum s.s.b. output from the transmitter, unless otherwise stated.		
	Anode of V4	Gain control at maximum	10 to 12
	Anode of V4	Gain control at normal	0·2 to 1·0
	Grid of V12	10m	10
		15m	10 to 11
		20m	10 to 12
		40m	12
		80m	12 to 14
		160m	10
	Grid of V13	10m	50
		15m	60
		20m	60
		40m	80
		80m	85
		160m	60

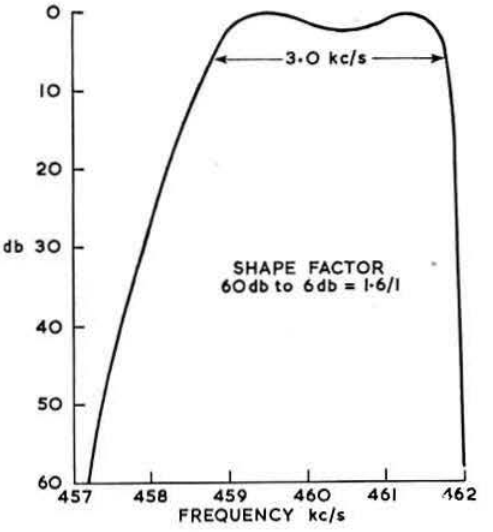


Fig. 2. Response of the sideband filter.

For the benefit of those amateurs who have—or can borrow—a diode probe valve voltmeter a table has been compiled of the r.f. and sideband voltage readings at different stages in the original transmitter. The values quoted are RMS values. When measuring the voltage at the grid of the EF80 amplifier V12, it should be remembered that the input capacity of the diode probe will de-tune the anode circuit of the conversion mixer V10 and give a false low reading. When the probe is in position each circuit must be brought back to resonance by unscrewing the dust core a few turns until a maximum reading is obtained. Similarly when measuring the voltage at the grid of the 6146 valve the grid tuning control should be peaked to bring the circuit to resonance on each band.

The various oscillator output voltages are not particularly critical and are quite satisfactory if within 20 per cent. If they are outside these limits they can most conveniently be adjusted by changing the value of the anode feed resistor.

The sideband filter response curve is conveniently plotted by removing the carrier crystal, unbalancing the potentiometer VR2 and feeding the output of a BC221 to the grid of V3A. The valve voltmeter probe can be connected either to the anode of V4 or the grid of V13. If built as the original the pass band should be as shown in Fig. 2. The sideband suppression (measured at the transmitter output terminal) is 45db. Intermodulation products are better than 30db down.

The transmitter has considerable reserve of voltage amplification. On the lower frequency bands the DRIVE control is backed off and progressively increased as the operating band goes higher. It should only need to be fully on when operating on 10m. There is also reserve of audio gain (sufficient for a low level microphone); the correct position of the audio gain control when using the normal crystal microphone is between one-quarter and one-third of the available rotation from the minimum position.

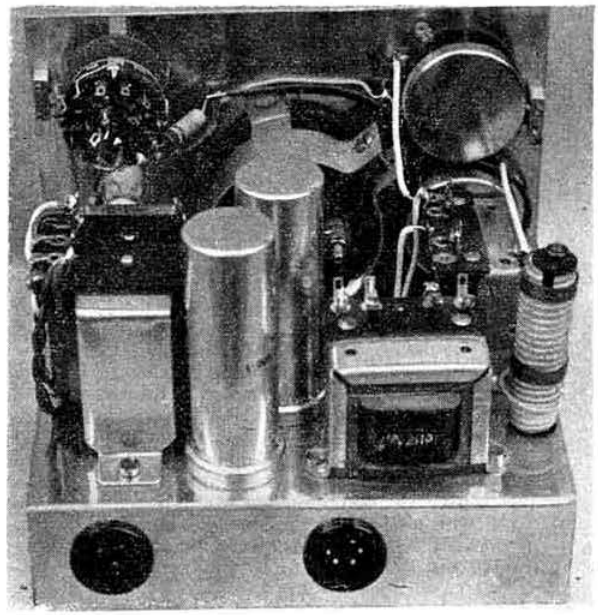
Due to the low impedance diode modulators the carrier balance is particularly stable. The carrier suppression is better than 55db. (Concluded.)

Mains Power Supply for Battery-operated Equipment

By C. H. L. EDWARDS (G8TL)*

MEMBERS of R.A.E.N. and others who use battery-operated equipment with 1·4 volt valves will find the power supply to be described of particular value where an a.c. supply is available. Modern dry batteries have quite a long shelf life and can therefore be kept for use with the gear in the country in a car or when the mains fail.

Provided the special chokes specified and the values of capacitor shown in Fig. 1 are employed, it will be impossible to tell whether the set is being operated from batteries or from the mains and no hum will be noticeable. Where the unit is to be used only with a receiver, the variable resistors will not be required. Instead a fixed series resistor of suitable value may be inserted in each supply lead and adjusted to give 1·3 volts (the recommended value for 1·4 volt valves when not operated from a battery) or 90 (or 120 volts) h.t. when the equipment is switched on. For use with a transceiver, two sets of fixed resistors will be necessary, one for use in the receive position and one in the transmit position. The values should be adjusted to provide the correct working voltages. If it is desired to employ the unit with several different sets of equipment or for experimental purposes variable resistors will be found more convenient. In order to prevent damage to the 1·4 volt valves, these resistors should always be set to maximum resistance before the unit is connected to the equipment, as the open circuit voltages from the l.t. and h.t. supplies are 6·5 volts and 250 volts respectively. It is suggested the panel should be clearly marked with the minimum and maximum resistance positions. It is also a good idea to incorporate a voltmeter in the unit. A suitable instrument can be made from a burnt-out r.f. ammeter and series resistors, the scale being marked appropriately.



A rear view of the power supply showing the layout of the major components.

fuse and input and output sockets are mounted under the chassis with the other parts on top. The mains transformer and the chokes should be at right angles to each other. The general layout can be seen in the accompanying photograph.

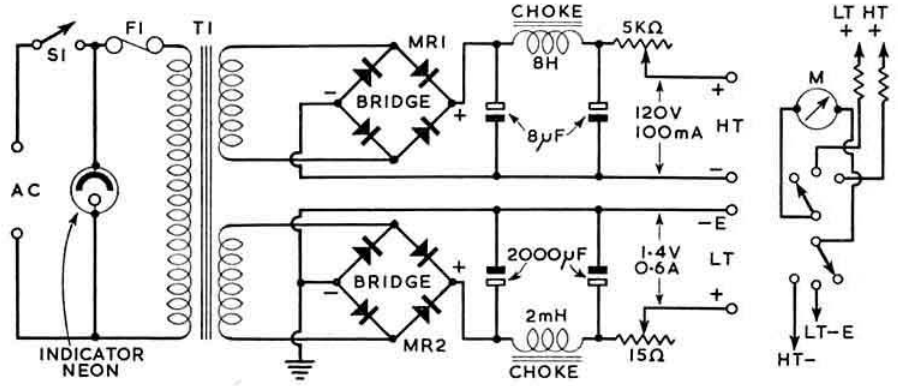


Fig. 1. Circuit diagram of the l.t. and h.t. supply for use with equipment employing 1·4 volt valves. MR1, S.T.C. rectifier type 420SD-7B1-S; MR2, S.T.C. rectifier type 440SD-1B1-S. The 2mH and 8H 600 mA chokes and 120 volt/1·5 volt transformer are available from Acadex Engineering Co. Ltd., Basildon, Essex. The 8 μF capacitors should be 350 volt working type and the 2000 μF capacitors 6 volt working. The meter should read 6 volts and 250 volts f.s.d. in the l.t. and h.t. positions respectively.

Construction

The unit can be comfortably built on an aluminium chassis measuring 6 in. × 5 in. × 1½ in. deep fitted with a 6¼ in. × 5 in. front panel. The bridge rectifiers, switch,

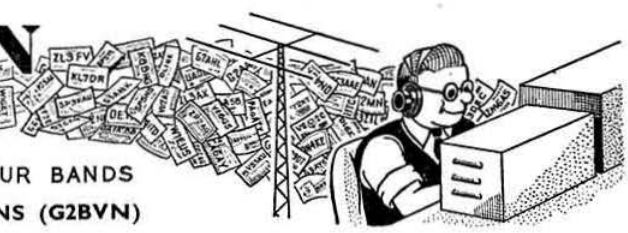
The power supply can be used to operate a Wireless Set R209, many of which have been available on the surplus market. The filaments in this receiver are wired for a 6 volt supply but it is a simple matter to bridge the dropping resistor for each valve for 1·4 volt operation.

Faraday Lecture 1959-60

PROFESSOR M. G. SAY, Ph.D., M.Sc., M.I.E.E., F.R.S.E. of the Heriot-Watt College, Edinburgh, is to give the Faraday Lecture at centres throughout the U.K. during the 1959-60 session. Professor Say's subject will be "Electrical Machines." Further details may be obtained from the Secretary, Institution of Electrical Engineers, Savoy Place, London, W.C.2.

* *28 Morgan Crescent, Theydon Bois, Essex.*

The MONTH ON THE AIR



A CHRONICLE OF EVENTS ON THE HF AMATEUR BANDS

By J. DOUGLAS KAY (G3AAE)*, R. F. STEVENS (G2BVN) and JOHN A. ROUSE (G2AHL)

CONTEST time being in full swing, and propagation conditions good on all bands, there should be a great upswing in the quantity of DX worked and heard during the next few months. In fact, with the tremendous amount of activity on the bands the best results will probably only be obtained by the stations using receivers with a really high degree of selectivity. G3FPQ proves the point when he reports working 37 of the 40 Zones during the weekend of the *CQ* Telephony Contest: his receiver is a 29-valver, home-built and with all "mod. con." Incidentally, the Zones he did not work were 18, 19 and 23. These are always extremely difficult Zones to work on 'phone because of the paucity or absence of activity there, but both 18 and 19 are amongst the easiest to work on c.w. while JT1AB is known to be active from Zone 23, so there appears to be a distinct possibility that someone will complete a WAZ feat during the c.w. weekend of the contest. Any claimants?

News from Overseas

Korea. The secretary of the Korean Amateur Radio League sends full details of activity in the Land of the Morning Calm. There are only five licensed stations in Korea at present, and four of these are operated by U.S. personnel. The fifth is the club station of the Korean Amateur Radio League, HL9TA, photographs of which appear on the next page. HL2 licences have been issued to schools for experimental purposes but these stations are not permitted to contact amateur stations. It is hoped that individual licences will shortly be issued to Korean nationals, when activity from HL9 will increase considerably. The addresses of all HL9 stations are listed in *QTH Corner*.

Tobago. VP4WD has been off the air due to receiver and power pack troubles and a snapped aerial mast, but should be on again by this time. A fair amount of DX has been worked including GI5UR, GI3ATH and G3AHE. A.R.R.L. has still not given a decision regarding country status for DXCC purposes but Jack still lives in hope. Meanwhile, the weather had delayed the film unit's work on location and VP4WD does not now expect to return to G3TA until mid-January 1960.

Togoland. G2FHM reports that the first two weeks of February 1960 look the most probable time for **ZD2AMS** to visit Togoland. At the time of writing, ZD2AMS was having equipment trouble but hoped to be on again soon.

Aden. VS9AZ, now very active from Aden, says that he has his **ZD8SC** logs and a supply of ZD8 QSL cards with him, and is willing to send a duplicate card to anyone still needing confirmation. When he left Ascension Island he handed his rig over to ZD8JP. The Aden address of VS9AZ is in *QTH Corner*.

Marcus Island. A four-day DXpedition to Marcus Island in the Pacific is scheduled to commence on January 15, 1960. It is possible s.s.b. will be one of the modes used.

Macau. CR9AH and **CR9AK,** two of the most active stations in Macau, may be leaving for other parts in the not too distant future. Those who still require CR9 contacts would do well to make them as soon as possible.

* *Reports should be sent to G3AAE, 40 Fryston Avenue, Coulsdon, Surrey.*

3A2BB and 3A2BT, Monaco

Reporting on his recent trip to Monaco with G3IEW, Norman Fitch **G3FPK/3A2BT** says that conditions were not nearly so good as on the 1957 sortie. Noise in Monaco seems to have increased a great deal during the last two years, particularly from cars.

For the first two days **G3IEW** also used 3A2BT but was then issued with his own Monagasque call, **3A2BB**. In all, 602 contacts were added to the 3A2BT log using a K.W. Electronics Valiant transmitter with a multiband trap aerial loaned by G8KW, a 14 Mc/s dipole, a 21 Mc/s rotatable dipole loaned by G3KZI and 3A2AH's Hg-Gain three band "Trap Traveler" mounted vertically. G3FPK says that for its size of 16 ft. 8 in., the "Traveler" worked "like a bomb on 20 as well as on 15 and 10."

A supply of QSL cards donated by the Citroen car firm was unfortunately lost in the post but a new supply is being printed in the U.K. Norman adds, "If I don't receive a card from anyone, I shall assume that he doesn't need a 3A QSL."

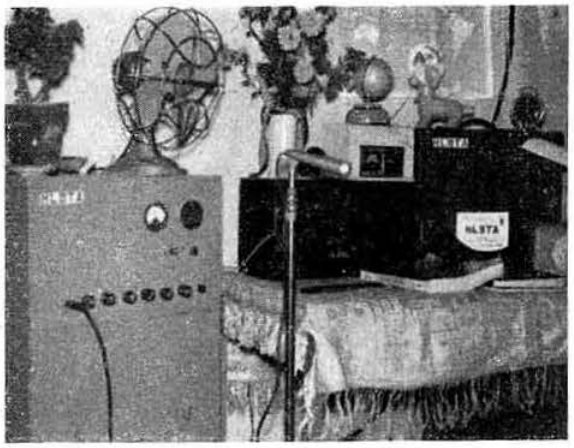
On the subject of Monaco call-signs, G3FPK says that M. Passeron, who is responsible for Amateur Radio matters in the Principality, is to re-issue all calls previously allocated but not so far used before starting on the 3A2D- series.

Late News

Via **W.G.D.X.C.** comes news that W4IYC has received logs from HB9QP/CR8 and will answer all deserving applicants. VK3ARX is returning to Lord Howe Island and will operate VK2FR's rig while he is there. VR3V (G3KMG) and VR3X (G3JHI) have left Christmas Island after having worked several British Isles stations, leaving VR3W active. W5GNG has the log and a small supply of FW8AS cards should anyone lucky enough to work this station still be lacking confirmation.

DXotic Showcase

Call-sign	kc/s		G.M.T.	
KZ5SW	7,001	c.w.	00.13	Canal Zone
UA0SP	7,010	c.w.	22.43	Siberia
KM6BI	14,265	s.s.b.	06.45	Midway
UA0IT	14,120	c.w.	09.10	Siberia
VR3X	14,077	c.w.	09.30	Christmas Island
VR3V	14,080	c.w.	09.40	Christmas Island
VR1B	14,080	c.w.	09.45	Gilbert & Ellice Is.
VK0RT	14,080	c.w.	10.15	AustralianAntarctic
KX6BT	14,300	s.s.b.	13.20	Marshall Islands
HB9QP/CR8	14,300	s.s.b.	17.20	Goa
ZS2MI	14,180	a.m.	17.20	Marion Island
VQ1SSB	14,320	s.s.b.	18.15	Zanzibar
FU8AC	21,130	a.m.	10.00	New Hebrides
FK8AU	21,180	a.m.	10.19	New Caledonia
KC6GJ	21,280	a.m.	10.45	East Carolines
BV1USB	21,040	c.w.	13.55	Formosa
EA0AB	21,035	c.w.	14.00	Spanish Guinea
HS1B	21,240	s.s.b.	15.15	Siam
KC6JA	21,200	a.m.	15.30	West Carolines
VP3ER	21,075	c.w.	15.40	British Guiana
VS5GS	21,170	a.m.	16.35	Brunei
FB8GP	21,170	a.m.	17.25	Comoro Island
ZS9P	21,350	a.m.	17.27	Bechuanaland
BV1USC	28,350	a.m.	10.20	Formosa
VK9BS	28,560	a.m.	12.05	Papua
YA1AO	28,205	a.m.	13.25	Afghanistan



HL9TA, the club station of the Korean Amateur Radio League, runs 60 watts on all bands 7 to 28 Mc/s, but activity is mainly on 14 Mc/s 'phone. Six operators (one a YL) share the honours. More details of HL9TA can be found in News from Overseas. The operators are shown in the right-hand picture.

It seems that quite a lot of people have obtained calls over the years but have never yet set foot in Monaco.

28 Mc/s

Ten has been producing the DX in fine style and quite frequently has been open to all parts of the world at the same time. Particularly good conditions existed during the *CQ* Phone Contest. It is therefore sad to record—if there should be anyone who has not noticed—that many of the signals from the Russian " R " stations leave much to be desired. From the sound of many of them they seem to be using wideband f.m. on self-excited oscillators and are frequently barely readable. Let's hope these chaps will soon be able to improve their transmissions to the benefit of us all, not least themselves.

G3BHW used phone for contacts with HH2Z (15.30, '420), HI8CJY (19.18, '400), HP1AC (17.55, '420), HR2MT (18.04, '400), MP4QAO (13.22, 29.050), MP4TAE (12.36, '390), UL7FA (14.20, '320), VK9BS (12.05, '560), VP3MC (15.21, '220), VS9OM (14.52, '290), VQ8AV (14.15, '350), XE2BM (17.20, '450). **G3IFB** reports a variety of stations including JA1YL (09.10, '010) and K6MOG/KG6 (10.30, '500) while **G3GMY** raised SU1AH (15.35, '450) and several JAs.

Norman Miller **G3MVV** (Romford) found plenty to interest him on the band and added phone contacts with VK9BS (12.48, '470), DU1VQ (13.10, '200), YA1IW (13.20, '410), YA1AO (13.25, '205), VU2NR (14.15, '400), KR6CG (09.12, '450), HI8CJY (20.07, '350), RO5SA (13.59, '200) and RN1AAB (15.12, '320) to the log. During the weekend of the *CQ* 'Phone contest **G3AAE** (Coulsdon) worked VQ3GC (08.30), RD6ADR (09.05), VS9AH (09.15), KR6CG (10.00), KR6DR (10.10), KR6JR (10.15), RL7KBG (10.20), BV1USC (10.35, '240), VQ5FS (11.22), KG6AIA (11.30, '540), VQ3GL (11.50), FQ8AT (12.30, '182), HH2Z (13.20, '405), FB8CM (15.50, '336), HI8CJY (17.00, '300), XE1CP (17.20, '480), ZS3S (10.30 '330), VS9AZ (10.50), RH8AAD (10.55, '362), VP8DW Falklands (11.05, '532), MP4QAO (12.00, '376) and OQ0PD (13.40, '406). **B.R.S. 2292** (Hounslow) heard a variety of interesting signals including those from CR4AD (15.00), PJ2AF (16.00) and HI8CJY (20.00).

Norman Fitch **G3FPK** (London, E.10), back from his Monaco trip with G3IEW, has his 10m quad in operation and has been working a fair selection, principally using n.b.f.m., including CR5SP, CX5BR, FQ8HA (c.w.), HZ1AB, RH8AAD and ZD7SA (phone and c.w.). **G6UT** (Great Hallingbury) enjoyed contacts with IP1ZGY (12.50, '350) and KG6AIA (12.15, '650), while **G3FXB** worked VS9OM (10.35, '300), 4S7YL (11.00, '300) and ZS3S (09.45, '300).

Tom Higginson **GW3AHN** employed phone to raise HI8CJY (18.15, '350) as well as a wealth of other interesting items. **G3FPQ** (Elstead, Surrey), who runs 140 watts to an 813 and uses the 29 valve receiver referred to earlier, raised XE1CK (17.30, '490), BV1USC (10.20, '350), KG6AIA (09.55, '520), TG5HC (17.40, '400), UL7FA (11.30, '330), RH8ABC (10.35, '360), VK9RO (10.25, '420), VP8BN (18.00, '260) and XW8AL (13.30, '340).

21 Mc/s

This band has certainly been carrying its load of the DX and **G3FPQ** raised FB8CD (17.45, '220), FB8GP (17.25, '170), FK8AU (10.25, '195), FM7WN (21.00, '185), FU8AC (10.00, '130), HS1B (15.15, '240), JZ0HA (14.10, '150), HV1CN (19.40, '110), KC6GJ (10.45, '280), KC6JA (15.30, '200), MP4DAA (17.05, '260), VP8BN, VP8CX, VP8DG, VP8DU, VP8DW, VP8EG, VR2AS, VR2AZ, VR2DF, VS5GS (16.50, '185), UL7FA (15.20, '160) and ZS9G (18.00, '200).

DU1VQ (15.30, '200), FE8AY (09.25, '150), HS1B (14.00, '200), VK9BS Papua (14.35, '200), all on phone,

QTH Corner

FP8BI. via W1PFA.
HI8CJY. La Romana, Dominican Republic.
HL9KJ. The Advisory Group, Ministry of Communication, Seoul, Korea.
HL9KR. Box 35, H.Q. 314th Air Div., S.P.O. 970, San Francisco, California.
HL9KS. KMAG, A.P.O. 102, c/o P.M., San Francisco, California.
HL9KT. 304 Sig. Bn., A.P.O. 301, c/o P.M., San Francisco, California.
HL9TA. KARL, Central Box 162, Seoul, Korea (HL QSL Bureau).
KC6JA. Koror, Western Caroline Islands, U.S. Trust Territory.
MP4DAA. c/o Box 330, Bahrain.
MP4TAE. via MP4QAO c/o Aviation Dept., Q.P.C., Umm-Said, Qatar.
VK0RH. via VK2EG.
VQ1SSB. } via VQ3 Bureau, P.O. Box 2387, Dar-es-Salaam,
VQ1WVR. } Tanganyika.
VQ8 QSL Manager. VQ8AD, P.O. Box 467, Port Louis, Mauritius.
VS5GS. c/o S.O.A.S. College, Brunei Town, Brunei.
VS9AZ. S. G. Crow c/o Cable & Wireless Ltd., Ras Boradli, Aden.
ZC4SC. Major C. Collins, M.E.L.F. Scales Branch, R.E.M.E., B.F.P.O. 53.
ZS9G. Post Office, Kazungula, Bechuanaland.

* * *

R.S.G.B. QSL Bureau: G2MI, Bromley, Kent.

and VS5GS (14.10, '050) and XZ2TH (16.00, '050) on c.w. were nice catches for **G3FXB** (Southwick, Sussex). **GW3AHN** (Cardiff), still using only 25 watts (but obviously very potent ones), had his full share of DX, VP8EG (20.00, '060 phone), FP8BH (19.30, '055), JZ0HA (14.55, '070), VK9RO (12.00, '050), VK9XK (10.20, '080) and ZC5AF (15.30, '100), to name only a few of his catches.

G3BHW logged VS9OM (15.51, '150), ZC5AF (14.22, '100), ZD1AW (19.01, '070), ZS9P (17.27, '350), HP4M (10.51, '045), BV1USB (13.55, '040), DU1SA (15.50, '150), EA0AB (14.00, '035), FB8XX (15.10, '120), FK8AU (10.19, '180), MP4DAA (16.09, '220), VK9XK (10.01, '080), VP3ER (15.40, '075) and VR2DF (09.51, '170). **G3DO** (Sutton Coldfield) worked KC6JA (15.25, '270), and VS5GS (16.35, '170) on phone while **G3GMY** (Potters Bar) exchanged reports with FP8BF (19.58, '054) on c.w. **G3KSH** (Kenton), also on c.w., raised CR5AR (06.55, '010), ST2AR (06.58) and FE8AH (07.00).

G3MVV found HZ1AB (07.13, '100), UL7FA (15.33, '140) and HS1B (15.37, '140) on phone. John Farrar **A.1965** of Penzance, a welcome newcomer to *M.O.T.A.*, heard ET2US (19.40), HV1CN (14.58), PZ1AA (23.20), VP8DH (19.35) and VP8DI (19.50). **G6UT** (Great Hallingbury) worked K2ICA/MM on the *Flying Gull*.

G3CQE (Norwich) broke new ground by working VE7KX and several Ws on RTTY.

14 Mc/s

Twenty metres continues as the pre-eminent hunting ground for the ardent DX man, not least those of the s.s.b. fraternity.

For instance, **G3FPQ** (Elstead) found BV1USC (15.43, '295), BV1USE (16.05, '300), ET2US (06.00, '320), FP8BH (18.05, '298), HB9QP/CR8 (17.15, '300), KH6AHQ (04.35, '280), KL7FAK (04.55, '290), KM6BI (06.45, '265) and KX6BT (16.00, '270) all on sideband while a.m. produced HH2Z (05.25, '170), I5GN (18.20, '160), KG4AA (00.34, '190), 7G1A (18.45, '330), MP4DAA (19.20, '150), OA4ED (21.10, '145), TG9AD (23.00, '160), YN1CK (04.20, '150), VS9OC (23.05, '230) and 4S7YL (20. 35, '165). LA1NG/P (19.30, '090) was a good catch on c.w.

G2BVN (Romford), with a pair of the new G.E.C. TT21 valves going great guns in his linear amplifier, used s.s.b. for contacts with HB9QP/CR8 (17.20), MP4BBW (19.48), ZE3JA/ZD6 (16.50), KR6GE, KR6LL (16.30), OK7HZ/OD (21.07), KX6BT (13.20), CR9AH (15.25), KL7CDF (08.15), PJ2AV (23.35), TI2HP (21.55), VQ1SSB (18.15) and VS6AZ (17.15), all on frequencies between 14,300 and 14,350 kc/s.

G3BHW (Margate), in the midst of an extensive rebuild, found time to exchange greetings with DU1OR (21.21, '095), FB8XX (19.16, '040), FP8BC (19.21, '080), FY7YG (23.21, '065), LA3SG/P (18.36, '085), VS9OC (18.40, '110) and 7G1A (21.47, '070). **G3IFB** raised VE6AAE/SU (14.55, '095) in the Gaza Strip.

VK0RT (10.15, '080) and UA0IT (09.10, '120) were both good catches for **G6UT** (Great Hallingbury) who also raised 3A2AE (17.53, '033), UH8KAA (11.05, '055) and VE2AIG/SU (08.15, '030) in the Gaza Strip. **G3FXB** (Southwick, Sussex) had c.w. converse with LA3SG/P (17.40, '100) and VS9OC (18.55, '100). Francis Garnet **G6XL** (Calverley, Yorks) also worked LA3SG/P, VR3V (09.40, '080), and VR1B (09.45, '080), both the latter rather weak. VQ8BBB was heard working W7s at 16.25 on October 25 around 14,025 kc/s.

ZS2MI (Marion Island) was the only new one for **GW3AHN** on the three higher frequency bands but then that is not so surprising when one gets so high up the countries worked table. LA3SG/P was worked on both c.w. (19.00, '090) and phone (19.15, '090). **G3GMY** raised FP8BG (21.38, '050) and CT2BO (00.10, '068) on c.w.

Bill Wilkinson **B.R.S.20317** has the aerial back at the 30 ft. level and heard XW8AI (18.46, '003), VK9XK (20.45, '005), UA0KIA (20.50, '025), UJ8KAA (20.55, '038), FG7XC (21.30, '040), UA0LW (12.25, '084), FB8XX Kerguelen (17.40, '040), FR7XD (17.45, '020) and XZ2BB 18.26, '026), all on c.w., and KX6BT on s.s.b.

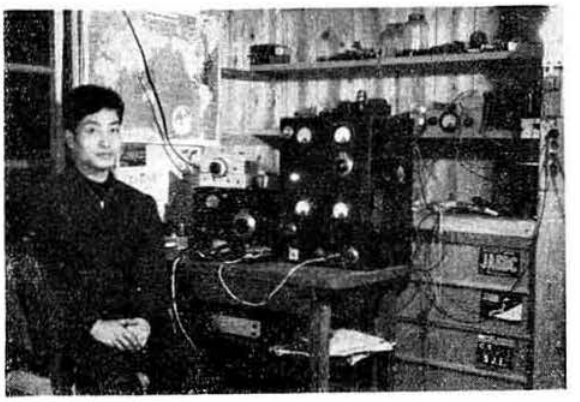
The Lower Frequencies

Although conditions on 1·8, 3·5 and 7 Mc/s have been good very few reports have been received—most people seem to be making the most of the high m.u.f. to work the world without most of the troubles which plague our lower frequency bands.

B.R.S. 20317 found some excellent DX on 7 Mc/s in LU6DBQ (23.17, '003), UA0SP (23.43, '010), UJ8KAA (23.21, '000), KZ5SW (00.13, '001) and UI8AM (00.40, '003). **G3KSW** (Hyde, Cheshire) exchanged reports with KZ5SW at 00.05 G.M.T. just h.f. of the band edge while **G3KSH** (Kenton) worked PY7NS at 21.30. **G3FXB** found 4X4FY (23.45, '100) and 5A2CY (00.05, '100) both on phone and **G3BID** (Abbotsbury) reports phone signals from W3PHL (07.58, '280). **B.R.S.2292** heard 4X4KC (21.00), UF6AA (21.00), YV5AIZ (06.30) and ZB2A (21.00). Which all goes to show it is worth keeping an eye on 7 Mc/s for all its noises off.

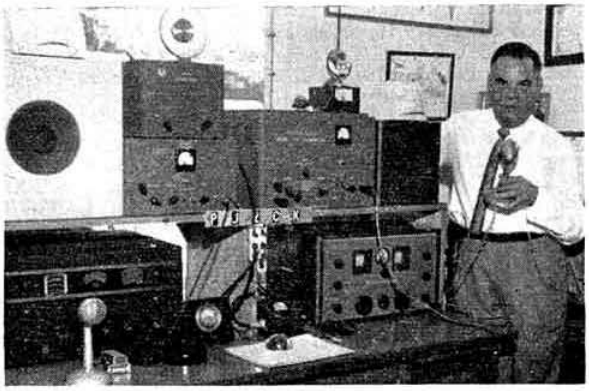
The 3·5 Mc/s band rewarded **B.R.S.20317** with ZC4IP (23.20, '506), W3DQG (23.47, '506), K3EKO (23.35, '504)

Johnny Alvares, CR9AH, of Macau operates almost exclusively on 14 Mc/s using single sideband or c.w.



JA6BC of Miyazaki has a home-built receiver, quad aerial and a transmitter running 100 watts.

(Photo via G3MVV)



August Sprock (PJ2CK) of Curacao, Netherlands Antilles, uses a Lettine transmitter running 120 watts input, an AR88 and Hammarlund HQ140X receiver.

and W4SNH (23.40, '510) while **G3KSH** logged K6MHR (06.30) and W8PWI (06.30).

Top Band has been excellent for inter-G working and **G3MGS** (Chislehurst) worked GC, GD, GI, GM, GW and DL and heard 13 OKs on November 1–2. **B.R.S.2292** also heard GI, GM and GW signals as well as OK1VG/P (22.00).

The Commonwealth Competition

In the August *M.O.T.A.* it was announced that an annual competition would start on January 1, 1960. Besides being unanimously welcomed this announcement has brought forth a number of useful constructive suggestions, most of which have been embodied in the simple rules.

On page 226 of this issue appears the list of Commonwealth call areas to be used for the 1960 B.E.R.U. contest, and it is upon this list that the competition is based.

The competition will be open to all transmitting and listening members, both at home and overseas, and one point can be claimed for each call area worked (heard for listeners) on 28, 21 and 14 Mc/s while two points may be claimed for 7 Mc/s and three points for 3·5 Mc/s. Thus the table for March 1960 might look as follows:

Call-sign	28	21	14	7	3·5	Total
G3YYY	14	54	52	22	24	166
G3ZZZ	36	56	24	—	—	116
G3XXX	3	1	93	6	18	121

LEADERS

Overall	28	21	14	7	3·5
G3YYY	G3ZZZ	G3ZZZ	G3XXX	G3YYY	G3YYY

The competitive element is very strong amongst DX workers, and while many fight shy of 48-hour endurance tests, an annual competition such as the above should do much to stimulate interest. Additional points have been put on 7 and 3·5 Mc/s not only because they have been so neglected of late, but also because DX does take more working on these bands than on the other three.

No putty medals will be awarded, but the reward will be the pleasure derived from entering into a friendly competition with fellow enthusiasts and jostling for a better place in the table. The maximum score over a 12-month period appears likely to be around 400, which gives plenty of scope for action.

The first table will appear in the February 1960 *M.O.T.A.* based on claims received up to January 18.

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Reports for the January issue by December 18, please.

Heathkit Valve Voltmeter

Reviewed by JOHN A. ROUSE (G2AHL)

THE Heathkit Valve Voltmeter Model V7A-UK is a versatile instrument covering a wide range of a.c. and d.c. measurements. As a voltmeter it has fourteen ranges: 0-1·5, 0-5, 0-15, 0-50, 0-150, 0-500 and 0-1,500 volts a.c. (r.m.s. and peak-to-peak) and d.c. Seven resistance ranges measuring 0·1 ohm to 1,000 Megohms with the internal battery are provided. The scale is also calibrated in decibels with centre zero. On the 1·5 volt d.c. range, the sensitivity is 7,333,333 ohms per volt.

A 12AU7/ECC82 valve is used in the meter bridge and a 6AL5/EB91 double diode as rectifier for the a.c. ranges. The meter is a 4½ in. 200μA f.s.d. instrument in a clear plastic case.

Like all Heathkit equipment, the Valve Voltmeter arrives as a carefully packed assortment of components of well-known manufacture which have to be assembled according to the instructions in the manual supplied. This manual itself is a masterpiece of clarity and, in the case of the V7A-UK, runs to 31 pages of text. The colour code for resistors and capacitors are given on the covers. The manual not only explains how to build and use the voltmeter but also gives advice on soldering generally, and soldering to the printed circuit board in particular. In addition, large scale drawings showing the positions of all components and the circuit diagram are included as supplements for sticking to the wall above the workbench.

As a check on its accuracy it was decided to assemble the kit exactly according to the book. On completion of the kit it was clear that any other method would have made the job much more laborious; in fact, it was just the opposite. The Heathkit designers have clearly given great thought to the best possible sequence of assembly operations and experience shows that it is by far the best plan to follow their instructions to the letter.

No difficulty was experienced in building the kit, although in assembling the range switch it was found that the tag holes would not accommodate all the resistors in one or two cases. Wrapping the leads around the tags was however quite satisfactory. The range switch was, incidentally, the most time consuming single operation.

Putting the main circuit together was immensely simplified by the printed circuit board—in fact, all the components including the valveholders and power supply were fitted into position and soldering completed in under 1 hour. Final assembly was simple and straightforward.

Testing and setting up was readily carried out in accordance with the instructions but obviously time and care spent on this procedure will result in more accurate calibration. In this connection it is a good idea to allow the 12AU7 valve to age by leaving the unit on for about 48 hours before doing the final calibration. Setting up of the a.c. ranges is carried out by using the a.c. mains as a source voltage and a warning of the possible danger is included in the manual. However, as the case of the instrument is connected to one side of the circuit being measured (in this case, the mains) it is felt that a more prominent notice would be appropriate.

With the standard test leads supplied, the V7A-UK is usable at frequencies up to 1 Mc/s. For higher frequencies an r.f. probe is available as a separate kit (Model 309U). Construction time for this item was under half an hour. The r.f. probe extends the frequency range to 100 Mc/s, with useful indications up to 300 Mc/s.

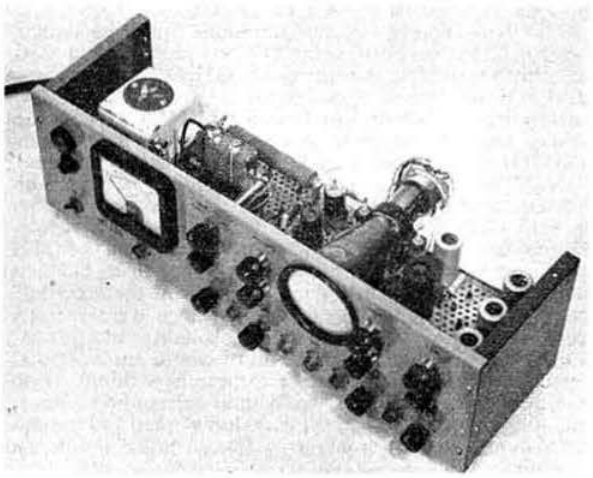
The kits are manufactured in England from British components throughout by Daystrom Ltd. of Gloucester; the V7A-UK costs £13 and the Model 309U £1/5/6.

Lektrokit Prefabricated Metalwork

Reviewed by R. F. STEVENS (G2BVN)*

IDEALLY, an item of home built apparatus should not only be of a high technical standard, but should also be attractive in appearance, and one of the problems confronting the constructor who has limited metal-working and painting facilities, is the production of a commercial finish.

For some time A.P.T. Electronics Ltd. of Chertsey Road, Byfleet, Surrey, have been manufacturing the component parts of a system known as Lektrokit, a constructional method whereby electronic chassis can be made from simple and inexpensive prefabricated components. This system



A small oscilloscope using Lektrokit prefabricated metalwork.

which has been used extensively by manufacturers and laboratories is now available to amateur constructors.

The basic feature of Lektrokit is the unit chassis plate which is a prefabricated sub-chassis with uniform perforations and hole groups for either miniature or octal based valves. The chassis plates are mounted on a pair of chassis rails, which, with two end plates, makes a complete chassis. Front panels and ventilated covers finished in stove enamel are available for either a sloping or vertical front to the assembly. Other items in the Lektrokit range are rack mounting brackets, stacked assemblies (for oscilloscopes, etc.), preformed heater wiring and accessories such as tags, hinges and mounting clips. The standard front panels are of 16 gauge light alloy. The paint finish is given a special keying pretreatment to avoid chipping during drilling.

It will be seen that an infinite variety of chassis can be made from the basic components available, and a complete assembly, with a front panel measuring $8\frac{7}{8}$ in. $\times$ $5\frac{7}{32}$ in. and suitable for a converter or small transmitter, would cost in the region of 30/-.

The manufacturers have produced a 68-page illustrated handbook which gives full details of Lektrokit and this invaluable publication is obtainable by members of the R.S.G.B. from the address given above at the nominal cost of 3/-.

In the London area Lektrokit components can be obtained from Super Radiotech Ltd. of 38 Monmouth Street, London, W.C.2, who have facilities for cutting holes in front panels to individual requirements at a nominal cost.

* *Members of the Technical Development Sub-Committee.*

Labgear Standing Wave Coaxial Unit Type E.5048

Reviewed by G. C. FOX (G3AEX)*

THE Labgear Standing Wave Coaxial Unit Type E.5048 consists of a short section of rectangular transmission line with a nominal characteristic impedance of 75 ohms, terminated at both ends by coaxial sockets. The outside dimensions are approximately 5 in. $\times$ 1 in. $\times$ 1 in.

A subsidiary 75 ohm line is placed close to the inner conductor and terminated in a 75 ohm resistor. By means of a germanium diode the voltage developed across the terminating resistor of the subsidiary line may be measured by a microammeter and series resistor connected to the d.c. terminals of the unit, which are decoupled for r.f. by lead-through capacitors. The unit operates on the principle of the reflectometer and enables the relative magnitudes of the forward and backward waves in a feeder to be measured, and hence the s.w.r. on the feeder may be determined. It is suitable for operation at frequencies from 3·5 Mc/s to

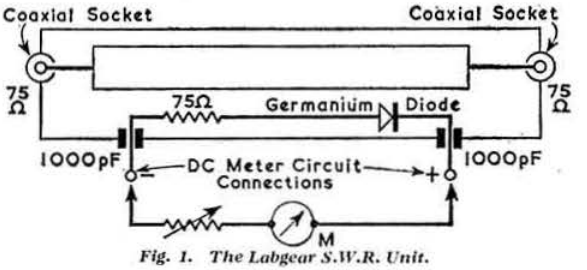


Fig. 1. The Labgear S.W.R. Unit.

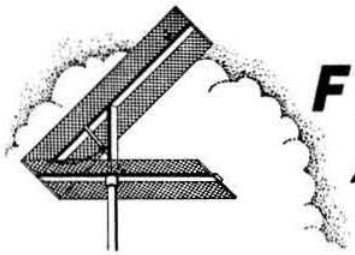
150 Mc/s at power levels up to 1 kW. The d.c. metering circuit is first set up to a reference level of 500 μA on the forward wave. The unit is then reversed in the feeder and the meter reading again noted. By reference to a calibration chart the s.w.r. on the feeder may be determined from the magnitude of the reading in the reverse direction.

A diagrammatic representation of the unit is shown in Fig. 1.

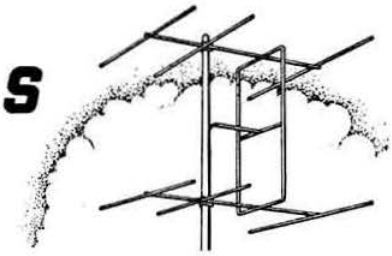
A sample unit has been functionally tested at 28 Mc/s and 144 Mc/s and a determination of directivity and of the attenuation between the main and subsidiary lines at the various amateur band frequencies has been made. The directivity is a measure of the discrimination between the forward and backward waves on the feeder and was found to be better than 20db. This is considered to be adequate for the purposes of monitoring the s.w.r. on the feeder of an amateur band transmitter. The attenuation between the main and subsidiary lines was found to be 25db at 28 Mc/s and varied at approximately 6db/octave with frequency. This means that for a power on the feeder of 20 watts the d.c. metering circuit requires a 500 μA f.s.d. or 1 mA f.s.d. meter in series with a resistor capable of being varied between 400 ohms (at 3·5 Mc/s) to 22 K ohms (at 144 Mc/s). The data given will enable suitable resistor values to be computed for differing power levels. The characteristic impedance of the unit was found to be sufficiently close to 75 ohms to cause negligible mismatch in a 75 ohm line at 144 Mc/s.

Audio Ratings for TT21/22 Valves

RATINGS for two TT21 valves in class AB1 show that with an anode voltage of 1250 and 300 volts on the screens a power output of about 200 watts is available at the secondary of the output transformer. The no-signal anode current is 60 mA, rising to 240 mA at full output. A bias of -40 volts is required on the control grids.



FOUR METRES AND DOWN



By F. G. LAMBETH (G2AIW)*

THE evergreen subject of Transatlantic Tests on 2m is again in the news in no uncertain fashion. Interest has been revived by some remarks of DL3FM regarding the various proposals which have been made from time to time. DL3FM reminds us that he and others have been advocating for years now the establishment of a v.h.f. station on the Atlantic coast of Ireland, and suggests that surely such a scheme could ask for the help of scientific institutions and the electronics industry. It must be remembered also that EI2W has already announced he will lead an expedition to Clew Bay, Co. Mayo, in the summer of 1960 for the purpose of tests of this type. The major problem appears to be the regular manning of such a station over the optimum period, which would probably call for a fairly large pool of zealous operators—it would obviously be useless unless the station could be kept continuously operative during any period when communication was likely. G2AIW would be glad to hear from any 2m enthusiasts who could lend their aid to such a praiseworthy effort—they could certainly rely on good co-operation from the other side of the Atlantic. It is always surprising how soon a far away date looms up, so please let us have some constructive comment and offers. The potential surely exists.

Two Metre News

At the end of October, with large movements in barometric pressure and very unsettled weather conditions, the v.h.f. bands seemed to have folded up for the time being.

A.1491 (Palmers Green) says a new activity drive is needed for Mondays. Conditions are now generally very poor, but all the same, stations like G2HCG, G3FAN, G3JWQ, G5YV and G3EHY still manage to be heard, which tends to prove that conditions are never quite so bad as they may seem. On October 14 G5YV was peaking S9+, fading to 0, while working G3JWQ who was peaking S8 with QSB to 0! On October 18 G3BNC (Portsmouth) was heard, but the rarest DX during the month was G3JMA/P (Huntingdon) on October 25. New stations on the band included G3ABB, G3BPT, G3GBO (VQ4EV, home again for a time), G3LXE and G5JZ. A.1491 is running a twice-weekly sked with G3MNQ (Notts.) which has proved successful, relative to conditions, so far.

G2XV (Cambridge) says that now winter is with us conditions have collapsed, but he would like to get in touch with GW2FVZ and G2ADZ on 2m to fix schedules for 70cm. **G3JGJ** (Moretonhampstead) reports that the sked with GC2FZC has deteriorated lately, no signals being heard on many occasions. There is a sked with GW3MFY at 19.00/19.10, but so far they have only occasionally heard one another. G3JGJ has just made a 300 ohm aerial change-over relay, and hopes to work to the n.e. and the n.n.e. The 2m transmitter now in use is an Eddystone 440B which operates on 2m with a tripler final (RK34) and a self-contained modulator. It works well on G3JGJ's 25 volt d.c. power supply. The 440B also drives the 70cm tripler to a final 832A. G3JGJ is on every evening from 18.00/19.15 G.M.T., seven days a week, and on Sunday morning at 10.00 (sked with GC2FZC).

G3EGK (Timperley) found conditions pretty good until October 6, but no outstanding DX has been worked since just after the contest in September. G3LTF, from the new QTH in Danbury, was a good signal at the end of September when using an indoor aerial, whilst G3HXS (Tring) was worked for the first time. A new station in Birmingham is G3ITH, with a good signal for a newcomer to the band. G3NAQ was heard and called on October 10 under indifferent conditions. Unfortunately the gales on October 18 bent G3EGK's aerial which was taken down rapidly (but not so rapidly re-erected). A proposed change of QTH early next year indicates little activity until then, but it is hoped to put out a fairly good signal from the local hill, 200 ft. a.s.l. Several very happy evenings were recently spent in Surrey thanks to the hospitality of G5MA, G3KEQ, G3GHI and G3DVV, all of whom are consistent signals in Cheshire. It was nice to hear how things sound from the DX end! G3EGK has had an outstanding summer and in just under a year on the band has worked 150 stations in 35 counties and seven countries from a rather indifferent location.

G3MED (Northwich) says only about six stations seem available each night. It is thought that too many people do not come on unless the barometer is about 1020 mb. Even Monday evenings have shown little activity lately. Two active 2m stations have been heard saying (on 40m) that they have finished with 2m for this year. As some of the best openings often appear during the winter months this is a somewhat doubtful decision to make.

G5MR (Hythe, Kent) has usually been able to keep the sked with F8GH. This has been temporarily on 2m as the 4m equipment is being overhauled; unfortunately the rotary mast came down during the gale of October 26/7. The 70cm portion was smashed and the 2m portion damaged. Pending repairs to the mast and aerials G5MR is out of action. It is hoped the return will not be long delayed.

G6OX (Englefield Green) has only short minor openings to the east (as far as the German border) to report due to pressure fall after a " high," but no Scandinavians have been heard this time. The sked with ON4DY is being maintained daily except Wednesdays and Sundays at 22.00 G.M.T. ON4DY's frequency is 144·45 Mc/s. G6OX reports that a 2m phone net is in operation in the Ghent area. The net frequency is centred around 144·45 Mc/s and ON stations

V.H.F. ACTIVITY NIGHTS

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

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

* *V.H.F. Manager, 21 Bridge Way, Whitton, Twickenham, Middlesex.*

are frequently heard in QSO between 18.00/18.30 G.M.T. When conditions are suitable G6OX joins in; other operators are advised to watch this frequency in order to assess conditions. Several ON and PA stations have been worked, sometimes more than once, in spite of poor conditions lately. Finally G6OX says that GW3MFY (Bridgend) is using increased power on c.w. and can be heard and worked under almost any conditions.

G3HAZ (Birmingham 31) says that conditions have appeared as " rock bottom " lately, and a certain amount of time has therefore been spent in modifying an RF26 unit for a listening member, not exactly as described by G3ECA but rather with CV66 first r.f., EF54 second and EF54 pentode mixer with i.f. output on 25 Mc/s. The oscillator is an EC52 on 120 Mc/s. The EC52 was mounted horizontally above the two EF54s, a small plate being soldered to the screen and main chassis. Oscillator stability is quite good. The CV66 seems to be rather poor compared with the EC91, 6AM4 and similar valves as far as noise factor is concerned. Coming back to operation, very little at any distance has been heard since the last report, except for a brightening on October 30 when G3BDQ and G3KMP in Hastings were worked and a few others heard in the south east. G3NLV is a new station in Lichfield while GW3LJP is on from Radnor. G3DFL (local but QTH at 700 ft. a.s.l.) continues to work stations others cannot even hear, and reckons to be putting up a better aerial soon (a 4-over-4 slot).

G5NF has received the Gold Medal of the Civico Istituto Colombiano of Genoa for his part in setting up the new Two Metre European Record with I1KDB on June 14. The medal was received on G5NF's behalf by the British Ambassador to Italy and the medal transmitted by courtesy of the Foreign Office, to both of whom G5NF has expressed his thanks.

Two Metre News from Scotland

GM2FHH (Aberdeen) reports a little auroral activity on the night of October 30 when GM3BDA and GM3GUI were heard at 57A by this mode. Two G phone stations, also heard, were unidentifiable. GM2FHH hopes to build an s.s.b. transmitter during the winter, news which will no doubt please G3CCH and G3MED.

Two Metre News from Wales

GW3MFY (Bridgend) has had 100 per cent success in his skeds with G3LTF (Danbury, Essex) since starting on October 16. The sked takes place at 23.05 G.M.T. every evening. GW3MFY's frequency is 145·35 Mc/s. G3JAM (Woodford Green, Essex) was a welcome QSO after the sked with G3LTF on October 23, as was G3LAR (Tooting) on October 31. All these contacts were, of course, on c.w. G3JHM (Worthing) has also been worked twice. The path to G3BDQ (St. Leonards-on-Sea) is not so good, however, and only one contact has so far been made, although " whispers " have been heard on a number of occasions.

October 31 was one of the best nights recently with GI3GXP heard on phone working GW3ATM (Chepstow, Mon.). G5MA was RS58 on the morning of November 1 and also worked GW3LJP (Radnor) who had had contacts with GW8SU, G2ADZ (Woolacombe), G3EHY (Banwell, Somerset) and G6GN (Bristol).

GW8SU reported hearing auroral signals from GM3EGW late on the evening of October 19 but the aurora was only brief. Finally, GW3MFY says G6OX *always* obliges with a contact.

Two Metre News from Overseas

LA9T (Oslo) reports hearing and working many OZ and SM stations during the period September 29 to October 13. On October 5 LA4RD, LA4VC and LA9T worked G5YV, G6LI, G3HBW, DL3YBA and many SM stations.

The Society's Patron, H.R.H. The Prince Philip, Duke of Edinburgh, K.G., talking to George Taylor (G3IUL) during a visit to the radio workshops of British European Airways.

On the 6th LA4VC and LA9T worked six OZs and some SM6 and SM7 stations. An effort by LA9T and G3CCH to make contact by meteor scatter propagation on October 8/9 during the Giacobinids shower was unsuccessful as far as LA9T was concerned but efforts will continue.

OZ5MK (Lyngby) also mentions the opening of October 6 which coincided with the Long Term OZ/SM7 Tuesday contest (which takes place on the first Tuesday in each month). OZ7BR (Copenhagen) worked G5YV on c.w. and GM2FHH, six SM6 stations, one SM4 and two other SMs. OZ8ME (Copenhagen) worked G5YV on c.w. OZ5AB of the same city, worked GM2FHH, plus six LA stations, two SM6, SM5 and a DL. There were many OZ stations active, so it is probable that many other G-OZ contacts resulted.

DL3FM refers to September 12/13 and says that from 21.00 (local time) to 04.30 next morning he worked 35 Gs on phone, among them GW3MFY, GW5BI, GW3ATM and a couple of stations in the Bristol area who had never heard Germany before on 2m. DL3FM's last contact was with G5LK, who was first worked on 80m 10 years ago! DL3FM was still in hospital at the time of writing, but is getting better, we are glad to say.

The Italian Society, A.R.I., has produced a special certificate for the 1959 European V.H.F. Contest which will be awarded to the leading stations in the various competing countries.

Meteor Scatter

G3HBW (Bushey) reports that OE1WJ heard plenty of " pings " and one " burst " from him on each day of the Orionid period (October 20/21). G3HBW himself heard nothing on this occasion.

OH1NL has confirmed the reception of " pings " from G3HBW during the Giacobinids shower. This means that " pings " have been heard both ways but no QSO has yet taken place. OE1WJ, OE3SE and OE6AP/P also reported hearing " pings " and bursts from G3HBW. Unfortunately, G3HBW heard nothing from these stations.

Seventy Centimetre News

G3JGJ (Moretonhampstead) is active with a 6-over-6 slot beam aerial at about 25 ft. and an 832A final.

A.1566 of Cheshire, who is now in Newcastle-on-Tyne, says he is back on the 3·6 and 7 Mc/s bands. The 70cm equipment has had to remain in Cheshire, but will, it is hoped, come into operation next year.

G3HBW has sent the following list of frequencies in use by stations active on 420 Mc/s:

G2ANT	435·4	G3GDR	434·33	G3KKD	434·13
G2BVW	434·13	G3GZM	434·79	G3KPT	433·97
G2CIW	435·43	G3HAZ	434·75	G3LHA	434·51
G2DD	434·8	G3HBW	434·65	G3MED	434·92
G2DDD	435·54	G3HYH	434·22	G5DT	434·91
G2FCA	435·23	G3IRA	434·51	G5LL	434·46
G2FNW	434·73	G3IRW	434·69	G5NF	435·34
G2BDJ	434·52	G3JHM	435·69	G5UM	434·4
G2OI	433·31	G3JMA	435·27	G5YV	434·07
G2RD	434·46	G3JQN	435·62	G6NB	434·61
G2XV	435·17	G3JWQ	434·12	G6NF	434·67
G2WJ	436·03	G3JZG	434·68	G8AL	434·83
G3EYV	434·89	G3KEQ	434·98	G8RW	434·5
G3FP	435·08	G3KRA	434·76		

★ ★ ★

Reports for use in the January issue should reach G2AIW by December 18, 1959.

Worked and Heard on V.H.F.

Two Metres

G3JGJ (Moretonhampstead, S. Devon) September 17-October 26. *Worked:* G2ADZ, 2DCI/M (Dorset), 3EFY (Exeter), 3ICO (Yeovil, Somerset), GC2FZC. *Heard:* G3ASM/M (Dorset), 5BM (Gloucester), 5QA (Exeter), GW3MFY.

G6OX (Englefield Green). Worked up to October 30: ON4BZ, 4DY, 4FG, 4GN, 4HU, 4TW, 4ZH, PA0BM, 0CML, 0FB, 0JF, 0LOD, 0LQ, 0RG, 0VEL, 0WAR, F9CQ (Paris).

V.H.F. QSY

Members who wish to acquire or dispose of crystals in connection with the revision of the British Isles Two Metre Zone Plan announced in March 1959 are invited to send details to "V.H.F. QSY," R.S.G.B. *Bulletin.*

Crystals Offered

By G3KYU, 9 Well Meadow Gardens, Copthorne, Shrewsbury, Shropshire. 6000, 6025, 6075, 8000, 8025, 8050 and 8070 kc/s, all FT243 ½ in. spacing.

Crystals Required

By G3KYU, as above. Any 6 or 8 Mc/s ½ in. spacing suitable for Zone G (6055 to 6062 kc/s or 8073 to 8083 kc/s).

The Jack Wyllie (GM5YG) Trophy was presented to Len Hardie (GM2FHH), left, and Fraser Shepherd (GM3EGW), right, at the Glasgow Regional Meeting on September 12, 1959, in recognition of their work during the International Geophysical Year. The presentation was made by the Zonal Representative, E. G. Ingram (GM6IZ).

Current Comment

(continued from page 201)

far better appreciation of each others' points of view by both sides, who in general found themselves united in their determination to overcome the problems of TVI just as those of BCI were overcome many years ago.

Cases of BCI still do occur of course but it is no longer the problem it was. And it is hoped that the same may soon be true of TVI. Statistics issued by the Post Office show that in the quarter ended July 23, 1959, amateur transmitters were responsible for only 155 out of a total of 23,778 cases of interference to all broadcasting services investigated. In contrast, 8,705 cases were found to be due to faults at the receiving installation. Band I television produced 124 complaints, found on investigation to be due to amateur transmitters; 4,329 complaints on the same band were due to " unsatisfactory conditions at the receiving site."

The situation on Band III was similar; amateur transmissions were found to be responsible for 12 complaints and receiving conditions for 1,218.

On these figures, no comment, current or otherwise, seems necessary.

However, the fact remains that many amateurs watch television or otherwise voluntarily do not transmit during TV hours. With demands for longer hours of transmission constantly being made, time is running out for those who avoid TVI troubles by staying off the air. A far better policy is to pursue one's hobby to the full: if interference is caused, it may require some work on the equipment but it will be very well worthwhile in the long run. In some cases, members may experience other difficulties. It is for them and all members who suffer interference troubles of any kind that the TVI/BCI Committee exists to serve.

As a matter of policy, the Committee looks to the time when every amateur who operates his transmitter within the terms of his licence may in fact be able to work on any band whenever he desires. May that day soon dawn. —J. A. R.

New Series of Mullard Filmstrips

THE Mullard Educational Service has announced the introduction of a new series of filmstrips designed to assist the teaching of electronic engineering in technical colleges, services training establishments and industrial apprenticeship courses. The first of the series—*Thermionic Oscillators*—is available now from the distributors, Unicorn Head Visual Aids Ltd., 42 Westminster Palace Gardens, London, S.W.1, price 25s. a copy including comprehensive teaching notes. The second, which deals with non-sinusoidal oscillators, is in preparation, and will be followed by others covering the subjects of modulation and transmission.

Amateur (Sound) Licences

READERS are reminded that an Amateur Radio station may be operated only by the licensee or by a duly qualified person in the presence of the licensee. Duly qualified persons are other amateurs licensed by the P.M.G. and holders of the Post Office Radio Amateur Certificate.

R.S.G.B.

International Radio Hobbies Exhibition

Royal Horticultural Society's Old Hall, Vincent Square, London, S.W.1.

Wednesday, November 25, to Saturday, November 28, 1959

LIST OF EXHIBITORS

A.P.T. Electronics Ltd.
Avo Ltd.
British Amateur Television Club.
Collins Radio Co. (of England) Ltd.
Data Publications Ltd. (" Radio Constructor ").
Daystrom Ltd. (Heath-Kits).
Enthoven Solders Ltd.
Hi-Fi Magazine.
Home Radio (Mitcham) Ltd.
Iliffe Press Ltd. (" Wireless World " and " Electronic & Radio Engineer.")
Jason Motor and Electronic Co.
K.W. Electronics Ltd.
Labgear Ltd.
London U.H.F. Group.
Maestrovox Ltd.
Mayra Electronics Ltd.
Minimitter Co. Ltd.
Mullard Ltd.
Norman Price (Publishers) Ltd.
Radio Society of Great Britain.
Relda Radio Ltd.
Richard Maurice Equipment Co.
Royal Navy.
Royal Air Force.
James Scott & Co. (Electrical Engineers) Ltd.
Short Wave Magazine Ltd.
Siemens Edison Swan Ltd.
Taylor Electrical Instruments Ltd.
Territorial Army.

THE R.S.G.B. International Radio Hobbies Exhibition at the Royal Horticultural Society's Old Hall, Vincent Square, London, S.W.1. will be opened by Rear-Admiral K. R. Buckley, M.I.E.E., M.Brit.I.R.E., Director of Engineering and Electrical Training, Admiralty, and Chief Naval Electrical Officer, at 12 noon on Wednesday, November 25, and will remain open daily from 11 a.m. to 9 p.m. until Saturday, November 28.

One of the highlights will be a display of British, American and European communications receivers in operation side by side. Many of the receivers will be making their first appearance in this country since the ending of the restrictions on imports from U.S.A. and it will be possible to see some of the equipment in current use by American radio amateurs.

Commercial Stands

On the commercial stands there will be plenty of new equipment to be seen. **Collins** Radio Co. (of England) Ltd. will be showing the KWM-2 single sideband transceiver and the S-line transmitters and receivers. Daystrom Ltd. will be exhibiting the whole range of British **Heathkits** including the DX100U transmitter, the B1U balun coil kit, test gear and hi-fi equipment.

Home Radio of Mitcham will be introducing a new low price transmitter for 10-160m and the " Globe-King " shortwave receiver kit. ***Hi-fi News,*** a newcomer to the exhibition, will be showing publications for the " do-it-yourself " hi-fi and tape recording enthusiast.

KW Electronics will be exhibiting the National NC303, a new 10-80m s.s.b. transmitter with a crystal filter type exciter, a commercial version of the " Mickey-match " and mobile whips for 10-160m. **Labgear** will be introducing a number of new products at the Exhibition including a new s.w.r. unit and a new moderately priced transmitter.

The principal new exhibit on the **Minimitter** stand will be a receiver for the amateur incorporating a crystal lattice filter, Q multiplier and audio-derived a.v.c. for s.s.b. reception

Transistors will be the main feature on the **Siemens Ediswan** stand where a new pamphlet *The Magic of Transistors* will be available. A display of semi-conductor devices will include drift transistors for operation in the 100 Mc/s region, and transistors for audio output stages handling from 500 mW to 12 watts.

Taylor Electrical Instruments Ltd. will be showing the Model 127A pocket size 20 range multimeter which has a sensitivity of 20,000 ohms per volt and measures resistances from 1 ohm to 20 Megohms. Also on display will be the Model 100A testmeter with a sensitivity of 100,000 ohms per volt.

Amateur Stands

On the amateur stands there will be a great deal to interest and intrigue the visitor and particular emphasis is being placed on working displays including a demonstration of the alignment of filters for TVI reduction. Amateur Television equipment will be displayed by the **British Amateur Television Club** who hope to exhibit an amateur system of recording TV signals and amateur RTTY equipment by the **British Amateur Radio Teletype Group.** V.h.f. and u.h.f. gear will be shown by the **London U.H.F. Group.**

The Exhibition station, operated by Society members, will again operate under the call-sign **GB3RS** and contacts with amateurs at home and abroad will be appreciated.

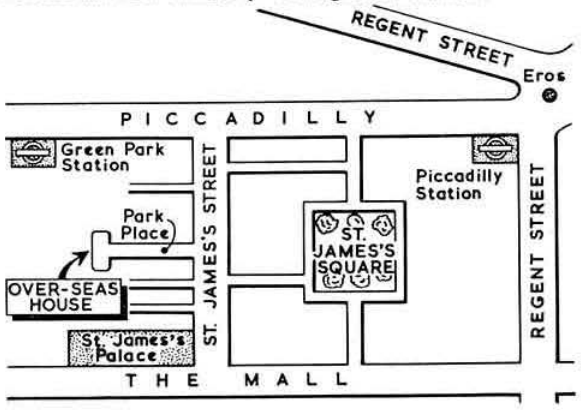
Publications of all kinds for the radio amateur, including the new 1960 edition of the *R.S.G.B. Amateur Radio Call Book*, will be on sale in the Bookshop on the **Society's** stands. The **Home Constructors' Section** will again display a wide variety of home-built equipment loaned by members in all parts of the country.

The R.S.G.B. Radio Hobbies Exhibition 1959 promises to more than live up to the high standards set by its predecessors and should on no account be missed.

Society News

A.G.M. Venue

THE Annual General Meeting of the Society will be held in the St. Andrew's Hall of Over-Seas House (Headquarters of the Over-Seas League), Park Place, St. James's Street, London, S.W.1, on Friday, December 11, 1959, commencing at 6.30 p.m. Buffet tea will be served from 6 p.m. Over-Seas House is about five minutes' walk from Green Park and Piccadilly Underground stations.



Region 4 Representative

OWING to pressure of business, Dr. E. S. G. K. Vance (G8SA) resigned as Representative for Region 4 with effect from November 9, 1959. At the same time Dr. Vance withdrew his nomination for the office of Region 4 Representative for 1960-61.

Mr. F. C. Ward (G2CVV), notice of whose nomination appeared in the October issue of the BULLETIN, is accordingly elected Region 4 Representative and will take office on January 1, 1960.

South West Scotland Regional Meeting

THERE was an attendance of 63 at the business session of the South West Scotland Regional Meeting held in the grounds of the Towan's Hotel, near Prestwick Airport, on September 13, 1959. The Council was represented by Messrs. D. Findlay, D.F.C., G3BZG (Penultimate Past President), J. Douglas Kay, G3AAE (Member of Council) and E. G. Ingram, GM6IZ (Zonal Representative) who were introduced by the Regional Representative, Mr. D. Macadie, GM6MD.

Before the meeting commenced, members stood in silence in memory of GM4PW and GM2ACQ who both did so much for the Society in Region 14.

At the end of the business session there was a display of commercial equipment and a cubical quad array.

At the Dinner in the evening, at which the chair was taken by Mr. Jack Wilson, GM3KJF, there was an attendance of 93. Speakers included Mr. Macadie, Mr. Kay and Mr. D. Tannock, GM2BUD (County Representative). A toast to the visitors was replied to by Mr. Brockie, VE4AN, of Winnipeg, Canada. Prizes were presented by Mrs. J. Wilson.

A presentation to the Council representatives of the works of Burns was made by Mrs. D. Tannock. On behalf of the Council representatives Mr. Findlay thanked the members present for their generous gesture.

Credit for the organization of this highly successful meeting is due to the County and Town Representatives and their many helpers. —GM6MD.

Receipts

RECEIPTS for subscriptions paid by cheque, bankers' order or postal order are not now issued unless specially requested. Receipts are drawn, however, and kept on file at Headquarters for six months.

This group photograph was taken at the Southern Regional Meeting at the Royal Hotel, Southampton on September 20, 1959, at which there was an attendance of nearly 60 members.

Douglas Findlay, D.F.C., G3BZG (Penultimate Past President) presenting the Maitland Trophy to W. G. Cecil (GM3KHH), at the Regional Meeting in Glasgow on September 12, 1959.

The Army Wireless Reserve Squadron

THE official Army Reserve unit for radio amateurs has undergone another change of name, and will now be known as 404 Signal Squadron AER (Press Communications).

The original objects of the Squadron are unchanged and it continues to provide profitable part-time training and facilities for radio and motor cycling enthusiasts. Details can be obtained from G3FDU, 28 Jack Lane, Davenham, Northwich, Cheshire.

Transistors in Communication Equipment

MR. E. WOLFENDALE, B.Sc., will give a lecture entitled " The Transistor and its Use in Communication and Control Equipment " at the meeting of the South Western Section of The British Institution of Radio Engineers at the School of Management Studies, Unity Street, Bristol, on December 17, 1959, commencing at 7 p.m.

Lincoln Hamfest and Mobile Rally

ABOUT 160 visitors attended the Annual Hamfest and Mobile Rally organized by the Lincoln Short Wave Club and held on September 20. A lecture on " V.H.F. from the Amateur Viewpoint," given by Mr. D. W. Furby (G3EOH) of Siemens-Edison-Swan Ltd., was of great interest.

The prize for the greatest number of contacts on the way to the Rally was won by G3GWR/M with G2CAJ/M in second place. A prize was also awarded to Colin Watts, of Liss, Hampshire, the short-wave listener travelling the farthest distance to attend.

Prizes were donated by many well-known manufacturers while a display unit was loaned by Mullard Ltd., and equipment by K.W. Electronics Ltd. The Ladies' prize, a stool, was made by a short-wave listener, Mr. Wind of Lincoln.

GB2RS SCHEDULE

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

Frequency	Time	Location of Station
3600 kc/s	10 a.m.	London
	12 noon	Yorkshire
145·55 Mc/s	11.15 a.m.	Beaming south-east from Leeds
	11.30 a.m.	Beaming south-west from Leeds
	11.45 a.m.	Beaming north from Leeds
145·3—145·4 Mc/s	12 noon	Beaming north from London area
	12.15 p.m.	Beaming west from London area

OK DX and Brazilian Navy Week Contests 1959

MEMBERS wishing to take part in the International C.W. Contest organized by the Czechoslovak Central Radio Club may obtain a copy of the rules by sending a stamped addressed envelope to Headquarters. The contest will take place between 00.00 G.M.T. and 12.00 G.M.T. on December 6, 1959, on the 3·5, 7, 14, 21 and 28 Mc/s bands. Copies of the rules for the Brazilian Navy Week Contest to be held on December 6-13, 1959, are also available.

Silent Key

TOM LAING (GM6LG)

It is with deep regret that we record the death of Mr. Tom Laing (GM6LG). Tom held a licence for over thirty years and was one of the first members of the R.S.G.B. in the Aberdeen area. Until recent years his call was familiar on Top Band. He was an extremely capable technician and an expert on oscillator circuits. Old timers will remember his articles in the BULLETIN on Franklin v.f.o.'s He represented the Society as D.R. at various times and was an enthusiastic supporter of N.F.D. from the earliest days.

Sympathies are extended to Mrs. Laing and her daughter.

G. M. J.

There was an attendance of about 100 at the Lincoln Hamfest and Mobile Rally on September 20, 1959.

Rules for the Twenty-third B.E.R.U. Contest

January 16-17, 1960

1. **Sections.** The contest is divided into two sections: (a) High Power—maximum licensed power; (b) Low Power—maximum input 25 watts.
2. **Duration.** The contest (both sections) will start at 00.01 G.M.T. on Saturday, January 16, and end at 23.59 G.M.T. on Sunday, January 17, 1960.
3. **Eligible Entrants.** The contest is open to all fully paid-up corporate members of the R.S.G.B. resident within the United Kingdom and to all British subjects outside the U.K. but within the British Commonwealth and British Mandated Territories. All entrants agree to be bound by the rules of the contest.
4. **Operator.** Only the entrant will be permitted to operate his station for the duration of the contest.
5. **Entries.** Entries must be set out, as shown in the example, on **ONE SIDE ONLY** of foolscap paper. **Entries must be postmarked not later than February 1, 1960,** and must be addressed to the Contests Committee, Radio Society of Great Britain, New Ruskin House, 28/30 Little Russell Street, London, W.C.1, England.

B.E.R.U. CONTEST, JANUARY 16-17, 1960

Claimed Score.....

Section: (High or Low Power).....

Name ..... Call-sign .....

Address .....

Transmitter.....Power input.....watts

Receiver..... Aerial(s).....

DECLARATION: I declare that this station was operated strictly in accordance with the rules and spirit of the contest, and I agree that the decision of the Council of the R.S.G.B. shall be final in all cases of dispute. I certify that the maximum input to the final stage of the transmitter was.....watts.

Date..... ..... Signed.....

Failure to sign the declaration may involve disqualification of the entry.

Date	Band Mc/s	Time GMT	Call-sign of station worked	My report on his signals	His report on my signals	Leave blank	Bonus Points	Points Claimed
17	14	0005	G3XXX	569001	559002		20	5
17	14	0009	VK2ZZZ	579002	569034		20	5
17	14	0012	GM3YYY	569003	579012		—	5
17	21	0730	GW8XXX	589004	589054		—	5
Total (Points Claimed + Bonus Points) 20 + 40 = 60								

6. **Bands.** Operation is restricted to the following bands: 3·5, 7, 14, 21 and 28 Mc/s. Transmissions must be of type A1 (pure c.w.) only, and frequent tone reports of T8 or less may result in disqualification.
7. **Licence Conditions and Power Input.** Entrants must operate within the terms of their licences. The input to the valve, or valves, delivering power to the aerial must not exceed 25 watts in the Low Power section.
8. **Contacts.** Contacts may be made with any station using a British Commonwealth call-sign except within the entrant's own call area. British Isles stations may not work each other for points. Contacts with unlicensed stations will not count for points. The decision as to whether or not a contact is valid will rest with the R.S.G.B. Contests Committee. Only one contact on each band with a specific station will count for points. Duplicate contacts should be logged, but no points claimed.
9. **Scoring.** Each completed contact will score 5 points. In addition a bonus of 20 may be claimed for the first contact with each new Commonwealth call area (as defined in the Appendix) on each band. All British Isles stations (G, GC, GD, GI, GM and GW) count as only one call area.
10. **Contest Exchanges.** Serial numbers must be exchanged and acknowledged before a contact can count for points. The serial number of six figures will be made up of the RST report plus three figures **starting with 001 for the first contact** and increasing by one for each successive contact, e.g. 559001 for the first and 439002 for the second contact, etc.
11. **Awards.** At the discretion of the Council, a trophy or miniature will be awarded to the winner of each section, and certificates will be awarded to the first three entrants in each section. In addition a certificate will be awarded to the leading entrant in each call area regardless of the number of entrants in his call area provided that his score exceeds 1,500 points in the High Power section or 750 points in the Low Power section. A certificate will be awarded in each call area in which there are ten or more entrants to the runner-up, provided his score exceeds 1,500 points in the High Power section or 750 points in the Low Power section.

Appendix

The following call areas are recognized for the purposes of scoring in the B.E.R.U. Contest:—

G, GC, GD, GI, GM, GW—as one call area.
MP4 (Bahrein).
MP4 (Qatar).
MP4 (Trucial Oman).
VE1
VE2
VE3
VE4
VE5
VE6
VE7
VE8
VK0 (Australian Antarctica)
VK0 (Heard Island).
VK0 (Macquarie Island).
VK1
VK2
VK2 (Lord Howe Island).
VK3
VK4
VK5
VK6
VK7
VK9 (Admiralty Island).
VK9 (Christmas Island).
VK9 (Cocos Island).
VK9 (Norfolk Island).
VK9 (Papua).
VK9 (New Guinea and Bismarck Island).
VO
VP1
VP2 (Anguilla).
VP2 (Antigua and Barbuda).
VP2 (British Virgin Islands).
VP2 (Dominica).
VP2 (Grenada and Dependencies).
VP2 (Montserrat).
VP2 (St. Kitts and Nevis).
VP2 (St. Lucia).
VP2 (St. Vincent & Dependencies).
VP3
VP4
VP5 (Jamaica).
VP5 (Cayman Islands).
VP5 (Turks & Caicos Islands).
VP6
VP7
VP8 (Falkland Islands).
VP8 (Grahamland).
VP8 (Sandwich Islands).
VP8 (South Georgia).
VP8 (South Orkney Islands).
VP8 (South Shetland Islands).
VP9
VQ1
VQ2
VQ3
VQ4
VQ5
VQ6
VQ7 (Aldabra Island).
VQ8 (Chagos).
VQ8 (Agalega).
VQ8 (Rodrigues).
VQ8 (St. Brandon).
VQ8 (Mauritius).
VQ9
VR1 (Gilbert & Ellice Islands)
VR1 (British Phoenix Islands).
VR2
VR3 (Christmas Island).
VR3 (Fanning Island).
VR4
VR5
VR6
VS1
VS4
VS5
VS6
VS9 (Aden).
VS9 (Maldive Islands).
VS9 (Muscat and Oman).
VU2
VU4 (Laccadive Islands).
VU5 (Andaman and Nicobar Islands).
ZB1
ZB2
ZC4
ZC5
ZD1
ZD2
ZD3
ZD6
ZD7
ZD8
ZD9 (Gough Island).
ZD9 (Tristan da Cunha).
ZE
ZK1 (Cook Islands).
ZK2
ZK3 (Tokelau Island).
ZL1
ZL1 (Kermadec Island).
ZL2
ZL3
ZL3 (Chatham Island).
ZL4
ZL5 (N.Z. Antarctica).
ZM6
ZS1
ZS2
ZS2 (Marion Island)
ZS3
ZS4
ZS5
ZS6
ZS7
ZS8
ZS9
AP
4S7
9G1
9K2
9M2

CONTEST NEWS

RESULTS — REPORTS — RULES

Rules for the B.E.R.U. Receiving Contest, 1960

1. **Eligible Entrants.** The contest is open to all fully-paid up members of the R.S.G.B. resident within the United Kingdom and to all British subjects outside the U.K. but resident within the British Commonwealth and British Mandated Territories All entrants agree to be bound by these rules. Only the entrant may operate his receiving station for the duration of the contest. Holders of amateur transmitting licences are not eligible to take part.

2. **Duration.** The contest will commence at 00.01 G.M.T. on Saturday, January 16, 1960, and end at 23.59 on Sunday, January 17, 1960. The B.E.R.U. Contest for transmitting amateurs will take place during the same period.

3. **Entries.** (*a*) To count for points, logs must show, in columns. (i) Date/Time (G.M.T.); (ii) Call-sign of Station Heard; (iii) Report sent by Station Heard; (iv) Call-sign of the Station being worked; (v) Band in Mc/s.; (vi) Bonus Points Claimed; (vii) Points Claimed. CQ or Test calls will not count for points.

(*b*) Entries must be set out on ONE SIDE ONLY of foolscap or quarto paper. Entries must be postmarked not later than **February 1, 1960**, and must be addressed to the Contests Committee. Radio Society of Great Britain, New Ruskin House, 28-30 Little Russell Street, London, W.C.1

(*c*) All entries must contain the following declaration:

I declare that this receiving station was operated strictly in accordance with the rules and spirit of the contest and I agree that the decision of the Council of the R.S.G.B. shall be final in all cases of dispute. I do not hold an amateur transmitting licence.

Date..... . Signed.....

4. **Scoring.** Each complete log entry will score 5 points. In addition, a bonus of 20 may be claimed for the first station heard in each new Commonwealth call area (as defined in the Appendix on page 226) on each band. The British Isles (G, GB, GC, GD, GI, GM and GW) count as one call area only. A station may be logged only once on each band for the purposes of scoring. Where both stations in a contact are heard, they should be logged separately; points may be claimed for both entries.

5. **Awards.** At the discretion of the Council a trophy or miniature will be awarded to the winner and a certificate of merit to the runner-up.

Low Power Field Day 1959

THE results of the Low Power Field Day held on September 20, 1959, are as follows:

Posn.	Call-sign	Location	Points
1	G3KLH/P	1½ m. S. of Deddington, Oxon.	126
2	G3CGD/P	4 m. N.W. Cheltenham	87
3	G3BZM/P	High Wycombe	85
4	G3FAS/P	High Wycombe	73
5	G3ISU/P	Ealing	60
6	GW3GHC/P	Cardiff	54
7	G3BY/P	Alt, 2 m. S. of Oldham	53
8	G3JMT/P	Crookham Common, nr. Newbury	49
9	G4RJ/P	Bolberry Down, Devon	46
10	G3CWL/P	Ranmore Common, Surrey	42
11	G8NN/P	Bradfield, Yorks	29

Second 144 Mc/s Field Day, 1959

THE Second 144 Mc/s Field Day held on July 5, 1959, attracted a total of 38 entrants but the logs received by the Contests Committee show that a very much larger number of stations were active. Conditions, both weather and radio, were generally good and many long-distance contacts were made.

Very few comments were received from competitors which would tend to suggest the rules generally found favour. However, it is noted that competitors appear to experience difficulty in accurately measuring distances as well as locating the exact site of the station they have worked. In one instance it was necessary to adjust the claimed score by well over 600 points!

The winner of both Sections, with a score of 12,470 points, was GW2HCJ/M, who used an input of 25 watts to a QQV03-20A. The aerial system was a three-element Yagi on the roof rack of the car and the receiving set-up was a crystal controlled cascode converter working into a BC455. The runner-up and Leading Portable Station was GW3MED/P with a score of 11,997 points. The table shows the scores of both portable and mobile stations.

Thanks are due to G3HBW and G3CHW for submitting check logs.

Posn.	Call-sign	Points	Posn.	Call-sign	Points
1	GW2HCJ/M	12,470	20	G3IAM/P	4,426
2	GW3MED/P	11,997	21	G2DSP/P	4,298
3	G3DIV/P	11,237	22	G3MJU/P	4,273
4	G3AYT/P	11,012	23	G3ERD/P	4,141
5	G3MAR/P	9,577	24	G3GKD/P	4,114
6	G3ION/P	9,112	25	G3JZW/P	3.965
7	G3JWQ/P	8,783	—	G3JQN/P	*3,911
8	G3LTF/P	8,576	26	G3JAZ/P	3,598
9	G3KMT/P	7,698	27	G3JZG/P	3,508
10	G2DTO/P	7,479	28	G3LCH/P	3,067
11	G3EEO/P	7,406	29	G3APY/M	2,590
12	G3EKX/P	7,365	30	G3MHD/P	2,379
13	GW8UH/P	5,816	31	G5CP/M	2,072
14	G3FD/P	5,552	32	G3IRW/P	1,675
15	G3LAY/P	5,512	33	G4BD/P	1,370
16	G3GOP/P	5,440	34	G3FEX/M	1,167
17	GW3ATM/P	5,017	35	G3GGK/P	1,090
18	G4LU/M	4,757	36	G2BDQ/P	1,030
19	GW2FVZ/P	4,723	37	G6SC/P	567

* Late entry.

Affiliated Societies' Contest 1960

THE rules governing the Affiliated Societies' Contest to be held on February 6 and 7, 1960, will be sent to all affiliated societies and clubs in the United Kingdom early in January. Applications to participate will not be necessary.

The contest will take place between 18.00 and 23.00 G.M.T. on both February 6 and 7. Telegraphy only will be used in the 1·8 to 2 Mc/s band.

R.S.G.B. Contest Forms

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

CONTESTS DIARY

November 28-30 CQ World-wide DX Contest—C.W. Section
(See page 70, August, 1959)

December 6 OK C.W. DX Contest

December 6-13 Brazilian Navy Week Contest (see page 225).

1960

January 16-17	- B.E.R.U. Contest B.E.R.U. Receiving Contest
January 31	- 144 Mc/s C.W. Contest
February 6-7	- Affiliated Societies' Contest
February 27-28	- First 1·8 Mc/s Contest
March 5-6	- 144 Mc/s Open Contest*
March 26-27	- 1250 Mc/s Tests
April 9-10	- Low Power Contest
April 24	- D/F Qualifying Event
May 8	- First 144 Mc/s Field Day*
May 15	- D/F Qualifying Event
May 22	- 420 Mc/s Contest
May 29	- D/F Qualifying Event
June 11-12	- National Field Day
June 19	- 70 Mc/s Contest
July 3	- Second 144 Mc/s Field Day*
July 10	- D/F Qualifying Event
September 3-4	- European V.H.F. Contest
September 3-4	- National 144, 420 and 1250 Mc/s Contests*
September 4	- D/F National Final
September 25	- Low Power Field Day
October 2	- R.A.E.N. Rally
November 6	- Second 1·8 Mc/s Contest
November 19-20	- R.S.G.B. Telephony Contest R.S.G.B. Telephony Receiving Contest

* To coincide with Region 1 I.A.R.U. v.h.f. contest dates.

R.A.E.N. Notes and News

BY E. ARNOLD MATTHEWS (G3FZW)*

THE British Red Cross Society No. 4 Region Communications Test, mentioned last month, took place on October 25 and appears to have involved considerably more stations than the one fixed and one mobile actually in contact with B.R.C.S. members in the counties involved. In fact about 30 mobiles and 20 fixed stations were active in an area of some 4,000 square miles. The object of the exercise was to test R.A.E.N. ability to provide communications between the B.R.C.S. County H.Q.s in the Region and the Region H.Q. at Chelmsford; and from County H.Q. to County H.Q. Each county also had an " incident," with a mobile station on site to provide a link to the county H.Q.

Norfolk H.Q. was manned by G3HRK/A and G3NOJ. G3KAY/M was stationed at Thorpe, while G4KO and G3LFU (fixed stations) stood by in case of need. Messages to Chelmsford were routed through Suffolk stations G3MQU and G3DDK.

Suffolk had the fixed station G3NDA at B.R.C.S. H.Q., Bury St. Edmunds, with G3KUM/P as an attached outstation. Owing to the poor location of the B.R.C.S. H.Q., G2CPL/M was located on high ground nearby to act as control and routing station. Relays westwards and southwards were by G3FVP/M, at Newmarket, and G3AGN/M at Sudbury.

Essex provided the stations for Cambridgeshire, Huntingdonshire and Hertfordshire in addition to their own county's needs. The exercise control station at Chelmsford under call-sign G3JSV/A was operated by West Essex Group members. Several monitor stations were provided by both West and South-West Essex Groups, and seem to have been dotted well over their areas. The long journey to Cambridge was undertaken by G2BCX/M and G2OR/M, whilst G3DSW/M and G3MML/M went to Ware, Hertfordshire. G3HWG/M and G3NMR/M went to Huntingdon. Traffic from Huntingdonshire and Cambridgeshire to Chelmsford was relayed via G3LXE/P and G3JMA/P who were located near Fenton, Huntingdonshire. The latter station operated on 2m with G4DC, G3AMF acting as standby. G3JQP/M acted as relay for the Bedford station, and was located on high ground near St. Neots.

Buckinghamshire Group sent G3IYX/M and G3KVT/M to Bedford B.R.C.S. H.Q., whence G3KVT was posted to an " incident " site at Chichely. G3HIU operated from home in Wolverton.

Although this was one of the most ambitious, if not the most ambitious exercise undertaken by R.A.E.N. the results appear to have been highly successful. This reflects much credit on the County Controllers for their care and on the operators for their enthusiasm. The Essex C.C., G8TL, reports that making preparations required over 40 letters and even more telephone calls! Thanks are also due to Mrs. Edwards, West Essex A.C. G2BCX, and Mrs. Judd for their assistance with the paperwork.

Hampshire St.J.A.B. Exercise

This exercise, parts of which were filmed for transmission in the B.B.C. West of England TV News, was based on a story of a supposed railway accident at Fareham Station, and is a forerunner of a very large-scale exercise to be held later. Realism was the keynote, and even the weather appears to have done its best (or worst) to make things difficult for the participants, who included numerous well made-up " casualties."

The police were also involved and R.A.E.N. provided communications for both services, all control of the scheme being carried out on a channel separate from that carrying " exercise " messages, the frequencies used being 144·35 and 144·13 Mc/s.

Using the former frequency for the link between the incident and the " local hospital " (actually Fareham St.J.A.B. H.Q.) were G2FGD and G3HKT. Also at the " hospital " was G3GOP, acting as external link to G3FAN and G3LOK for transmission of information to G3ION at County Police H.Q., Winchester. G3ION also linked with G3JLS who was located at County St.J.A.B. H.Q.

The police officer in charge of the incident fully appreciated R.A.E.N. and made great use of the service. Despite the severe weather all went smoothly and at one time 12 messages were passed in 17 minutes.

Other members taking part were G3CGE, G3MDH, G3IXN, G3EUQ and B.R.S.16075. Among the observers were the Region 17 Representative, G2MN, and the Chief Constable of Portsmouth.

R.A.E.N. Membership Cards

In an emergency the Police may require R.A.E.N. members to produce their membership cards. Carry yours with you—*always*.

Surrey Group's First Field Exercise

An exercise was held in the Thames Valley area on November 1. This was a purely " domestic " scheme in which it was assumed that flooding had occurred in the district. Thirteen fixed, mobile, and portable stations operated on the outskirts of the area. Messages were deliberately routed in roundabout fashion in order to occupy all stations as fully as possible. The A.C., G3VK, reports that no difficulties arose and he now feels that the group is in a position to offer its facilities to the user services.

This is rather an important point. More harm than good can result from too early an approach to the user services, for if R.A.E.N. standards are not as high as they are required to be the users will naturally regard the emergency use of R.A.E.N. as a very risky business.

Essex Listeners' Watch

In order to stimulate interest amongst non-transmitting members of the **Essex Group**, a Listeners' Watch is being introduced by the County Controller in connection with the general test of preparedness carried out by G3ABB and G3MWD. G3ABB is to call G3MWD on 1980 kc/s at 8 a.m., 12 noon, 5 p.m. and 11 p.m. clock time on an irregular basis. G3ABB will make a short call only and stand by for one minute. If G3MWD replies a normal contact will take place in accordance with county Raynet arrangements.

Listener members are invited to listen at the times stated and log any transmissions heard from G3ABB or G3MWD. At the end of the 12 months the logs will be sent to G8TL and an award made to the person submitting most accurate log.

Tactical Tip

The fact that a message has been delivered (or received at the destination station, which is not the same thing as being delivered) should be notified to the originator, with the time of delivery, if possible. Where a message is relayed, the originating station cannot know whether the message has been delivered unless an acknowledgment is sent.

Personnel

R. A. Wilson (G3NCE) 5 Dunholme Road, Newcastle upon Tyne, 4, has been appointed acting Area Controller for Newcastle upon Tyne and Gateshead.

* *1 Shortbutts Lane, Lichfield, Staffs.*

Letters to the Editor . . .

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

Heat Sinks

DEAR SIR,—With reference to your comment on the letter from Mr. Thompson (G3MQT/M), the figures you quote seem to be unduly pessimistic.

The allowable collector dissipation of a power transistor is given by the formula $P_c \text{ max.} = \frac{T_y - T_a}{\theta_m + \theta_i + \theta_h}$

where T_y is the maximum permissible junction temperature
T_a is the maximum desired ambient temperature
θ_m is the heat resistance between the junction and the mounting base of the transistor
θ_i is the heat resistance between the mounting base and the heat sink
and θ_h is the heat resistance of the heat sink

Data for the Mullard OC16 shows T_y to be 75°C: θ_m to be 1° C/W and with no mica washers $\theta_i = 0{\cdot}3°$ C/W.

At 10 watts input assuming a maximum ambient temperature of 30°C this becomes $10 = \frac{75 - 30}{1{\cdot}0 + 0{\cdot}3 + \theta_h}$

From which $\theta_h = 3{\cdot}2°$ C/W.

If mica washers 0·002 in. thick are now fitted θ_i rises to 0·7° C/W.

$$\text{Thus } P_c \text{ max} = \frac{75 - 30}{1{\cdot}0 + 0{\cdot}7 + 3{\cdot}2}$$
$$= 9 \text{ watts}$$

which is somewhat different from 2 watts.

As a matter of interest a heat sink of 3·2° C/W represents a piece of blackened aluminium (16 s.w.g.) approximately 8 in. by 8 in., although this can be considerably modified by the presence of hot resistors or other components which partly offset the radiation of the aluminium heat sink.

Yours faithfully,
Selsdon, Surrey. G. W. J. HAYDEN (G3BLP).

Contests

DEAR SIR,—May I please claim a further small amount of your space to reply to the two letters under the above heading in the September BULLETIN. It may well be that only a minority of amateurs are contest minded but then it is surely very obvious that only a minority of the world amateur population is active on the DX bands at any one time. My point was that it seems pretty obvious that the general level of activity increases tremendously when there is a contest in progress, and I am sure that the only real reason for this is that contests are popular.

Referring to Mr. E. M. Wagner's letter, surely statistics prove nothing, for, judging by the activity that does take place during contests, it would appear that only a very small percentage of the amateurs taking part submit scores to the organizing body. They merely take part for the fun of the thing and leave it to the really enthusiastic types to worry about who is going to win, and claim scores.

Yours faithfully,
South Croydon, Surrey G. G. E. BENNETT (G5BZ).

DEAR SIR,—As a casual observer in the "Contest" controversy it struck me that if Mr. D. P. L. May (G2BB) can find the time to make 14 contacts per day (his figure 5,000 QSOs per year) I don't see what he has to complain about.

As for QRM, might I suggest that his c.w. would be most welcome on the 2m band where it is sadly lacking and where QRM is unheard of.

Yours sincerely,
Bridgend, Glam. W. M. LEE (GW3MFY).

Raffle Prizes

DEAR SIR,—In a recent letter from Headquarters to society representatives quoted in the BULLETIN (September 1959, p. 139) it is stated ". . . the organizers of a raffle should take steps to ensure that every prize winner writes a personal letter of thanks to the company or firm responsible for supplying the gift. . . ."

This seems to me to be a quite ridiculous imposition, even if one ignores the fact that these gifts are usually a form of advertising by the firm concerned. It is both common courtesy and expedient for the organizers to thank the donor and reasonable enough to expect the winner to thank the organizers but I fail to see that the winner is under any special obligation to the donor. There is no objection to encouraging a winner who wishes to write to thank a donor but ordering him to do so is quite another matter.

I write in the hope that a little common sense will be applied in matters of this kind.

Yours faithfully,
Eccles, Lancs. A. A. H. Moss (G8VF).

Underground Aerials

DEAR SIR,—On glancing through back issues of the BULLETIN I observe several interesting references to underground aerials. I further note that no mention of them is to be found in recent copies and wonder if this is indicative of a less "down to earth" general policy, or a sign that this intriguing subject has been finally buried?

Yours faithfully,
High Wycombe, Bucks. A. J. GOODWIN (G3LSK).

Scottish QSLs

DEAR SIR,—During the last few months, an increasing number of amateurs have asked me over the air the best method of extracting QSL cards from GM stations. Many of these operators have gone to some lengths to obtain a confirmation from GM (repeat QSLs, IRCs, etc.) with poor results. Some of the GMs in question appear regularly in various DX lists such as DXCC credits, country tables in magazines and so on. It would appear, therefore, that there are some stations willing to accept QSLs and to claim credit for them at the same time ignoring requests by other stations to QSL. For many years Scottish amateurs have enjoyed the reputation of having a high standard of operating ethics. May I be permitted the use of your columns to appeal to my fellow countrymen not to let Scotland down.

If there is no intention to QSL tell the other man during the QSO and put him out of his misery. On the other hand if you do promise to QSL, do it within a reasonable time, at the same time remembering the thrill you got when that last exotic card dropped through your letter box.

Yours faithfully,
A. G. ANDERSON, B.Sc.
Pitfodels, Aberdeen. (GM3BCL, Region 12 Representative).

TVI From Amateur Transmissions

DEAR SIR,—I was extremely interested in the information on pages 42 to 44 of the August BULLETIN and give my experiences.

(1) While transmitting on 21 Mc/s a neighbour reported that I was spoiling the picture and coming through with the B.B.C. sound.

On investigation it was found there were two sockets for balanced feeder input. One socket was not being used, the other was joined to a short piece of coax, which in turn was connected to a piece of 300 ohm ribbon which ended at the picture rail.

I therefore tried a ½ wave dipole with 72 ohm twin feeder in the room, and the interference completely disappeared.

(2) Interference as above. It was found the gain on the television was right up, and my neighbour agreed the performance was poor. Eventually the television was serviced with a new tube etc., and there has not been any more trouble.

(3) Complaint from 300 yards distant that I was coming through strongly on B.B.C. sound—picture o.k. Transmitter frequency 21 Mc/s.

As there was some hostility from the complainant I approached the Post Office who investigated. The aerial installation was inefficient and the television receiver in poor shape. The outcome

in this case was that the complainant withdrew his complaint and stated he was shortly obtaining a new receiver and aerial.

(4) Another neighbour has now obtained a new television receiver and my signals are loud and clear on all channels with no aerial. The picture is o.k. This is mainly while transmitting on 28 Mc/s. It is possible that this interference is carried by the house wiring and is being investigated.

On my own 9 in. Pye t.r.f. receiver in the next room to transmitter, I am clear on B.B.C. while operating all bands 160m to 10m, but there is ample gain using a door rod aerial fixed in the roof.

I run 30 watts input (3·5 to 28 Mc/s) with pi-output and ½ wave dipoles on 10, 15, 20, 40. I use a Z match with standing wave indicator, low-pass filter and mains filter.

It would be interesting to hear the experiences of others.

Yours faithfully,

North Finchley, N.12. ALAN G. EDWARDS (G3MBL).

Sylvia

DEAR SIR,—I do not care who Sylvia is or where she is, but I've just got to get this message to her somehow even if she has never got a message before.

Sylvia, after only eighteen months of this Amateur Radio racket you don't know anything and have had only a taste of things to come.

I've been married to my husband for nearly eighteen years and he to his radio for considerably longer, and believe it or not " we three " are still as one (except of course when you count the children and then we are five).

The word " ham " meant nothing to me except when accompanied by salad and it was not until we had been married for nearly two years that my dear husband even told me that he was one of the afflicted ones, and then the information came by letter while he was gallantly serving his country in North Africa. The distance between England and North Africa being what it is, made it somewhat difficult for me to express my feelings adequately and on second thoughts I decided I should find out more about it before I attacked him. Well, I did find out more as time progressed and also discovered that it's in their blood and it is the only thing for which medical science has not discovered an antidote.

I am well experienced in welcoming complete strangers who come to the house as a result of having seen the tallest pole in the world entrenched in the front garden. I know by the look in their eye what they have come for and so I invite them in and while waiting for the OM to disentangle himself from a worry of wires, I proffer a cup of tea or coffee according to the time of day or maybe night. I now find it easier to run a Coffee Club here on the night the local Club meets when I get the regulars and sometimes strays whose names I never know for the pure and simple reason that the OM doesn't know either. " Oh, just some bloke who dropped in at the Club and so I had to bring him back too." Yes, that's quite all right provided the milk holds out.

I know all about Field Days, Rallies Mobile and otherwise, and play the role of the dutiful wife who stays at home on these occasions ready to welcome the conquering hero home at any time of the night with a hot bath and a meal.

For goodness sake don't try and get your ticket! One in a family is enough and take it from one who knows, the only sort of ticket you or I will ever get will be a yellow one.

For your information an OHM is a GNOME with a co'd in his " dose."

Yours faithfully,

Filey, East Yorkshire. PATRICIA M. SWINNERTON (Mrs. G2YS).

Slow Morse Practice Transmissions

G.M.T.	Call-sign	kc/s	Town
Sundays			
09.00	G3BHS	1810	Southampton
11.00	G3GZE	1840	Blackburn
11.00	G2FXA	1900	Stockton-on-Tees
12.00	G3LP	1850	Cheltenham
12.00	GI5UR	1860	Belfast
15.00	G3LEQ	1900	Tunbridge Wells
20.00	G3MRA	1915	Southampton
20.30	G3HTA	1850	Exeter
21.00	G2FIX	1812	near Salisbury
Mondays			
18.00	G3GZE	1840	Blackburn
18.30	G3NC	1825	Swindon
19.00	G3EJF	1820	Bury, Lancs.
19.00	G3KTP	1850	Heanor, Derby
19.00	G3LMT	1850	Exeter
20.00 †	G3EWE / G3IAF / G3NEU	1975	Woking
20.00	G3MDH	1915	Southampton
20.30	G3AGN	1875	Felixstowe
20.30	G3MXI	1910	Derby
20.00 †	G3LCK	1935	Barnet
21.00	G3LXP		
21.30 †	G3LGK / G3MXI	1980	Ilkeston, Derbys.
		1980	West Hallam, Derbys.
Tuesdays			
17.30	G2AAM	1875	Swanwick, Derbys.
18.00	G3GZE	1840	Blackburn
18.30	G2FXA	1900	Stockton-on-Tees
20.00	G2FCI	1850	Exeter
20.00	G3IBI	1915	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3MEH	1980	Sutton, Surrey
21.00	G3EFA	1855	Southport
21.15	G2CPL	1875	Felixstowe
21.45	G2UK	1875	Lowestoft
Wednesdays			
18.00	G3GZE	1840	Blackburn
19.00	G3EJF	1820	Bury, Lancs.
19.00 †	G3MCJ / G3FLK / G2FCI / G3HTA	1845	Exeter
19.00	G3LZC	1830	Heanor, Derby

G.M.T.	Call-sign	kc/s	Town
Wednesdays			
19.00	G8RQ	1850	Chesterfield
20.00	G3BHS	1915	Southampton
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3MXI	1910	Derby
21.00	G3BHS	1810	Southampton
21.00 / 22.00	G3AGX	1920	Hull
22.00 †	G3LGK	1980	Ilkeston, Derbys.
	G3MXI	1980	West Hallam, Derbys.
Thursdays			
17.30	G2AAM	1981	Swanwick, Derbys.
18.30	G3NC	1825	Swindon
20.00	G3NBV	1915	Southampton
20.00	G3NHR	1900	Hounslow
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3GDZ	1910	Kingsbury, N.W.9
20.00 †	G3EWE / G3IAF / G3NEU	1975	Woking
21.00	G3BHS	1810	Southampton
21.30	G3HMY	1850	Exeter
22.00	G3JKY	1990	Beckenham
Fridays			
18.30	G3DMN / G3FVP	1880	Ipswich
19.30	G3FUA	1850	Kilburn, Derby
19.30	G3MHR	1850	Swanwick, Derbys.
20.00	G3JLS	1915	Southampton
20.15	G2AYQ	1875	St. Agnes, Cornwall
20.30	G3ICX	1915	Sutton Coldfield
20.30	G3KGU	1915	Theydon Bois, Essex
21.00	G3BHS	1810	Southampton
21.30 †	G3KLZ / G3KSS	1900	Bradford
22.00	G3KYU	1859	Bournemouth
22.00 †	G3LGK	1980	Ilkeston, Derbys.
	G3MXI	1980	West Hallam, Derbys.
Saturdays			
13.00	G2FXA	1900	Stockton-on-Tees
20.00	G3MCL	1915	Southampton

† *Alternately.*

Regional and Club News

Brighton and District Radio Club.—At the A.G.M. held on October 28, 1959, the following were elected: *Chairman*—R. T. Henley; *Hon. Treasurer*—R. Langridge; *Hon. Secretary*—H. R. Henly, 72 Loder Road, Brighton 6. Prospective members and visitors are always welcome at meetings which are held at the Home Guard Club, British Legion, 76 Marine Parade, Brighton, every Wednesday at 8 p.m.

Crawley Amateur Radio Club.—The inaugural meeting of this new club was held on October 15 and was well attended. Meetings have been arranged for December 10 and January 7 at 7.30 p.m. at the " Brewery Shades," Crawley, where visitors and prospective members will be warmly welcomed. *Hon. Secretary:* D. A. Hunt (G3LBH), 18 Maiden Lane, Langley Green, Crawley, Sussex.

Crosby Amateur Radio Society.—Meetings are held on Tuesdays at 8 p.m. at the " Colonsay," Crosby Road South, Waterloo, and are preceded by Morse instruction. Technical classes are held on Thursdays and constructional sessions on Fridays. The club station G3JQA is active on Top Band on Wednesday evenings. A talk on aerial design was due to be given on November 24 while G3GST, G3IZT and G4BM will give a report on the R.S.G.B. Radio Hobbies Exhibition at the meeting on December 1. Details of the meeting on December 15 may be obtained from the *Hon. Secretary:* F. Rosete, 13 Menai Road, Bootle 20, Lancs.

Mitcham and District Radio Society.—A talk entitled "An Advanced Transmitter Design " was due to be given on November 20 by G3JJG. Forthcoming meetings at " The Cannons," Madeira Road, Mitcham, will be on December 4, when a member of the B.B.C. Engineering Dept. will give a lecture on " Television Radio Link Equipment and Techniques," and on December 18 when the Christmas draw and Constructional Contest will take place. A club net is held on Top Band at 8 p.m. on Tuesdays. *Hon. Secretary:* D. Johnston (G3NFA), 59 Acre Lane, Carshalton, Surrey.

Ravensbourne Amateur Radio Club.—Meetings at Downham have been discontinued and replaced by monthly meetings at Bromley. Details may be obtained from the *Hon. Secretary:* J. Wilshaw (G3MPX), 4 Station Road, Bromley, Kent.

Reigate Amateur Transmitting Society.—A newsletter is now being issued and R.A.E. and Morse classes have been arranged. A new clubroom is being sought. *Hon. Secretary:* F. D. Thom (G3NKT), 12 Willow Road, Redhill.

South Birmingham.—Meetings are now held on the third Thursday in each month. Another mobile rally is to be held at Lickey Beacon shortly. A Junk Sale is arranged for December 17 at the Friends' Institute, 222 Moseley Road, Birmingham, 12.

South Manchester Radio Club.—At the recent A.G.M. the following were elected: *Chairman*—D. Provan (G3LQQ); *Vice-Chairman and Hon. Treasurer*—N. Ashton (G3DQU); *Hon. Secretary*—J. A. Elliott (G3KIQ), 2 Pennine Close, Blackley, Manchester 9; *Affiliated Societies' Representative*—C. M. Denny (G6DN). Meetings are held every Friday at Ladybarn House, 17 Mauldeth Road, Manchester 20.

Tees-side Amateur Radio Club.—The Annual Christmas Dinner is to be held on December 12 at 7.30 p.m. in Settlement House, 132 Newport Road, Middlesbrough. Tickets, price 10/6 each, may be obtained from the Hon. Secretary. G3LXG/A will be active on Top Band from 18.30 G.M.T. to guide in visiting mobiles. The programme will include the usual prizes and a novel " swop table." Further details may be obtained from the *Hon. Secretary:* Allan L. Taylor (G3JMO), 12 Endsleigh Drive, Acklam, Middlesbrough.

Torbay Amateur Radio Society.—At the October meeting, L. Mays (G2CWR) gave a lecture on transistor theory. Visitors included G3HRS from Scarborough and members of the Exeter society. The next meeting will be held at the Y.M.C.A., Castle Road, Torquay, on December 12 at 7.30 p.m. *Hon. Secretary:* George Western (G3LFL), 118 Salisbury Avenue, Barton, Torquay.

Wirral Amateur Radio Society.—At the A.G.M., L. Roberts (G3EGX) was re-elected *Chairman*, A. Keiller (G3KXR) was re-elected *Honorary Treasurer* and A. Seed (G3FOO), 31 Withert Avenue, Bedington, Wirral, Cheshire, was elected *Honorary Secretary*. A Junk Sale is to be held on December 4 while G3FXC will be giving a colour slide show on December 18.

The Reigate Amateur Transmitting Society operated G3MHD/A on 144 Mc/s, G3NKS/A on Top Band and G3JDN/A on 7 Mc/s at the Reigate Grammar School Summer Fair. Equipment included an SCR522 and Vanguard transmitters and HRO, R208 and S640 receivers. The aerials were a 4-over-4 and 150 ft. end-fed wire.

Region 1 Field Day 1959

WIRRAL Group were the winners of the Region 1 Field Day 1959 with 140 points, followed by Stockport and Bury with 90 and 81 respectively. The weather was most favourable and there was a larger than usual entry, nine groups competing. The winners achieved their position by concentrating on the 21 Mc/s band, which gave them a large number of North American contacts.

A.R.M.S. Meeting

A MEETING of the Amateur Radio Mobile Society is to be held in the Small Hall, St. Bride Foundation Institute, Bride Lane, London, E.C.4, on Saturday, January 30, 1960, commencing at 3 p.m. The programme will include a film show, lectures and a buffet tea. Further details may be obtained from the Hon. Secretary, George Storey (G3HTC), 10 Avon Road, Sunbury-on-Thames, Middlesex.

Wireless World Diary 1960

THE *Wireless World* diary for 1960 contains a useful 80-page reference section of technical and general information in addition to the usual diary pages of a week to an opening. Base connections for about 700 valves is another useful feature. The *Diary*, which is published by T. J. & J. Smith Ltd. in conjunction with the *Wireless World*, costs 4/6 (rexine cover) or by post 5/- from R.S.G.B. Headquarters.

Forthcoming Events

Details for inclusion in this feature should be sent to the appropriate Regional Representatives. T.R.s and club secretaries are reminded that the information submitted must include the date, time and venue of the meeting and, whenever possible, details of the lecture or other event being arranged. Regional Representatives are requested to set out copy in the style used below.

DATES FOR YOUR DIARY

November 25-28.—R.S.G.B. International Radio Hobbies Exhibition, London.

December 11.—Annual General Meeting at Over-Seas House, London, S.W.1.

January 22, 1960.—Presidential Address.

March 11.—London Lecture Meeting at the I.E.E.

April 24.—North Midlands Mobile Rally.

June 26.—Longleat Mobile Rally.

REGION 1

Blackburn.—Fridays, 8 p.m., The Corporation Park Hotel, Revidge Road.

Blackpool (B. & F.A.R.S.).—Tuesdays, 8 p.m., December 1 (F.M. Receivers " by J. C. Kirkham), Squires Gate Holiday Camp.

Bury (B.R.S.).—December 8 (A.G.M. and Junk Sale), George Hotel, Kay Gardens.

Chester.—Tuesdays, 8 p.m., Y.M.C.A.

Crosby (C.A.R.S.).—Tuesdays, 8.30 p.m., Colonsay, Crosby Road South, Waterloo.

Liverpool (L. & D.A.R.S.).—Tuesdays, 8 p.m., Gladstone Mission Hall, Queens Drive, Stoneycroft.

Macclesfield (M. & D.R.S.).—December 1, 15, 29, " The Bruce Arms," Crompton Road.

Manchester (M. & D.R.S.).—December 14, 7.30 p.m., The Wellington Hotel, Nicholas Croft, High Street, off Market Street.

Manchester (S.M.R.C.).—Fridays, 7.30 p.m., Ladybarn House, Mauldeth Road, Fallowfield.

Preston (P.A.R.S.).—Wednesdays, 7.30 p.m., 145 Hammond Street.

Stockport (S.R.S.).—December 9, 23, 8 p.m., The Blossoms Hotel, Buxton Road.

Wirral (W.A.R.S.).—December 4, 18, 7.45 p.m., 4 Hamilton Square, Birkenhead.

REGION 2

Cleckheaton.—November 25 (" Printed Circuits "), December 9 (" The Coupling of Aerials to Transmitters with special reference to the Z Match and Monimatch " by a B.B.C. Engineer), 7.30 p.m., George Hotel, Cleckheaton.

Leeds (L.A.R.S.).—November 25 (Visit to Electron Microscope, Dept. of Biomolecular Structure), December 2 (Snag Night), December 9 (Discussion for Social), December 16 (Social Evening), Swarthmore Education Centre, 4 Woodhouse Square, Leeds 3.

Scarborough (S.A.R.S.).—Thursdays, 7.30 p.m., Chapman's Yard, North Street.

Sheffield.—December 2 (Annual Dinner—Tickets 10/- each), 7.30 p.m., S. and E. Co-operative Stores.

REGION 3

Birmingham (M.A.R.S.).—December 3 (Visit of Mr. Carl Moseley, W0FQY, of Moseley Electronics Inc.), December 15 (Auction), 7 p.m., Birmingham Midland Institute, Paradise Street.

Birmingham (Slade).—December 4 (" Colour Organs," D. T. Wilson), December 18 (" Fun and Games "), 7.45 p.m., The Church House, High Street, Erdington.

Coventry.—December 18, 7.30 p.m., Vine Street Schools.

Stourbridge and District.—December 7, 8 p.m., Brotherhood Hall, Scotts Road; December 18 (Christmas Informal), " White Horse," Amblecote.

Sutton Coldfield.—November 26 (A.G.M.), 7 30 p.m., Club Room.

REGION 4

Derby (D. & D.A.R.S.).—November 28 (Annual Trip to London). December 2 (Auction Sale of Surplus Items), December 9 (Open Evening), December 11 (Christmas Party), December 16 (" Electronic Gadgets "), January 6 (Open Evening), January 13 (Members Exhibition), January 20 (Open Evening), 7.30 p.m., Room No. 4, 119 Green Lane, Derby.

Derby (D.S.W.Exp.S.).—Sundays, 10.30 a.m., December 10, 17, 31; January 7, 14, 21, 7.30 p.m., Club Room, Nunsfield House, Boulton Lane, Alvaston, Derby.

Leicester (L.R.S.).—December 7, 14, 21, 28; January 4, 11, 18, 7.30 p.m., Old Hall Farm, Braunstone Lane, Leicester.

Lincoln (L.S.W.C.).—December 16, 30; January 13, 27, 7.30 p.m., Technical College, Cathedral Street.

REGION 6

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

LONDON MEMBERS' LUNCHEON CLUB

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

at 12.30 p.m. on Fridays, December 18, 1959 and January 15, 1960

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

REGION 7

Acton, Brentford and Chiswick.—December 15 (" Low Power Field Day Transmitter " by G3IGM), 7.30 p.m., A.E.U. Rooms, 66 High Road, Chiswick.

Barnet (B. & D.R.C.).—December 12 (Grand Christmas Party), 7.30 p.m., Hadley Memorial Hall, Hadley Highstone, Barnet.

Bexleyheath (N.K.R.S.).—November 26 (" International Amateur Radio " by A. O. Milne, G2MI). December 10 (Demonstration by K.W. Electronics), 8 p.m., Congregational Hall, Bexleyheath, Kent (near the Clock Tower).

Croydon (S.R.C.C.).—December 8, 7.30 p.m., " Blacksmith's Arms," South End, Croydon.

Dorking (D. & D.R.S.)—Second and fourth Tuesdays, 8 p.m., Star and Garter Hotel, Dorking.

Ealing.—Sundays, 11 a.m., ABC Restaurant, Ealing Broadway, London, W.5.

East Molesey (T.V.A.R.T.S.).—December 2 (Talk), December 5 (Annual Dinner), Carnarvon Castle Hotel, Hampton Court.

Enfield and District.—December 17, 7.30 p.m., George Spicer School, Southbury Road, Enfield.

Harlow and District.—Thursdays, 7.30 p.m., rear of G3ERN (G. E. Read), High Street, Harlow.

Holloway (G.R.S.).—Mondays, Tuesdays and Wednesdays, 7 p.m., RAE and Morse; Fridays (Club), 7 p.m., December 4 (Lecture by A. O. Milne, G2MI), Montem School, Hornsey Road, N.7.

Ilford.—Thursdays, 8 p.m., G2BRH, 579 High Road, Ilford.

Kingston.—Lectures alternate Thursdays, Theory and Morse classes weekly; December 3 (" History and Application of Metal Rectifiers " by R Newman, B.Sc.(Eng.), illustrated with slides), 7.45 p.m., Y.M.C.A., Eden Street, Kingston.

New Cross (C.A.R.S.).—Fridays, 7.30 p.m., 225 New Cross Road, London, S.E.13.

Romford (R. & D.A.R.S.).—Tuesdays, 8.15 p.m., R.A.F.A. House, 18 Carlton Road, Romford.

South Kensington (C.S.R.S.).—December 1 (Film Show); December 15 (Informal Meeting), The Science Museum, South Kensington.

Slough.—December 7, 8 p.m., " Stag Hotel," Wexham Street, Wexham.

Welwyn Garden City.—December 10 (Talk on tape recording and demonstration by Wyndsor Recording Co.), 8 p.m., I.C.I. Restaurant, Blackfan Road, Welwyn Garden City.

REGION 9

Bristol.—December 11 (" Current Trends in 144 Mc/s Equipment and Operation " by D. V. Newport, G3CHW), 7.15 p.m., Carwardine's Restaurant, Baldwin Street, Bristol 1.

Weston-super-Mare.—December 9, 7.30 p.m., Albert Hotel, Sea Front.

Yeovil (Y.A.R.C.).—Wednesdays, 7.30 p.m., Grove House, Preston Road, Yeovil.

REGION 10

Penarth.—November 30 (" Simple Crystal Grinding " by John Douglas, GW2CAS), December 28 (Debate), Y.M.C.A., Penarth.

REGION 11

Prestatyn (F.R.S.)—December 7 (Social Evening), 7.30 p.m., Railway Hotel, Prestatyn.

REGION 12

Aberdeen.—December 1, January 5, Aberdeen Members' Luncheon Club, 12.45 p.m., Royal Atheneum Restaurant. ('Phone, GM3HTL, Aberdeen 34928, for reservations).

REGION 13

Edinburgh (L.R.S.).—December 3 (Film—" Junction Transistors "), December 17 (" B.B.C. Sound Studio Equipment and Techniques "), 7.30 p.m., Y.M.C.A., 14 St. Andrew Street, Edinburgh 2.

REGION 14

Prestwick.—Third Sunday in each month, 7.15 p.m., Royal Hotel, Prestwick.

High Frequency Tape Recording

A LECTURE on " The Development of High Frequency Tape Recording " will be given by Mr. P. J. Guy to the West Midlands Section of The British Institution of Radio Engineers on December 8, 1959, at 7.15 p.m. The meeting will be held at the Matthew Boulton Technical College, Suffolk Street, Birmingham.

Magnetic Recording Techniques

A SYMPOSIUM on magnetic recording techniques will be held at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, London, W.C.1, on December 15, 1959, at 3 p.m. and 6 p.m. Further details may be obtained from the General Secretary, The British Institution of Electrical Engineers, 9 Bedford Square, London, W.C.1.

Electrolube is a complex, low carbon liquid composition which increases conductivity between conducting surfaces. It is particularly useful in potentiometers, switches, vibrators, turret tuners and v.h.f. equipments as it penetrates oxide, sulphide and other chemical films without attacking the contact surfaces. A descriptive leaflet may be obtained from Holiday & Hemmerdinger Ltd., 71 Ardwick Green North, Manchester 12, but supplies are available only through normal trade channels.

Francis & Lewis Ltd., manufacturers of aerial towers, have moved to a new factory and offices at School Lane, Fairview Road, Cheltenham. (Tel. No. 53882.)

Standard Telephones and Cables Ltd. have recently made available a silicon h.t. power rectifier, type FST1/4 which has a rating of 400 volts p.i.v. (280 volts r.m.s.) and a current capacity of up to 500 mA. Two of these units in series in a half wave rectifier circuit will deliver 325 volts at 300 mA when supplied direct from 240 volt a.c. mains. Full details of characteristics and operating conditions are given in booklet MF/109 which is available from the manufacturers at Edinburgh Way, Harlow, Essex. This rectifier is primarily intended for use in television receivers but clearly has many applications in amateur equipment with all the advantages attendant upon the use of silicon units. The retail price is at present 28/- which is high compared to the equivalent valve rectifier, but possibly quantity production will enable this figure to be reduced in the future.

The type 2N511 p-n-p alloy junction germanium power transistor is now obtainable in the U.K. from Texas Instruments Ltd. This unit is intended for use in audio amplifiers and switching circuits, and is designed for a maximum collector current of 10A with a dissipation of 80 watts at 25° C. The body of the transistor is no larger than a halfpenny and has the standard JETEC base arrangement whereby the base and emitter connections are brought out to offset pins on the underside. This type of transistor has applications in amateur mobile service where it could be employed in modulators and power supplies. In the latter application it is claimed that a power converter giving an output of 115 watts and working at an efficiency of 95 per cent can be constructed using two 2N511 units. Full details of the operating characteristics are given in the Tentative Specifications leaflet which can be obtained from the manufacturers at Dallas Road, Bedford. The company are reluctant to quote a firm price for this transistor as they hope that the present figure will be reduced in the future. Intending purchasers are therefore recommended to contact Texas Instruments Ltd.

Can You Help?

● A. D. Bishop (G3MSV/A), c/o R.S.H.C., Queen Street, Portsmouth, who requires the circuit diagram, components values and valve types for the Army type 36 Sender?

● J. A. Clarke (A.1949), 40 Morland Avenue, Dartford, Kent, who wishes to obtain the circuit diagram of the Receiver MCR1?

● E. R. Crane (B.R.S. 13336), 29 Seymour Buildings, Seymour Place, London, W.1, who requires information on the conversion of Unit type R1/ARR-1 for use on 144 Mc/s.?

● F. S. Houlston (B.R.S.19782), 11 Dawlish Avenue, London, S.W.18, who wishes to know the types of valve used in the ex-R.A.F. Receiver 1448?

● R. A. G. MacIntosh (B.R.S.20894), 50 Field Lane, Oldswinford, Stourbridge, who requires the manual and/or circuit diagram for the Radio Receiver type BC348Q?

● E. W. Pilgrim (B.R.S.22378), 18 Park Lane, Thorpe Bay, Essex, who requires the manual and simplified circuit diagram for the CR300/2 receiver? Mr. Pilgrim also requires information on installing an " S " meter in this receiver.

● A./A. Thompson, D. W., 684189, Hut 253, " A " Squadron, 1 Wing, R.A.F. Locking, Weston-super-Mare, Somerset, who wishes to know a source of supply of a guard channel unit for the Receiver type R.1475?

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(Continued on page 240)

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