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The SHORT WAVE Magazine

VOL. XXVI DECEMBER, 1968 NUMBER 10

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SHORT WAVE MAGAZINE

(GB3SWM)

Vol. XXVI DECEMBER, 1968 No. 302

CONTENTS

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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT WAVE Magazine

EDITORIAL

Cover *For a long time now we have been displaying, on our front cover, the advertising announcements of K.W. Electronics, Ltd.—one of the few firms in the U.K. making a positive contribution as an indigenous manufacturer in the Amateur Radio field, in which they have great success, both at home and overseas. Against the strongest competition, K.W. Electronics do good business in many countries outside the U.K.*

Other purveyors of radio amateur equipment, of interest to readers (and the trade) equally have wished to feature as "front-cover advertisers" in SHORT WAVE MAGAZINE. *We are therefore glad to be able to say that, with effect from the forthcoming (January) issue, the front-cover position will be available to other approved advertisers with something to offer in the context of Amateur Radio.*

At the moment of writing, seven of the front-cover positions for 1969 have already been booked, by advertisers (including K.W. Electronics, Ltd.) in whom readers can have the fullest confidence.

* * * *

Christmas *The writer of this piece offered his first Christmas message to readers of* SHORT WAVE MAGAZINE *in our issue for December 1938. It is a long time since then, and much has happened. But the message remains the same:*

To all who may see these lines—at home, abroad
or on the high seas—Happiness for Christmas.

Austin Forsyth, G6FO.

WORLD-WIDE COMMUNICATION

DIRECT READING REFLECTOMETER

CONSTRUCTION AND USE OF AN ESSENTIAL INSTRUMENT FOR AERIAL MATCHING

R. K. WHILE (G3UXP)

A PIECE of equipment which should be in constant use to ensure correct aerial matching and maximum radiation, is a Reflectometer. After reading up the subject, a prototype was made which proved quite satisfactory electrically, but was of rather poor appearance. An improved version was conceived that was a better looking job, and a batch of six of them made up, all of which are in regular use. One of the prime requirements was that this unit be direct reading to eliminate an unnecessary switching operation. With the general availability of the inexpensive Japanese meters the doubling up of these and other components was felt to be no drawback. Costwise, the Reflectometer described here can be built, buying components at full retail prices and professional spraying, for £7 10s.

No claims are made for originality of the circuitry—*see* Fig. 1—which has been published many times in various forms, but is based on the Monimatch.

Construction

The whole unit is fitted in an Eddystone diecast box, Type 683SP, which is used inverted. Note that the fixing holes for the coaxial sockets should be offset equally about the centre line of the wall of the box. This is to ensure that they will be in line with centre-conductor ends when the pickup line is formed into a coil (Fig. 2). The holes are countersunk to such a depth that the screw heads are sunk below the surface of the box and locked into position with shakeproof washers and 4 BA full nuts. The recesses are filled with *Araldite*, no fixing screws thus showing externally. Box and lid can then be sprayed.

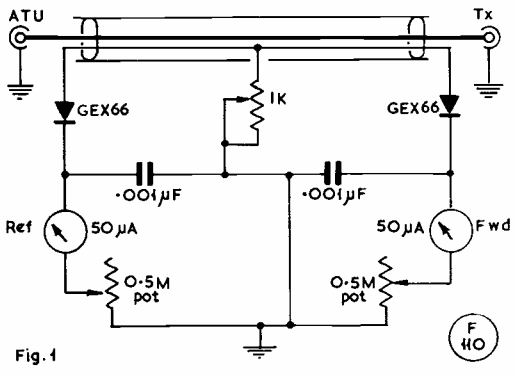


Fig. 1. Circuit of the Reflectometer, as discussed in the text.

Next, an internal bracket must be drilled and bent to fit as suggested in Fig. 3. This is not too critical dimension-wise, things to watch being that the two holes for the sensitivity potentiometers are in line with the holes in the front wall of the box. It may be better here to put them in after the bending operation, using the holes in the box as guides. Then make the small insulation piece to carry the balance potentiometer; this can be made from $\frac{1}{16}$in. perspex, or similar insulating material.

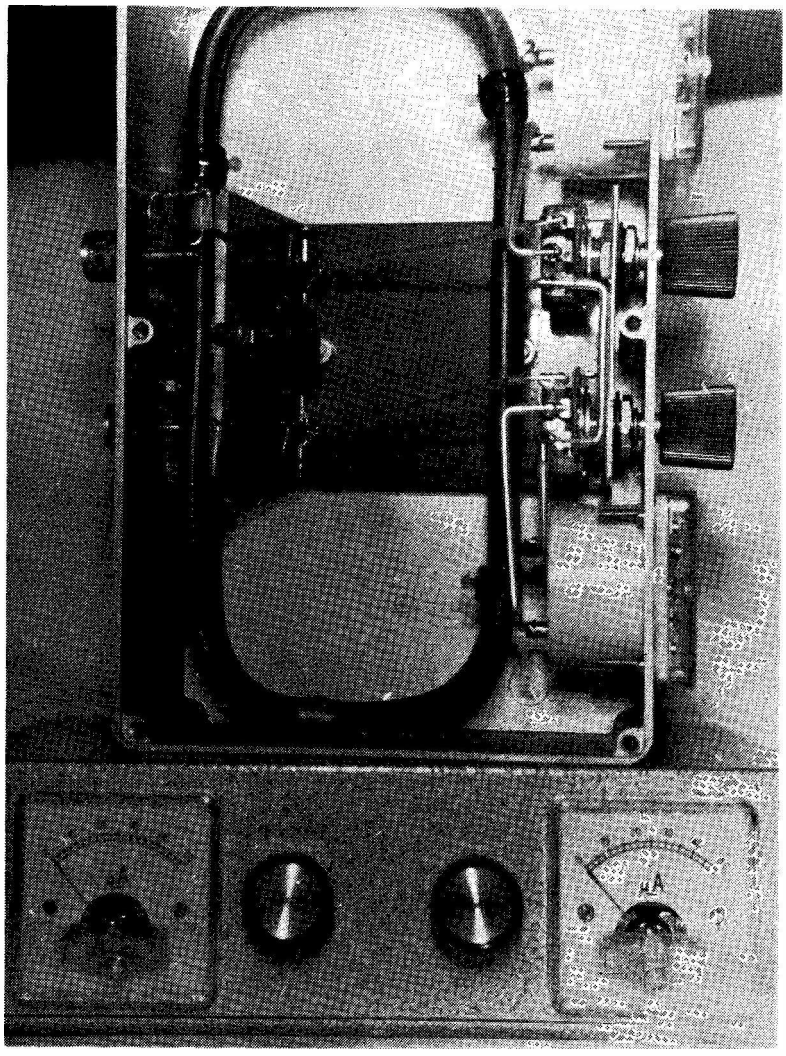
Pick-Up Section

Heart of the Reflectometer is the pick-up line as shown in Fig. 2, and can be made up as follows: From 75-ohm low loss *Aeraxial* cable (which has several cavities surrounding the centre conductor), cut a piece exactly 34 inches long, this being the maximum that can be accommodated in the box under this arrangement—but will be found to give ample sensitivity (in the writer's case using a 6-watt Top Band rig). Remove $\frac{3}{4}$in. of the outer casing at each end, part the copper braiding revealed, but do not twist together at this stage. Next take $\frac{3}{8}$in. off the dielectic at each end. At the centre of the coax cut a window about $\frac{3}{8}$in. long x $\frac{1}{4}$in. wide in the outer sheathing and push the braiding back to show the dielectric. Using a suitable "sharp instrument" (like a bradawl) with a bit of care a hole can now be made which breaks into one of the cavities.

Now comes the tricky bit: A length of 30-34 gauge enamelled wire should be fed into this hole and gently eased through the cavity until it protrudes out of the cavity at one end of the coax. The other end of this length of wire is now fed into the same hole but the opposite way until it in turn protrudes beyond the coaxial cable. One now has a length of coax cable with about 2 or 3 inches of enamelled wire extending from the ends and a loop protruding from the centre hole—*see* Fig. 2. It is advisable to leave plenty of end protruding because the coax now has to be formed into the coil of Fig. 2—and nothing is more disconcerting than to have the pick-up wire disappear under highly unamusing circumstances when this is done. At this point the centre conductor ends should be bent at right angles away from the enamelled wire. Twist and solder the braid parallel to the ends, cut to same length. Fig. 2 illustrates all this. *See* p.608.

The final operation is to coil the coax into just under two turns with the ends on $1\frac{1}{2}$in. centres to bring them in line with the coax sockets, and shape the cable to form a rectangle that fits snugly into the box. The general arrangement at Fig. 3 shows the layout. It is important that the pick-up line be absolutely symmetrical and a little care taken in this direction is well worth the effort.

The enamelled wire ends and loop should be cut to a suitable equal length to make the connections. All this takes longer to write about then actually do—half-an-hour should be all you need.



This picture shows the interior construction (above) and the front-panel appearance (below) of the Reflectometer described in the article by G3UXP. It is built into a standard Eddystone die-cast box. See Figs. 2 and 3 on p.608 for general constructional details. A Reflectometer is an essential item for aerial/ATU matching.

Assembly of the Reflectometer

Mount the 1K balance pot'meter (which must be a carbon type) on the insulating strip, in turn fastened to the bracket. Wire out to the circuit of Fig. 1. Solder the diodes between pairs of feed-through pins on either side of the balance potentiometer and then the decoupling condensers from the lower pins to earth. Fit the meters in the box, then the bracket on to fixing screws. Drop the pick-up loop into position and solder the braid to tags on outer screws holding the coax sockets, then fit the centre conductor to the socket pins. Now the enamelled wire loop and ends should be soldered to the potentiometer slider and upper feed-through pins respectively. Finally, put in the connecting wiring between the diodes, sensitivity potentiometers and meters.

Setting Up

Insert the Reflectometer in the coax line between transmitter and a suitable dummy load. Tune the transmitter up on 14 or 28 mc in the normal way, having first made sure that the sensitivity potentiometers are at minimum. It is advisable to set the reflected meter to 5 microamps by means of its adjuster before setting up. Turn the sensitivity up towards maximum until a clear reading appears on both meters—say, half full-scale on the "forward" and quarter full-scale on the "reflected." The 1K balance potentiometer should be adjusted until the reflected reading reaches the bottom of its *null*. During this process the sensitivity may have to be increased to give a clearer indication of the minimum, at the same time the forward sensitivity will have to be decreased to prevent the needle banging hard

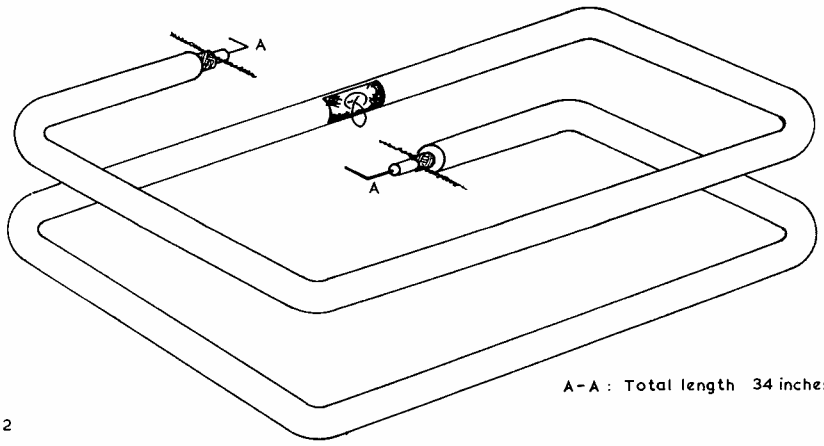


Fig. 2

F 111

against its stop. When the reflected reading is a minimum the bridge will be balanced and the Reflectometer is ready for use.

The " forward " meter can be set to some suitable reading (in the writer's case 40 μA), and the reflected 5 μA. Now change over from dummy load to aerial when (unless one is very lucky) the SWR will have changed causing a drop in " forward " current. By adjusting the taps on the ATU and switching from dummy load to aerial and back one should reach a point where there is no change in readings between the two and it can be assumed that the transmitter is working into a 75-ohm impedance.

No attempt has been made to calibrate this Reflectometer as the actual SWR other than 1:1 is an academic one. The unit is used in conjunction with a good ATU to give optimum radiation with minimum reflected power, as the only criterion. The instrument should be left permanently in circuit, so that a constant check is maintained.

The writer would like to acknowledge the help of G3GVA and G3RGD for advice, and help in testing this Reflectometer at full input on various bands.

MATERIAL REQUIRED

One *Eddystone* diecast box, Type 6838P. Two meters, 0-50 μA, MR38P miniature. Two miniature carbon potentiometers, 470K or 500K linear, *Radiospares*. One pre-set carbon potentiometer, 100-ohm if possible but probably lowest value conveniently available would be 500-560 ohms. Two diodes, *G.E.C.* GEX-66, GEX-34, or similar. Two ·001 μF disc ceramic capacitors. Two coax sockets, *Belling-Lee* type. Yard of " super low-loss " *Aeraxial* cable. Four feet 30-34g. enamelled.

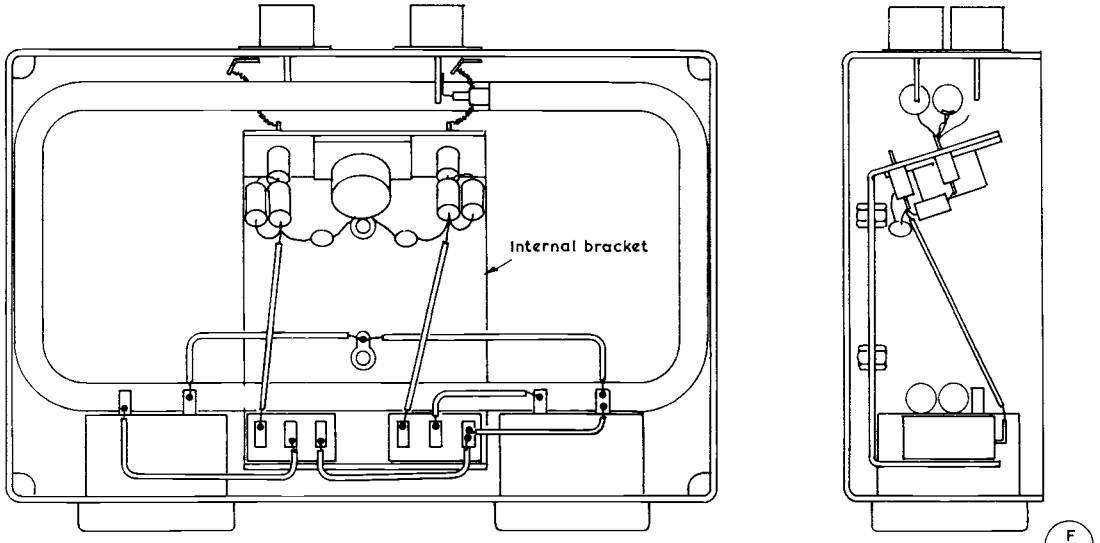


Fig. 3

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RTTY STATION CONTROL SIMPLIFIED

SINGLE AND DOUBLE CURRENT WORKING —IDENTIFICATION—SOME FINAL POINTS

R. W. ADDIE, M.A., F.I.E.E. (G8LT)

The first part of this article appeared in our issue for November, and should be read with these concluding notes.—Editor.

AS already mentioned in Part I of this discussion, dealing with a practical layout, it is good practice to arrange that all Autosenders rest on "mark." To this end Creed machines such at 6/S have S/R contacts like the printers, which make this a simple matter.

It may be necessary to mix Creed machines working double-current with say a Teletype Autosender which is essentially designed for single-current. There are a number of solutions:

1) Convert throughout to single-current operation.

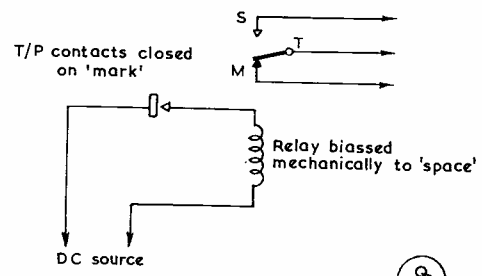
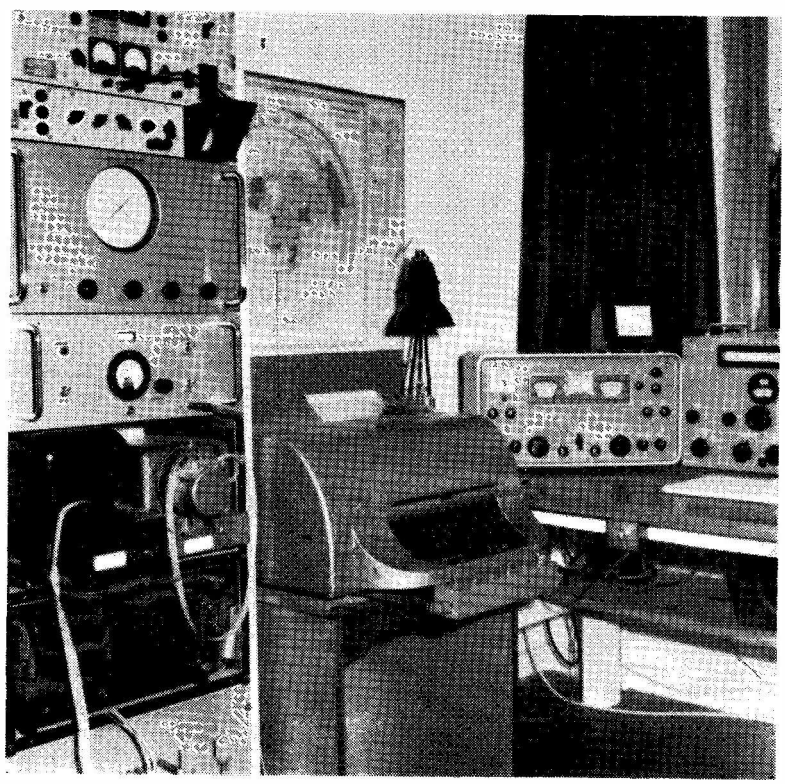


Fig. 5

2) Add a biassed relay keyed by the single-current machine to itself key the loop in the double-current mode. One of the cylindrical mercury-wetted types which plug in are ideal. (Fig. 5).

3) If a Carpenter or similar polar relay is available having two balanced windings one of them can be used to carry a biassing current, as in Fig. 6, p. 610. R is adjusted for currents shown. Note directivity.

If this is, say, 1mA to the right, as shown in Fig. 6, and the keyed current through the other winding is 20 mA from the Autosender and in the opposite sense, then the relay will be working



Teleprinter operating position at G8LT. The machine is a Creed 54/N, and the main control switches can be seen on the outboard mounting at the front of the T/P keyboard. At upper left in the rack is the Shift Monitor, designed by G8LT and described in the April 1968 issue of "Short Wave Magazine."

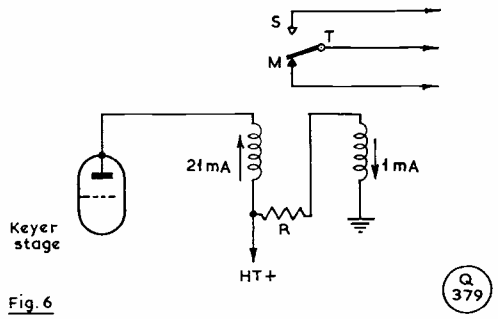


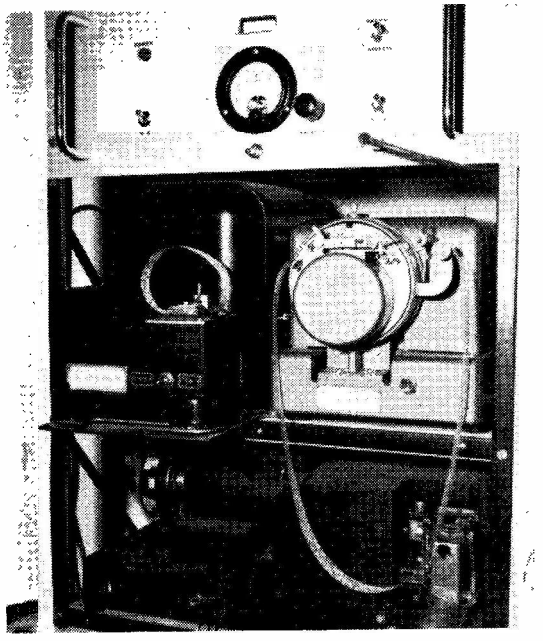
Fig. 6

truly balanced and can be used to key the double current loop.

The licence regulations require that Morse identification be given at the end of an RTTY transmission. It is very considerate to the receiving operator if this is done so as to "hold" his printer at rest during identification. If the "mark" carrier is simply keyed, or keyed between "mark" and "space," then the receiving printer will be jumping about and printing a garbled mess. A neat way of overcoming this is to shift the carrier not by the full 850 cycles but by, say, 100 cycles, which will still pass through the receiving station's T.U. "mark" filter and hold the printer still. Alternatively, the author simply applies a small amount of phase modulation on the "mark" carrier which not only achieves the same object but has the merit of being most distinctive as well!

Finally, the beginner's time will be well repaid if the speeds of printers, autosenders and the reperforator are set with care. Equally important is the correct setting of polar relays so that they are free of bias and distortion. While a T.D.M.S. is ideal for this if access can be had to one, very good results can be achieved for 50 baud working by purely static adjustments.

The foregoing is not intended to be "the answer to RTTY" but if it helps others to devise further improvements the object will have been attained.



Above, home-built DL6EQ Terminal Unit, as described in "Short Wave Magazine" August 1965 and '66. Centre, two Autosenders selected by switch. Below, the reperforator. As installed at G8LT, Wappenham.

WHAT ABOUT A BOOK?

We list a large number of good and useful books in every issue of SHORT WAVE MAGAZINE—they are all selected titles, cover the whole field of Amateur Radio, are available from stock, and normally orders are posted on the day of receipt. For a licensed amateur who wants a ready reference to the practice and techniques of Amateur Radio, we can recommend either the *Radio Handbook* (88s. 6d.), the *Radio Communication Handbook* (69s.), or the ARRL *Radio Amateur's Handbook* (50s., or 60s. hard cover). These are all the latest issues of the various titles.

For a beginner, or a keen SWL aspiring to a licence, a good basic text is *Amateur Radio* (26s.), while any amateur, licensed or SWL, would appreciate a reliable treatment of the all-important subject of Aerials (without an effective aerial, you get just nowhere), and here our titles include: The *ABC of Antennæ*, at 16s. 9d.; *Amateur Radio Antennas* (36s.); the ARRL *Antenna Handbook* (25s. 6d.) and the books entitled *Antenna Round-up*, Vol. I (27s. 6d.) or Vol. II of the same (33s. 6d.).

Many amateurs and SWL's will already have one or other of the titles already mentioned—so they would be interested in either the *Radio Amateur Call Book* (expensive, but the set of two directories at 102s. 6d. covers the whole world, listing by call-sign, name and address every known amateur, and there about 400,000 of them!), or our *DX Zone Map* (14s. 9d., in colour, with revision list right up-to-date, alphabetically by prefix, zone and country); the *Radio Amateur Operator's Handbook* (5s. 6d.); the U.K. *G Call Book 1968* (7s. 2d.); or the *Ham's Interpreter* (9s. 6d., which is a pronouncing dictionary in nine languages, covering the phrases and sentences commonly used in telephony contacts between the world's radio amateurs).

The foregoing are suggestions only, mentioned because among them are those books we use and value ourselves. There are a great many others, which will be found in the advertising in these pages. All prices quoted are post free U.K., and you can be sure of despatch without delay, while stocks last. Orders, with remittance, to: Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. We cannot, of course, carry unlimited quantities of these titles and some are difficult to repeat, especially at this time of year—so get in early!

REVERSING THE CAR ELECTRICS

FROM POSITIVE TO NEGATIVE CHASSIS—SIMPLE CONVERSION PROCEDURE

W. FARRAR (G3ESP)

VARIOUS items of radio equipment, with provision for 12-volt DC operation, are designed for negative-earth operation. This is true of the Sommerkamp FT-100 and FT-150 transceivers, and Heathkit units working through the HP-13 power unit. Readers will doubtless know of other apparatus designed for negative-earth working. Whereas the latest cars are tending towards negative-earth battery systems, many models and certainly the not-so-new types still have positive-earth systems. This was true in the writer's case. Having bought an FT-150, intending to use it for occasional mobile or portable excursion powered from the car battery, it was found that the earthing systems of the radio and the car were incompatible.

Not wishing to delve into and try to modify a new transceiver under warranty, thoughts turned to converting the car electrics. Enquiries of local electrical and automobile "experts" produced alarming tales of the need to replace this and that at great expense. Enquiry of Joseph Lucas (Sales and Service) Ltd., who supply most of the electrical equipment in British cars, showed that the whole business is quite simple, and cheap. In fact, it can cost nothing more than a few minutes of one's time!

The writer's car is a 1966-registered Ford Cortina, manufactured with a positive-earth battery system. On this, the lights will, of course, function with either positive- or negative-earth connection. The fuel and water-temperature meters will also work either way, being thermo-devices, not electro-magnetic. The cut-out, the regulators and the starter-switch, being like the familiar relay, are also independent of current direction. The starter, screen-wiper and heater/ventilator motors all have electro-magnetic fields. Reversal of the battery will reverse the current through the field coils *and* through the armature coils. Either of these reversals alone would reverse the direction of spin; both reversals together therefore leave the direction of spin unchanged. This leaves only the ignition and generator systems.

If the current flows in reverse in the primary of the ignition coil, then it will be reversed also in the secondary. To keep it flowing the same way as before in the secondary, the primary current must also flow the same way. This is accomplished simply by changing over the LT connections (the two wires which go to the terminals or lugs on either side of the ignition-coil housing). This is not essential, however, as ignition is effected and the engine will run whichever way the coil is connected.

Generator Reversal

In the generator, the armature needs to be repolarised—that is to say, the residual magnetism in the core of the field coils must be reversed, otherwise the unit will still give negative output when driven by the engine, which would charge the battery backwards!

The essential procedure then is as follows:

(1) Disconnect the battery, turn it round on its mounting, and connect the negative pole of the battery to the earthing cable. (If the battery has the cap-type connectors, they will need to be changed over also.)

(2) Disconnect from the generator the cable going to the field coils (the small connector marked F).

(3) Take a suitable length of stout insulated wire. Hold one end to the F terminal on the generator and flick the other end several times against the positive (unconnected) battery pole. This will reverse the magnetism in the field core.

(4) Reconnect the generator F terminal to its cable, and connect the positive pole of the battery to the starter cable (to which is also connected the main conductor for the rest of the electrical system).

(5) Switch on the ignition and start the engine. Everything should work as it did before the conversion.

With older cars, having electro-magnetic meters, these will probably read backwards. This is simply rectified by reversing the connections to the meters. The same applies if the car is fitted with an ammeter.

If any transistorised equipment is already in use in the car it will need reconnecting for the new polarity. The handbook or fitting instructions should therefore be consulted.

MOBILE RALLY DATES—SEASON 1969

For the information of those organising Mobile Rallies—or interested in knowing when next Season's events are going to be—following are the dates for some well-known mobile meetings, as already notified to us:

April 20, Midlands Rally at Drayton Park, Staffs.; *June 1,* A.R.M.S. (Amateur Radio Mobile Society) Rally; *June 29,* West of England Rally at Longleat, Wilts.; *July 6,* South Shields, Co. Durham; and *August 17,* Derby Mobile Rally.

Unless there is to be good geographical separation, as far as possible these dates should be avoided by other Rally organisers. To prevent clashing, we will publish dates as they are notified.

NOTES ON THE JR-500S RECEIVER

POSSIBLE MODIFICATIONS FOR IMPROVED PERFORMANCE

E. JOHNSON (G2HR)

RECENTLY, the writer thought that a receiver more in line with modern trends would be an asset. After some deliberation, it was decided to go in for the Japanese JR-500S, which is in the moderately-priced category. Some modifications to what is a good basic design seemed desirable.

First conversion is by way of crystals for each band, *plus* a range for WWV, the 10m. band being split into three. One crystal, *i.e.* 19·1 mc, serves for WWV and the LF end of 10 metres, the oscillator running on either side, thus giving a coverage of 28-28·6 mc, or 9·6-10·2 mc (WWV on 10 mc). The first IF varies between 8·9 mc and 9·5 mc. A solid-state VFO then converts to the conventional 455 kc IF. Two mechanical filters *plus* diode or product detector, and a crystal BFO off-set at 453·5 kc, is also part of the specification.

For calibration, the sprung outer dial can be set to the gauge mark on WWV. As U.K. amateur stations will have crystal calibrators or frequency-check devices (to conform with regulations) the WWV range was not considered necessary. However, more of this later.

Impressions

Performance on SSB is excellent. Speech on AM stations may appear a little woolly, but slight detuning can overcome this. For the keen CW man, the IF curve is too flat-topped, although the skirts show a sharp drop at ±3-4 kc. At 2 kc off tune, there is a drop of about 10 dB only, totally inadequate for CW working. The obvious answer is to fit a Q-multiplier to the 455 kc stage.

Performance with Q-Multiplier

The Codar model RQ-10X was chosen, and the parallel inductor on the output enables one to cancel out the capacity reactance of the coax cable, thus eliminating the need to re-align the IF stage. This is, of course, quite usual but not always appreciated.

With peak control fully advanced, attenuation at ±2 kc was now around 60 dB. The rejection position gives an extremely narrow notch, with attenuation up to 70 dB. A heterodyne can be eliminated from a 'phone transmission (unless local or unusually strong), with no effect whatever on quality.

One can use the Q-multiplier for carrier insertion on SSB transmission, with the receiver switched to AM, and select USB or LSB, although performance with the product detector on the main receiver is infinitely superior.

Top Band Factors

The receiver WWV range is of no real value when there are crystal check-points in the shack. Although the JR-500S can be obtained with a conversion to Top Band, it adds substantially to the price. The writer is indebted to G3VCJ for making a suitable conversion in about one hour. Virtually all that is needed is an extra

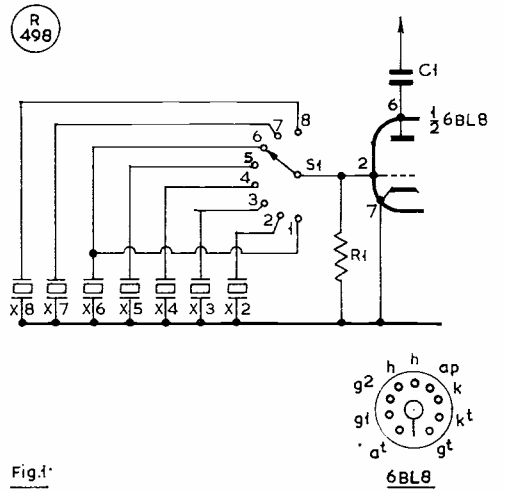


Fig. 1. Crystals are X2, 12·9 mc, 80m.; X3, 16·4 mc, 40m.; X4, 5·1 mc, 20m.; X5, 12·1 mc, 15m.; and X6, 19·1 mc—X7, 19·6 mc—X8, 20.2 mc, for 10m. R1 is 100K and C1 3 μμF. Note: Posn. 1 uses 10m. xtal with oscillator running on other side for WWV. Preselector and 1st mixer coils tuned accordingly.

coil *plus* an 11 mc crystal. The 160m. band will then cover 200-300° on the " red " tuning scale.

Minor Snags

Rarely can one modify a receiver without some unlooked-for trouble occurring. There is a " birdie " at the low frequency end of the 160m. band, which appears to be the 4th harmonic of the 2nd IF. It is not unduly troublesome, as the tuning rate is obviously multiplied by a factor of four.

A snag, unexpected, was TVI. One immediately looks to the transmitter, but this was discounted as no trouble had shown up before—or ought not to on Top Band! Slight, but irritating patterning appeared on Channel 1. The 5th harmonic of the receiver VFO was suspect, running as it does from 8·4465-9·0465 mc. However, a harmonic trap is fitted, and the trouble did not occur before the modification. The answer was 4th harmonic radiation from the 11 mc crystal, despite adequate screening and earthing. No alleviation was apparent upon removal of the aerial. Could it be mains-

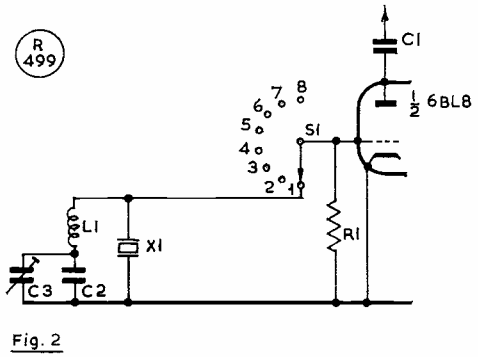


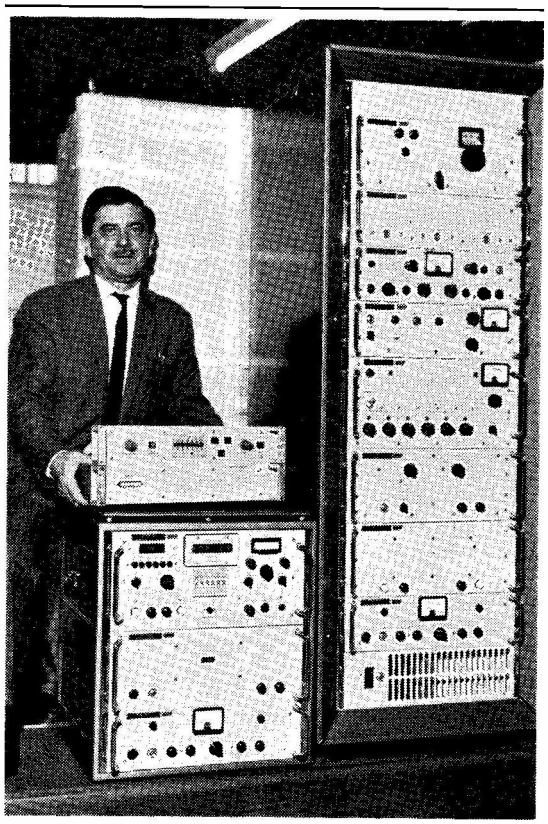
Fig. 2. X1, 11 mc, with posn. 6 lead removed. R1, 100K; C1, 3 μμF; C2, 30 μμF; C3, 25 μμF. L1, 15 turns 18g. to 0·3in. dia. For Top Band, preselector control should be swung over 3·5-14 mc range for peaking.

borne? Even so, surely the way to tackle the problem should be at its source.

The crystal oscillator is the triode section of a 6BL8. The writer does not warm to rejectors in the anode, as they have a habit of " taking-off " (causing self oscillation). An acceptor down to earth was not thought advisable, as coupling to the pentode section is *via* a very small condenser, C1 in the circuits shown, and the low reactance of the acceptor at the wanted 11 mc frequency could seriously reduce injection. Neither was it considered suitable to put the acceptor across the whole bank of crystals.

Finally, the acceptor was connected across the 11 mc crystal only. The device consisted of a 15-turn, 0·3in. diam. coil of 18g., air-spaced by wire diameter, in series with a 30 $\mu\mu$F condenser, with a 25 $\mu\mu$F beehive variable in parallel. This was tuned to 44 mc with the aid of a GDO. It is important that this operation be done *in situ* (*see* Fig. 2).

All traces of patterning disappeared from the home TV receiver, although there still remains a small residual trace in a TV/Rx only some 15 feet away in the next-door maisonnette. As in this case a set-top aerial is used, with the front-end gain screwed-up to the limit, a tactful suggestion that something better is needed for pick-up of the TV signal seems the obvious approach.



Modern construction techniques exemplified—the item of equipment held by the engineer entirely replaces the other two pieces of gear—the Racal " Speedrace " remotely controlled receiver, with synthesizer control. This new Racal microelectronic communication Rx is a forerunner in its field, is designed for ship-borne use, and gives a performance on the HF bands that ensures the receiver will not be the limiting factor in any communication system. Complete, including synthesizer, PSU and frequency control, it occupies only 7in. depth in a standard 19in. rack.

Calibration

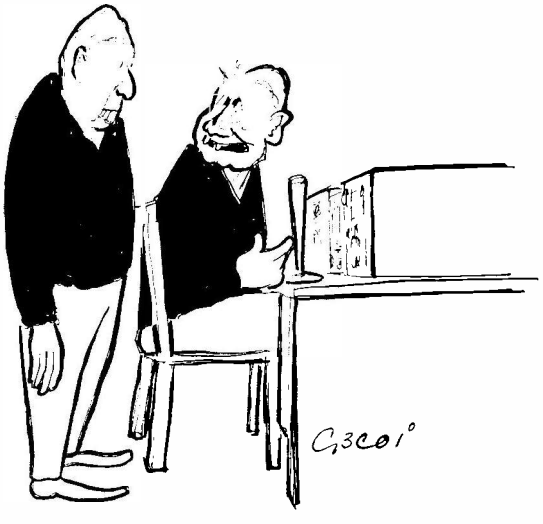
The net reactance on the fundamental does not affect calibration. The makers claim that the JR-500S dial can be read to an accuracy of 1 kc. For a receiver in this price range this may be exaggerated, as the maximum error on Top Band is about 2 kc.

A refreshing feature of JR-500S is that the S-meter has been found to be substantially accurate in showing the conventional 6 dB difference per S-point. Surprisingly enough, a larger instrument has not been incorporated as with the makers' cheaper version.

The writer prefers to make aural reports, but the accuracy of the scale is invaluable for giving comparative readings. If a station puts the needle against the stop, one can estimate reasonably well readings above the +40 dB mark. There are radial lines on the RF gain control, and backing off to the first marker depresses the reading by about 10 dB, and the second by about 15 dB. Further reduction causes a large decrease which makes an estimated reading over " S9 " valueless. Using this little dodge thus enables one to give a carrier level of up to roughly 55 dB above the arbitrary " S9."

ZS LICENSED FOR TOP BAND

It may not be generally known that our South African *confrères* have a 160-metre allocation, at 1930-1970 kc. We have no immediate information as to the extent to which Top Band is used by the ZS's—though over the years good far-DX by individual operators has been reported—but it would seem that some serious tests G/ZS would be well worth while. In the report, in the current issue of *Radio ZS*, on the recent S.A.R.L. Contest, there is no mention of any 160-metre operation.



". . . he says we're beautiful . . ."

CENTRE-FED MULTI-BAND AERIALS

DESIGN CONSIDERATIONS FOR VARIOUS TYPES — FEEDING AND TUNING — SIMPLE SERIES-PARALLEL TUNER

F. G. RAYER, A.I.E.R.E. (G3OGR)

CENTRE-FED aerials do not rely on an earth connection to complete the RF " circuit " (as do end-fed aerials). This is of advantage with a poor earth, or to help avoid earth-return currents which may contribute to TVI. A half-wave aerial centre fed with 75-ohm twin feeder is generally a balanced and trouble-free system, but is mostly used for one band only. As working two or more bands with the same centre-fed aerial is convenient, ways of doing this are worth investigating.

For 7 and 21 mc

As 21 mc is the 3rd harmonic of 7 mc these two bands have a special relationship. On 7 mc a ½-wave dipole has maximum current at the centre, so needs low-impedance feeders (75 ohm coaxial cable, or 75-ohm twin for a balanced system). For 21 mc, the same aerial length accommodates three ½-waves, Fig. 1. So the 7 mc (40m.) aerial can generally be used successfully as it stands on 21 mc (15m.).

An overall top length of 66ft. 4in. should usually do, this being for about 7·05 mc and near 21·2 mc. As with all other aerials, the exact length depends somewhat on height, etc. One length should do for a whole band coverage—though it is better to get the length resonant for the band area in which it is desired to work. Standing

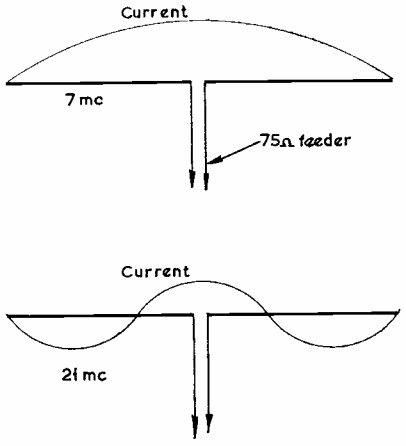


Fig. 1: 7 and 21 mc - A Special Case

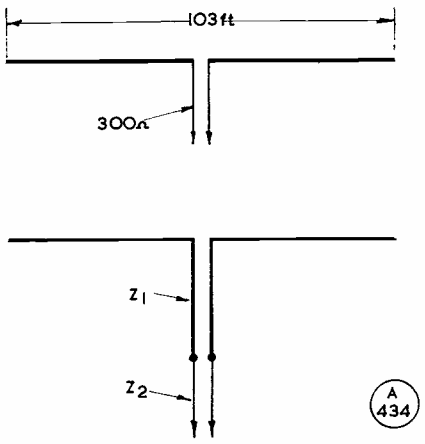


Fig. 2. The Collins Multiband and the Johnson-Q centre-fed types—see text.

waves on the feeder should be near zero at the chosen frequency, and will rise slightly HF and LF of this. Should the SWR reading go up only when moving HF (or loading difficulties begin) the aerial is probably a little too long. (Similarly, it is too short if these difficulties occur only towards the LF end of the band.)

Collins and Johnson-Q

Fig. 2 shows two arrangements for these. The writer's own earliest contact with them was the 1938 *Radio Handbook* but they were doubtless known earlier. The 103ft. Collins Multiband was for 80, 40 and 20m., but will also work on 15 and 10m. The feeder is designed to be a geometric mean between high and low impedance feed conditions. Shorter tops are more especially suitable for HF bands, such as 67ft. for 40, 20, 15 and 10m.

The Johnson-Q has a section of feeder with impedance Z1, to match to a flat line Z2. Z1 is specified as about 200 ohms and ¼-wave long. As example, assume a 66ft. top for 40m.: Then Z1 is 33ft. On 40m., the top centre impedance is low, and transformed to about 600 ohms by Z1. On 20m., the top is two ½-waves, the centre impedance is high, but Z1 is now a ½-wave, so the same impedance (about 600 ohms) is available for Z2.

Efficient aerials of this kind best use open-wire lines for high impedance feeders. But for simplicity, 300-ohm flat twin is practicable. Results over some years seem to suggest that such flat-twin is reasonably efficient when new and dry, and if the length is not too great, but that losses can become quite severe with aged feeder, dirty and wet, and long feeders. If 300-ohm ribbon is employed, it is the *electrical length* which may be important, so the velocity factor of the particular feeder must be allowed for when measuring.

Common-Fed Dipoles

Fig. 3 shows the method. L1 is the LF band dipole, and L2 is for an HF band. Should L1 or L2 be for 40, this can also work on 15m. L2 is suspended about 3in. to 6in. below L1, by insulated spreaders or similar means. Three or more dipoles can be set up in the same way, for further bands.

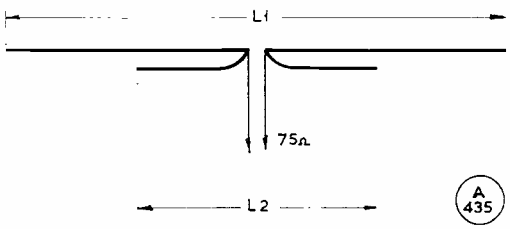


Fig. 3 : Two or more half wave dipoles with single feeder

Such an aerial, with L1 124ft. and L2 33ft., was employed for a lengthy period (80 and 20m. bands) and no actual reduction in efficiency compared with a single dipole was noticed. It was found that L1 needed to be a little shorter than the usual 132-136ft.

A trap aerial also has a common 75-ohm feeder, Fig. 4. There may be two or more resonant circuits or wavetraps. These isolate and load various sections on different bands, so allowing some or all bands from 80 to 10m. to be worked, according to design. The making and adjusting of waterproof traps is not easy, so this type is generally purchased ready-made.

Inverted-V Aerial

This is shown in Fig. 5 and was first used by the writer some years ago. No doubt similar arrangements were tried earlier under like conditions. The idea is to choose a length which does not give very high or extremely low impedance feed on as many bands as possible, so as to allow a " middle impedance " feeder, while on certain frequencies directional lobes from the two arms and from earth " image " wires combine.

This aerial produced many good reports, including some Top Band (for which it was never intended!). High standing waves arise on the feeder, which was originally only 15ft. long with equipment in an upstairs room, but was later 45ft. for a downstairs room.

Tuned Doublet

This is probably the best known centre-fed multi-band aerial, and can undoubtedly give very good results. It is generally used with a 600-ohm or similar tuned line, Fig. 6. The line is made of 14g. to 16g. aerial wire, or 7/26's for greater flexibility, with spreaders of 5in. or so at intervals of about 18in. to 3ft., according to circumstances.

The system has two important dimensions—the top, and feeder lengths. Almost any lengths may be used for either, but some are not readily tuned.

If A to B (half the top *plus* the feeder) is near a ¼-wave or odd number of ¼-waves the feed impedance at the transmitter end of the feeder is low, calling for series tuning. Should A-to-B be near a ½-wave, or multiple of ½-waves, the feed impedance is high, requiring parallel tuning. The feed impedance may be similar for several bands, or completely changed from one band to the next, according to the lengths used.

The tuner is a simple piece of equipment and can be made baseboard fashion with a few short pieces of flex with clips to change connections experimentally. Fig. 7 has the coil L2, with coupling loop L1. C1 and C2 are in series for series tuning. One or both capacitors may be placed across L2 for parallel tuning. C3 can be added to tune out link reactance. This can reduce the coaxial lead SWR. *See* Fig. 7, p.616.

For 80 to 10m., L2 needs to resemble the 80m. transmitter tank. About 26 turns of 16 or 18g., occupying 3½in. or so on a 2½in. diameter former will do. L1 can initially be about three turns of stout insulated wire, on the centre of L2. C1 and C2 can usually be 250 $\mu\mu$F but lower capacities will be more suitable for the HF bands. C3, if used, is ·001 μF (2-gang broadcast band capacitor).

The whole coil is required for 80m., but clips are moved in equal amounts for 40-metre and higher-

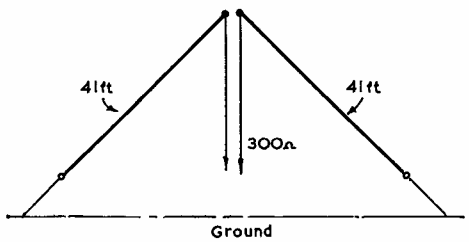


Fig.5 : Single pole inverted vee aerial

frequency bands. Tuning conditions for each band should be noted, when found. Experiments suggest that tapping L2 for the HF bands does not cause any loss of signal strength, compared with using a smaller coil specially for the band.

The way to tune Fig. 6 depends on lengths and frequency. The need for series or parallel tuning can be anticipated, as already mentioned. For example, if A-B (half top *plus* feeder) is a ½-wave on the lowest frequency, and a multiple of ½-waves on higher bands used, parallel tuning is satisfactory.

Results vary considerably. A 135ft. top is half-wave on 80 metres, with a radiation pattern like a ½-wave

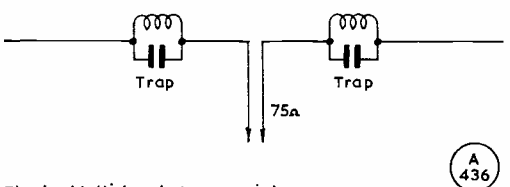


Fig.4 : Multi-band trap aerial

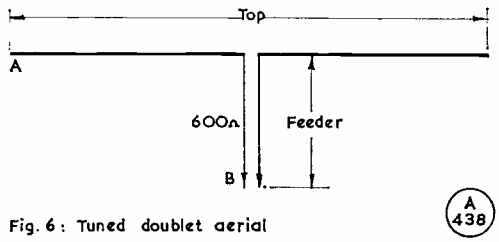


Fig. 6 : Tuned doublet aerial

aerial. But on 40m. the wire is two ½-waves in phase, with some gain. On 20 metres it is two full-waves in phase.

Should the top be three ½-waves on one band, sections in phase are separated by about a ½-wave, forming a double extended Zepp (gain about 3 dB over a dipole). Tops from 264ft. to 66ft. have all been used with success, with feeders from 12ft. to 45ft. Random lengths, such as putting up 100ft. of wire as purchased, are satisfactory. The aerial may also have its top sections at right angles or some other angle, if this suits supports better.

With some awkward impedances it may prove convenient to employ as much of L2 as necessary to permit tuning the coil to resonance on the band, then tapping the feeders only equal amounts towards the centre of the winding.

For best results on LF bands, the doublet top should be at least a ½-wave. However, results can be good if the *total* system (top *plus* twice feeder length) is a ½-wave.

The same tuner is suitable for Fig. 5. With any tuned feeder system the receiver S-meter will generally show resonance—when using the system for reception—and this simplifies tapping the coil and tuning adjustments. If the tuner is set up for maximum S-meter response from some signal in the wanted band, or even general noise, this is a starting point for the transmitter adjustments. Using a receiver with 75-ohm aerial input, it was generally found that if the tuner was adjusted for best reception, the transmitter could then usually be loaded without any further adjustment to the tuner—showing that the whole system was in balance.

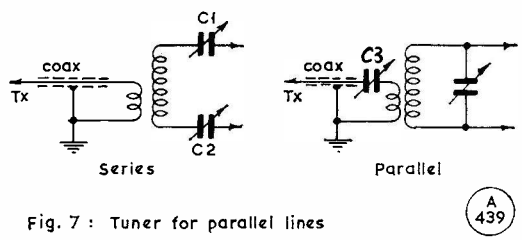


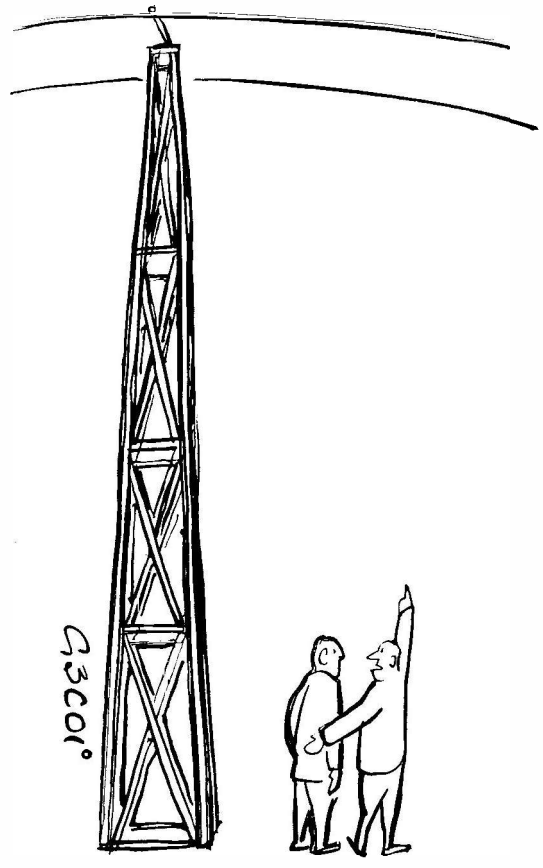
Fig. 7 : Tuner for parallel lines

A 439

Fig. 7. Referring to p.615, in both these sketches L1 is the smaller (left-hand) coil, and L2 the larger, wound to resemble the PA tank—a suggested valve for L2 is given on p.615. The variable capacitor in the parallel arrangement can be a combination of C1, C2—see text.

Generally speaking, if the re-adjusted Tuner settings from band to band can be established and reproduced with certainty, and the re-tuning procedure is acceptable as a necessary exercise when changing bands, the systems of Figs. 5 and 6 will give excellent results (if used with the Tuner of Fig. 7). When laying out the aerial system itself to make the most of the available space, the aim should always be to get as near as possible to "a ½-wave of wire" for the *lowest* frequency band to be used.

Finally, it should be remembered by SWL's who wish to get the best possible results on the amateur bands that all the same considerations apply on the receiving side as for transmission.



". . . They'll never get me up one of those things . . ."

ESPIONAGE—G3KFL

Readers will not expect us to have much to say about this dreary and disgraceful business, so fully reported in the daily press of November 5—there has been enough heard about the failure of a weak character, a traitor to his Service, the methods of trapping used by the "other side," and all the rest of it. It affected us to the extent that—because there was an Amateur Radio angle, with a "ham" (*sic*) involved—we had numerous eager press enquiries and requests for "background" (fortunately, so far as this particular individual was concerned, we had none). As far as was possible, we played it down, and it is probable that at least two "follow-up stories" were stopped. It is to be hoped that, in all the miserable circumstances surrounding the wretched G3KFL, the damage that may have been done to the image of Amateur Radio has been the least possible. While our man languishes in what may seem to be "easy retirement" for the next 14 years or so, the probability is that his contact-man, hurriedly "recalled for consultation," will be shot for his ineptitude.

ROTATABLE MAST FOR BEAM WORKING

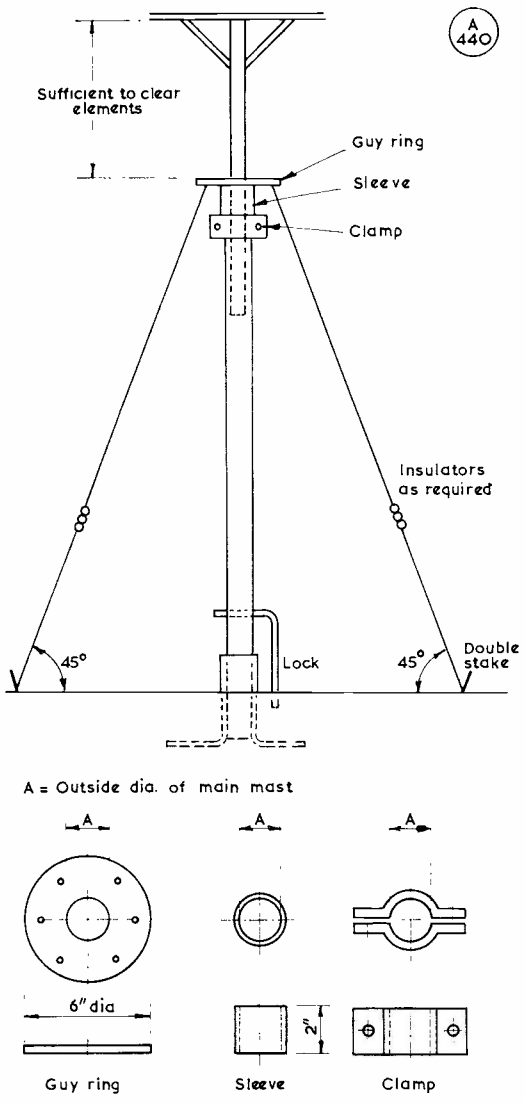
SIMPLE ARRANGEMENT FOR MANUAL CONTROL

D. I. MITCHELL (G3MQY)

A SIMPLE yet sturdy system of beam rotation was needed at G3MQY when it was impossible to erect a permanent structure. The system shown in the diagrams herewith was conceived and constructed, and has survived quite a few West Cornwall gales with a 15-metre Cubical Quad on the top of a 35-foot mast. The whole mast is rotated either by hand (" handraulic "), or any simple mechanical means, and is locked in the required direction with a right-angled rod through the mast, arranged to drop into holes in the surface.

An experiment to prevent beam damage was successfully tried out and consequently may be of interest. The lower 25 feet of the mast was a normal scaffold pole and the top 10 feet was of a very springy steel tube. The idea was that it would be better to have a flexible element *above* the guying point to cope with high winds. The top section was rammed into the lower and welded in place. Then a flat strip with angled stays was welded to the top to support the Quad boom. The guy wire ring, sleeve and clamp were attached just below the joint in the two sections and, even in the strongest wind encountered, while the Quad and top section of the mast flexed considerably, the remainder stood steady and no damage occurred.

A sunken tube in which to rotate the mast would be advisable for longer masts but a small plate or hard ground would be suitable for shorter masts—the writer used the latter method successfully for two years in Singapore with a Quad on a 12-foot mast.



IDEA FOR CHRISTMAS ?

There are those who say that one of the most acceptable presents they can find on Christmas morning is a year's subscription to SHORT WAVE MAGAZINE—and if you feel like being generous to someone, either at home or abroad, it will cost you but 45s. for a year of 12 issues, post free to any part of the world. Send your order, marked " Gift Subscription," with remittance 45s. (cheque or P.O.) to Subscription Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1, and we will do the rest. Over the years, we have had the pleasure of processing many such gifts—and the donor is not embarrassed by being reminded about the renewal.

R.A.E. DECEMBER

There will be a number of readers taking the Radio Amateur's Examination (" Subject No. 55 ") in a few days' time—to them, good luck, and may all who feel they deserve it achieve the coveted pass-slip.

AUTUMN "DX CALL BOOK"

The U.K. section of the Autumn ("Fall") edition of the international *Radio Amateur Call Book* runs to 46 pages, and includes all QTH's and changes-of-address as published in the " New QTH " page up to and including our July 1968 issue (the *Call Book* is revised and published quarterly). If your call appears in " New QTH's " in the *Magazine*, it is re-printed automatically in the (international) *Radio Amateur Call Book*, for which we are the U.K. and European agents. The cost of this current issue of " DX Listings, Call Book," is 42s. 6d. post free, and includes (as well as the U.K.) all countries of the world *outside* the continental United States.

JUST LICENSED — G3XYL!

After waiting some while for the callsign to come up in sequence, Mrs. Barbara Janes—who is the wife of G2FWA—is now on the air in her own right, though sharing the G2FWA station, in which they have a Heathkit SB-100 for working CW/SSB on the HF bands, with an AM/CW rig for Top Band. G3XYL teaches geography at Cheltenham Ladies' College, the famous public school for girls. The

objective now is to establish G4CLC as the College station—and why not! What better way of teaching geography than by having an active amateur station in the school grounds—an oasis of elegance and learning in the heart of the delightful town of Cheltenham, with about two acres of field and garden across which antennæ could be strung without in any way detracting from the amenities. But that is all for the future—in the meantime, we congratulate G3XYL and G2FWA on what they probably regard as just a modest family success in the radio amateur context.

NEW DAYSTROM CATALOGUE

We are asked to announce that a large new illustrated catalogue, covering the wide range of Heathkit gear, is available, free of charge to readers, from Daystrom, Ltd., Gloucester—just write in to them, mentioning that you saw this in SHORT WAVE MAGAZINE.

AMATEUR RADIO IN NIGERIA

At the present time, only 5N2 stations in Lagos, Kaduna and Zaria can operate, and there are but eight active Nigerian calls. While the country continues to be torn by its internal troubles—so distressing to the rest of the world—no new amateur licences are being issued, though it is understood that applications received are being processed ready for issue when things return to normal in Nigeria. (Acknowledgements *IARU Region I Bulletin.*)

INTERESTING STATISTIC

It is reported, in the current issue of the *IARU Region I Bulletin*, that in the tiny Duchy of Luxembourg, the local radio society has no less than 111 members, of whom 73 hold LX licences! There are also 38 registered SWL's.

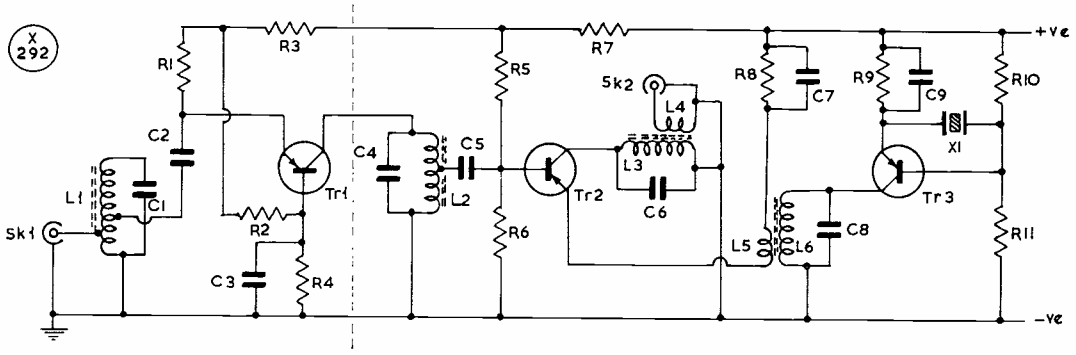
Table of Values

Circuit of Four-Metre Transistor Converter

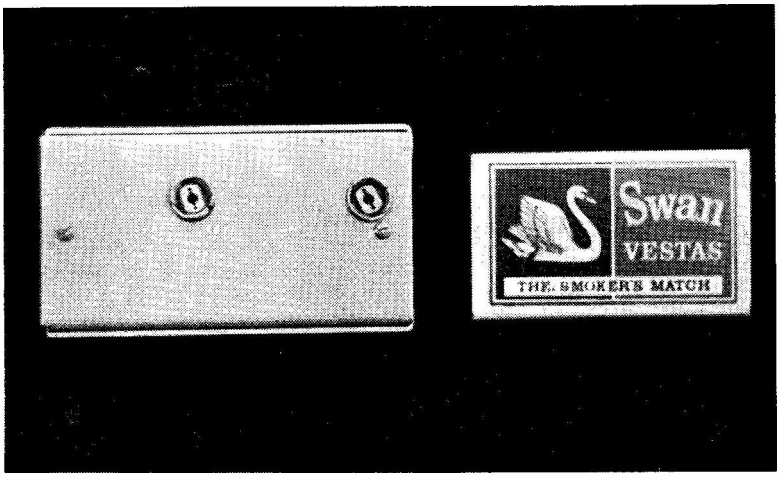
C1, C4, C6, C8	= 10 $\mu\mu$F	R5	= 22,000 ohms
C2	= 27 $\mu\mu$F	R7	= 100 ohms
C3, C7, C9	= ·001 μF	R9	= 330 ohms (*see text*)
C5	= 100 $\mu\mu$F	R10	= 10,000 ohms
R1, R8	= 1000 ohms	R11	= 47,000 ohms
R2	= 2,200 ohms	Tr1	= GM290A
R3	= 16 ohms	Tr2	= AFZ12
R4, R6	= 15,000 ohms	Tr3	= OC170

TABLE OF COIL DATA

L1, L2, L3	— 5½ turns 30g. on ¼in. slugged former, close wound, with L1, L2 tapped at 1¼ turns.
L4	— Two turns 30g. p.v.c. covered, wound on earthy end of L3.
L5	— One turn as L4, at earthy end of L6.
L6	— 10 turns 28g. on ¼in. slugged former, for 51·5 mc. crystal.

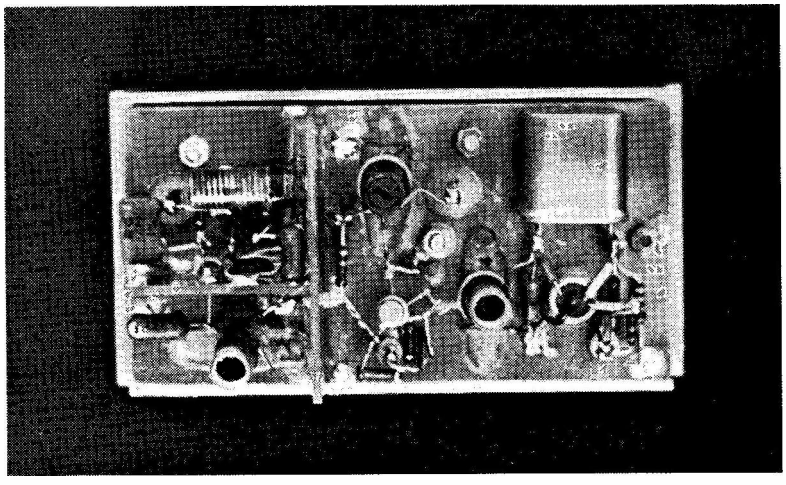


Circuit of the Four-Metre Converter.



At left, the four-metre converter, with a size comparison—see circuit p.618.

On the right, view inside the converter discussed by G3PRX in his article. The input (aerial) end is to the left.



TRANSISTOR CONVERTER FOR FOUR METRES

TUNABLE IF AROUND 20 Mc

G. R. GRIGG (G3PRX)

THIS simple transistorised converter for 70 mc uses common base configuration and an RF stage into a common-emitter mixer, with the crystal oscillator running at 51·5 mc and an HC6U type crystal. Other crystal frequencies could, of course, be used, with appropriate adjustment to L3 and L6.

Aerial coupling to L1 could be by a single-turn loop and it might be found desirable to move the emitter tap on L1 to give a better noise-factor—but whether this is worth while depends very much on the receiving site, *i.e.*, aerial noise usually exceeds the inherent noise of a good RF stage at 70 mc.

All inductor circuits are permeability tuned. No damping of the IF output coil L3 was found necessary and over the 600 kc of the 4-metre band gain remains reasonably constant and quite adequate throughout this range.

With some very active crystals, oscillator injection to the mixer could be too high, causing undue noise; increasing the value of R9 to 1K should affect a cure.

The whole converter can be built on to a cooper-laminated board about 1¾in. by 3in., and fitted into a small aluminium box—*see pictures above.*

Circuit and Table of Values on facing page.

THE ZL MINI-QUAD

CUT-DOWN TWO-ELEMENT QUAD, FULLY DRIVEN ON 20 METRES— DESIGN, CONSTRUCTION AND RESULTS— POTENTIALITIES FOR FURTHER DEVELOPMENT

P. E. H. DAY (G3PHO/ZL2BDA)

MOST radio amateurs have heard of the "ZL-Special," a two-element fully driven beam thought to have been developed in New Zealand, and first described in SHORT WAVE MAGAZINE for July 1950. The writer makes no excuse for similarly christening his infant, for apart from it being developed in New Zealand it possesses several features also found in the "ZL-Special." The system described here is basically a Driven Quad. In addition it is miniaturised to almost half the dimensions of a full-size array.

This antenna became a reality when the writer went out to Gisborne, N.Z. in 1966. The G3 licence was exchanged for the ZL one and the gear quickly set up for contacts with the U.K. At first, verticals and simple wire aerials were tried for the 14 mc SSB skeds kept with G3HQG and G3KVG. Only limited success was the result. A beam was therefore an obvious requirement. The writer's house (being rented from the employing authority) could not be treated as a permanent QTH. Any beam put up would have to be compact and easily installed (and as easily dismantled when necessary). The ZL-Quad for 14 mc is slightly smaller than its full-size brother on 21 mc! Each of the elements is only 10ft. 6in. square, in comparison with the 17-foot sides of a full-size Quad. One man can assemble and install this antenna with ease. Loading coils resonate the loop elements to 14 mc. A boom length of 7ft. 9in. facilitates the driving of both elements with a one-eighth wave phasing section, as in the "ZL-Special." Driving the elements approximately 135° out of phase improves gain and lowers the angle of radiation, compensating somewhat for the inevitable loss in performance in shortening the elements.

Fig. 1 shows the essential features of the system. The phasing section is made of 300-ohm ribbon 93 inches long. Open-wire line could be used but the length would be nearer 7ft. 3in. in this case. Note that the line is transposed by twisting the ribbon at the exact centre. The phasing section is best positioned across the *top* of the antenna as then it cannot be fouled up in guys and the mast when the array is rotated.

Construction

There are two possible types of construction—either the "square loop" or the "diamond loop" shape (*see* Fig. 2). The writer has tried both methods and is convinced that the diamond configuration gives best results, although this is not noticed on full-size Quads. This improved performance is thought to be a result of the greater separation or stacking distance between the current points, *i.e.*, where the coils are inserted. In the diamond quad this stacking distance is over 14 feet compared to only 10ft. 6in. in the square quad. Gain falls off rapidly as this distance is reduced.

The boom and the end cross-pieces are made from standard galvanised water pipe and associated fittings. These should be easily obtainable at any builders' supplier. The boom is 1in. pipe 7ft. 9in. long, threaded at each end to take round water-pipe flanges. Each flange has four 12-inch lengths of ¾in. pipe welded to it, at right angles to each other (Fig. 3). These short lengths serve as mountings for the quad "arms," which may be made of any non-metallic material. It is important to keep metal out of the field of the loops as much as possible. In the writer's case cheap ¾in. dowel is used and has proved to be very resistant to wind, sun and rain, if properly protected with liberal coats of paint. This antenna has been subjected to very fierce winds straight off the Pacific Ocean (only a mile from the writer's QTH) and yet no damage has been done. Fibre-glass arms would be ideal, of course. Each arm is 7ft. 6in. long.

Loading Coils

The coils are wound on p.v.c., alkathene or similar insulating formers. It is an advantage to have these threaded on a lathe to allow winding on the 18g. copper; 12 turns per inch seems suitable. Fig. 1 gives the coil winding data, but it must be said that these figures are only a starting point—tuning is done by adjusting the number of turns until resonance on the required frequency is obtained. The rear element coil L1 is 30 turns, and the coil L2 is 25 turns, both 1¾in. diameter.

The boom can be fixed to its mast with the readily

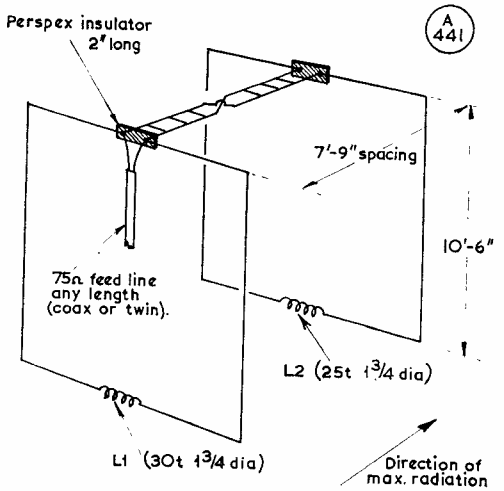


Fig. 1

Fig. 1. Illustrating the 20-metre version of the ZL Mini-Quad. Coils L1 and L2 are wound on insulating formers, with turns spaced at 12 to the inch. Wire is 18g. copper.

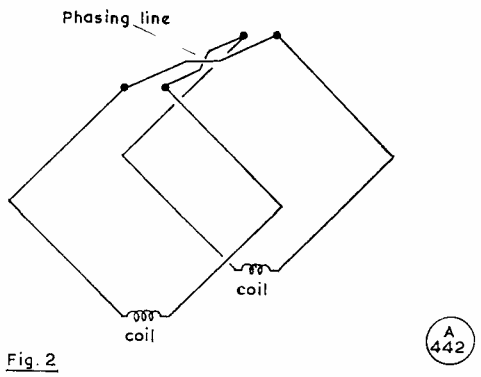


Fig. 2. The diamond configuration for the Mini-Quad, as discussed by G3PHO in the text.

available TV aerial clamps or, again, galvanised pipe fittings could be used. A T-section coupler was obtained, to slide the boom through one part and the mast through the other (Fig. 4).

Readers may now have become alarmed at the possible weight of this Quad, so let it be said that the writer can easily lift the complete assembly above his head and walk the full length of the garden with it! This type of construction ensures a sturdy, permanent installation.

Assembly

The elements are laid out on the ground. If the wire is precut to 42 feet and marked with tape at 10ft. 6in. intervals, after being formed into a loop connection to the quad arms becomes a simple matter. Shallow slots are cut near the ends of the arms and these serve to hold the wire elements in place. The arms are fixed in their mounts on the cross-pieces by single fixing bolts or pins (Fig. 3). Once the elements are slotted into the spreaders they can be secured with short lengths of wire which are later soldered. (Fig. 5, p.622).

Next, the two loose ends of each loop are soldered to the loading coils, after the wire has been pulled reasonably tight. Any slackness remaining should disappear when the beam is raised off the ground. Two-inch perspex strainers (or 3-inch glass insulators) are then inserted in the centre of the top side of each element. The elements are then screwed on to the boom (an advantage of using the flanges) and the array raised off the ground on to a step-ladder or some similar support. The phasing line is next installed, together with a connector or socket for the feedline. The beam can now be raised for tuning. If possible, it should be tuned in its operating position, for if adjusted at ground level it will certainly not be in tune when raised to the top of the mast. If a low tuning height is unavoidable then it might best be tuned in a vertically polarised position, *i.e.*, with the coil in the side rather than the top of the loop.

Tuning Procedure

This must be done carefully if good results on the air are to be obtained. A grid-dip oscillator and SWR indicator are absolutely essential, preferably transis-

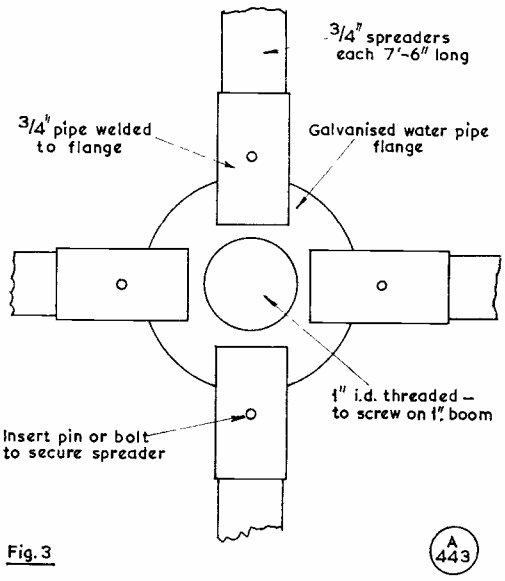


Fig. 3. The flange and mounts for the Mini-Quad spreaders. The minimum of metal should be allowed in the field of the assembly.

torised in the case of the GDO as this will be used outside. The 75-ohm feedline is connected to the beam and the coils are carefully pruned until the GDO indicates the resonant frequency chosen. The writer tuned the forward element to 14·05 mc and the rear element (the one with the feedline connected) to 14250 kc. This tuning was very finely done by sliding short lengths of ferrite rod in and out of the coils until this "slug tuning" dipped on the GDO.

A check on SWR can be taken at the feedpoint. In the writer's case 1·1:1 was obtained at 14180 kc, rising to around 2:1 at the band edges. (A full-size Quad exhibits a rather broader bandwidth than this loaded version.)

Once the system is tuned all connections can be weatherproofed with epoxy adhesive or fibreglass. The coils should be carefully covered as any moisture will

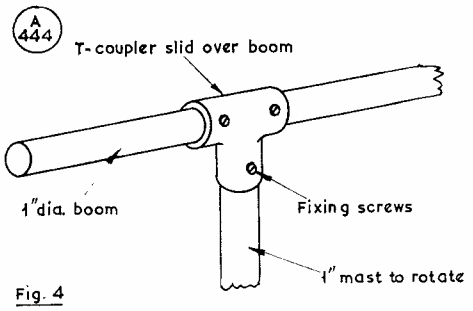


Fig. 4. Coupling the boom to the mast. TV-type fittings, or plumber's piping, can be very useful here.

soon detune them. Fibreglass or a silicone spray (*Holts* " Dampstart ") seems ideal for this.

Results

The ZL Mini-Quad has been in use at ZL2BDA since May 1967 but a prototype parasitic version was tried out with some success in 1966. Throughout 1967 a regular weekly schedule was kept on 14195 kc Sideband with G3HQG in Sheffield. Since the mini-quad was installed this sked has been 100 per cent reliable, with a power input of 100 watts at the ZL end. Reports are 1½-2 S-points up on the writer's 5/8th wave vertical, itself an excellent performer on 14 mc. Compared with a dipole the mini-quad is *far* superior, its lower angle of radiation giving many S-units of effective gain at DX distances. Back-to-front ratio is not as high as was hoped —18 dB was obtained on the original installation, about one S-unit down on the full-size Quad.

As a compact or " compressed " beam this design performs very well for its size. The advantages of reduced dimensions and ease of construction outweigh any slight loss of gain over its full-size brother.

Future Development

While experimenting with a parasitic version of this mini-quad system, *i.e.*, one with the phasing line omitted, it occurred to the writer that a two-band array could be contrived by connecting open stubs across the loading coils. If the loops are made some 11 feet square they will make, without the coils, a 21 mc Quad. The coils are electrically shorted out for 21 mc by the action of ¼-wave open stubs cut for the 15-metre band.

On tuning up, the coils are adjusted for operation on 20m. while the stubs are carefully cut until resonance on 15m. is obtained. However there was no time available to investigate the feed impedance of the system at 21 mc. While 70 ohms was indicated on 20m. it seems probably that the same feedline would not be a good match on 15 metres.

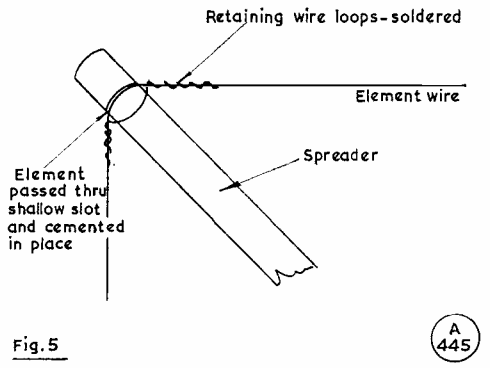


Fig. 5. Suggested method of fixing the element loops to the spreaders. Since a Quad usually whips about a good deal, these fastenings must not only be secure, but also made so that the wire itself cannot fracture.

The mini-quad could also be built for the 40-metre band, as doubling all dimensions already given will result in an assembly only a little larger than a full-size 14 mc array—although the boom will be over 15 feet long. However, this still remains a very practical solution to the beam problem for Forty.

Parasitic versions of the writer's Quad as described here are also in use at ZL2QK and ZL2AYI, while VK3AAR and ZL2FA have both tried it out, discarding it only because they could install full-size antennae. When G3PHO is operational again, the " ZL Mini-Quad " will certainly be in use from the U.K.

Jamboree-on-The-Air

October 18-20, 1968

IT seems pretty certain that this year's J-O-T-A, the eleventh in the series, has been the best yet—in terms of U.K. support, world-wide activity and the number of actual Scout stations participating in the event. Most important to remember is that this Jamboree-on-The-Air is *not* a contest in the usually accepted sense—it is simply a gigantic Scout QSO Party, conducted by the medium of Amateur Radio. No prizes are given, nor certificates offered. About all you may expect to get is a specially printed QSL card from the stations you are able to work. The idea is simply to put Scout groups in touch with one another by radio communication using the amateur bands—be it locally into the next parish, or across the world.

The theme of the event is *communication*, between like-minded people having the same interest—Scouts, and Scouting.

To make J-O-T-A work involves the active support and participation of local amateur stations all over the world—the point being that there are relatively few *Scout* groups holding a callsign of their own, with the equipment (and the operating ability) to make full use of it in terms of working the real DX.

Of the many U.K. stations, reporting to us, who took an active part in the October J-O-T-A, we have selected the following:

GB3TDS, Tonbridge District Scouts: Operating from the local Scout Hq., G3MQT (we seem to have heard of him before!) and G6TQ set up a station consisting of a KW-2000, an SB-101 and a long-wire aerial. In the presence of many visitors, they worked no less than 88 Scout stations in 25 countries, including the international Hq. station for the event, 4U1ITU (World Scout Bureau, Geneva) on three bands. Four local Rx stations were also in operation, on which Scout visitors could listen to the DX being worked by GB3TDS.

For the 1968 Jamboree-on-The-Air, station G3XTL/A was set up at the Scout Camp in Sherwood Forest, Notts., the local group entertained being the 2nd Warsop Scouts and Cubs. The gear used by G3VDF and G3XTL included a Vanguard transmitter and HRO receiver, with power from a (noisy) P-E set, eventually tamed after over-the-air advice by Mansfield Club members. A lot of time was taken up explaining things to the younger Scouts—who were most enthusiastic about it all—so that they thoroughly understood the object of the exercise. Using a long-wire aerial, coverage was from UA to W, and many interesting contacts were made.

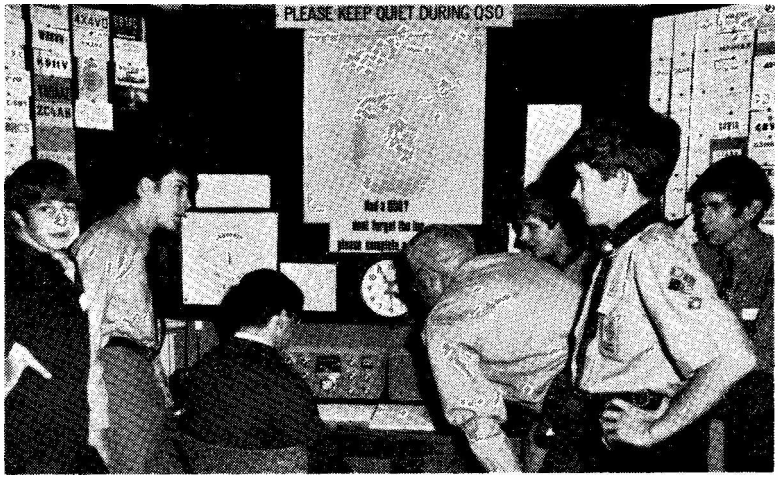
GB3SSA, South Manchester, for Sale Scouts Association: Running all bands 10 to 160m., this enterprising group —G3HZM, G3SMM, G3SMT, G3UTL, G3VIW, G3WFT and G3XDS—worked two Scout stations on Top Band, seven on 80m., four on 20 metres, three on Ten, and 4U1TU on 15m. They had numerous other interesting DX contacts on the HF bands, such as WA7IFM (15 metres); and on Ten, VE7's in Vancouver, W6's in California, CR7FM and TG9LD. Gear at GB3SSA included Sommerkamp FL-200B/FR-100B, Sphinx Tx, Heathkit Mohican receiver and an Inoue-700 transceiver. Their antennae were a TA-33Jr., a long wire and a dipole cut for 15 metres.

GW3XOT/A, Haverfordwest, Pembs.: The Scout groups involved here were the 5/6 Milford Haven Sea Scouts and the 6th Haverfordwest, with about 60 boys camping on site (Talbenny Hall) for the whole weekend. The J-O-T-A station was set up and operated by GW3KGD and GW3SQD, with SWL Dixon as logging assistant. The local District Commissioner joined the party for the weekend, and he and his Scouts witnessed contacts made by GW3XOT/A with stations in some 35 countries, from Europe to the U.S.A., including 4U1ITU at Hq., amounting in all to 50 Scout stations across the world.

GB3WWS, Heswall, Cheshire, for 1st Barnston Scout Group: Using a KW-2000A, K.W. Vanguard, AR88LF and Eddystone 888A, a Cannonball SSB transmitter, with transverters and VHF converters, all bands 160m. to 10m. and two metres were worked. Scout stations raised, among many others, included 4U1ITU, ZD3D and GB3GP (Gilwell Park, the permanent international Scout camp in the U.K.).

GB3HBS, Hale Barns, Cheshire, 1st Hale Barns Scout Group: For this specially-licensed station, the gear was provided and installed by G3AOS and G3EGK, who operated it for about 30 hours of the 48-hour weekend. Some 200 contacts were made in 45 countries, mostly Scout stations or overseas amateurs associated with Scouting. In addition to the 50 Scout stations worked in the U.K.—surely an impressive total in this context— the Hale Barns boys achieved QSO with DK2RZ, LA1JAM, LX1JAT, ZS5UW, VE1ASJ, HV3SJ, OZ5SW, ZC4SS and 4U1ITU, all Scout stations in one way or another.

5N2BSN, Lagos Scouts: Two stations were put on for the HF bands, with over 100 Nigerian Scouts attending. Unfortunately, contacts with Scout stations proved



The station which signed G4RS and G3BHK/A for the Jamboree, operated from the Royal Signals Amateur Radio Society Hq. at Blandford, Dorset. During the weekend, some 20 Scouts were present and here we see G3VYZ operating, with G3BHK (in uniform, leaning over). It was G3BHK who, ten years ago, conceived the idea of J-O-T-A. He is now the U.K. organiser for what has become a worldwide QSO Party.

very hard to get—GB3GP was called several times without success—but stations in CR6 and ZS were worked, also LX.

G3BZU, R.N. Amateur Radio Society, Leydene, Hants.: Entertaining the 1st Sheet and 2nd Cowplain Scouts, an introductory talk on Amateur Radio was given by G3JFF, after which G3BZU went on the air, working round the world, including Scout stations in Malaya, Florida and Europe.

G3BHK/A-G4RS, Blandford Camp, Dorset: Operating from the Royal Signals A.R.S. Hq., some 20 Scouts from the district attended for the whole weekend. Using a KW-2000A and SB-101, with a 3-ele multiband beam for HF and a large inverted-Vee for the LF bands, the main operators were G3BHK, G3EKL and G3VYZ —the log at the end showing that they had worked 75 Scout stations in 23 countries. Best DX was a 30-min. contact, R5 both ways, with ZL3BT, Christchurch, who had Scouts of the local North Beach Troop with him. In the course of this QSO it was discovered that, specially for the J-O-T-A occasion, the New Zealand authorities allow Scouts to speak over the air from accredited ZL stations on for the event—this is a valuable concession that might well be made for the U.K. by our Post Office. Other interesting callsigns encountered were MP4BHF, at MP4BBA for the local 1st Manama Scouts—his father being G3TXG, a Scout leader in Exeter and worked on the next LF-band QSO—4U1ITU, HV3SJ with G3WQZ operating, and SKØXAB.

G3RZK/A was laid on for the 1st/3rd Ruislip Scout Group by members of the Radio Society of Harrow, working all bands from Top to VHF. Left to right here are G3RAN (microphone), G8AZQ (logging), G3MLS (standing), and G3RZK. The DX worked on the HF bands included Scout stations 5N2BSN, ZS6BHH, HV3SJ and PJ2CA. And the boys served the operators a wine - and - chicken repast !

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

QUITE a month, one way and another. First, more governmental interference with Amateur Radio—putting up deposits on the gear the "appliance operators" use; secondly the affair G3KFL, about which no more need be said except possibly that the man was *not* suborned through Amateur Radio, but rather through his hobby, which might well have been music or the arts. Thirdly, the onset of a period of conditions only describable as "lousy" which followed—Murphy's Law—the erection at this station of an "invisible" aerial, leading to anxious searching of empty sky after each examination of dead bands to determine whether or no the wire was still there! Such is Amateur Radio.

Changing tack a little, recent discussion about the low level of HF amateur activity in the U.K. has led to quite a bit of comment on one or another aspect of the matter. One of the more amusing was from G8HX, misquoting A. A. Milne, who said that when Christopher Robin got his AT-licence "I tune up the rig and put out a call, and nobody knows I'm there at all" *apropos* Top Band. One wonders if he got a QSO!

Over The Bands

How about Forty first? A home brew 150-watt transmitter with an 813 linear, in conjunction with a modified Eddystone S.640 receiver, was used by G3PPP to drive a "G5RV" aerial at about 20 feet. This netted W2BYN, WB2EFI, WB2REE, K2DDK, W3LYO, WA3KLN, K3JH, W5AB, W8HSK, W9BQM, WAØKDI, VE2DFR, VE3FRR, VE3QE, VE7BDJ, all on CW, with CM2DC, 5N2ABG, EA7HZ worked using SSB. In addition there were gotaways, in the form of CO2RM, TI2PZ, WA7BHK, VP1DW all CW, and TI2ES, PJØMM, and OA4OS SSB. The interesting thing here is that this lot was garnered during the period 0515 to 0610z using quite a modest set-up, particularly in the aerial department, demonstrating that one does not need to possess a superb array of gear to work the stuff on Forty. As for site, this was all from the home QTH at New Duston, Northampton.

G3PQF (Farnborough) seems to work on the principle that a change of bands should involve a change of aerials. After having a ball in the *CQ* WW contest, Dave pulled the Quad down to make room for the 40-metre DX-attracting array with a view to the 7 mc Contest.

From MP4BGX we have a mention that several members of the Middle East and Africa net on Twenty are proposing to change to Forty—and indeed Eighty as well—and liven things up there; so keep the ears skinned for interesting DX.

G3LZQ (Hull) complains of work being a nuisance—don't we all—and proved it by writing in his screed from a hotel bedroom. On Forty, John only made one QSO, with AP2MR, and heard ZL2BO at 1630z during the VK/ZL Test, working JA's.

Quite the most interesting of all the bands, Forty, thinks G2DC (Ringwood) this month, after his

SIX-BAND DX TABLE
(All-Time Post War)

Station	Countries	28 mc	21 mc	14 mc	7 mc	3.5 mc	1.8 mc
G2DC	335	169	307	327	163	108	20
G3DO	334	192	231	327	90	83	9
G3NOF	311	161	207	295	34	39	2
G3IAR	219	120	158	191	87	71	12
G3LZQ	254	138	155	201	72	38	8
G3IGW	204	123	152	167	122	86	42
W6AM	348	131	140	347	116	54	7
G8DI	187	80	132	164	77	46	8
G3VDL	137	47	48	100	45	22	—
G3IDG	121	73	88	55	27	19	11
G3NYQ	147	35	70	107	40	30	21
G3MDW	115	46	66	82	20	15	7
G3KOR	163	40	57	135	52	39	23
G3PQF	153	93	42	84	84	49	11
G3VPS	101	13	28	79	50	32	14
G3EJA	106	93	23	50	22	12	2
G3SED	85	2	18	55	38	32	37
G3JWS	57	—	8	46	35	36	12

Note: Placings this month are based on the "21 mc" Column.

CW had managed to extract OY7ML, PY1SJ, PY3MU, PY4BGM, UI8AI, UI8LK, UL7BKF, VK2VN, VK3APN, VK3MR, VK7SM, ZS1AJ, ZL1AJU, ZL1ATW, ZL3GO, ZL4BO, VE1-4, all W call areas, JA1HU, and JA4AK from the ruckus.

The Tables for 1969

Once more we come round to the time for reappraising the Tabular matter. As far as the HF-band Tables are concerned, all seems to be well, and both seem to be well-supported. However a certain greyness hangs over the Top Band Tables. To deal with the G3V-- and G3W-- ladder first, support has been, to put it mildly, erratic, and so, instead to making it G3W-- and G3X-- for next year, it is proposed to make it a table on the same basis, but restricted to entries from operators who are in their first year of licence holding. Entries will also be split into CW and Phone as far as counties go, with a *total* entry (CW and Phone) in the Countries column. Thus a typical entry might by:

" G3ZZZ, Counties CW, 20; Counties Phone, 40; Countries 10. Date of licence 1-11-1968." Entries will only be accepted in the first instance if the date of initial licensing is given, although it will not be necessary to repeat this wnen " topping up " entries come in.

As for the Counties and Countries Table, it is proposed to add a further *dis*qualification in that a *nil* report for six successive months will also entail the axe, as well as the existing one which comes down in the absence of *any* report for three successive months. Commencing date for the new rules will be January 1, 1969, which gives those who have been sending in *nil* reports time to do something about it, and from then on should ensure that the Table fully reflects current activity.

TOP BAND COUNTIES LADDER

Station	Confirmed	Worked
Phone and CW		
G2NJ	98	98
GM3UVL	96	98
G3APA	95	96
G2HKU	90	94
G3WQQ	74	87
G3WPO	74	82
G8HX	72	81
GI3WSS	66	78
G3VLX	63	85
G3IDG	55	61
G3WJS	40	78
G3XGD	25	54
Phone only		
G2NJ	98	98
G3VBG	77	90
G3PQF	52	76
G3WPO	51	67

(Failure to report for three months entails removal from this Table. Claims may be made at any time.)

Top Band Topics

A note first on the VP8 activity, and also VP2, from G3NMH (Swindon), to whom thanks. VP8JR is QRV on 1850 kc, 0200z onwards—but he has a pirate using his call-sign, so be careful! VP2GBR is looking out on 1822·5 kc, and has G3XGC to do the QSL chore.

As always, quite a lot of news from W1BB this time, with the latest issue of his *Top Band Bulletin*. First, and possibly most important, is the sad news that W1DQF, Stew's XYL, has suffered a severe heart attack, and so of course her well-being must take priority over amateur activities for Stew.

A well-known Top Band man, HB9TT, has passed on, due to heart trouble. Our sincere sympathies to his wife, HB9YL, herself a noted 160-metre operator.

Although VK9GN has had to return to the States, VK9KS is hoping to pick up the Top Band threads, and has an 1803 kc crystal as well as a suitable collection of high towers on an excellent location. We hear that G3RFB and G3MDR will be doing an operation from VK for a period of ten days, starting about the time this piece is published; frequencies around 1821-1824 kc, transceive, using a KW-2000A. Not much likelihood for U.K., as it is understood the times are to be 1900-2000z—but having said that, quite likely someone may pull it off just to prove E.P.E. wrong!

Now to the more domestic front: G3PQF (Farnborough) mentions that he has been able to keep the score moving by working GM3NVU/P, Kinross, and GM3ONS/A for Ross and Cromarty, since last reporting.

G8HX (Mansfield) had quite a surprise at 1620z on October 20, when he heard HB9NL calling CQ on an apparently dead band. Before Frank could tune up on him, over he went, and four stations called the HB, including an OK! Sadly, nobody connected, and so the band reverted to somnolence till around 1800 GMT.

From G3VLX (Sidcup) comes a note saying that with a Mini-Five Tx, as described in SHORT WAVE MAGAZINE (Nov.-Dec., 1966) he has been having quite a good time. On G3KFE's invisible aerial, Deryck was such a strong signal as to block the receiver in Bishops Stortford, so he is certainly doing well. The main result of interest for G3VLX was a couple of OH's on SSB.

A report on his activities in Caernarvon during August has come in from GW3KOR/P; the site was 600ft. a.s.l., and the gear a KW-2000A powered by a Honda generator. About 150 contacts in all were made, and the cards, when to hand from the printers, will go out *via* the Bureau.

From GI3GRD (Co. Fermanagh) comes a mild gripe about the slowness of the return QSL's. Bill normally sends his direct, whenever the stations are in the *Call Book*, and does not require an s.a.e.—so it is not unreasonable of him to want a card in return for that courtesy. Incidentally, he comments on the *enormous* signal from G3TRF, on SSB, as heard from GI, and reckons they should be a natural for a contact with W1BB.

Now to G3WUD (Stockport) who finds the best way of getting his SSB signal completed and on to the band is to lend out his old rig! A good idea, this, which has enabled G3XIC to get back on 160 metres again into the bargain. Robert reckons that by the time the next piece is ready he will have both a new, better, aerial and the transmitter to actuate it, and so we may expect some fireworks.

On the stage at the Garrick Theatre, London, are (left to right) G2DQU, G3JDP, G3AGP and G3KVF, the occasion being the presentation of a cheque for £250 from the proceeds of the A.R.M.S. Rally at Mildenhall last June. Brian Rix, G2DQU, is the well-known actor, and here is still in costume from the last scene of his "Let Sleeping Wives Lie." The A.R.M.S. cheque goes to charity, the League of Friends of Normanfield. In another theatrical capacity, G2DQU is a backer of the musical "Close the Coalhouse Door," at the Fortune Theatre.

Old-timer G2NJ (Peterborough), who sits on top of the table both on CW and Phone, mentions the pleasure it gave him to have a CW QSO with G3XYL, near Cheltenham. Barbara is the XYL of G2FWA, and is another of the growing band of YL's on the air. G3KFE just missed a first QSO with G3XVC (Dartford), Maureen's signals being not quite good enough to copy on AM due to the QRM, although it sounded very nice when the QRM piped down for the odd moment.

Activity from G3XGD has fallen to nearly *nil*, thanks to his move to the University of Kent. However, Glyn is keen enough, and is busily infecting the others with the enthusiasm; the University Club station is available, and so he hopes to be able to spend a few hours operating in between the studying sessions.

G3VMK (Abbots Langley) also has to report no activity on the band, albeit he lifts the score up to 19 countries with the arrival of a batch of cards. Possibly the most uplifting one of the batch was from TGØAA —understood!

Poor old G2HKU (Isle of Sheppey) is really down in the dumps this time—he had to write his own letter instead of getting his daughter to type it! Never mind, the exercise is good for the keying fingers. Possibly that was why G2HKU stuck to CW, which yielded QSO's with GW3XJC, GM3BGW and GW8PG.

A very thoughtful letter next, in a first report from G3XTL (Warsop), who has imposed on himself a period of a year of Top Band CW working to get the feel of things before he even considers shifting on to the HF bands. Charles has a good point when he remarks that the chaps with el-bugs really ought to slow the things down to the speed at which they can receive—apt comment, this, and not confined to el-bug operators; but so easy to do in the heat of the moment. Another gripe concerns the clot who called CQ DX, got a GM, who, he said, he could not copy because of a poor Rx—and then went back to calling CQ DX! This, incidentally, was *not* a new callsign, either, but one which had been around for several years. Charles has, at the present, after six weeks of operating, connected with 44 counties and 7 countries on 160 metres.

Next, G3XAP (Stowmarket) who has put up a fifty-foot stick in the garden, with the assistance of a group of the locals, which will carry a Top Band wire, dipoles for 40 and 20 metres, and possibly a T2FD aerial, although a small hiccup occurred in the plan when the 888A receiver chose this moment to go on the blink with one of those exasperating faults that refuses to be located.

Quite a pleasure to hear G3RFS (East Barnet) around again after a longish spell of inactivity. Neville has not done much DX chasing on Top Band yet, but he can afford to rest on his laurels a little with 31 *countries* worked and WAC already.

Your scribe has been mainly on Top Band during the month in question, trying out his new aerial. The plot is an "invisible" half-wave, which has just been taken down again so as to make it permanent, having established that nobody in the nearby houses had noticed it after three weeks! Trying this aerial out, so many more distant contacts were made that the records were brought up to date, and effort made to fill in some of the gaps. One such was Sussex(!) and there the omission was rectified by a net contact with G3LQI, G3WPO, G3WQQ *et al.* There seems no doubt of the efficacy of the 28 gauge wire used as a half-wave end-fed against a small earth-mat as a solution to the problem of getting out on Top Band, in comparison with a similar system coiled all round a small garden.

Eighty Metres

Undoubtedly not only a much-neglected band in terms of DX, but also a band where early rising pays off. G3RFS has worked a fair amount on it of late, mainly SSB, with AP2MR, W1FZJ/KP4, ZL2BCG, ZL2GL, ZL3RJ, ZL4AV (all but the first in the early morning),

ET3USA, (2300z), VE1-3, W1-5, W8, as the choicest. Such goodies as CT3, OY7Z, and TF3 have been heard as early as 2100. The aerial is an inverted-vee, with apex at 57 feet, and a sixty-foot vertical with many radials.

Not much activity from G3VMK, although Dale reports regular contacts with ZL's and East Coast W's; however, he wants Africa for WAC on the band—anyone willing to oblige? A similar story comes from G3XAP, who managed to book in some new ones in 9H1, EA, UO and YO, using a half-wave centre-fed aerial all of fifteen feet high.

Having, as recounted elsewhere, parted company temporarily with his transmitter, G3WUD has reverted to the role of SWL, and spent a bit of time on Eighty "casing the joint," as some would say. His researches in the early morning yielded quite a crop of W's around 0620, one of whom peaked to well over S9.

G2DC (Ringwood) spent a little time with his key on Eighty, and worked W1-4, W8-9, VE1-3, ZL3FZ, ZL3OP, ZL4IE and ZL4IF.

Here and There

It appears that somehow it has recently been put about that an operator "Colin" has not been carrying out the VS9MB QSL chores correctly. G3WRN writes in from Changi to say this is somewhat of an embarrassment to him in that he is named Colin and operates VS9MB fairly regularly. In fact, his logs are *always* sent straight off to QSL manager W2CTN immediately on his return home. Anyone short of a VS9MB card for a contact with operator Colin *since February 1968* should either apply to W2CTN, or direct to: Colin MacRae, VS9MB, 40 Jalan Chempaka Puteh, Singapore 16.

From G3GKV we have a note which mentions the fact that he is now ZS5WI, and had no trouble whatever in obtaining his reciprocal licence, on payment of a fee of ten shillings—considerably less than the fee charged for his 5Z4FK and 9J2FK calls.

Some of the VK lads in Queensland have banded together to form the Queensland RTTY group, with schedules on Fifteen and Twenty. Anyone who wants to work RTTY with VK could do worse then contact VK4PJ, 16 Bede Street, Balmoral, Brisbane 4771, Australia. In their turn the group would be glad to have, in addition to QSO's, *information* on any RTTY gear and parts, particularly tape equipment. They are using, in the main, Creed page-printers, working at the American 60-baud speed standard.

Now to G2FUX (Ringwood) who writes to advise that, owing to pressure of commitments, G3NMH has had to resign from the duty of certification for the Ex-G Club. All applications, therefore, should now be sent to G8FG, Howard Cunningham, *QTHR*. And we might add a tailpiece by saying that without the efforts of G2FUX and G3NMH, the Ex-G Club activity in U.K. would be far less than it is.

* * *

It has been said that the effort put out in the *CQ* WW affair at the beginning of the period under review, coming after a spell of reasonable conditions, was too much for the bands and overtired them! Be that as it may, they certainly subsided shortly after into a stubborn and mutinous silence, from which they have now largely recovered—touch wood!

Twenty Metres

A pre-War-teenage SWL makes his first report, in the guise of G3WSL (Chandlers Ford). When the bug bit again a year or two ago, Stan came back to a situation where he nad never heard of 15 metres, nor of SSB as a mode of communication. However, he was not deterred, and brewed himself a SSB transmitter and receiver, albeit limited to the bands 3·5, 14 and 21 mc. Operation thus far has been exclusively on Twenty, mainly since July, with 316 prefixes (279 CW) booked in, and 32 Zones, 96 Countries (86 CW). Although he has the planning permission for a beam, he is hesitating to put one up for fear of what the neighbours will say! One case only of TVI, which cooled no end when Stan took his own box over to the complainants and demonstrated perfect reception; a filter in a tobacco-tin did the rest—*see* SHORT WAVE MAGAZINE, May 1968. CW has yielded AP5, CE3, CR6, HPØ, KH6, KL7, VP8, XW8, VK, ZL and JA, while SSB has done as well with CR6, EP2, KA9, VE8, ZD8, VK, ZL, JA all booked in. Of course, the *CQ* WW business helped a lot, and in that Contest G3WSL improved his standing to the tune of TA3AR, PY4ND, ZL4BO, VK2APK, WØVXO/KV4, ZC4MO, 5A3TX, VE6ADX, VK4MW, VE7PV, ZD8Z, KA9MF, CR6CA and YV5CMQ.

The early part of October showed great promise on 20m., but things went to pot well and truly, with November 1 to 3 as the worst, in the view of G2DC. VK1-8, VE1-7, all W call areas, ZL1-4, and KG6AAY about summed things up for Jack. Incidentally, KG6AAY said he was packing up for home about the end of November, and the station would be closed down.

G3VPS (Hailsham) clicked with six new countries, by way of M1 HC (both on CW), plus FØCH/FC, VP8, 8P6 and AP2 on SSB, to bring his all-band total up over the "magic ton." In addition, Peter rang the bell with OA4, TA, VU, CN8, UW9, UD6, LU, KV4, 9H1, VE and W's, including his first-ever W7.

AP2MR, VQ9DH, MP4BGX, YA1HD, 9N1MM and ET3USA all get together on the Middle East net at about 1500z on 14285 kc plus-or-minus the QRM. The net is open, and calls would be welcomed, especially from stations in the Middle East, Indian Ocean, Africa, India, etc. Thanks to MP4BGX for passing on the information on this one.

ALL-BAND ZONES AND PREFIXES TABLE

Starting date: January 1, 1968

Station	Zones	Prefixes
G3IAR	40	392
G3LZQ	40	382
G3WSL	32	316
G3PQF	31	240
GA3AQ/M	26	239
G3VPS	24	232
G3SED	24	110
G3IDG	23	111
G3WJS	19	216
G3WPO	18	149

Reporting the HF Bands

Only SSB was worked in the past few months from G3LZQ (Hull) who says the reason is a rebuild of the key! However, VR1P, DU1FH, KX6GS, 31 assorted VK's, HS1MD, K1DWQ/LX, 9M2DQ, KR6KN and '6NR, TA3AR, HL9US, XW8CS, VS6DR, 6W8BM, VQ9B, ET3USA, CR4BO, A2CAH (ex-ZS9H), 9I4MG (a special Zambian prefix), TU2CF, PJØMM, TG9UZ, a crop of six PZ1's, PJ9CQ/M, FG7T1/FS7, PJ2VD and 'ICU, YS1XEE, YS2CEN, YN1SA, YN1GLB, KZ5AO, HQ2GK (a new prefix for Honduras) OA's and CO2FA, were all brought to book during the *CQ* WW contest weekend.

G3NOF (Yeovil) found the combination of the Solar flare and the onset of winter conditions almost too much to bear, but the general story is one of not much in the mornings till the VK/ZL openings around 0900, and the band closing most days by 1800z. SSB contacts were made with CT2's, EL2W, FØCH/FC, FG7TI/FS7, JA's, PJØMM, TA's, VE6ADX, VKØIA, VP8FL, VR2CC, WØVXO/KVA, WAØJGP(N. Dakota), ZL's, and 5Z4 'KL and 'LJ. Don adds a note clarifying the QSL situation as far as TA3AB is concerned, after the recent suggestion that he was a pirate. Without going into details, it all seems to have been a storm in a tea-cup over addresses to be used for QSL's, and the answer is to send the cards to the TA Bureau, which is now PO Box 699, Istanbul.

A note from G3NBR/M, who disclaims all interest in DX-chasing as such—but Roy has just received the Bornholm Island Award, which has been overstamped "The first G Mobile," to his great pleasure. Just to make it all complete, G3NBR/M connected with VK2NN, to make his first VK contact from the car.

At G2HKU, all his 14 mc activity can be summed up as keeping his daily sked QSO with ZL2KP, an effort which has been made a lot harder by the fiddling about with clock-time instead of GMT, which makes the G end of the contact almost in darkness.

Contests

First under this heading, a preliminary mention of the **ARRL Phone DX Contest,** the first leg of which is played off over the weekend February 1/2, with the first CW session coming on a fortnight later, February 15/16. However, before this we have the **CQ WW 160 DX Contest,** which kicks off at 0001 GMT Saturday, January 25, and runs through to 1500 GMT on January 26. Rules are the same as last year, and logs are to arrive at: *CQ WW 160 Contest*, 14 Vanderventer Avenue, Port Washington, L.I., N.Y., 11050, U.S.A., postmarked February 28 or earlier. If anyone has not kept his copy of *CQ* containing the rules from last year, we understand they will appear in the December issue in full. The gist of them will be given here next month.

On the operating side of this 160-metre DX Contest it will be of great interest to have reports from U.K. participants, bearing in mind that the portion 1825-1830 kc, which was generally recognised as "DX Alley," is this year open to W's to use; in addition, higher power and the recent extension of the band allocations over there could mean more Stateside participation, more QRM, and whatever—so, let us have reactions.

Fifteen Metres

Back to our muttons. This band has always been pretty well queered for any station in a BBC Ch.I area, and it does look as though this is the case in some other parts of the country. However, although this prevents many of us operating, we can listen, and this was what G3NOF found: Several openings over the long path to S.E. Asia and Japan, from about 0800 onwards, with a few VK's on occasion. A little later the VK stations have appeared over the short route. Other than this, nothing very exciting. Sideband QSO's were logged with DU1AN, JA's, KL7AHB/KL7, ZP5CN and a sprinkling of the less-interesting varieties of U.S. stations.

Obviously, Twenty and Fifteen have always tended to carry the meat of the DX traffic, and our TVI problem is purely a local one —which means that for those who are prepared to set to work to lick

The neat and well equipped station of Mrs. Edna Cooper, G3UGO, at 17 Fernhill Road, Newquay, Cornwall—with, on the left, her husband G3VJB and on right his brother G3LMO/DL5XD/DL2ZN. Mrs. Cooper is the very active president of the Cornish Radio Amateur Club, and gained her licence as G3UGO before G3VJB got his callsign. The station seen here is operated jointly.

the TVI out of existence, WAC is possible on most days, even in a disturbed period such as the month under consideration. But so many people just do not make the first beginnings of the attempt at curing TVI—just sit back passively or go on Top Band. There is no *incurable* case of TVI yet presented, and the expense argument is faintly ridiculous when we think that 50 high-pass filters would cost a darn sight less than the commercial transmitter we have lying idle in the shack for want of a few such filters. (A new article on TVI is to appear in an early issue. *Editor.*)

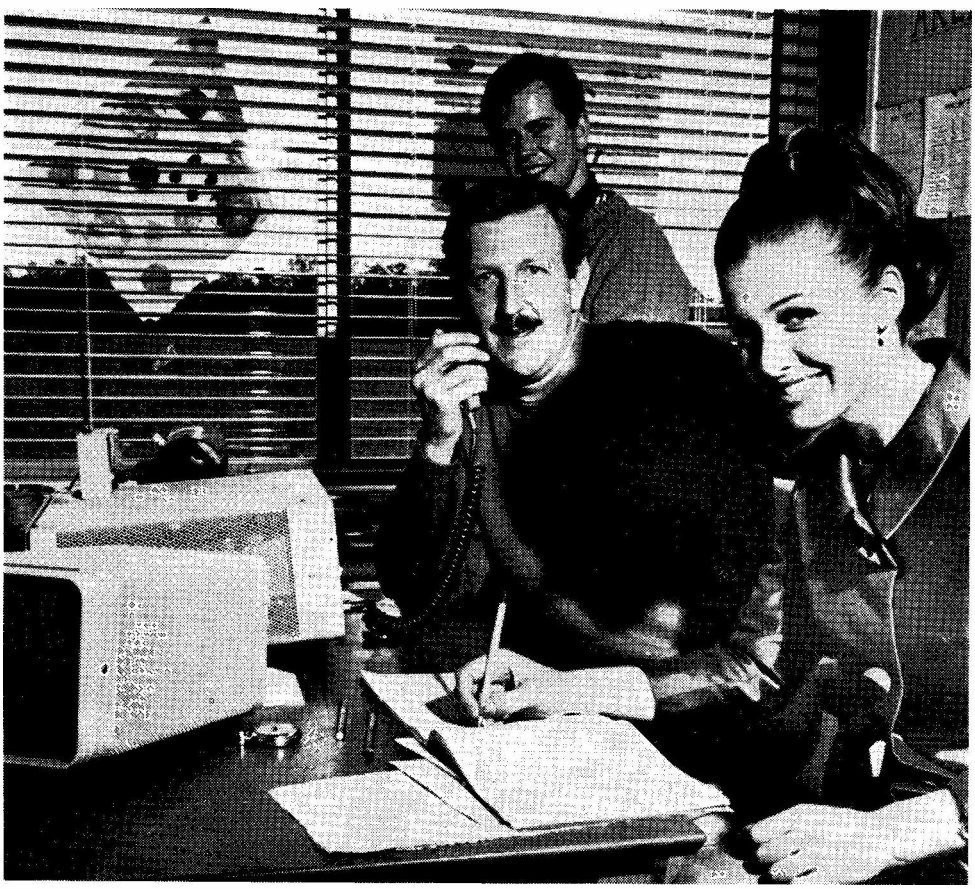
Openings to the rarer parts of Oceania have been the main shortage this month, in the view of G2DC, and on the odd occasion when a nice DX signal has appeared he has very rapidly been sunk without trace under the usual heap of mugs who call on his frequency—'twas ever thus! Nonetheless, CW accounted for KX6BQ, VS6FK, VK2APK, VK3XB, VK3KS, VK4ZB, VK4FH, VK5FM, VK7SM, ZL1HW, ZL1AJU, ZL1DV, ZL3GQ and ZL4BO, just to prove the band still usable!

As a counterblast to the various folk—E.P.E. included—who have been wondering, both privately and publicly, just where all the G's on the DX bands have gone, we have a letter from G3WW—who your scribe always thinks of as an operator of great skill and ability at VHF. Richard says he has just collected from *CQ* his credit for 269 confirmations, two-way SSB, to add to his ARRL DXCC-260 endorsement and *CQ* WPX SSB-500 parchment—so it can and is being done!

Ten Metres

Naturally, in such a month of disturbed conditions, Ten is the band which has suffered most, especially when, as ever, half the problem is lack of activity. When the activity *is* there, then the scores go booming upwards, as several entries in the Tables this month prove. For people in the top half of the table six or ten new ones worked during the *CQ* WW contest was quite frequent, and for some more humbly-placed the increase was dramatic.

G3LZQ first, who has recently managed to raise himself up to the giddy heights of " 100-plus countries on Ten during 1968." His offering for this time, all SSB, include ZD5B, ZD5V, FS7RT, ZS3LU, VU2LO, HS3RF, AP2MR, 9M2's, VS6's, ZD8Z, ZD8JL, ZD9BE,



When G3XKX, Deryk Wills, 70 Hidcote Road, Oadby, Leicester was operating /A during September from his school at Oadby he had none other than Miss Jennifer Lewis (" Miss U.K. 1967 ") logging for him. We are told that the attention of the boys was about equally divided between her and the KW-2000A, with which a number of interesting contacts were made on 80 metres.

ZD3D, 7Q7RM, VP8KE and VP8KF (both Falklands), VP8JT (Argentine Island), 8P6CA, XW8AL and XW8BP, HR1JMF, 7P8AR, 4S7PB, 9X5AA, FG7XT, FG7XL and KG4DH. Quite a haul, for a " dead " band!

Another who found 10 metres usable most days was G3VMK, who on CW raised CR6, CR7, CT2, CT3, JA's, KZ5, LU, PY, VP8, VQ8, VQ9, VS6. all W call areas, ZE, ZS, 7Q7, 9J2, 9K2 and various others.

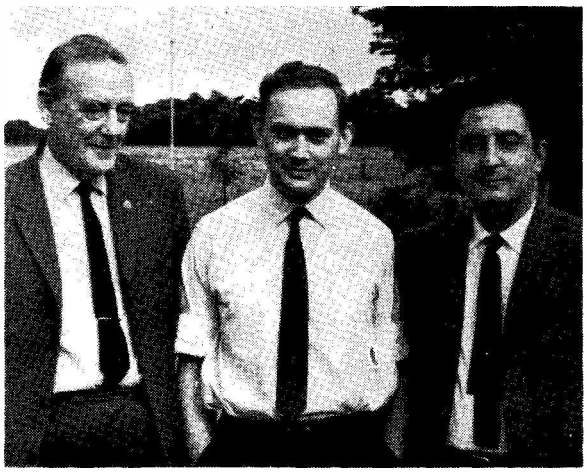
Even at the exalted height of 192 countries on the band, one can still find new ones, as G3DO (Sutton Coldfield) did by working OD5BA, UJ8KAJ, and 9L1KZ. Doug is now on the hunt for some more to be added to his ten-metre account.

Not very often we hear from G3MBL (Finchley) who runs separate 2-element beams on 28 and 21 mc, to a Mosley receiver and 25 watts of RF. Alan uses the period around 0800-0845z, and the past month has netted him ZE1CB, JA3MIX and UL7AYF for new ones. Incidentally, Alan was an early victim of the new 'flu bug, which we are warned, is going to be pretty potent this year—it must be, to keep G3MBL off the air for a whole week!

TOP BAND LADDER

(G3V-- and G3W-- stations only)

Station	Counties	Countries
G3VMW	97	21
G3VGR	94	16
G3VYF	92	19
G3WUD	92	14
G3WQQ	87	16
GW3VPL	85	18
G3VLX	85	12
G3WDW	83	9
G3WPO	82	18
G3VLT	80	16
GI3WSS	78	10
G3VMK	74	19
G3VQM	73	16
GW3WWN	67	8
G3VES	63	16
G3VOK	61	15
G3WJS	55	10
G3VPS	50	14
G3XTL	44	7
G3VWC	40	8



Left to right: G4JZ, G3NMH and CE3ZN, who was visiting G3NMH in Swindon when this was taken. CE3ZN is one of those who have operated from Juan Fernandez, CEØZ, in Zone 12.

That pole at G3XAP is being made to work for a living; part of the load is one end of a " ZL Special," cut for 28·02 mc, which is apparently rotated by the ingenious method of using the pole to hold up one end, and walking the other end round until the thing fires in the right direction, and attaching to any convenient object at that point! It has, though, demonstrated about 2-3 S-points average gain over a dipole on the majority of contacts, and indeed in the first 97 minutes of testing Phil worked most W call areas, VE, KL7, PY, OA, YV, CX, VK3, CR6, CR7, 5N2, ZS3, JA2 and finally a UA2 to make the WAC. The aerial for this test was up at about fifteen feet.

It is interesting to compare this with the efforts of G3VPS, another old graduate from our " SWL " feature. Peter made his first foray on the band by hanging up a dipole at five feet high, on which he worked UB5 and 9J2. Later, the dipole was hoisted up to its present eminence of twelve feet, when it produced thirteen other countries, including a ZD8—much more like the *true* ten-metre form!

G3PQF said that " by chance " he had a little time off, and so he took the opportunity to take a grip on Ten; the upshot was VK6KL, VQ8CC, VS6AL and 9K2BJ while testing out, and AP2MR, 7Q7RM, VP8KF, ZD8JL, ZD9BE and 9L1KZ when taking it seriously.

Don of G3NOF was not at all keen on what he heard for most of the time, but during the better periods did connect with CX2CO, ET3USA, FG7TI/FS7, HI3ABB, HKØBKX, KV4AD, MP4BHA, PJ1CU, HS3MJ, PZ1BX, VK2NN, VP2AI, VP2SY, VP8JR, VP8KD, VP8KF, VP9DL, W5's, W6's, W7PEY (Arizona), WØHXN (Colorado), WØVXO/KV4, ZD3D, ZD8Z, ZD9BE, YA5RG, ZS's, 4A3P at the Olympic Village, 5N2AAF, 7Q7RM, 9J2BC and 9L1KZ.

Not much 10-metre comment at all by G2DC, who confines himself to offering PY1, 2, and 7, VK3XB, VS6FK, 4S7DA, all W call areas and VE1-4 plus VE7, as his contribution.

Sign-off— and Christmas Greetings

And that is about the lot for this month. By the time our next piece comes out everyone will be full of good food and good resolutions. Ours is to wish you all, whether readers of this piece or its correspondents, a very Happy Christmas, and every best wish, both DX and otherwise, for the New Year.

Deadline for the January issue must be set a little early, because of the inevitable mail delays—**first post December 6,** addressed as ever to " CDXN," SHORT WAVE MAGAZINE, BUCKINGHAM.

VHF BANDS

A. H. DORMER, G3DAH

VHF conditions have been on the poor side generally throughout the whole of the month, although barometric pressures have been reasonably high for most of the time and might have led one to suppose that there would have been more DX about than in fact there was. After some rapid fluctuations between 1020 and 1010 mBs around October 14, the reading remained fairly constant at 1020 mBs until the 25th/26th when it dropped again to 1010 mBs and by November 1 had fallen to 990 mBs, recovering to 1020 mBs again within the next few days, and continuing around that level up to the middle of November. These conditions appear to have been widespread over most of Northern Europe, and from those QSO's which it was possible to make with Continental stations, it was learned that there had been little in the way of long-distance working over there either. During a couple of evenings spent with G2JF, it was barely possible to raise any G stations, and that is saying something!

Very little activity was observed during the DARC two-metre CW contest over the weekend of November 2-3. Conditions were just about as poor as they could be, and as far as can be ascertained, no G/DL contacts were made. The following extract from the notice of the contest is apposite in view of recent comments about CW operating in this feature: " More CW activity would improve the DX chances for us all, but how can we get this activity? One means could possibly be the issue of a special CW Certificate for the VHF/UHF bands. Of course, being in the nature of CW, this would be a DX Diploma as well."

There seems to be a lot of sense in this suggestion and SHORT WAVE MAGAZINE might be prepared to sponsor something along these lines in this country. What about sending in your suggestions? There might perhaps be merit in separate Tables for CW working only.

Things were a little livelier around November 12-13, with PAØ and F at good strengths, but even so, there was little to be heard south of the Paris area or east of the Dutch border. Of course, poor conditions are nearly always accompanied by a reduced level of activity, and so a more reliable guide to propagation conditions is afforded by a check on the various VHF Beacons in this country and abroad (a daily task at G3DAH) but here again results were poor. The best day was October 23, when DLØER, GB3ANG, GB3CTC, GB3GW and F3THF were all around the RST-539 mark.

Conditions brightened up a bit on November 12, when PAØ and F stations were coming through in the South at good strength. F9FT (Rheims) and F1CF (Paris) were both easily copied around 2230z. What a pity they were not available on the previous evening, since they were both on SSB and could have provided useful DX contacts during the SSB Contest.

The highlight of the period was the Auroral opening on the night of Oct. 31-Nov. 1. Some warning of this came when solar noise was detected on two metres on October 30. By 1630z this had reached a level of some 30 dB above normal noise and it was obvious that something unusual was on the way. First evidence of Auroral propagation came around 1700 on the 31st, when the GM's were heard with distinctly rough notes. GI, GW, and GM were all worked in quick succession with RST-54A reports, the optimum beam heading then being almost due *East*. SM and OZ followed later in the evening, and SL8AL was also heard, but not worked, at RST-44A, although it is reported that a PAØ station did succeed in making contact, also with UP2BA (for a first PAØ/UP), and with UR2CQ. Nice going, indeed! U.K. stations heard/worked included GW3FSP, GM3EOJ, G3LTF, G3UUT, G3LQR, GI5AJ, GW3PDI, GM3TFY, G3CCH, EI6AS, GM3GUI, GW2HIY and finally G3BA, who had the most perfect /A note for long periods, and seemed to be doing very nicely, including a QSO with SP1DX.

There was a reappearance of the Aurora the following day, November 1, when GM3EOJ was raised at 1520z at RST-55A both ways for the first /A QSO of the day. Thereafter, a string of SM, PAØ and OZ stations were worked, with OZ9PZ and SM5BSZ among the strongest. By 2000, the effect was rapidly disappearing, the last station worked by this mode being OZ6OL at RST-55A, although several weak signals were heard at brief intervals up to about 2200z, but fading was severe and they were up and down in the noise for the most part. U.K. activity appeared to be low during this opening, such regulars as G6OX and G3MOT—who usually latch on to an opening such as this pretty smartly—not being heard at all. There was a bit of consternation at the low end when one G, working Phone out of Zone and calling " CQ Test Transistor " (whatever that may mean), sat himself down on the frequency being used by SM6PU and so wrecked a few possible QSO's—but perhaps his best friend told him, because he shifted shortly afterwards! Optimum beam headings varied from almost due East, to about 040° magnetic during the Aurora.

* * *

It may be of interest to have a closer look at the mechanism which produces an Aurora in the light of knowledge gained from instruments carried in the various satellites, notably *Explorer 1*, which have been sent into space recently. At one time it was believed that the upper level of the ionosphere, at about 400 miles above the surface of the earth, was the limit of the terrestial environment and that beyond this

level there was but empty space. Particles emitted from the sun bombarded this region and caused magnetic disturbances which interfered with radio transmission and at lower heights caused elemental particles, such as oxygen, etc., to emit visible light, so accounting for displays of the Northern Lights. However, the instruments on *Explorer I* detected zones of intense radiation at a distance of about one earth radius and subsequent exploration showed that there was another zone extending out to some 30,000 miles from the earth's surface, and it is these zones which are primarily responsible for auroral activity. The inner of the two zones was named the Van Allen belt, after the American scientist who discovered it. The separation between the two zones is not clear cut for certain particles in various energy ranges, but broadly speaking, it may be said that the inner zone is composed of protons and the outer of electrons. These particles are retained in their appropriate zones by the action of the earth's magnetic field; it is a fundamental law of physics that if a charged particle, such as an electron or a proton, is injected at high speed into such a magnetic field, it will be trapped there. The particle will spiral along the lines of magnetic force, and in the case being considered, will begin eventually to descend into the earth's atmosphere as it approaches the North or South Poles. However, it will never quite get there. As the particle descends, the helix will tighten, and before it reached the atmosphere it will reverse direction and return to the other hemisphere, continuing to do this until some agency causes the field lines to change and the particle then descends and is lost in the earth's atmosphere. This is not the whole story, though, because as well as spiralling, the particles are rotating about the Earth, the electrons going west-east and the protons going east-west, thus forming the onion-skin bands. (Confusing, isn't it!)

Leaving for the moment the question of the origin of the particles, let us now see how they are affected by radiation from the Sun. Under normal conditions, the radiation which we are most concerned here is known as the *solar wind*, and consists of streams of electrons moving at high velocity. At about 30,000 miles from the sunward side of the Earth, this radiation encounters the magnetopause, a region where the geophysical environment of the Earth ceases to have a predominant effect. The solar wind, as a plasma, carries its own magnetic field and this interacts with that of the Earth and influences the movement of the particles in the Van Allen belts and the ionospheric regions. All this occurs then, under what are known as normal " quiet sun " conditions. However, from time to time, and at unpredictable intervals, there occurs a phenomenon known as a *solar flare*, or large sunspots may appear. Under these conditions, there are violent eruptions of charged particles from the solar corona, and the solar wind is increased in magnitude and and velocity by a factor of two or three. The disturbances caused to the earth's magnetic field under these conditions are such that the particles in the Van Allen belts are no longer held in the trapping regions, but drain away into the Earth's atmosphere where they collide with atoms and molecules at the 50-60m. height, giving rise to the visual Auroræ, and ionospheric disturbances which in turn cause interference with long-distance radio circuits.

From the point of view of the VHF operator, the sequence of events from which he can profit is as follows: There is a disturbance on the quiet sun, either in the form of a solar flare or a large sunspot, and an intense burst of ultra-violet and X-ray radiation reaches the Earth almost immediately and causes a short-lived disturbance in the Earth's magnetic field and the ionosphere, such that HF radio circuits are badly affected or even completely blacked out. This is sometimes known as an S.I.D.—*Sudden Ionospheric Disturbance*—and is reported by various observers as a warning of a possible protracted fadeout on long-haul radio circuits. This disturbed sun can also be heard on two metres quite regularly if you can get the beam on to it. This is our chance. The solar wind, although enhanced by this disturbance, travels much more slowly, and can be expected to reach the magnetesphere after a delay of some twenty-four hours or so—and it is then that interaction with the Van Allen belts occurs, an Aurora appears and, usually but not invariably, we can get cracking and work all the SM's.

So a fade-out on the HF bands is a good indication that there may be an Aurora effective at VHF, as is a sudden increase in solar noise.

Contrary to the widely-held belief, it is *not* essential to point the beam to the Magnetic North for the best results. In fact, the most profitable heading for working within Northern Europe, including GI and GM, is around north-east, and even then the optimum bearing may change as the Aurora progresses. Low-angle radiation is an advantage, and the operator with a six-over-six will usually do better than he with a ten-element at the same height. It is well to bear in mind also that *Ar* effects can be quite long-lived and may well re-occur with significant intensity after a further period of twenty-four hours. But there are few hard-and-fast rules which can be applied to guarantee results *every* time, so best of luck with the next one!

* * *

All this chat about Aurora, implying as it does CW operation, leads one to wonder why there is not more A1 traffic on Two. There is some good DX to be found at the bottom of the band in almost any conditions, and QSO's can result which would be quite impossible on other modes of transmission, including SSB. If the oft-quoted maxim that the purpose of holding a transmitting licence is to communicate is true (and it seems a reasonable statement) then many opportunities are being missed by lack of patience, lack of interest, or both. Regular local Phone QSO's have their uses, although using 100 watts to make them seems rather brute-force, but these must pall after a time, and a 200 mile CW contact makes a refreshing change. That apart, however, there have been some contacts made on two-metre CW which have really pushed out the boundaries. As an instance, G3IMV in Bletchley, one of the most consistent, and one of the best, of CW operators, has worked, *inter alia*, YO7VS and

three YU stations during his three years on the band, and that from a QTH which is not all that good for VHF. Incidentally, his claim for VHFCC on Two was interesting in that it included only one G station —but he had sixty-four DJ/DL, eight OK and three HB9.

VHFCC Awards

Awards this month have gone to G3LAS, G3EKP, G3VPI, G8AEJ, G3ILO, G3IMV and G3OZP. Congratulations!

At G3LAS (Hertford Heath) the Award was for stations worked on Two only, as the four-metre cards seem to be coming in very slowly, John says. G3EKP (Blackburn) achieves the Four-Metre Award with a very interesting list of stations worked, including over thirty in GI, for which area he is very favourably placed. This also explains why G3EKP was such a good signal into the GB2NI expedition mentioned last month, although the QTH quoted then was extracted from the 1969 *Call Book* which shows it incorrectly. Some 200S have now been worked on 4m. and 115 cards received so far, a rather better return than for G3LAS. The G3EKP transmitter runs 22 watts to an EL91-5763-QQV0-20A combination into a 4-ele Yagi and the QTH is 850ft. a.s.l., which is very handy for VHF working. On the receive side, the transistor converter is home-brew and is in fact a "tobacco-tin version" of a design published recently in SHORT WAVE MAGAZINE. G3EKP is also active on two metres and 70 Cm. with home-built transmitters, and has SSB on VHF as his next constructional project.

Eric Carver, G3VPI (Ipswich, Suffolk) gains the Award for operations on two metres from a QTH 150ft. a.s.l. at Rushmere St. Andrew. The take-off is clear in all directions, although a certain amount of trouble is experienced from HV overhead lines in the vicinity. The transmitter is a commercial rig by Pye/Rees Mace, originally designed for operation on 100-125 mc. The set-up is EF91-3/5763 multipliers—QQV03-20A driver and fan-blown QQV06-40A in the final, running at a cool ninety watts. Modulation is by EF86-12AX7-p/p EL38, the whole thing in one cabinet with remote control gear, all power supplies, and a crystal-controlled receiver. Listening aids are a TW nuvistor converter into a Hammarlund SP600JX receiver tuning 28-20 mc. A tunable VHF receiver, the American BC-639A is also available. The beam at G3VPI is a 6/6 slot-fed Yagi at 25ft. rotated by worm-and-pinion to a hand wheel under the operating bench.

G8AEJ (Penge, London) claims the 70 Cm. Award with eight countries and 35 counties worked. He is also chasing the Two-Metre Award, but is having a certain amount of TVI trouble, which curtails the operating hours somewhat. He first came on 70 Cm. in October 1964 and after clearing the usual troubles, was soon getting good results from an average QTH at 108ft. a.s.l. He had most of the cards required for the Award within three years, but operation on 23 Cm. was then, as now, taking up a lot of time. The rigs for Two, 70 Cm. and 23 Cm. are all-rack mounted and run 50 watts each into a Parabeam for 70 Cm., a 10-ele Yagi for 2m. and a 3ft. diameter parabola for 23 Cm., all at around the 35ft. height. It is hoped to have a log-periodic feed to the dish in the near future, to cover 23 and 13 Cm. The converters are all transistorised with an IF of 12-14 mc. That used for 13 Cm. is the one used from G2RD/P when G3MCS was worked over a 75-mile path. The latest 23 Cm. job uses a 1N2313 mixer diode and yields a NF of 10 dB. Best DX so far is LA4FE on Two, OZ7SP worked on 70 Cm. but heard only on 23 Cm.

G3ILO (Dursley, Glos.) gets his VHFCC Award for work on Two Metres. He runs 10-12 watts output from a home-built ECF80-ECF82-QQV03-20A set-up and the receiving side consists of a converter with a 6CW4 RF stage, tuning 28-30 mc into an AR88, Heathkit RA-1 or a Commander double superhet. The aerial system started as a 4/4 J-beam at 16ft. and this was eventually pushed up to 26ft. In September 1966 it was replaced by a 10-ele Skybeam at 40ft., which has been doing yeoman service ever since. The QTH sounds good, 350ft. a.s.l. with ground dropping away to north and west and some hills to the south about three quarters of a mile distant. The Cotswolds to the east rise to 800ft. or so but are five miles away and do not cause much trouble. Like so many of us again, G3ILO likes CW operation but finds so little of it on Two. He says that he is going on 70 Cm. shortly; he already has a Parabeam for the band, but it will be surprising if he finds much CW on that band either. Operations were somewhat curtailed this year due to the antenna being struck by lightning, but even so, Tom has managed some 400 contacts to date compared with 600 during 1967.

John Hunter, G3IMV (Bletchley, Bucks), very well known for his CW and Phone operation on Two particularly, receives his VHFCC Award both for that band and Award No. 1 for Four Metres. On 144 mc, the transmitter is a 75-watt home-built job running a QQE06-40 in the PA. The converter is also home-built, with a 6CW4 RF stage, tuning 3-5 mc into a Hammarlund SP-400. The beam is an eight-over-eight slot-fed at 30ft. On Four Metres, the Tx runs 50 watts to a QQE06-40A, the converter has a 6CW4 front end and tunes 1·5-2·1 mc into the same IF/AF strip; the aerial is a 4-ele beam also at 30ft., QTH being 270ft. a.s.l. The modulator for both the transmitters is a pair of 807's in Class-B. John was first urged on to 4m. by G2BKC in January, 1964, and was very active on that band until March, 1965 when he migrated to Two. Score to date on Four is six countries and 42 counties with the best DX, inevitably, ZB2VHF. Score on Two is 21 countries and 70 counties, all confirmed—lucky chap—with the best DX YO7VS/P. The QTH is average with a good take-off to the east, but is screened to the north by rising ground and steel-framed buildings. John is also a member of the FOC.

The last Award for this month goes to G3OZP (North Shields) with an impressive list of stations worked which includes *no* G's at all, but 28 DJ/DL, two EI, two F, five LA, four ON, 17 OZ, 38 PAØ, one PI and three SM. Not a bad haul! The station consists of a Heathkit SB-101 working at 28-30 mc into a G3BA-type transverter with a QQV06-40A output stage running 150w. p.e.p. The receiver is a

nuvistor converter and the beam is a "much-repaired" 8/8 slot at 40ft. The QTH is 250ft. a.s.l. Peter finds the transceiver a bit of a drawback at times when trying to work the AM stations, as it often involves out-of-zone operation when calling a station on his own frequency, and with some of the "AM/FM signals with auto band sweep "(!) which he hears on 2m., the exalted carrier reception mode and the narrow bandpass filter make things even more difficult. However, he is now considering a high-power *AM* transmitter, possibly with 4CX250's. G3OZP was first licensed in May, 1961, but did not really get going on VHF until October, 1965. Since then he has worked 250S in the British Isles and 150 others. Total countries worked now stands at 15 and counties at 53. Best DX to date is UR2CQ. He doesn't say if this was *via* Aurora or during the fabulous extended tropo/sporadic-E opening in July, 1965—probably the former one would think. Bet it was on CW, though! Operation on 4 metres is just about impossible in the Northumberland area with TV up there on Ch. V.

Just a reminder to claimants for the VHFCC Awards—please send in station details and any other interesting information with your claim. You might be surprised to learn how many chaps are keen to know just how you did it!

Contests

Conditions during the RSGB two-metre Sideband Contest on November 11 were no better than average, the best DX paths being apparently north-south. Very little was heard from the west, with the exception of the regular GW stations on this mode, and GI3GXP, who was weak, but just workable in the south. Activity seemed to be lower than for the previous event, with some 60 or so stations on, including a few who were making their *debut* on the band with SSB. At a rough guesstimate, there must be about 150 stations now active on Two with SSB and the number seems to be increasing steadily. A certain number of Phase Two transverters have recently become available and G3OSS (Finchley, London) was heard giving his the baptism of fire during the Contest. Congestion in the south was not too bad, but must have been fierce again in the Midlands, which may have accounted for the ± 30 kc spread about the calling frequency. Known scores include G3BA and G3DAH with 41 contacts; G6CW and G3BHW with 39; G3JWZ, 35; G6RH and G8BBB with 34; and G3SKT/P, 31—but as the results are based on distance as well as the number of QSO's, final placings cannot be determined from these details.

Contests to come include the Fourth 70 mc (CW) event on December 1 and the First 144 mc (SSB) Contest on a revised date of January 13. The Second 144 mc (CW) Contest takes place on January 26 as announced previously. For those who enjoyed the previous series of Cumulative Activity Contests, these are due to start again in 1969, but initially will be confined to operation on 70 Cm.

News Items

It was good to hear G3NHO (Watford, Herts.) back on two metres again after his long sojourn in hospital with a broken leg. Apparently, George is not completely fit yet, and certainly his friends will wish him a speedy recovery. Listen for him on CW at the bottom end.

For those who think it is hard going to make contacts on Two, spare a thought for G8BMI (Keighley, Yorks.) who in seven months operating has worked only fourteen different stations from the QTH in the valley there. Last month's suggestion that he would like to arrange skeds with the southerners seemed a little optimistic perhaps, but you never know, given a

THREE-BAND ANNUAL VHF TABLE

January to December, 1968

Station	FOUR METRES Counties	FOUR METRES Countries	TWO METRES Counties	TWO METRES Countries	70 CENTIMETRES Counties	70 CENTIMETRES Countries	TOTAL pts.
G3LAS	41	5	51	15	17	3	132
G8BBB	—	—	53	13	32	6	104
G3DAH	23	2	52	15	10	2	104
G3COJ	10	3	44	9	22	3	91
G8AEJ	—	—	32	7	37	8	84
G8AUE	—	—	33	4	29	3	69
G2AXI	18	2	34	4	5	1	64
G8AAZ	—	—	38	8	16	1	63
EI6AS	17	7	32	6	—	—	62
G8APZ	—	—	30	5	8	1	44
G3FIJ	3	1	16	3	17	2	42
G3AHB	—	—	28	5	7	2	42
G8BNR	—	—	35	6	—	—	41
G8BJK	—	—	33	6	—	—	39
G8AUN	—	—	26	8	—	—	34
G3XFW	—	—	15	4	11	2	32
G8APJ	—	—	20	4	6	1	31
G8APX	—	—	16	2	11	2	31
G8AYN	—	—	13	1	5	1	20
G8BJC	—	—	12	3	—	—	15
GC8AAZ	—	—	6	3	—	—	9

Scores are from January to December. Position overall is shown by the total in the last column. This Table closes for the year 1968 on December 31. All claims up to that date should be sent in by January 11, for the final placings to appear in the February 1969 issue. The Table opens again w.e.f. January 1st, 1969, and claims for the new listing should be made as they accrue.

decent opening and a lot of patience. He hopes to be running something with a little more power in the foreseeable future.

G2JF (Ashford, Kent) is pressing on with construction to bring his QRO 70 Cm. rig on the air. It will run two 4X150A's in a rectangular cavity driven by a QQV06-40A and from his 625ft. a.s.l. site he should really go places with it. Converter is a JXK and IF strip an HRO.

Talking of converters, one still hears about the snags of operating transistorised versions with some of the foreign receivers on the market. In some cases, these are connected to the mains by a two-pin socket only, leaving the chassis floating even if the two mains leads are by-passed to it by the usual ·01 μF capacitors, with the result that the metal work can be as much as 240 volts AC up in the air. Connecting a transistor converter to this lethal piece of apparatus and to an earthed coaxial change-over relay will produce expensive damage. The remedy should be obvious—a good earth to all chassis. As a further protection for the front-end transistor, it is a good idea to arrange the antenna change-over relay in such a way that the input to the converter is earthed under "transmit" conditions and also when the equipment is not in use, thus preventing possible damage from lightning strikes. Instances are known where this treatment has resulted in the converter going unstable on returning to the "receive" position of the relay, and in these cases a cure can be effected by arranging for the c/o system to switch off the supply to the converter during transmit, and to switch it on again after the aerial load has been restored.

G8AAZ, now GC8AAZ, at Ledbury, Samares Inner Road, St. Clements, Jersey, C.I. is back on Two operating with a TW-Communicator and a halo from Sorel Point ("YJ60f") in the north of the Island, about 400ft. a.s.l. Contacts to date have been mainly with stations in the south of the country, but he has heard, inevitably, G2JF. He operates regularly on Sunday evenings from 1830z onwards with the GC net, and then looks north round the band for further calls. The frequency is 144·126 mc and any QSL's sent direct should be *via* GC3GS, who is acting as QSL manager until Lawrence gets fixed up in a permanent QTH. The final G8AAZ score from the Wimbledon QTH was 371 stations in 38 counties and eight countries, in six months operation on two metres, and 326 stations in 35 counties and seven countries on 70 centimetres.

G8CEF hopes to be active on Two before long. He will also be taking gear with him when he returns to the country of his birth, EI, next summer and hopes to be QRV from Tipperary, Kilkenny and Waterford. That is the first notice of an expedition in 1969 received to date. Further details as they become available. Since he is not yet in the *Call Book*, the full address is:—Sedan, Stock Lane, Ingatestone, Essex.

The young SWL, whose exploits with the bicycle-borne six-over-six were reported last month, has now made life a lot easier for himself by constructing a halo. However, it is reported that his brother-in-law is still trying to trace the copper tubing which seems to be missing from the back of the refrigerator!

G8APX will be QRV /M near Newcastle during December 21-28 and in Bristol from December 29 to January 2. Operation on two metres only, and he would like to arrange skeds. The correct address is—Royal Masonic Senior School, Bushey, Herts. WD2 2LN.

Apology Section. When talking about the opening to EA last month, reference was made to the fact that these signals were heard as far north as Nottingham (G6CW) and had given many stations their first EA contact. By inference, therefore, John was among these. Not entirely so. Though he did in fact raise EA on this occasion, he has worked several others previously.

G8APZ joins the ranks of those who maintain that SSB operators on Two are not much interested in working AM stations, and notes that many of them, even with carrier reinserted, do not announce that they are tuning the band. He also comments that many SSB stations complain that the AM operators do not bother to switch in the BFO to see whether they are being called by a SSB station. So the grouse works both ways! Robin is also troubled by Phone stations in local QSO at the bottom end of the two-metre band during an opening, and suggests more use should be made of the technique of announcing "Tuning from 144·1 up." Fine, and the excuse that the West Country stations are in that zone is no longer valid since they are now in Zone 2!

Further news from GM comes from GM8BZX in the shape of a list of stations active in the Angus area. These are GM3GUI, GM2DRD, GM6RL and GM8BZX himself, all within a few miles' radius of Forfar and all operating a schedule from 2100 until around 2230z. 'BZX uses a QQV06-40A with 30 watts to a 6-ele at 25ft. The QTH is:—Frank Hall, GM8BZX, 45 Priory Cottages, Lunanhead, By Forfar, Angus.

G3LSR (Sittingbourne, Kent) now runs a transistor rig with 70 mW input and is getting out quite well on it. The PA is an AF178 from a TV tuner and this has produced better results than the AF180 previously tried in this position. Modulation is by OC81.

G6GN (Bristol) has completed his home-built *Dexion* tower, which now carries the beams for Two and 70 Cm., at 50ft. The whole thing is motorised and remotely controlled from the shack, and the new signal from Harry is very good indeed. Construction gave him a headache or two (he started building it in the kitchen) and by the time he had finished, it had spread through the house a bit as it was fabricated in 20-foot sections.

The next meeting of the South-East VHF/UHF Group takes place on December 6, at Rutherford College, University of Kent, Canterbury. The speaker on this occasion will be Geoff Stone, G3FZL, who will be introducing some new developments and techniques on VHF/UHF. All interested welcome.

Deadline

Deadline for the January, 1969 issue is **Thursday, December 5**, to allow for possible delays over the Christmas period, so please let us have your reports, claims and comments by that date. Address is "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM. Cheers for now, 73 and a Happy Christmas *from G3DAH.*

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for February Issue: January 10, 1969)

***(Please address all reports for this feature to "Club Secretary,"* Editorial Dept., SHORT WAVE MAGAZINE Buckingham.)**

THOSE who follow this feature closely will hardly need to be told that the Big Event of the period was MCC, the Magazine Club Contest on Top Band, played off during the weekend November 9-10. Before 1700z on the Saturday, a few stations could be heard testing, diddling on the key, or having snap contacts and parting with "BCNU later!"—obviously ready for zero-hour. When it struck, the LF end of Top Band burst into life!

From 1700 to 2100z on both days, the 1800-1880 kc area was chock-full of Club-station signals, and it seems fair to say that once again MCC was making its impact. By 2100z on Sunday 10th, the party was over and an unearthly silence descended on the CW area, broken only by a lone OK1 calling "CQ Test."

All this will be fully reported in our next issue (for January 1969, due out on December 27)—and this means that, as usual, there will be no "Month with The Clubs" in January, because we need the space for the MCC Report. Scribes and secretaries are asked to note that the deadline date for their next regular Club report is Friday, January 10, for appearance in February's SHORT WAVE MAGAZINE, with which "Month with The Clubs" resumes.

* * *

Coming to the current period, your scribe thought to simplify the presentation this time by adopting as his geographical reference the VHF Band Plan—with which the *Magazine* had so much to do at its inception. This lists U.K. counties in terms of Zones. Thus, we have Zone 9 for Scotland, Ireland and the I.o.M.; then come Zones 6 and 8, which we call "Midlands and North"; Zones 2, 3 and 7 for Wales and the West; and finally Zones 4 and 5 for South-East England. There is also an additional clip to take in the various national groups of one sort or another. The idea seems to have worked—though he was surprised by his own weakness in the geography of the U.K.!

The National Groups

Among these we have, of course, the **RAIBC**, in a sense the radio amateur's own charity, because they look after the invalid members of our fraternity. And from the current issue of their *Radial*, it is nice to notice that quite a number of local groups have made donations to RAIBC funds as the result of special collections taken up at Mobile Rallies and similar events.

At the AGM of the **Royal Navy** ARS, it was decided that in future they would extend the privileges of associate-membership to members of the Merchant Navy and foreign navies; under this rule the first signings were GM5AHS and ON5OJ.

According to the hand-out on file, **Pathfinder** Radio Group are currently in the throes of re-organisation, to expand the range of activities.

British Rail had the misfortune to lose an issue of the *Newsletter* through circumstances beyond the control of the editor, but are now back in circulation with quite a file of new members to welcome. This crowd cover British Rail employees, together with those who work in the associated undertakings, such as docks and waterways.

G3KGM sent his note about the activities of the **Civil Service** gang from his bed, where he was temporarily "horizontally polarised"; he mentions that the December meeting will be a Christmas Party and 3·5 mc net combined evening, while in January there is G2MI to show films of his recent American trip. Farther ahead there is a lecture on the Joystick VFA to look forward to. Meetings in the Civil Service Sports Centre, Monck Street, London, S.W.1.

West and Wales

At **Taunton**, where they recently held the AGM and elected G3WPJ to the hon. sec. post, the current problem is one of Hq., although we gather there are certain hopeful signs and portents. At the time of writing, it is understood that they are using a room at Taunton Technical College, but a line or telephone call to G3WPJ seems to be indicated—*see* Panel, p.639.

Torbay have a change of date this time, from the last Saturday in the month to December 14, when they are hosts to Exeter and Plymouth groups for a Christmas Social Evening and Quiz contest, at Hq., Bath Lane, rear of 94 Belgrave Road, Torquay.

Like Taunton, **Salop** have a Hq. problem on their hands, having lost their shack; however, while they are looking round, they are still able to run meetings at the Old Post Office Hotel, Milk Street, Shrewsbury, as before, but without the station and practical activities. Thus for December, they have booked the 5th for a talk on DX Working by G2FSP, and the 12th for a Coffee Evening with "Les Girls."

Saltash will have had their AGM by now, and your scribe was rather amused at the blood-curdling tone of the exhortation to attend the meeting contained in the editorial comment in the *Tamar Pegasus* for the previous month—but he should ensure 100% attendance! The lads foregather at Burraton Toc-H Hall, Warraton Road, Saltash, on alternate Fridays.

It has to be admitted that **Stoke-on-Trent** is not normally regarded as coming in the Wales and West

area; but Staffs. is in Zone 7, and so—in it goes! December 5 sees a rather good idea, in which G8ASG will talk about various 144 mc converters, and it is hoped to be able to compare performance of different types. On the 12th, G3DML is the judge of the home-brew equipment contest, with the winner to take a silver cup for the year. December 19 is given over to Christmas Party games, and the lads claim this one is not to be missed as it gets better each year! All these events are down for Hq., which is 2 Racecourse Road, Oakhill, Stoke-on-Trent.

Haverfordwest had a fine old time in the Jamboree-on-the-air, almost as much indeed as the local Scouts; which is to the benefit of both sides. Normally, they can be found on Thursday evenings at the SWEB Canteen, Withybush, Haverfordwest, where they have regular talks, ragchew sessions, and, in the near future, a Junk Sale.

Just recently the **Jersey** group held their second Annual General Meeting, and now they go forward to a pretty comprehensive programme, including GC2FMV on Aircraft Electronics, down for December 6, a Members' Open Night on the 20th, and, in January a Grand Social Evening. Visitors and intending members are always welcome, on Monday, Wednesday and Friday evenings as well as Sunday mornings, at Fort Regent, St. Helier, Jersey, C.I.

December 11 is the date chosen by the **Yeovil** crowd for a tape lecture on " Tape Recording," and January 1 is down for the Annual General Meeting—better the day, the better the deed!

In addition to their main meeting, on December 5, when they have a Junk Sale in aid of RAIBC funds, at the SWEB Clubrooms, Pool, Camborne, **Cornish** have VHF and SSB groups going; and now they have acquired an offshoot at Newquay, where there are enough members to justify a separate section. The latter are in Hq. at Treviglas School, Newquay, and have alternate Wednesdays for a programme which is to have a strongly practical bias. For details of all Cornish activities, contact the hon. sec.—*see* Panel.

Alternate Wednesdays is the routine at **University College of Wales,** Swansea, in the Lab Technicians Common Room; December 11 is down for a Social Evening.

Midlands and North

Liverpool have first shot this time, with Dec. 3 down for G3PNL to talk about Servomechanisms; then a Hamfest on the 6th, for which the tickets are to be a pound apiece, from G3MCN; the 10th is given to a talk on Audio and some films; and G2AMV rounds off the month by paying them a visit.

Once a month the **Melton Mowbray** lads get together, usually at the St. John Ambulance Hall, Holwell Works, Asfordby Hill; but this time there is a visit to the shack of G3NVK, for details of which contact the hon. Secretary.

The lads at **Pudsey** have also only advised us of one event, theirs being the annual dinner, for which there are a few tickets spare—contact the hon. sec. at the Panel address.

Over at **Derby**—one of the strongest Clubs in the country—a crowded programme is in prospect, with a Surplus Sale on December 4, and their contest for the G5YY Trophy; another contest, this time for home-construction, to be run off on the 11th; and a third, the president's trophy, to be competed for on December 15, As if that were not enough, there follows the Annual Christmas Party on December 18. On Christmas Day. the lads will be on the band for a net at 10.30 a.m. Hq. for this crowd is Room 4, 119 Green Lane, Derby.

Now to **Mansfield,** where the form is a meeting on the first Friday in each month, at the New Inn, Westgate; a recent activity was the Jamboree-on-the-Air event, run in conjunction with the Warsop Scout group, who have their being in Sherwood Forest; the exercise was rendered more interesting by the presence of a German Scout, the son of DL3SB, on a visit to the district.

Norfolk have a Show Night on December 2, and an informal on the 9th; a Christmas Party is going to be enjoyed on the 16th, and a Quiz on December 30. Incidentally, this is the group who used to put out *Challenge*, one of the best Club compilations ever to cross our desk, the imminent demise of which causes the writer to hope that *Challenge* will pull through and return to its old glory.

The third Tuesday in each month is the date to book if you want to look in on the **Midland** gang, at the Midland Institute in Margaret Street, Birmingham 3. The Annual Christmas Party, Equipment Sale, and presentation of the Society Trophies will all be taking place on the evening of Tuesday, December 17.

When there are nearly 250 Clubs on file, with all their Secretary addresses, anyone who sends his group programme in without mentioning *which* group, is asking to be left out of the running. Two such this time, but luckily memory and research solved both mysteries. **Lincoln** were the first, where a film show is booked for December 3, and negotiations are in hand for a visit to a TV station. For further details, contact the hon. sec.—*see* Panel, opposite.

T'other one turned out to be **Sutton Coldfield,** who have their annual dinner on December 6; a formal meeting on the 9th, at which G3KPT talks about Workshop Practice; and a good old-fashioned ragchew session on the 23rd; and the treasurer will be around, after the subs., during the month, ready for the AGM in January!

Pressing on, we have **Wolverhampton** next, where the story is of a film show, a night-on-the-air, and a social; the dates, December 6, 13, and 20, respectively. There would normally have been another on 27th, but this one has been " chopped." The venue is Hq. at Neachells Cottage, Stockwell Road, Tettenhall.

South Shields get together in the Trinity House Social Centre, Laygate, South Shields, where on Friday, December 13(!) G3WOM and G8BQF will display and discuss their new 144 mc transmitters. Good luck!

No programme has as yet been finalised for the **Worcester** crowd, albeit there are a few irons in the fire; nonetheless the lads foregather at Hq., 35 Perdiswell Park Droitwich Road, Worcester on each Wednesday and Saturday evening.

Not far from Worcester is **Hereford,** where they are still looking for a new Hq., but getting little response from the local Council; this has been holding up development somewhat. However, they are active and thriving, with December 6 dated for G3WTK and G3HVX showing

the first completed GDO's for the Club Project, at the Trinity Hall.

Solihull next, with Hq. at the Masons Arms in High Street, where they assemble on the third Thursday in every month—details from the hon. sec. at the address in the Panel, below.

One way of bumping up the AGM attendance is being tried at **Bury and Rossendale,** where the committee have allocated a sum of up to a *fiver* for the purchase of a raffle prize to be disposed of on the night—good for them, and we hope it works!

Next, a corker of a Club Project, by several members of the **Radio Club of Nottingham,** who are combining forces to put an Amateur TV station on the air. In another connection, because of the clash with the local R.A.E. class the meeting-night has been altered to Thursday evenings, at Sherwood Community Centre Mansfield Road, Sherwood. Incidentally, this A/TV project makes them operational on all bands from Top to Two, plus A/TV if it comes off—a fair record.

Northern Heights have a chat on Oscilloscopes down for December 4; the Annual Dinner on the 11th; and G8BMI will talk about the Economics of Shack Layout on the 18th. Incidentally, they recently gave themselves a treat and booked the W1BB tape-and-slide lecture Mk.2. Quite a joke, as their own hon. sec. is the lad who does the work on this one!

Nuneaton have a session on Cheese, Wine, and Talk laid on for December 12, but scrub the second meeting, which would have fallen on Boxing Day, when most people have " other commitments "—quite so!

A number of interesting things have happened in the

Names and Addresses of Club Secretaries reporting in this issue :

ABERDEEN: J. McCall, GM3HGA, 1 Pinewood Place, Aberdeen (*33838*), AB1-8LT.
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BRADFORD: W. G. Scarlett, G3RXS, 12 Otley Road, Eldwick, Bingley, Yorks.
BRITISH RAILWAYS: H. A. J. Gray, Eleven, Swanton Drive, East Dereham, Norfolk.
BURY & ROSSENDALE: A. Cooper, G3VVQ, 411 Holcombe Road, Greenmount, Nr. Bury.
CHESHUNT: K. Arnold, 21 Montayne Road, Cheshunt, Herts.
CHILTERN: M. Arnold, 42 Cressex Road, High Wycombe.
CIVIL SERVICE: D. McLennan, G3KGM, 52 Pinewood Avenue, Sidcup, Kent. (*01-300 0767.*)
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CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London, S.E.23. (*FORest Hill 6940.*)
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ECHELFORD: M. Clift, G3UNV, 45 Fordbridge Road, Ashford (*59628*), Middx.
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FAREHAM: J. A. Rampton, G3VFI, 23 Oxford Close, Fareham, Hants.
FULFORD: G. B. Widnall, G3XJJ, 5 Heslington Croft, Fulford (*77501*), York.
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HARROW: R. H. Medcraft, G3JVM, 134 Dulverton Road, Ruislip Manor, Ruislip, Middx.
HAVERFORDWEST: D. Roberts, GW3UBV, 33 St. Martins Park, Haverfordwest (*2409*), Pembs.
HEREFORD: B. Edwards, G3RJB, 5 Powys Walk, Hereford.
JERSEY, C.I.: T. Morrissey, Darlinghurst, Bagot Road, St. Saviours, Jersey.
LINCOLN: W. Felton, 4 Eastfield Close, Welton, Lincoln.
LIVERPOOL: H. James, G3MCN, 448 East Prescot Road, Knotty Ash, Liverpool.
MAIDENHEAD: E. C. Palmer, G3FVC, 37 Headington Road, Maidenhead (*20107*), Berks.
MANCHESTER: G. Tillson, G3TJX, 203 Droylsden Road, Newton Heath, Manchester, 10.
MANSFIELD: F. N. F. Bewley, G8HX, 116 Westfield Lane, Mansfield (*25208*), Notts.
MELTON MOWBRAY: R. Winters, 32 Redwood Avenue, Melton Mowbray (*3369*), Leics.
MIDLAND: C. J. Haycock, G3JDJ, 29A Wellington Road, Handsworth, Birmingham, 20.
MID-HERTS: H. R. Thornton, G3PKV, 43 Fordwich Road, Welwyn Garden City (*23163*), Herts.
MID-SUSSEX: E. J. Letts, G3RXJ, 87 Meadow Lane, Burgess Hill, Sussex.
MID-WARWICKSHIRE: J. F. Coggins, G3TFC, Market Corner, Coventry Road, Baginton, Warwickshire.
NORFOLK: M. J. Cooke, 76 Falcon Road West, Sprowston, Norwich (*46093*), NOR-73R.
NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax (*44329*).
NORTH KENT: P. T. Baber, 64 Latham Road, Bexleyheath, Kent. (*01-303 8655.*)
NOTTINGHAM: K. Viles, 27 Cresta Gardens, Mapperley Rise, Nottingham. (*48201, day.*)
NUNEATON: J. Roughton, 42 Severn Road, Bulkington, Nr. Nuneaton, Warwickshire.
PATHFINDER: A. Lex-Arnold, 13 Little Road, Hemel Hempstead, Herts.
PETERBOROUGH: D. Byrne, G3KPO, Jersey House, Eye, Peterborough.
PUDSEY: P. Conway, G3XLV, 10 Tyersal Grove, Tyersal, Bradford (*64220*), 4.
PURLEY: A. Frost, G3FTQ, 62 Gonville Road, Thornton Heath, Surrey, CR4-6DB.
R.A.I.B.C.: Mrs. F. Woolley, G3LWY, 331 Wigan Lane, Wigan, Lancs.
REIGATE: D. Thom, G3NKS, La Collinette, 6 Bracken Close, Copthorne, Crawley, Sussex.
ROYAL NAVY: R/S W. Metcalfe, G3TIF, H.M.S. *Mercury*, Leydene, Petersfield, Hants.
SALOP: W. Lindsay-Smith, G3WNI, 22 Kingswood Crescent, Copthorne, Shrewsbury.
SALTASH: J. A. Ennis, 19 Coombe Road, Saltash, Cornwall.
SHEFFORD: M. B. Goodwin, G3WKR, 16 Roe Close, Stotfold, Hitchin, Herts.
SILVERTHORN: D. Standley, G3XSA, 212 Westward Road, Chingford, E.4.
SOLIHULL: J. Lester, G3VXV, 173 Damson Lane, Solihull, Warwickshire. (*021-705 3060.*)
SOUTH BIRMINGHAM: R. Price, 60 Coralin Close, Chelmsley Wood, Birmingham, 37.
SOUTHDOWN: L. E. Tagliaferro, 9 Tugwell Road, Hampden Park, Eastbourne (*54244*), Sussex.
SOUTHGATE: R. Wilkinson, G3TXA, 23 Ashridge Gardens, Palmers Green, London, N.13.
SOUTH SHIELDS: D. Forster, G3KZZ, 41 Marlborough Street, South Shields.
STOKE-ON-TRENT: A. Bucknell, G6TES/T, 32 Haywood Street, Shelton, Stoke-on-Trent.
SURREY: R. Morrison, G3KGA, 33 Sefton Road, Croydon, CRO-7HS. (*01-654 5982.*)
SUTTON COLDFIELD: A. W. Ferneyhough, G8AVH, 114 Endhill Road, Kingstanding, Birmingham, 22c.
TAUNTON: H. P. Jones, G3WPJ, 17 Bowood Road, Taunton. (*81192.*)
TORBAY: D. T. Hind, G3VNG, 46 Thurlow Road, Torquay, Devon.
UNIVERSITY COLLEGE OF WALES: D. West, GW3TYI, c/o Students Union, University College of Wales, Swansea.
VERULAM: J. Thomas, G3RXA, 9 Highland Drive, Hemel Hempstead (*55136*), Herts.
WESTMORLAND: N. Stanley, G3UEC, 9 Castle View, Sedgwick, Kendal, Westmorland.
WOLVERHAMPTON: J. P. H. Burden, G3UBX, 28 Coalway Road, Wolverhampton.
WORCESTER: R. L. Avery, G3TQD, 24 Alexander Avenue, Droitwich (*3943*), Worcs.
YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset.
YORK: J. A. Rainbow, G8BOK, 14 Temple Road, Bishopthorpe, York, YO2-1QN.

last couple of months at **Bradford;** and December has G3KEP discussing Emergency Communication on the 3rd, followed by a Quiz Night on the 17th.

Nice to hear from **Westmorland** once again, who say the main reason for it is to announce they have now moved into new Hq. at 24 Park Road, Kendal. The Friday evenings are group meetings, while on Monday and Thursday R.A.E. classes are running; here there is room for more support, and new customers would be very welcome.

York have Hq. in the British Legion Club, Micklegate, where they get together every Thursday evening. December 12 is a special date when they are to hear the tape lecture " The World at Your Fingertips." Another group in the neighbourhood are **Fulford,** who are gaining ground in their battle to knock up an acceptable programme; Tuesday evenings here, at the Social Hall, School Lane, Fulford.

The Scouts' Hut, St. Stephen's Parish Hall, Pershore Road, Selly Park, is the venue for the **South Birmingham** lads on December 4, when they have an annual Christmas Party and Junk Sale.

Mainly history in the letter from **Manchester,** but rather to indicate that the lads have been pulling out of the doldrums. December 4 is the annual general meeting, and for the up-to-the moment details we suggest a rapid contact with the hon. secretary, G3TJX.

At **Peterborough** the committee received a vote of confidence at the AGM, when they were voted back into office *en bloc.* December 6 is down for a Film Show, which is to be at the Technical College; back to Hq. on January 11 when there is to be a talk on Direction-Finding.

East Worcestershire get together at the Old People's Centre, Park Road, Redditch, but we have no news about the programme—thus contact with the hon. sec. again seems indicated—*see* Panel.

The published programme of the **Mid-Warwickshire** Club has taken a mighty pasting through one thing and another but all is now well and under control—the arrangement now is every Monday evening at 28 Hamilton Terrace, Leamington Spa, when they put G3UDN on the air before and again after the meeting proper. Several new faces have lately been signed in. For the details, drop in, or give the secretary a shout—*see* Panel, p.639.

Scotland, and Zone 9

Bad news from **Aberdeen,** where they have had the ill-luck to have the premises broken into and their Sommerkamp FL-200B transmitter stolen. Police were, at the time of writing, still " pursuing their enquiries "; meanwhile the place does not look quite so homely with the gap on the bench—*see* photograph p.566, November SHORT WAVE MAGAZINE. However, programmes are still going on, with a Junk Sale on December 6, a talk on Space Flight Communications by GM3AEL down for December 13, the annual dinner on December 20, ending up the month with a ragchew on the 27th.

South and East

This is a bumper crop, containing as it does most of London and the Home Counties; first off the mark are **Fareham,** who have Sunday evenings booked at the Portchester Community Centre. December 8 is set apart for a tape lecture on The Human Machine as a Radio Operator, by Dud Charman, G6CJ, and on the 15th the fourth in their " How? " series, this one being about the oscilloscope and given by G8BLQ.

Greenford, Middlesex, also use the local Community Centre, in Oldfield Lane, not far from the junction with Western Avenue; their next one is on December 13, in Room 1.

Shefford go to the Church Hall, Ampthill Road, for Hq., and in December have cut right back to two meetings. These are on December 5, when the Construction of Receivers will be the theme of G3XTQ; on the 12th, G3TDW will discuss Receivers.

As ever, visitors will be welcomed at the AGM of the **Crawley** crowd, but we understand that any attempts by " foreigners " to infiltrate the management will be fended off with vigour—sounds as if the AGM should be of interest! December 11, and the venue is the Trinity Congregational Church Hall, Ifield.

Only one session is in prospect for the **Edgware** lads in December, at 51 Flower Lane, Mill Hill, on the 9th, when the programme will be announced at the start of the evening. **Harrow,** on the other hand, have Practical, on December 6; a Junk Sale on the 13th; and a Christmas Party on the 20th—all at Roxeth Manor School, Eastcote Lane, South Harrow.

Two Informals, on Monday 2nd and Tuesday 17th, followed on December 21 by the Christmas Party at Hq., Victory Hall, Cox Green, is where all these activities have been arranged for **Maidenhead.**

A change of hon. secretary to record for **Silverthorn,** as shown in the Panel; to him should go any enquiries on the activities of the group, who get together at Friday Hill, House, Simmons Lane, Chingford, E.4.

December 5 is the date on which Peter Blair, G3LTF (of E-M-E fame) is going to explain to the **Cray Valley** lads what " VHF Moonbounce " is all about. This one is at the Congregational Church Hall, Court Road, New Eltham, S.E.9, while the informal on the 19th is a " Natter Nite," at the All Saints Hall, Bercta Road, New Eltham. In January, G3SVK is coming along to the former venue to discuss the snags and how-to-do-it of " Activating Rare Counties "—and who should know better than Fred?

Verulam have the knack of getting the lectures to draw the customers in, including, recently, G3SBA talking about SSB Power Measurement, and Ched Gordon " going to town " on the inner workings of Goonhilly. On December 4 they are coming down to earth with a bump, by way of a debate on " Tidy Shack *versus* The Heap," the latter side being led by G3OFH. This should get the strings of controversy tuned up for the AGM on the 18th. Both are at the Cavalier Hall, Watford Road, St. Albans.

Quite a change in the slate of officers as a result of the recent AGM of **Grafton,** who now have SWL members as hon. sec., hon. treasurer and chairman. This crowd, who have such a name in North London for their R.A.E. class, are to be found at Montem School, Hornsey Road, Holloway, London, N.7.

Two *Newsletters* are to hand from **Mid-Sussex,** but *neither* has the information on what is in hand for

Taken at a recent meeting of the Newquay group of the Cornish Radio Amateur Club, which is so large, and covers such a wide area, that separate arrangements have to be made for several centres in the district. Those to be seen in this group include G3UGO, G3THT, G3EHT, G3VCV and, standing at far right, G3XC.

December; it looks like the first and third Thursdays at Marle Place Further Education Centre, Leylands Road, Burgess Hill.

Now to **Surrey,** where the lads are to have a lecture on " DX Operating on the LF Bands," to be given by G6LX, aided and abetted so we understand by G3FPQ. Quite a versatile chap, G6LX, who, if your old scribe recalls aright, in the *Magazine* did one of the first articles ever on the subject of TVI prevention, nigh on twenty years ago. As for G3FPQ, Top Band enthusiasts who chase DX will not need reminding what he has done.

SARA is an organisation of Clubs, comprising Purley, Wimbledon and the rump of South London Mobile, which exists to make co-operation easier between the groups. What more natural, then, than a Joint Christmas Party, to take place at Purley's Hq., the Railwaymen's Hall, 58 Whytecliffe Road, Purley. **Purley** themselves get together on the first and third Friday each month, using the small hall for the former, and the large for the second, main, meeting.

Business is the motto for **Southgate,** with no frivolity in December; on the 12th, the AGM is to be dealt with, at Bounds Green Secondary School, New Road.

Nattering is the **Southdown** idea of dealing with *their* December meeting. It is at Hq., the Victoria Hotel, Latimer Road, Eastbourne.

Hi-Fi for an evening is a regular part of the **Crystal Palace** programme, and is this year put in to fill the December spot, the rest of which is given over to a Party, on December 21, at the Emmanuel Church Hall, Barry Road, E. Dulwich, London, S.E.22.

A new title for the Christmas Party appears in the **North Kent** Newsletter—they call it by the resounding name of " Pre-Christmas Extraordinary Meeting," and it looks to have been finalised for December 16. For latest information, contact the hon. sec.—*see* Panel.

Reigate next, with a new address in the Panel to be noted. December 4 is the date to reserve here, at the George and Dragon, Redhill, when the Annual Construction Contest is run off in three classes, and judged by members of various *other* local groups.

Although subscriptions are not due until the AGM next March, the **Echelford** lads have a reminder that it is time to start saving-up if they are to be paid on time! Meanwhile, all interested can attend group meetings at St. Martins Court, Kingston Crescent, Woodthorpe Road, Ashford, Middlesex, and in particular the natter session slated for December 16.

Ealing and District have their corporate being at the Community Centre, 71A Northcroft Road, London, W.13. For the details, contact their secretary (*see* Panel).

Slight changes occur in the programme mapped out by the **Bishops Stortford** committee, which results in G3MUI being the lecturer at the December get-together, his topic being probably VHF. The third Monday each month is the date, and the venue the upper room at the British Legion Club, Wind Hill, Bishops Stortford.

Welwyn Civic Centre is Hq. for the **Mid-Herts** chaps, who are mainly the old Welwyn crowd under a new name. They have the Annual Junk Sale on December 12, and we are asked by the treasurer to exhort all members kindly to pay their subscriptions before going broke at the Sale!

Chilterns have Hq. at the British Legion in St. Mary's Street, High Wycombe, where they assemble on the last Thursday in each month; but this goes by the board for December when there are plans for a party—so contact with the hon. sec. seems indicated—*see* Panel.

Conclusion

Time now to sign-off for this month, and to remind all Club Secretaries that no reports will be printed in January, as this space will be entirely devoted to the MCC Results and Report. Thus, our next Club reports should be sent in to arrive by first post on **January 10,** 1969 with details of the February goings-on—or goings-off if you live in the North. Till then have a good Christmas, and a successful 1969.

The following Clubs sent in reports too late for coverage in this feature: Brighton Tech., Crystal Palace, Wirral and South Birmingham. Some Clubs included this time are those who were too late for last month.—*Editor.*

NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. callsigns, as issued, or changes of address of transmitters already licensed. All addresses published here are reprinted in the U.K. section of the "RADIO AMATEUR CALL BOOK" in preparation. QTH's are inserted as they are received, up to the limit of the space allowance each month. Please write clearly and address on a separate slip to QTH Section.

GM2BWF, E. D. Fleming, 147 Ardmory Avenue, Glasgow, S.2 (*re-issue*). (*Tel. Rutherglen 3675.*)

G2HN, E. Howell, 70 Oaklands, Chippenham, Wilts. (*re-issue.*)

GW3VBX, R. M. Luther, School of Engineering Science, Dean Street, Bangor, Caerns.

G3WVD, H. Moore, 269 Leeds Road, Ilkley, Yorkshire.

G3XNO, Otley Radio Society, c/o H. Moore, 269 Leeds Road, Ilkley, Yorkshire.

G3XQC, M. H. Holness, 46 Gresham Road, London, E.16.

G3XQE, K. D. Brown, 39/41 Winsford Avenue, Coventry, Warks. CV5 9JG.

G3XRL, C. N. Scott, 18 Coronation Road, Nuthall, Notts.

G3XRO, College of International Marine Radiotelegraphic Communications Amateur Radio Society, c/o Overseas House, Brooks' Bar, Manchester, 16.

G3XTC, P. J. R. Borrett, 21 Kenley Walk, Cheam, Sutton, Surrey. (*Tel. 01-644 3698.*)

GM3XTR, B. P. Dunn, 11 Johnston Terrace, Greenock, Renfrewshire.

G3XUP, G. Everest, 139 Junction Road, Burgess Hill, Sussex.

GM3XUV, F. McVerry, 217 North Dryburgh Road, Coltness, Wishaw, Lanarks.

GM3XVR, D. Higgins, 4 Stobo Street, Wishaw, Lanarks.

G3XVZ, R. F. Lowe, 1 Lowlands Drive, Normanton-on-the-Wolds, Keyworth, Notts. NG12 5HG.

G3XWA, J. A. Ennis, 19 Coombe Road, Saltash, Cornwall.

G3XWI, E. Tredgold, 17 New Windsor Drive, Rothwell, Leeds, Yorkshire.

GM3XWJ, S. K. Shakeshaft, 100 Earlbank Avenue, Scotstoun, Glasgow, W.4.

G3XWO, T. S. Lowe, 128 Hockley Farm Road, Leicester.

G3XWV, C. Thompson, 63 Weoley Avenue, Selly Oak, Birmingham, 29.

GW3XXB, A. E. Evans, 22 Heol Isaf, Rhiwbina, Cardiff.

G3XXH, S. Watts, 111 Ember Lane, Esher, Surrey.

G8BOA, N. Tomlinson, 33 Merchant Avenue, Leicester. LE3 6BF.

G8BYV, J. R. Tye, Inter-Nos., Swanton Morley, Dereham, Norfolk.

G8BYX, R. J. Street, 86 Old Lodge Lane, Purley, Surrey. CR2 4DD. (*Tel. 01-660 7278.*)

G8BZB, E. W. Peberdy, 18 Arden Road, Kenilworth, Warks. (*Tel. Kenilworth 52038.*)

G8BZF, H. Shaw, 80 Whitefield Road, Penwortham, Preston, Lancs. PR1 OQQ. (*Tel. Preston 43926.*)

G8BZJ, A. Matheson, Paradise Wood Cottage, Hartfield, Sussex. (*Tel. Forest Row 3216.*)

G8BZM, J. A. Kilroy, 18 Bank Street, Brimington, Chesterfield, Derbyshire.

G8BZT, D. Allen, 218 Hipswell Highway, Wyken, Coventry, Warks.

G8BZV, E. D. Dalton, 29 Windmill Lane, Wightwick, Wolverhampton, Staffs. (*Tel. Wolverhampton 61339.*)

G8BZW, J. Langan, 92 Liverpool Road, Birkdale, Southport, Lancs. (*Tel. Southport 68125.*)

GM8CAT, J. Currie, 156 Hillhead Road, Kirkintilloch, by Glasgow.

G8CBM, P. F. Duvoisin, 16 Holt Drive, Wickham Bishops, Witham, Essex. (*Tel. Wickham Bishops 784.*)

G8CCD, J. Hodge, 54 Spellow Lane, Kirkdale, Liverpool. L4 4DF.

G8CCV, M. E. O'Donnell, 52 Freeman Road, Didcot, Berks.

CHANGE OF ADDRESS

GW2FLP, R. D. Horrocks, Glan Rhyd, Dwyran, Llanfairpwll, Anglesey.

G2FXG, A. S. Green, Rosalern, Upper Princes Road, Freshwater, Isle of Wight.

G3ANK, A. Swindon, 62 Sidcup Hill, Sidcup, Kent.

G3DH, R. Sunter, Magnolia, Trafford Road, Alderley Edge, Cheshire.

G3DUF, W. F. Poole, 9 Furze Road, High Salvington, Worthing, Sussex. (*Tel. Swandean 739.*)

G3LDO, P. G. Dodd (*ex-9L1HX*), 3 High Street, Weybridge, Surrey.

G3NVK, R. Winters, 32 Redwood Avenue, Melton Mowbray, Leics. (*Tel. Melton Mowbray 3369.*)

G3PNQ, A. Floyd (*ex-GW3PNQ*), 27 Beachfield, Hilldale, Parbold, Lancs.

G3RUV, A. T. James, 37 Stratford Avenue, Whipton, Exeter, Devon.

GM3SBS, P. G. Bigam, 11 Oswald Road, Edinburgh, 9.

G3SIU, P. Hearson, 14 Osgood Gardens, Orpington, Kent.

G3TPI, E. M. Wagner, 9 Hambledon Crescent, Loughborough, Leics.

G3TRW, D. H. White, 2 Weedon Close, R.A.F. Henlow Camp, Beds.

G3UIQ, M. Yates, Top Flat, 23 Waverley Road, Newton Abbot, Devon. (*Tel. Newton Abbot 2025.*)

G3VMT, T. J. Poole, 4 Lower Broadmoor Road, Broadmoor, Berks.

G3VTQ, F. J. E. Bolton, Top Flat, 23 Waverley Road, Newton Abbot, Devon. (*Tel. Newton Abbot 3025.*)

G3VZV, G. P. Shirville (*ex-G8ADU*), 2 Bradford Way, Toddington, Dunstable, Beds. (*Tel. Toddington 470.*)

G3WVP, P. F. Vella, 78 Hurst Road, Sidcup, Kent.

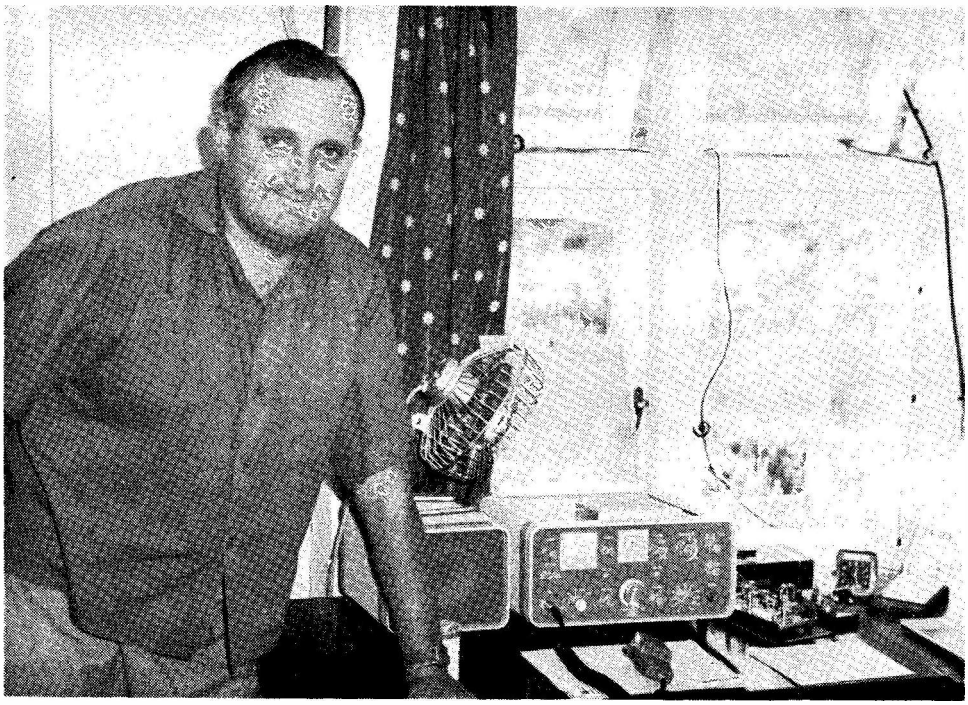
G3WZM, G. A. Suckling, c/o Mrs. L. A. Ellis, 571 Wilmslow Road, Withington, Manchester. M20 9QH.

G3XFD, R. Mannion, 23 Marston Road, Thornhill, Southampton, Hants.

G6ABO/T, F. A. C. Walklett, 29 Kirkstall Road, Chorley, Lancs.

G8AVW, F. A. C. Walklett, 29 Kirkstall Road, Chorley, Lancs.

G8BLE, D. P. Filer, 68 Castledine Street, Loughborough, Leics. (*Tel. Loughborough 4128.*)



THE OTHER MAN'S STATION ZC4GM

FIRST licensed as G3MCY in 1957, Flight Lieutenant Gordon Moore, who is a navigator in the Royal Air Force, became ZC4GM on arriving at R.A.F. Station Episkopi, Cyprus, in October 1967. The rig having been flown out to Cyprus some two weeks previously and with a ZC4 licence already issued, operation was commenced within 24 hours of arrival.

The equipment at ZC4GM consists of a KW-2000A transceiver, with two 6146B's in the final which are run at 220 watts p.e.p. to a TA-33 Jr. beam at about 20 feet above the ground. An indoor "Joystick" is used occasionally and, in spite of very poor earthing arrangements (one encounters solid rock at about 3 feet below the surface) has proved to be most effective, all Continents having been accounted for on SSB with the Joystick alone. A 200ft. aerial is due to be erected shortly, with which it is hoped to work 80 metres and Top Band.

Operating time is divided almost equally between the SSB and CW modes and, thanks to the invaluable services of W2CTN who, as QSL manager, looks after the fairly hefty task of issuing the QSL cards, it has been possible to maintain a high level of activity. (After 12 months of operation, four ARRL-type log books have already been filled.) These activities, together with the combined duties of secretary and compiler of the Cyprus Amateur Radio Society *Newsletter*, ensure that there is never a dull moment at ZC4GM !

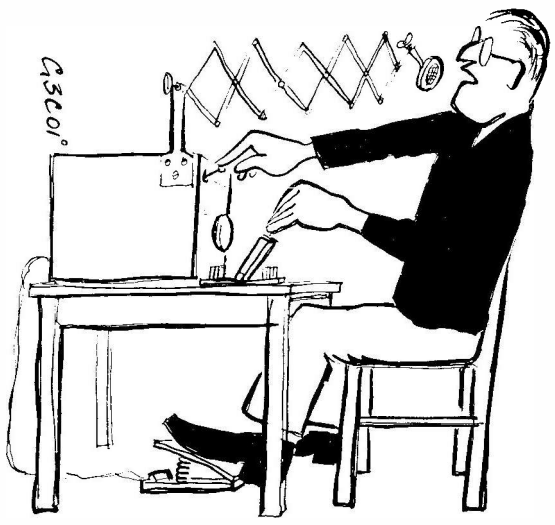
Operating conditions in Cyprus appear, by and large, to be better than those obtaining in the U.K. The general noise-level on the HF bands at Episkopi is low—an important factor when dealing with the weaker signals. The major obstacle to DX is the presence of very strong QRM from Europe and Russia—both of which are "on the doorstep," particularly on 20 metres. However, careful choice of operating times, and some juggling with the beam, can often phase out the intrusion. The fact that ZC4 is a "new one" to quite a number of stations, while being auspicious in that it is always nice to feel wanted, can often prove to be an embarrassment, especially on those occasions when a rag-chew QSO with the U.K. is in progress, when the more impatient "breakers" tend to rock the boat more than a little.

The KW-2000A has rendered sterling service and,

apart from a fuse blowing as a result of "operator error," has proved to be entirely trouble free. During the Summer months, with temperatures in the shack approaching the 100° mark, some overheating was experienced, but the simple expedient of opening the lid and providing a draught with a suitably placed electric fan cured this problem completely. The parallel problem of operator overheating was dealt with in a similar manner — a large refrigerator, suitably stocked, was installed as a matter of urgency, and the combination of air and liquid cooling ensure that the limits (of temperature, at any rate) are never exceeded.

In the first year 195 countries, in 38 Zones, have been worked, with 160 confirmed so far. For some reason, Zones 1 and 2 have proved to be distressingly elusive. On one memorable occasion a very weak VE8 was heard on 15-metre CW. However, he was working Europeans at RST-599 both ways, and after about an hour of trying, he was reluctantly abandoned.

Cyprus has certainly lived up to its reputation as an "island paradise," and the prospect of a further 18 months enjoying its delights is indeed pleasing. With about 9 months of perpetual sunshine (followed by a mild winter); swimming in warm seas; excellent local "vintages" readily and cheaply available; Greek and Turkish delicacies to be had for the asking; and unlimited opportunities for Amateur Radio, with a reasonably sought-after prefix. what more could one wish for? Except, perhaps. a posting to VR5 next tour!



". . . Always say you can't beat full break in . . ."

SMALL ADVERTISEMENTS

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QSL Cards and Log Books, GPO approved, cheapest and best. Prompt delivery.—Samples from Atkinson Bros., Printers, Looe, Cornwall.

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JANUARY 1969 Issue due for publication on December 27. Single-copy orders, 4s. post free, should reach us by Monday 23rd, for despatch before Christmas. Add 3d. (total 4s. 3d.) for "1st class mail" if desired. — Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FIRMS, workshops, educational institutions and others requiring good trade facilities for electronic components should contact **East Anglian Electronic Supplies, 56 St. Benedict's Street, Norwich, Norfolk, NOR-24J.**

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QSL Cards for Tx and SWL. Send s.a.e. for samples, stating which type required. Prices from 12s. 6d. per 100, purchase tax and post paid. **—Beaumont, G5YV, 8 Ashfield Avenue, Morley, Leeds.**

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3d. per word, minimum charge 5/-, payable with order. Add 25% for Bold Face (Heavy Type). Please write clearly, using full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box Numbers 1/6 Extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, London, S.W.1.

SELLING: Type 8KW Ee-Ze Match, an ATU covering 10 to 80m., brand new and never used, property of a deceased SWL, price £10, money-back guarantee.—Box No. 4711, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

OFFERING: Codar T.28 Rx, FB condition, £11 or near. Unmodified ex-RAF Type 1986 two-metre transceiver, with some crystals, data, but no circuitry, £4 or offer. Rhythm Morse record, with extras. 25s.—Griffith, G8BOC, 16 St. Augustine's Road, Wisbech, Cambs.

SELLING: GEC BRT-400 receiver; K.W. Vanguard Tx; Pye high-band Ranger; tape recorder. All going cheap.—Ring Kent, 01-959 6160 (London), evenings.

FOR SALE: Eddystone 840A receiver, coverage 500 kc to 30 mc, complete with isolation transformer and S-meter, price £23. BC-221 frequency meter, with charts and mains PSU, £15. Callers after 8.0 p.m. weekdays. — Gorrill, 30 Ashburnham Road, Furnace Green, Crawley, Sussex.

SALE: BC-221, £6. Cossor Wobbulator, internal mains, £5. BC-453, £5. Type 19 Set, 50s. Signal generator, 3000 mc, 50s. UHF Wavemeter, 45s. Forty valves/photocells, 20s. Various relays, transistor radios, etc.; send s.a.e. for details.—McDonald, 6 Great Meadow, Shaw (5494), Lancs.

FOR SALE: National HRO receiver, with 8 coil packs, including bandspread for 10 and 20m., with matching speaker, manual, PSU, voltage stabiliser, noise limiter, and Q-multiplier, price £18 or near offer. WANTED: Transistorised Top Band converter. —Ayton, 19 Percy Terrace, Sunderland, Co. Durham.

SELLING: Eddystone 680X receiver, in very good condition, price £60 or near offer. — Emmett, G3VKO, Box Tree Cottage, Whiteleaf, Princes Risborough, Bucks.

SALE: Lafayette HA-700, new January 1968 and in perfect condition, £25. Also an HA-230 Rx, price £15. Carriage paid (in makers' original cartons) and including manuals.—Gillett, Post Office, Alimora Crescent, Worthing, Sussex.

FOR SALE: Eddystone 888 receiver, with speaker and S-meter, £40. Heathkit DX-40U Tx and VFO, in good working order, price £25. Would deliver Birmingham area.—Millman, 46 Madison Avenue, Hodge Hill, Birmingham, 34.

DISPOSING: Sommerkamp FR-100B receiver, in as-new condition, price £80.—Williams, 25 Upper Carr Lane, Calverley, Pudsey, Yorkshire.

WANTED: Bases for 4X150, any condition. Mosley TA-33Jr. beam. Pye AM "Cambridge" or high-power "Ranger." Medium-power 70 centimetre Tx.—Robertson, 12 Hazel Close, Mildenhall, Suffolk.

SELLING: R.C.A. AR88D receiver, as new, with manual and tools, £48. Panda 150-watt transmitter, with manual and spares, £36. Also 45-amp welding set for 250v., complete with 16-gauge rods, ideal for chassis work, price £10.—Peck, 27 Thorburn Road, New Ferry, Cheshire.

WANTED: To buy or borrow, handbook or circuit for Hallicrafters S.27C receiver, 120 to 230 mc model.—Pearcey, 15 Southway, Carshalton Beeches, Surrey.

WANTED: Schematic or details for conversion of VHF Rx Type 1392D. Will buy, or pay for loan.—Howarth, 145 North Hill Street, Liverpool, 8.

FOR SALE: National HRO Rx, with xtal filter, nine coil packs to cover 50 kc to 30 mc, also PSU, all in good condition, £15. Deliver to 30 miles, or buyer collects. — Bell, G3RTB, 14 Eastbourne Road, Hornsea, East Yorkshire.

OFFERING: Type R.216 receiver, with all manuals, service data and power pack. Also on offer R.210 Rx, coverage 2·0 to 16·0 mc, no PSU, at £22. Aiwa portable transistor Rx, covers six bands, MW, SW, 88-108 mc, 108-136 mc and 148-174 mc, battery or mains, price £33. (Yorkshire).—Box No. 4712, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: National NCX-3 with original PSU. For Sale: Eddystone 888A, £60 or near offer. (Suffolk).—Box No. 4714, Short Wave Magazine, 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS. READERS—*continued*

FOR SALE: Heathkit DX-100U transmitter, in mint condition, price £40 or near offer. — McEwen, GM3PGY, QTHR. (Tel. 041-944 1023.)

SELLING: Heathkit SB-300E, two filters, CW/SSB, and professionally wired, £110. Heathkit DX-100U, factory-built, with SB-10U Sideband Adaptor, £60.—Neal, 34 Manor Avenue, Brockley, London, S.E.4.

WANTED: Manual or circuit for DR.5 receiver (about 1957). — Clarke, 13 Muirhouse Lane, Murray, East Kilbride, Scotland.

GOING ABROAD: So having to sell up. Offers invited for AR88D, Eddystone 770-U and Lafayette receivers, recorders, and also a host of good items, including valves, transistors, dekatrons, etc., etc. All must go, any fair offer for single items or The Lot considered—or would Exchange for good photographic equipment. (Somerset.)—Box No. 4713, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Transistor Rx for 40m. CW, or receiver to work off 220v. DC mains may do, also a KW-2000 or NCX-3. Prices must be reasonable. (Eire).—Box No. 4715, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Type 13A double-beam Oscilloscope, separate Y-amp., time base to 750 kc, and marker oscillator, price £15. Trio JR-60 receiver, coverage all bands plus two metres, 3 micro-V at 10 mc for 10 dB, with Q-multiplier, product and gated-beam detector, ANL, etc., price £40. De luxe Joystick with tuner, £6. BAY96 varactor tripler, 20w., £9. Also many books and magazines.—Ring Linton, 01-202 0212 after 6.0 p.m. (London).

GOING QRT: Everything must go. Eddystone EC-10 receiver. BC-348 Rx. Minimitter 150-watt AM/CW Tx. No. 7 Crystal Calibrator. Also transformers, valves, and various other bits-'n-pieces. Copies "Short Wave Magazine" November 1961 to September 1967. The Lot for £60, or near offer.—Millard, G3SBJ, 59 Climping Road, Ifield, Crawley, Sussex.

SALE: Panda T.20 Tx, in FB condition, price £25. (Going SSB). — Robb, G3VNK, Leazes Lane, Hexham (2035), Northumberland.

FOR SALE: Heathkit HW-30 two-metre transceiver, in mint condition, complete with crystals, microphone, 110v. transformer and handbook. Price £24.—Wilson, Woodlands Bungalow, Dog Kennel Hill, Kiveton Park, Sheffield S31-8NG, Yorkshire. (Tel. Kiveton 6773.)

DISPOSAL: Type 3X teleprinter, in very good conditon, with PSU and paper, also a 3X for spares. Type R.1392 receiver. TF-390G signal generator, 10 to 150 mc. Type LO-800A BFO, 0-16 kc. Graph pen recorder, 2 mA. Variac rated 2·5 amp. Thirty assorted meters. Telephones, 22, new and boxed. The Lot for £20.—Ring Ashcroft, 01-455 7333 (London), evenings.

SELLING: 1968 Heathkit SB-101 Transceiver with CW filter, at £190, and in matching cabinet, its PSU, speaker, SWR bridge, coax switch, dummy load, at £25. Complete for £210, or near offer.—Flt.-Lt. Ledger, G3UBL, Officers' Mess, R.A.F. Oakington, Cambridge.

SALE: Labgear LG.50 Tx, in fine condition, with new PA and modulator valves, £25. Home-built Top Band transmitter, two power supplies built in, price £10. TCS-12 receiver, £5. Modulation transformer, 50-watt, 30s. Transformers: 546-0-546v. 230 mA, 32v., 5v., 40s.; 425-0-425v. 150 mA, 5v., 6·3v., 35s. Suitable chokes, 20s. and 15s. Prefer buyers collect, Norfolk area.—Box No. 4716, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SELLING: Codar PR-30X preselector, coverage 1·5 to 30 mc, in near mint condition, £5. WANTED: FM receiver, covering 88 to 108 mc.—Roberts, 59 Hazel Road, Exeter.

SALE: R.C.A. AR88LF receiver, in good condition, £30.—Daws, 44 West Park Grove, Leeds 8, Yorkshire. (Tel. Leeds 664362.)

SMALL ADVERTISEMENTS, READERS—*continued*

FOR SALE: Receivers B.40, £17 10s.; R.209, £10 10s.; and R.107, £9 10s. Also telephone hand sets, 5s., and 30ft. guys and pegs, 70s. Post and packing extra.—Marshall, Braehead, Balbardie Road, Bathgate, West Lothian, Scotland.

FOR SALE: Creed 7B Teleprinter, in immaculate condition, works overhauled and not used since, with instructions and servicing manual. Offers invited.—Box No. 4717, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Receiver for VHF, tunable over approximately 60 to 180 mc, with internal mains PSU/speaker, £25. Marconi valve voltmeter, with probe, for AC/DC measurements, with internal PSU, £25. Manuals: For PSU Type 3, Crystal Monitor Type 4, UHF Test Set No. 28, 10s. each; for Wireless Set No. 58, 25s.; for R.208, Crystal Calibrator Type 18, 20s. each; at 30s. each, Calibrator Unit Type 120, R.3066, R.26, PSU Type 77, R.3102A (VHF), Modulator Type 20, T.3065A/B, Rebecca Test Set Type 31. Circuits For: Type 31 receiver (BC-1000), 5s.; Test Sets Type 31, 31A, 31B, 10s.; at 20s., Indicator Type CRT-1, Control Unit 381, Control Unit 704, Signal Generator Type 6; at 30s., Rx R.1933A. Please include s.a.e. with all enquiries.—Hayward, Sunnyfields, Lighthouse Road, St. Margaret's Bay, Nr. Dover, Kent.

SELLING OFF: Few copies of tne Summer Edition "DX Listings, Radio Amateur Call Book"—The World outside the U.S.A.—at 32s. 6d., post free. Current (Autumn) issue of the same costs 43s.—Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

EXCHANGE or Sell: R.C.A. AR88D, in very good condition, asking £35, or will Exchange for an Eddystone 840C, 640 or Heathkit RG-1 receiver.—Foster, 72 Vimy Road, Billesley, Birmingham.

FOR SALE: Eddystone 770R receiver, covering 19 to 165 mc, AM/FM, as-new specification, with handbook, £120, no offers. WANTED: Eddystone 888A.—Page, G3HKV, 16 Abbey Street, Crewkerne (2662), Somerset.

SELLING: Complete Mobile Rig, comprising Codar A.T.5 Tx, T.28 Rx, 12/RC control unit, 12/MS DC/PSU, Codar speaker, Halson whip aerial for 160m., and xtal microphone, £35 all in. Also an original Vibroplex de luxe Bug Key, in mint condition, at £9.—French, G3LGL, 54 Reddal Hill Road, Cradley Heath, Warley, Worcs.

WANTED: Marconi Type TF-643B VHF Wavemeter. T.W.2 or TW Communicator. Two-metre nuvistor converter with PSU.—Shrimpton, 23 Rotherwood Road, Putney, London, S.W.15.

FOR SALE: Eddystone 840C receiver, in very good condition, price £45. Buyer to test and collect.—Kirby, 45 Durham Close, Canterbury (61248), Kent.

SELLING: Heathkit HW-32A, almost new, with HP-23E and GH-12, price £70.—Hobbs, G3OBW, QTHR.

FOR SALE: Self-supporting aerial mast, 30ft., cost £30, accepting £15, buyer to collect.—Lines, 14 Church-Hill West, Brixham, Devon.

CLEARING Shack: Receivers SP-600JX6, coverage 540 kc to 54 mc; SX-62, 540 kc to 109 mc; National NC-77X; BC-348, £12 10s.; R.1155, £5. APR-4 receiver, covering 38 to 1,000 mc. Also signal generators, megger, USM-45 for 50-11,000 mc; spares AR-88, HRO, BC-221, gear-box, trimming tools, dials, crystals, manuals and valves. Pse include s.a.e. with enquiries.—Wright, 249 Sandy Lane, Hindley, Wigan (55948), Lancs.

SELLING: Heathkit HA-14 linear amplifier, used less than two hours, at £50. Home-built PSU, 2 kV at 500 mA, price £12.—Donald, GM3SKS, 5 Woodrow Circus, Glasgow, S.1, Scotland.

WANTED: Eddystone Type 898 dial; also McCoy or KVG crystal filter. Full details, pse.—Forster, G3KZZ, 41 Marlborough Street, South Shields, Co. Durham.

SMALL ADVERTISEMENTS, READERS—*continued*

OFFERING: Used Correspondence Courses for R.A.E., complete with exam. papers and answers over years 1958 to 1965, at £6 post free.—Box No. 4718, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Two HRO receivers, both scruffy and missing dial and knobs. One untouched, the other poorly modified, with six coil-packs, 160m. and 40m. BS. No PSU or speaker. Offers £6 to £8, plus carriage.—Cutler, G3MXF, 8 Kings Avenue, Parkstone, Dorset.

SELLING: Mobile Rig, complete, for 80/160m., comprising Minimitter transmitter and control box; Command receivers 1·5 to 3·0 mc and 3·0 to 6·0 mc; 12-volt PSU; lapel microphone; loading coils, whip and mounting; with circuits, etc. First £25 secures. (Midlands).—Box No. 4720, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Sommerkamp FL-1000 Linear Amplifier, in mint condition, £75. Channel-Master rotator automatic control unit, with alignment bearing, £17. Transmitter for 4 metres, runs 5 watts input, no PSU, 60s.—Jones, GW3TMP, QTHR.

FOR SALE: Factory-built Heathkit Mohican receiver, in really excellent condition, covered in heavy suede leather, price £34. WANTED: AR88D, KW-201 or Hamgear PR-II; must be in perfect condition.—Moore, 40 Donegal Pass, Belfast (41763), Northern Ireland. (Ring evenings 6.0 to 7.0 p.m.)

SELLING: National HRO, with nine GC coil packs, PSU, speaker and headphones, £23 or near offer. Preferably buyer to collect.—Jones, 80 Thorn Avenue, Cheadle Hulme, Cheshire.

OFFERING: Hammarlund SP-600JX 20-valve receiver, covering 540 kc to 54 mc in six bands, in excellent electrical condition but less cabinet, would accept £60, prefer buyer to examine and collect.—Sandwell, 41 Sunningdale Road, Crosland Moor, Huddersfield, Yorkshire.

SALE: Eddystone 680 Receiver, £39. Eddystone 730/1A, similar to the 680X but the professional job costing originally £220, in very good condition, asking £70 or a near offer. Could deliver to 100 miles, and part exchange suggestions welcomed.—Snowden, Swainsea Lane, Pickering, Yorkshire.

DISPOSING: Great Bargain for Enthusiast! Two-metre transmitter, running 100w. to QQV06-40A PA, with three xtal channels, separate modulator 2/807, including all power supplies, fully metered (three Ernest Turner milliammeters), relay controlled, in 19-in. three tier rack, 39 ins. high, incorporating indicator lights, switches and fuses, working but requires slight adjustments. price £25. Pitch-prop motor, with 230-24v. transformer, also 50v. supply for rectifiers, reversing relays and two Selsyns, this lot for £10. R.C.A. transformer 2000-0 2000v., 400 mA, as new, 70s. Woden UM4 modulator xformer, 60s. Two Electrovoice Type T.50 microphones, p-t-t, 50s. each; Calrad ditto dual impedance microphone, 65s. Heathkit OS-2 Oscilloscope, factory built, new and unused, listed £32, would accept £24. Two Zenith Variacs, 0-230v. rated 8 amps, £5 each. Vortexian Amplifier, 15 watts output, built of quality components, various line input and output impedances, for 230v. or 12v. vibrator supply, soiled but in perfect condition, only £5.—Lee, G5FH, QTHR (or ring 021-552 1338).

WANTED: A Geloso VFO, must be in good condition. All letters will be answered.—McWilliam, G3XUG, 5 Stonecliffe Walk, Leeds 12, Yorkshire.

SALE: An unmodified Eddystone 888A receiver, complete with matching S-meter, speaker and mounting blocks, at £65. Also a Model RCX Panoramic Adaptor, input 450 to 470 kc, sweep plus or minus 100 kc, price £20. Prefer buyers to inspect and collect.—Hodgson, G3TBT, 18 Clayhill, Lyndhurst (2127), Hants.

SMALL ADVERTISEMENTS, READERS—*continued*

URGENTLY Required: G.E.C. Miniscope IF Alignment Unit, Type BW-462, or any similar Wobbulator, transistor or valve.—Lindars, 52 Heathcote Drive, East Grinstead (23950), Sussex.

FOR SALE: An Evershed & Vignoles recording mA meter, 240v. AC drive, one milliamp movement, speed half-inch per hour, complete with instruction manual and six rolls of chart, price £15.—Grigg, G3PRX, 72 Elmstone Road, Rainham, Kent.

FOR SALE: Heathkit SB-10U Sideband Adaptor, £20. Three Japanese car radios, needing attention, £10. Three 10ft. x 1½in. aluminium masts, £6. Five 6ft. x 1in. dural tubes, 50s. Carriage paid.—Kennedy, 77 Seaview Road, Brightlingsea, Colchester, Essex.

OFFERING: A Gonset G-76 Transceiver, coverage six bands, running 100 watts, with mobile PSU and all accessories, ideal for table-top or mobile working, what am I bid?—Boyce, 63 Church Road, West Kirby, Wirral, Cheshire. (Tel.: 051-625 8945.)

SELLING: An Eddystone 888A, in first-class condition, price £60 (could deliver to 50 miles). Also a VHF signal generator, coverage 100 to 150 mc, 60s. Z-match ATU, 60s. SWR meter, 40s. Twenty-five yards low-loss 50-ohm coax, 30s. Copies "Short Wave Magazine," years 1963 (less Sept.), '64, '65, '66 (less July), 15s. per year, plus postage.—Sykes, G3NFV, 8 Uplands, Ashtead, Surrey. (Tel. 298-2546, evenings.)

SELLING: Labgear LG.300 Tx, coverage 10 to 80m., with AC/PSU, nice CW transmitter, at £25. Also a Heathkit Mohican Rx, just back from overhaul by Davstrom, £30. "Spy Set," Type A, Mk. III, 70s. Type 19 Set, Mk. III, 50s. Linear, 10 Set, 15s. Buyers to inspect and collect.—Williams, GW3TMH, QTHR. (Or ring Rhyl 2859.)

FOR SALE: Hammarlund HQ-180 receiver, price £80, buyer to try out and collect. (London area.).—Box No. 4721, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Type 62H 15-valve VHF communications receiver, coverage 95 to 155 mc, VFO, S-meter, in first-class condition, with good PSU, £20 or near offer.—Heppenstall, 83 Norman Road, West Malling, Kent.

EXCHANGE or Sell: Heathkit Mohican receiver, hardly used and checked over by Daystrom this summer. Any reasonable offer or W-H-Y?—Martin, 32 Clifton Road, Halifax (60438), Yorkshire.

WANTED: A two-metre Transceiver for fixed or mobile operation. SELLING: Hinode single-channel radio-control transmitter and receiver, bargain at £10.—Reed, G3LEX, 9 Trenchard Road, R.A.F. Station Digby, Lincolnshire.

SALE: Heathkit SB-300 receiver, with SB-600 speaker, two filters, price £115.—Baines, G3YBO, 11 Dale Crescent, New Tupton, Chesterfield, Derbyshire.

COMPLETE Station for Sale, in mint condition and hardly used, comprising Collins KWS-1 transmitter, Collins 75A-4 receiver and speaker, all matching units, cost £1,500. Offers and enquiries. — Jumbo, G5TZ, 82 High Street, Newport (3358), Isle of Wight, Hants.

SALE: Transistorised two-metre convertor, AF239 low-noise front end, HC-6U crystal, in heavy-gauge aluminium case, 4 x 3 x 1¼ inches, IF's either 20-22 mc or 24-26 mc, price £9, plus 3s. post/packing. Other IF's to order.—Grigg, G3PRX, 72 Elmstone Road, Rainham, Kent.

HAVING Bought an AR88, now wish to sell my AR77E; in very good condition, and complete with manual, £16.—Aylett, 6 Manor Close, Burgess Hill, Sussex.

SMALL ADVERTISEMENTS, READERS—*continued*

OFFERING: An FB R.C.A. AR88D receiver and Panda PR-120V transmitter, £55 the pair or near offer. Going QRT.—Platt, G3FEV, 78 Cunningham Drive, Unsworth, Bury, Lancs. (Tel. Whitefield 3981.)

GOOD OFFER! Hallicrafters S.20R receiver. This is the original type of communications Rx, covering 550 kc to 45 mc. In good condition, sensitivity up to manufacturer's specification, and complete with handbook. Price £25 only.—Bovill, 11 Grove Court, Drayton Gardens, London, S.W.10. (Tel. 01-373 3694.)

SELLING: A Junk Box, for £10. Good variety, mostly new items. Sorry, no lists. Buyer collects London area. Also an Avo-8, Mk. II, mint, £15.—Box No. 4723, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: R.C.A. AR88LF, price £25.—Bunyan, 17 Sonderburg Road, Holloway, London, N.7.

SALE: SR-550 double-conversion amateur band receiver, coverage 10 to 160m., a magnificent specimen, only 18 months old, a gift at £39. Also a Codar PR-30X preselector, 90s. All carriage paid.—Ring Glenn, Woking 4292, evenings.

ATTENTION! TR.GDX/20C transistor Rx, with BFO and all coils 500 kc to 30 mc, also 9v. battery, price £5 10s. including postage. WANTED: Two-mobile or similar Rx.—Cooke, 76 Falcon Road West, Sprowston, Norwich, Norfolk, NOR.73R.

JANUARY 1969 issue publishes on December 27. Single-copy orders, 4s. post free (or 4s. 3d. first class) should reach us by Monday 23rd or earlier if possible to ensure posting before Christmas.—And Season's Greetings from the Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED Urgently: Communication receiver, band-spread 10-160 metres, anything considered but must be good DX'er, not bulky and reasonable.—Roberts, Telephone Office, Queen Elizabeth Hospital, Birmingham, 15.

SALE: Eddystone 840C receiver, as new and still under guarantee, price £48. (Midlands area).—Box No. 4724, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: Z-Match or similar ATU, also a receiver for Top Band.—Marshall, G3RKH, 9 Colston Parade, Bristol (20587), BS1-6RA.

WANTED: For HRO, 40-metre bandspread coil pack. Also Class-D Wavemeter, or similar.—Johnston, GM3XUW, 236 Telford Road, Edinburgh 4, Scotland.

SALE: Eddystone S.640 receiver, realigned, with new valves and set of spares, also Joystick Ae. Price £20. Buyer inspects and collects pse.—Stampton, 67 Medhurst Crescent, Gravesend, Kent. (Tel. Gravesend 63284, evenings.)

DISPOSING: Heathkit SB-101 with 400-cycle filter, SB-600 speaker, HP-23E PSU, in very good condition, recently checked, tested and aligned by Daystrom, Ltd., price £205 complete. Would deliver free to 70 miles.—Eley, G3GHB, 14 Warmington Road, Hollywood, Birmingham. (Tel. Wythall 2036.)

SELLING: An Eddystone 940 receiver, in perfect condition, purchased 1967 and little used, price £90 or reasonable offer, buyer to inspect and collect, London.—Box No. 4725, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

DISPOSAL: Valves, new and boxed, 4-400A at £10, and 4CX250F, £5. Heathkit SB-640 VFO, offers? WANTED: SB-200 in any condition, and Collins 75A-4 Rx. SB-100 and cash offered against exchange.—Pilkington, 1 Deansgate Lane, Formby (72778), Lancs.

READERS In Ireland: Have for sale an AR88LF receiver, rewired by British Admiralty and fitted tuning meter, with circuit diagram. Price £43 or near offer. Buyer inspects and collects.—Hodge, Avonlea, Ballytruckle, Waterford, Eire.

SMALL ADVERTISEMENTS, READERS—*continued*

MANUALS: B.40, B.40 alignment, Collins TCS, 35s. Also CR-100, CR-300, AR88LF, at 25s. Many others.—Brooks, 5 Farrant House, Winstanley Road, London, S.W.11.

SALE: Mosley Commando II Sideband Tx, 180w. p.e.p., covering 10 to 80 metres, with 3/T121 linear, 300w. p.e.p. output, both in the one cabinet, £90. Also AR88LF rack-mounting Rx, few mods. including product detector, price £15. G2DAF-type Rx, £20, or EXCHANGE for general-coverage Rx, such as HRO, 640 or W-H-Y?—Johnson, G3MPN, 3 Folly Gardens, Wymondham (3382), Norfolk.

SELLING: Pye "Ranger," modified for two metres, price £8, plus carriage.—Pilkington, G3IAG, Hamrest, 28 Ely Road, Littleport (487), Cambs.

SELL: Unused Shure 444 microphone, at £9.—Bluer, GW3UUZ, QTHR.

FOR SALE: National HRO Tx, complete with coil packs and PSU, in excellent condition, £23. Avo mains-powered multi-tester, £8. Trio 9R-59 receiver, good condition, £25. Scaling counter, as new, £8. Avo Signal Generator, 100 kc to 80 mc, £6. Type TF-1100 valve voltmeter, as new, £20. Eddystone receiver covering 500 kc to 30 mc, in very good condition, £18. Labgear three-band Quad, complete and unused, £14. WANTED: Heathkit Type HD-10 Keyer.—Lord, G3PHN, QTHR, or ring Swadlincote 7557.

SALE: K.W. Viceroy Mk. IV CW/SSB Tx, with extra half-lattice filter and internal aerial relay, £90. Eddystone EA-12 receiver, as new, £120. Can demonstrate or deliver in South-West London.—Box No. 4726, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

OFFERING: £30 for an Eddystone 840C or EB-35, state age and serial number, delivery in Essex.—Box No. 4727, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SELLING: Heathkit 3in. service Oscilloscope, built and perfect, brand new, £21. Also a No. 52 Set, as new, built-in PSU, with manual and cabinet, £10. —Mobbs, Cross Farm, Waldron, Heathfield, Sussex.

WANTED: A receiver for VHF, R.216 or similar; also a Lafayette HA-55A. SELLING: Eddystone EC-10 receiver, £38. Codar A.T.5 with mains PSU, £18. Codar PR-30X preselector, £5. Shorrock Mk. V receiver, covering LW/MW and aircraft bands, £20. LM-14 Frequency Meter, mains PSU and calibration book, £25. All items in good condition.—Wyse, G3IWE, 36 Wilmslow Crescent, Thelwall, Warrington (64178), Lancs.

WANTED: Modern VHF receiver, in mint condition, coverage about 70 to 170 mc, preferably AM/FM type.—Newstead, 79 Pinnacle Hill, Barnehurst, Kent.

SALE: Codar A.T.5 and AC/PSU, no modifications, price £18, including carriage.—Sanderson, G3UQZ, 175 Johnson Road, Erdington, Birmingham, 23. (Tel. 021-373 8806.)

CHEAP: Quantity of amateur equipment for sale, including a Top Band transmitter, power supply and many other items; send s.a.e. for list.—Butland, 43 Dollis Park, Finchley, London, N.3.

FOR SALE: Large quantity of Radio Components, including resistors, capacitors, plugs, sockets, valves, also a Resistance-Capacity Tester, books and other items of interest, the lot for £75. Please send s.a.e.—Pierce, 80 Railway Road, Rock Ferry, Birkenhead, Cheshire.

EXCHANGE or Sell: Eddystone 840C for a 940 receiver. Also Wanted a crystal calibrator giving 10/100 kc points.—Silavant, 22 Arundel Road, Angmering, Sussex.

SALE: Heathkit DX-100U transmitter, a good specimen, new 6146's in final, Heathkit-designed grid block keying modification for T9x note, price £45, delivery by arrangement. WANTED: Good Viceroy or similar SSB transmitter.—Bantock, G3WNT, QTHR, or ring 021-445 1405.

SSB Mobile Racal Transceivers TR.108, coverage 3, 6, 12 and 15 mc in four bands, crystal controlled, 1·4 mc xtal filter, ALC, comprising (1) dashboard remote control, solid-state 12v. PSU and microphone (2) main send-receive switching (3) remote Ae. matching unit (4) mounting rack, trim tools, and diagram; one unit complete and immaculate, £65. Other very good specimens from £35.—Price, Underwood House, 110 Harestone Valley Road, Caterham (CA-45085), Surrey.

SELLING: BC-221M Frequency Meter, complete with internal mains PSU, stabilised, £20. Linear L1/10 10-watt AF amplifier, separate bass and treble control, price 55s. Labgear switched wide-band coupler for 10 to 80 metres, 35s. Boxed 813 valve, 27s. 6d. Bound volumes "Wireless World," 1948-'57, 65s. Prices include carriage.—Webber, G3ENX, 3 Shirburn Road, Crownhill, Plymouth (73238), Devon.

JANUARY'S Small Advertisements should reach us just as soon as possible. There will be severe postal delays during the next couple of weeks or so. **Charge 5s. minimum; 3d. a word after 20 words; add 25% for bold face; 1s. 6d. extra for a Box Number.**—Small Advertisement Dept., S.W.M.

FOR SALE: Eddystone model EA-12 receiver, in immaculate condition, extra plinth speaker, and with manual, price £120.—Dean, Cawsand, West Hill Road, Ryde, Isle of Wight.

COMPLETE Station for Sale: Immaculate Eddystone EC-10 receiver with AC/DC PSU's, also Heathkit DX-40U with VF-1U VFO. All in at £65. (Scotland).—Box No. 4728, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

STUDENT Engineer (age 22) needs lodgings, Monday to Friday, in or near Edinburgh. Also requires 48·6 mc HC-6U crystal.—Scott, GM8BDX, Manderston Stables, Duns, Berwickshire.

SELLING: R.C.A. AR88LF receiver, unmodified and in really first-class condition, at £25, prefer buyer collects.—Torkington, G3PY, 5 The Ashes, Glossop, Derbyshire.

OFFERS? French Ateliers de Montages Electriques 7G-1680 Communication Receiver, coverage 1·7 to 40 mc, a superb Rx in mint condition. (North-East). —Box No. 4729, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Hallicrafters SX-122 receiver, in mint condition and only four months old, price £100.—Ring Moore. 061-428 7019.

WANTED: Transistor aircraft-band receiver, or one covering 100-150 or 170 mc. Full details, pse.—Burton, c/o Bakelite Xylonite, Aycliffe Works, Nr. Darlington, Co. Durham.

SELLING Shack Complete, comprising the following: Sommerkamp FL-200B Tx, 240w. p.e.p., in mint condition; Hammarlund SP-600JX receiver, mint· BC-221, some calibration but no charts: Audio Oscillator; Heathkit GDO; Crystal Calibrator, 10/100 kc; Teletype apparatus—19 Printer with perforator and spare motor, 14 TD reader, PSU for these items, terminal units (incomplete): DJ6 Type Terminal Unit, in FB condition: Redifon IF Terminal Unit. no PSU: two stab. PSU's, 24v. + 24v. and 30v., both at 1 amp.; 30ft. Tower. Also several meters such as 25-0-25 μA, 100 μA. 200 μA DC, RF, moving-iron and current-transformer types; 100's of resistors. capacitors, transformers (IF and power types, HV/LV): transistors and diodes. Many items brand new. All going in one lot to the first £250 offered, buyer to collect.—Cavill, G3SBH, Quarry Farm House, Cam, Dursley, Glos.

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