

The SHORT WAVE Magazine

VOL. XXIII

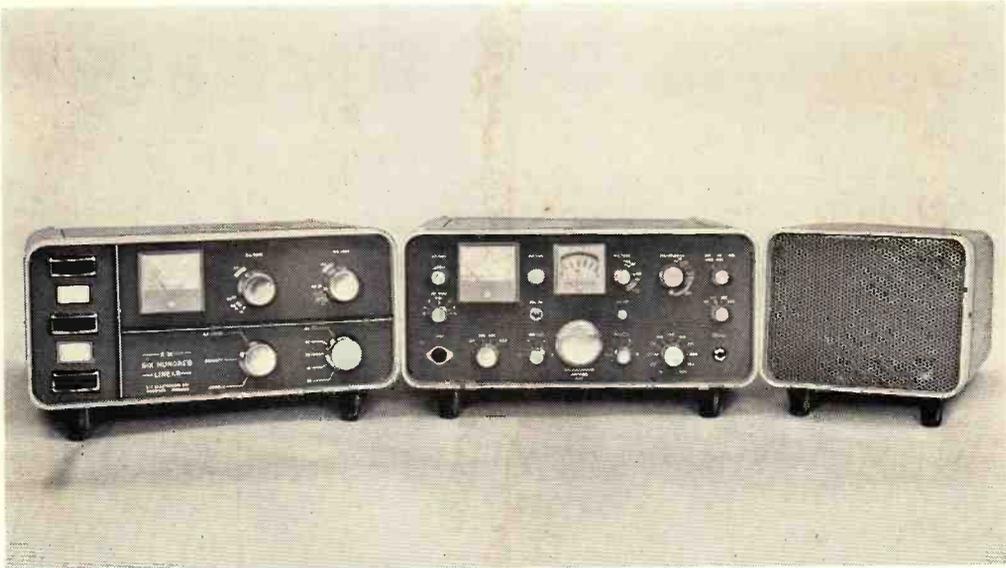
JULY 1965

NUMBER 5

K. W. ELECTRONICS for all your Amateur Radio Requirements

The NEW "G" Line by K.W.

A new style cabinet with lift-up inspection lid, handsomely finished in two-tone grey stoved-enamel, fitted now to the KW2000, KW2000A and KW600.



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TR44 latest model ...	£37.10.0
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KW2000A. SSB Transceiver (180 watts) PSU extra.	£195
KW600. Linear Amp. Complete with PSU	£105
KW "Viceroy." SSB Transmitter. Complete with PSU.	£155
KW "Vanguard." AM/CW Transmitter 10-160m.	£73/10/-

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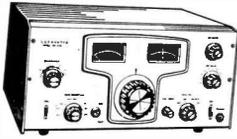
We accept trade-in equipment. Easy terms available.

HAMMARLUND RECEIVERS, HQ170A, HQ145X, HQ180A, HQ170A-VHF now in stock.

KW

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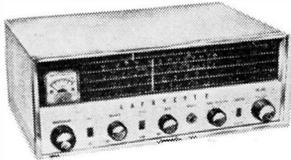
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NEW MODEL!
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NEW MODEL!
LAFAYETTE HA-230 AMATEUR COMMUNICATIONS RECEIVER
Supersedes model HE-30, 8 valves plus rectifier. Continuous coverage on 4 bands. 550 kc/s.-30 mc/s. Incorporates 1 RF and 2 IF stages, Q Multiplier, B.F.O., ANL, "S" meter. Electrical bandspread, aerial trimmer, etc. Supplied brand new and guaranteed, 33 gns. S.A.E. for full details.



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200µA	27/6	2mA	22/6	300mA	22/6	2v DC	22/6	15v AC	22/6	
500µA	25/6	5mA	22/6	500mA	22/6	50v DC	22/6	50v AC	22/6	
50-0-50µA	29/6	10mA	22/6	750mA	22/6	100v DC	22/6	150v AC	22/6	
100-0-100µA	27/6	50mA	22/6	1A	DC	22/6	150v DC	22/6	22/6	
500-0-500µA	22/6	100mA	22/6	5A	DC	22/6	300v DC	22/6	500v AC	22/6

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Model 7 £12/10/-
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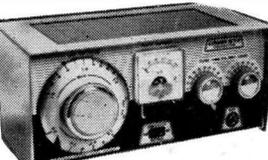
200 P.I.V. 200 mA	2/6
400v. P.I.V. 3 amp	7/6
200v. P.I.V. 6 amp	5/6
1,000v. P.I.V. 650 mA	7/6
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95v. P.I.V. 3 amp	3/6
70v. P.I.V. 1 amp	3/6
150v. P.I.V. 165 mA	1/-

Discount for quantities. Post extra.

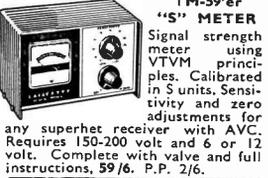
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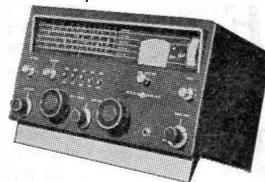
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(We haven't enough room to show you all of them)

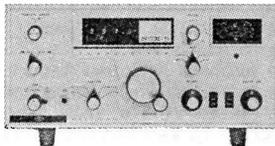
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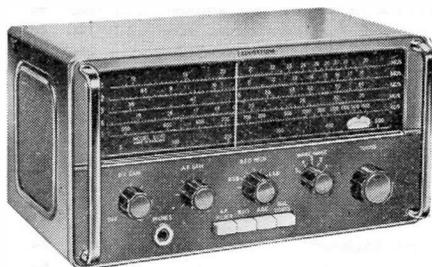


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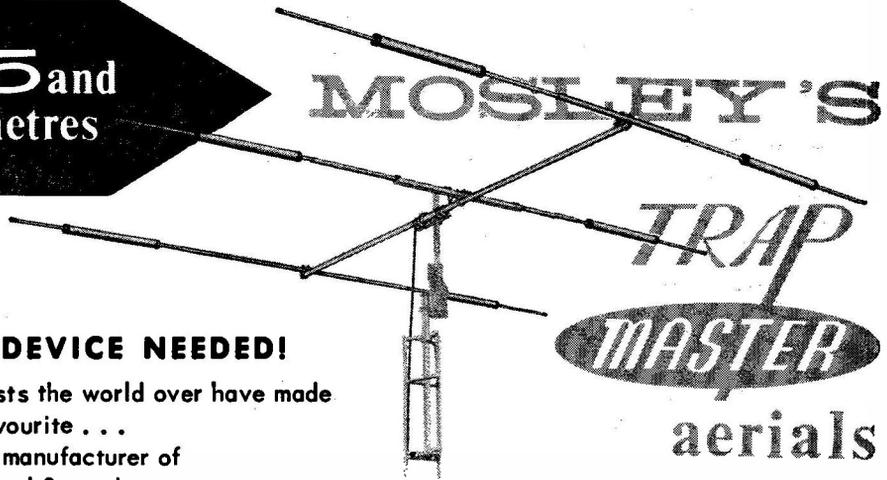
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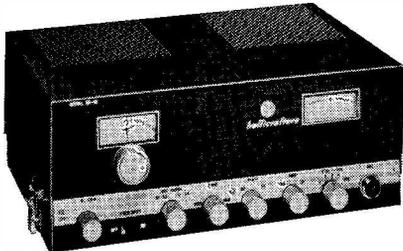
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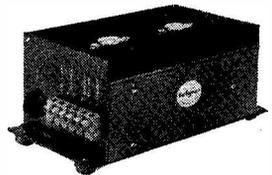
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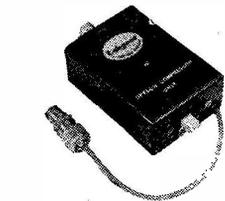


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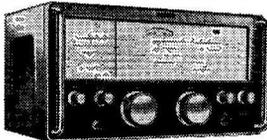
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**INDEX TO
ADVERTISERS**

	PAGE
B. J. Ayres & Co.	257
British National Radio School	262
Cathodeon Crystals, Ltd.	315
Charles H. Young	312
Codar Radio Co.	<i>cover iii</i>
Courier Communications	260
Daystrom	<i>cover iv</i>
Finnigan Speciality Paints	316
G. Francis	316
G3HSC (Morse Records)	315
G.W.M. Radio	312
Halson Radio Services, Ltd.	315
Henry's Radio	317
Home Radio	257
A. Imhof, Ltd.	262
J.T. Supply	317
K.W. Electronics <i>front cover</i> ,	318
Labgear	261
J. B. Lowe	262
Mosley Electronics	259
Partridge Electronics, Ltd.	316, 319
Peter Seymour	264
Short Wave (Hull)	318
Small Advertisements ...	313-320
Smith & Co., Ltd.	<i>cover ii</i>
S.S.B. Products	312
S.W.M. Publications	258, 313, 314, 320
Martin R. Tetley	317
Tweedy (Electronic Sup- plies), Ltd.	315
John Williams Electronics, Ltd.	320
Withers	264
Yukan Products	317

SHORT WAVE MAGAZINE

(GB3SWM)

Vol. XXIII

JULY, 1965

No. 261

CONTENTS

	Page
Editorial	265
A Four-Band Bi-Directional Array, <i>by F. W. Unstead (5ZAGF)</i> ...	266
Log-Periodic Aerial Systems	268
Do You Know That	270
Tidy Steel Tower, <i>by D. Morgan (G3SM)</i>	272
Loop Reception on Top Band, <i>by E. L. Gardiner (G6GR)</i>	275
Miscellany— <i>Comment on the Times</i>	277
“SWL”— <i>Listener Feature</i>	279
Top Band from Sierra Leone, <i>Notes by 9LIHX</i>	283
Specially on The Air	284
Single-Sideband Transmitter for 160 Metres, <i>by E. P. Essery (G3KFE)</i>	285
Communication and DX News, <i>by L. H. Thomas (G6QB)</i>	292
The Mobile Scene	299
VHF Bands, <i>by A. J. Devon</i>	304
New QTH's... ..	305
The Month with The Clubs— <i>From Reports</i>	306
A Club-Reviver Programme, <i>by R. C. Ray (G2TA)</i>	310

Managing Editor: AUSTIN FORSYTH, O.B.E. (G6FO/G3SWM)

Advertising: Maria Greenwood

*Published on the first Friday of each month at 55 Victoria Street,
London, S.W.1. Telephone: Abbey 5341/2*

Annual Subscription: Home and Overseas 42s. (\$6.00 U.S.) post paid

Editorial Address: Short Wave Magazine, BUCKINGHAM, England

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Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of quarto or foolscap sheets, with diagrams shown separately. Photographs should be clearly identified on the back. Payment is made for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on publication.

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The SHORT-WAVE Magazine

EDITORIAL

Overhearing *Every now and again, some keen SWL writes in to the effect that—being possessed of a general-coverage SW Rx—he would be very glad if we could let him know when and on what frequencies he can listen for ships, or aircraft, or whatever. This is sometimes varied by a request that we recommend a suitable receiver for the purpose, he being particularly interested in listening to ships (or aircraft)—it being also suggested that we would be doing a public service by publishing the necessary details in the Magazine.*

Regretfully, we cannot accede to these appeals—not because we have not got the information, but simply because it is contrary to the terms of the ordinary BC/TV receiving licence for any private individual to overhear on unauthorised channels. Look at Clause 1 (b) of your Receiving Licence—it confines you to broadcasting and amateur stations only, with a caveat at para. 4 of “the schedule” shown on the reverse of the licence. This is the law.

Before you sit down to write us a furious letter about the iniquity of it all, remember that it is not we who make the rules, nor even the G.P.O. The fact is that the Postmaster-General (whoever he may be, politically) is bound by the decisions of the last I.T.U. Conference, at Geneva in 1959, when it was laid down that all administrations must adhere to the principle of secrecy of correspondence in the radio sense. In other words, that nobody should be permitted to listen-in to transmissions not intended for general reception—much as you would not like your mail opened or your telephone tapped.

And in reply to those who may challenge us on the point, “broadcasting,”—being defined as from authorised stations for general reception—means not only entertainment, news, propaganda and TV, but also meteorological charts by facsimile and press transmissions from anywhere in the world, whether by hand-sent Morse, high-speed CW or RTTY.

*Austin Smith,
G6FO.*

A FOUR-BAND BI-DIRECTIONAL ARRAY

SHOWING HIGH GAIN AND
DIRECTIVITY

F. W. UNSTEAD (5Z4GF)

THERE must be many amateurs who operate on several bands and would like a beam for each. The popular commercial three-band rotaries fulfil this demand to some degree, but are not the whole answer. Cost is sometimes prohibitive, particularly overseas, where freightage and Customs dues can make the cost of a multi-band beam prohibitive. Also, the 40-metre band is often excellent for DX, where the advantages of gain and direction given by the three-band rotary on the higher frequencies cannot usually be realised.

The array to be described offers gain on all bands 40 to 10 metres, with considerably more gain on the higher bands than is obtained with a 3-element Yagi. It is, however, bi-directional.

This, in the writer's case, is not a deterrent as most operating interest is over the N/S path centred on Nairobi, Kenya. By angling the array to fire NW/SE coverage is available where required. As it is usually necessary to get up early in the morning to work the Far East and Australasia from Nairobi, the fact that the array, as aimed, will not cover these areas simply means that 5Z4GF can stay in bed.

This array also needs a fair amount of space in that it covers an area 133ft. wide by some 67ft. long. This is, however, far less than the ground required to erect a V-beam of equivalent gain, which the writer has often used as an all-band system. An added advantage of the new array over a long V-beam is that the "V" apex angle must usually be a compromise, since the optimum angle for 10 metres becomes far too small when using the same antenna on 80 metres.

Theory

Basically, the 5Z4GF array consists of a number of dipoles harmonically related and all fed on all bands—somewhat akin to the log periodic concept.

The usual fan-dipole arrangement (Fig. 1), although giving dipole performance on each band, has the other dipoles in a static or non-resonant, condition when they are not in use.

By making all dipoles operative on each band, gain is achieved on the principle of additive phased dipoles. This is obtained by mounting each dipole a finite distance along a 66½-foot open-ended stub, so that using the stub as a common part of each dipole, the distance between the ends of each dipole and the common feed point is also 67ft. It will be seen that this assures matching on all bands 40

to 10 metres.

A glance at Fig. 2 will show how this is achieved. (Fig. 2 is not to scale to ease clarification.)

To take an example: Dipole (a) is a wavelength long on 40 metres and is centre-fed with 600-ohm line. Dipole (e) is a wavelength long on 10 metres but by including the stub length between (e) and the common feed point, the overall length is a wavelength on 40 metres, and thus the 10-metre dipole will operate as a shortened antenna on 40 metres.

Conversely, when on 10 metres dipole (a) becomes effectively 4 wave-lengths long and operates correctly with 600-ohm feeders, centre fed. The same reasoning applies to all other bands and all other dipoles, as the stub a,y—a',x supplies the additional length necessary to allow all dipoles to operate on all bands.

The array is erected in the horizontal plane and thus takes the appearance roughly of a large Yagi.

Construction

In a system of this size it is convenient to lay out all components before construction. If this is not possible due to lack of space, some difficulty may be experienced in obtaining a true geometrical configuration, as the array should form an isosceles triangle.

All the individual dipoles should be made up, leaving some six inches extra on all lengths to allow for securing to the stub and end insulators.—See Table I.

The 66½-foot stub is then pegged down and the dipoles connected at their respective positions. The 133-foot 40-metre full-wave dipole, after connection to the feeder end of the stub, is stretched out and pegged down at each end.

A non-metallic line (the thicker plastic clothes line is suitable) is then fastened to the end insulators of this dipole and the far end insulators of the stub. This forms the triangular pattern of the array, and the other dipoles are then stretched out and their end insulators fastened to the plastic line on each side of the triangle, keeping a 90° angle with the stub and each dipole.

Four-point suspension is necessary if proper rigidity is to be achieved. Extra side stays of plastic

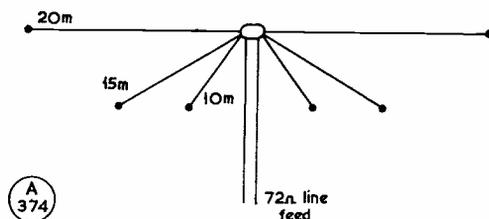


Fig. 1. The basic concept of a multi-band dipole arrangement, in which the unused (off-band) sections can play no useful part, since they are out of resonance. The author's design (Fig. 2) makes use of these additional elements in such a way as to provide gain over a wide frequency range—somewhat in the manner of the Collins log-periodic wideband array, now much used commercially for directional working.

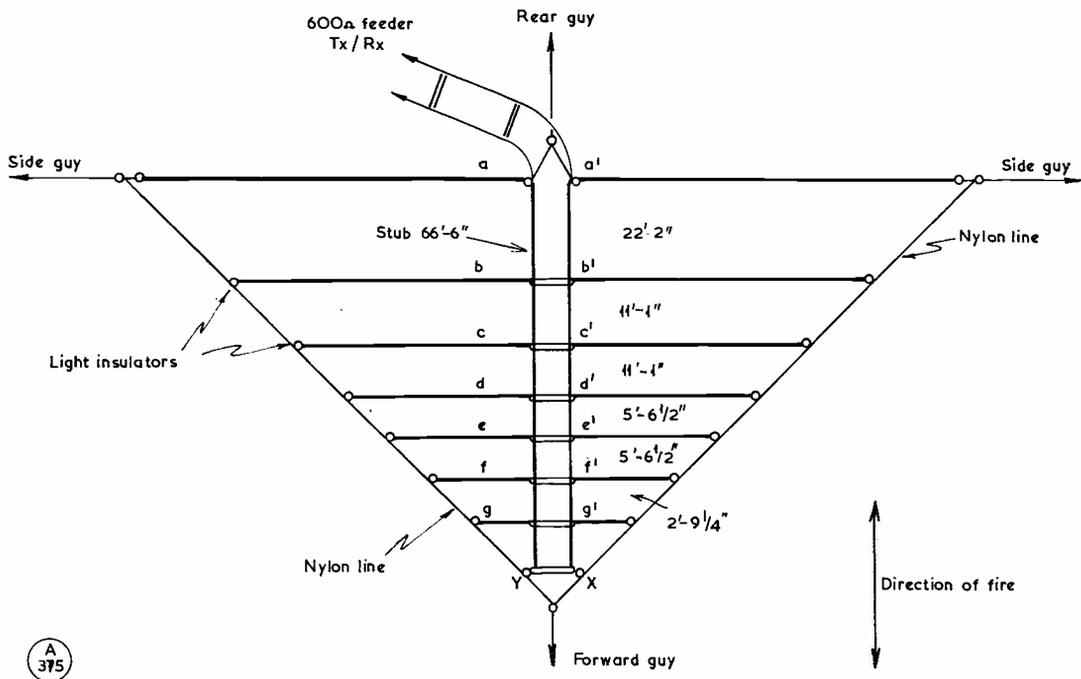


Fig. 2. The four-band layout developed by 5Z4GF, which can be fed to resonate at any frequency in the 10-15-20-40m. bands, with increasing gain as the frequency goes up. The general ideal is on the lines of the log-periodic system (also illustrated, separately). For the design shown here, a ground-space of about 135ft. by 70ft. is required, and the array is hoisted to form an isosceles triangle, level over this area. By using the lighter type of stranded aerial wire, with nylon guys and sidelines, and light insulators at the dipole ends, the array can be hauled up to be symmetrical with the minimum of sag along the stub-line a,a'-x,y. In the construction, all elements should be laid out flat on the ground, and measurements and joints carefully checked before erection. A suitable coupler arrangement for the array is shown in Fig. 3.

Table I

Dipole Lengths for the 5Z4GF Array

- a & a' = 66 ft. 6 ins.
- b & b' = 44 ft. 4 ins.
- c & c' = 33 ft. 3 ins.
- d & d' = 22 ft. 2 ins.
- e & e' = 16 ft. 7 1/2 ins.
- f & f' = 11 ft. 1 in.
- g & g' = 8 ft. 3 1/2 ins.

NOTES: Above are lengths in each arm, measured from the stub line. The stub is 66 ft. 6 ins. long, measured from a,a' to x,y. Fig. 2 refers, showing also spacing between elements, viz. a' to b' = 22ft. 2ins.

line can also be added at the dipole (d) point if too much sag is experienced, but were not found necessary in the writer's case.

The back stay from the 600-ohm feed point is

A 376

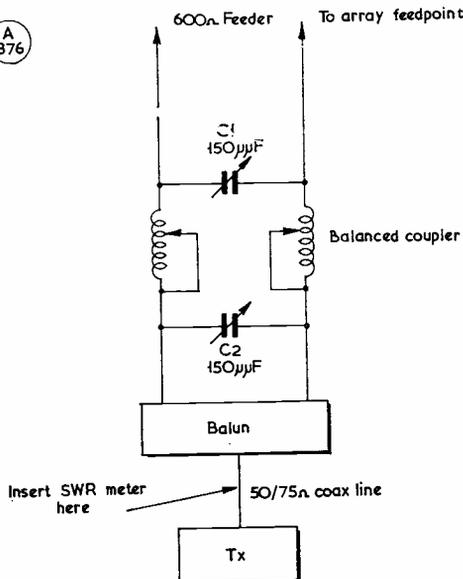


Fig. 3. Feeding the 5Z4GF Bi-Directional Array. The coils are each 12 turns of 16g., slightly spaced, on a 1 1/2 in. diameter former (or could be made self-supporting using a heavier gauge of hard-drawn wire) with tapping points for each band to short out unwanted turns. These points, when finalised, could be brought out to a suitable ceramic band-change switch. With everything going as it ought to, a very low SWR should be found on each of the four bands covered.

necessary as, without it, the array will form a Vee configuration and the 67-foot stub will sag considerably.

In the writer's case, the 600-ohm feeder was run as close as practicable to the operating position, then a short length of 300-ohm line was used to connect the feeder from the outside of the house to the aerial tuning unit in the shack. Although this practice may offend the purists, it was still possible to obtain a 1:1 SWR on all bands.

Results

All bands have been checked out using a Cesco CM75 commercial Standing Wave Reflectometer, a Heathkit Balun and a Collins-type balanced coupler, (Fig. 3).

A standing wave ratio of 1:1 is obtainable on all bands 40 to 10 metres. Frequency shift from top to bottom of any band merely requires a small retuning of the coupler to achieve the 1:1 SWR again.

It was originally considered that the mutual proximity of the various dipoles, and the different lengths, would give more gain in one direction than the other, as in a Yagi. This has not proved to be the case in practice, as a bi-directional pattern has been noted. Precise front-to-back figures are however not available, as propagation conditions and different equipment used at collaborating stations can never give completely reliable results when attempting to check back-front ratios at the same time.

No attempt was made to string pick-up aerials front and rear for all bands to measure gains, as this is rarely the complete practical answer. The only real test which is of value to an amateur is to know the gain DX-wise, as measured against an

operational dipole from the same QTH and erected in the same plane and height of the system under test. (Laboratory field strength measurements which rely on ideal conditions can in practice rarely be duplicated at the average amateur QTH).

A dipole was, however, erected on 14 mc to provide comparative transmission-reception checks with DX stations. A local amateur also co-operated, using the same power and transmitter as at 5Z4GF, and using a 14 mc dipole.

The array averaged between 12 and 14 dB gain on this band over both the local dipole and the transmission from the local amateur co-operating station.

Propagation conditions were, and still are, poor on 21 and 28 mc, but indications were that gain was considerably higher than that obtained on 20 metres. No figures can thus be quoted, but it is not unreasonable to expect well over 14 dB on these bands when the number of dipoles acting at these frequencies is considered.

LOG PERIODIC AERIAL SYSTEMS

Editorial Note

The foregoing article by 5Z4GF came in just after we had been looking at a design by G3LQC for a Log Periodic aerial, published in *Mercury*, the journal of the Royal Signals A.R.S.

His configuration is shown in Fig. 4 and the detailed layout used by G3LQC in Fig. 5, with dimensions in Table II. This can be described as a true (scaled down, amateur) version of the commercial type of Log Periodic Antenna. The

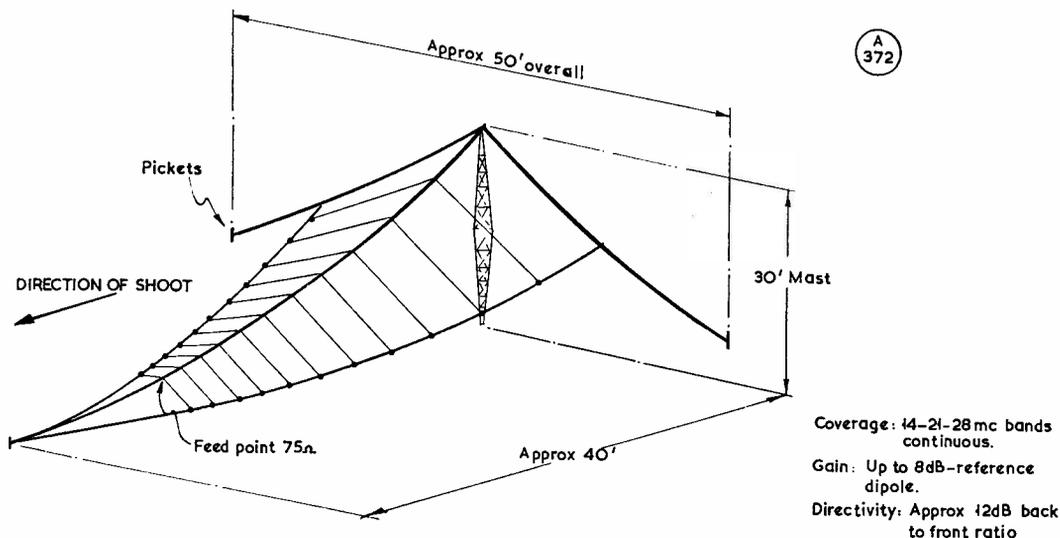


Fig. 4. The amateur-band Log-Periodic aerial design by G3LQC, for uni-directional working, showing a gain of up to 8 dB over a dipole on any band 14-21-28 mc, and having a back-to-front ratio of about 12 dB. This is a scaled-down version of the corresponding commercial design, and change of direction can be obtained by swinging the whole assembly round the mast. The electrical layout is shown in Fig. 5, with dimensions in Table II.

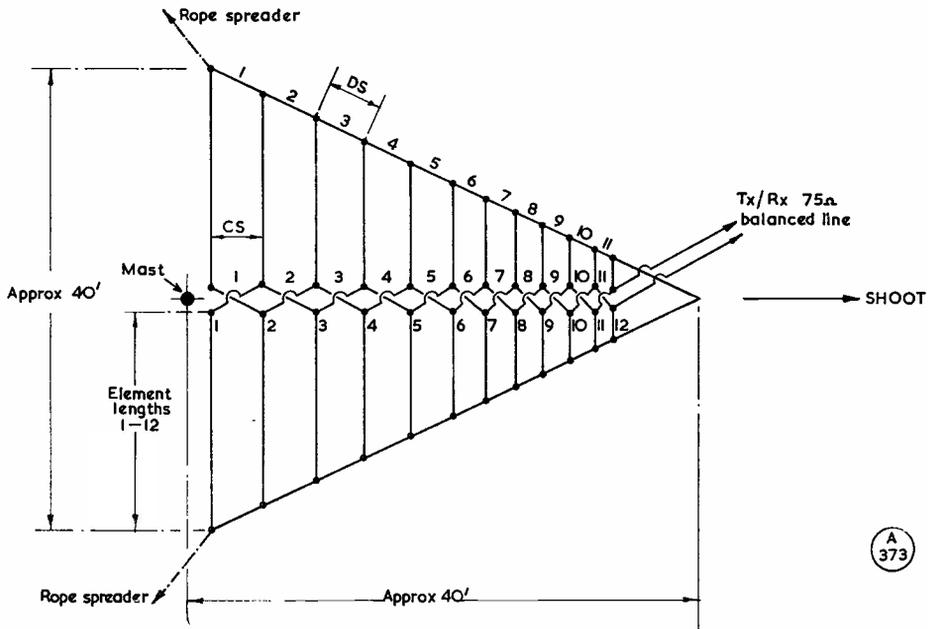


Fig. 5. The detail of the G3LQC Log-Periodic aerial configuration to cover the three bands 10-15-20 metres. A transposed feed-line is used, with 75-ohm balanced feed. The element lengths and spacings are shown in Table II.

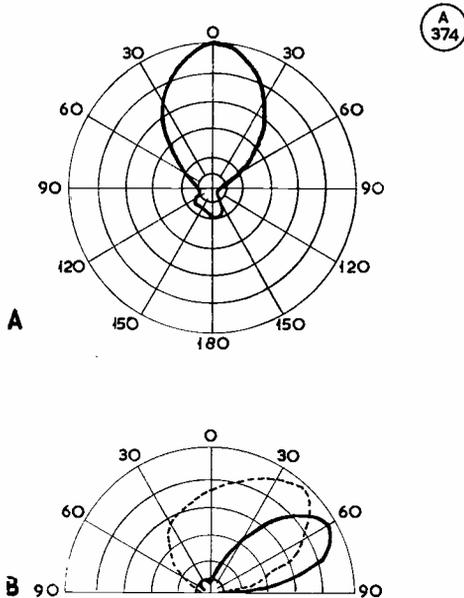


Fig. 6. The polar diagrams attainable with a commercial version of the Log-Periodic, (A) being the pattern in azimuth, and (B) showing it in elevation for 30 mc (full line), and at lower frequencies (dotted line). The particular Log-Periodic on which these curves are based is produced by the American firm of Granger Associates, for a frequency coverage of 4-30 mc, with gain varying from 10 dB relative to a dipole at 4 mc, to 13 dB at 30 mc.

directivity and polar diagrams attainable with such a design (that by Granger Associates, of Palo Alto, Calif.) is shown in Fig. 6, where (A) is in azimuth, and (B) gives the polar diagram in elevation, the full line being the shape at 30 mc and the dotted line that for the lower frequencies covered by the Granger system.

In the G3LQC version, directivity could be changed by swinging the whole assembly round the mast as a pivot. Obviously, this is not the sort of job one would undertake in the middle of a dark night, or even in a hurry, and about twice

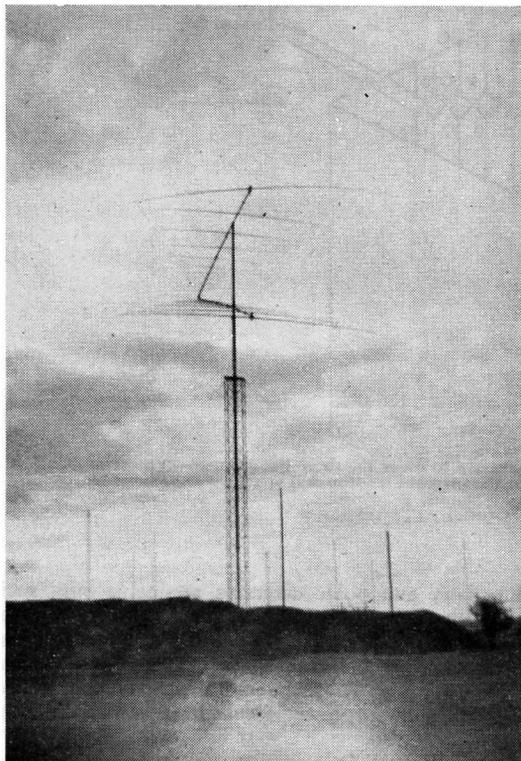
Table II

Dimensions for the G3LQC Log Periodic Array

Posn.	Centre Spacing (CS)	Diagonal Spacing (DS)	Element Length
1	4' 3 1/4"	4' 10 1/4"	19 ft.
2	3' 9 3/4"	4' 3 3/4"	16 ft. 8 ins.
3	3' 4 3/4"	3' 9 1/4"	14 ft. 8 1/2 ins.
4	2' 11 3/4"	3' 4 3/4"	12 ft. 11 1/4 ins.
5	2' 7 1/2"	2' 11 3/4"	11 ft. 4 3/4 ins.
6	2' 3 3/4"	2' 7 1/2"	10 ft. 0 1/4 ins.
7	2' 0 3/4"	2' 3 3/4"	8 ft. 9 3/4 ins.
8	1' 9 1/2"	2' 0 3/4"	7 ft. 9 ins.
9	1' 6 3/4"	1' 9 1/2"	6 ft. 10 ins.
10	1' 4 1/2"	1' 6 3/4"	6 ft.
11	1' 2 1/2"	1' 4 1/2"	5 ft. 3 ins.
12	—	—	4 ft. 7 ins.

NOTES: Fig. 5 refers, and construction is as indicated by Fig. 4.

the ground area would be required—but with the space available, the anchorage points could be pegged out beforehand for different directions and it would not be too difficult, nor a very lengthy operation, to change direction. The advantages are, of course, the high gain and the broad-band effect, with a good back-to-front ratio.



A commercial version of a broad-band Log-Periodic directional aerial system as designed and constructed by the Collins Co. of America, on a rotatable mounting for full directivity. It is quite a large and complicated assembly and rather expensive —about £6,000 all up!

THE "NEW QTH" PAGE

If you want to be included in the *Radio Amateur Call Book*—the only directory for the world's licensed AT-station operators—all you have to do is to send us your callsign, name and address (or change of address), as shown in "New QTH's" on p.305 of this issue. If you have appeared in our "New QTH" list at any time up to March, 1965, you will already be in the *Call Book*, and you can safely use *QTHR*—meaning "My address is correct in the latest *Call Book*"—in any communication with other amateurs. Since the *Call Book* is published quarterly, it is always up-to-date and the latest amateur listing available in print. The current issue, in both the U.S. and DX versions, is always available from us, as advertised on p.314 of this issue.

Do You Know That —

— An easy form of construction on VHF where transistors are concerned is to use printed-circuit board as "chassis." Disc ceramics can be soldered to the board, as can any coils or *Philips* type trimmers. Small pieces of the board, mounted vertically or as needed, can be fitted as screens and soldered in conveniently. (*G6SDB/T.*)

— The ordinary type of 35 mm. film cassette, when expended, can be filled with about 18ft. of 18g. resin-cored solder, wound on to the inner spool and then returned through the casing, to make an ideal palm-of-the-hand solder dispenser. Empty cassettes can usually be obtained for the asking from the local photographer's, and most 35 mm. camera owners will have more than they require. (*R. H. Kerr, Ryde, I.o.W.*)

— When using a GDO for passive tests, with headphones, sensitivity and selectivity can be much improved by leaving the HT switched on, *i.e.*, with the GDO in its oscillating condition. This will be found particularly useful for monitoring applications, where testing with the usual type of superhet Rx can result in confusion of beats and overloading. (*G3OJV.*)

— A dummy load for transmitter adjustments can be made by soldering a number of carbon resistors round the edge of metal discs of about 1½ in. diameter. One of these discs is bolted into the bottom of a tin can, and a flexible lead to the other disc. A 75-ohm load resistor can be made up by paralleling eleven 820-ohm 1-watt resistors, and if the tin is then filled with ordinary engine oil, the device will take up to 150 watts of RF. (*P. Nickalls, Barnehurst.*)

— The shanks of small diameter drills that get bent can be straightened by running them, on the drill-chuck, into a piece of thick timber. The process is continued until the drill is straightened. With a thin one, in the BA sizes from 5 or 6 to 12, one treatment for about half-a-minute is usually sufficient. (*GM3GOG.*)

— In order to prevent voltage-drop in /M installations where an ammeter is used, an 0-50 microammeter can be adapted with a heavy-duty shunt on the battery terminal. This can be a thick strip of copper, in series with the load, having the microammeter connected across it. The shunt is adjusted to give the correct reading in terms of amps., and the meter itself can be connected using bell-wire or light flex, as it is only carrying micro-amps. and will not introduce any voltage-drop in the main circuit. (*G3IES.*)

— Your bench can be attractively finished by using p.v.c. floor tiles (available in various colours) and stuck to the wood with ordinary woodworker's glue, as an expensive adhesive is not necessary. (*E. Houlty, Gainsborough.*)

— Resistors, condensers and similar small “sticky” items can easily be de-greased and cleaned in bulk by putting them in a screw-top jar with a little of the emulsifying solvent known as *Gunk*, obtainable from garages and cycle-shops. The jar is gently shaken, the solvent tipped back into its tin for re-use, and the components dropped into a bowl of water for a final wash-off and drying. It is all a little quicker and easier than trying to wipe off individual items separately! (*G. W. Price, Carnforth, Lancs.*)

— Flexible screening can be made very conveniently by forming a sandwich of tin-foil stuck to thin card. It can be cut as required and bent into odd shapes easily. A suitable tin-foil is that found in the *Quaker Oats'* breakfast-food known as “Sugar Puffs” (this material already having a thin paper backing) and the card can be obtained at the local Woolworth's, or any stationer's. (*F. A. Gay, Bracknell.*)

— The FT-243 type of crystal, or any such that are supported by fine wires, can be lowered a few cycles in frequency by putting a small blob of adhesive in one corner, carefully spotted on using a pencil or some similar fine tool. The job needs doing carefully and is a matter of experiment as regards the frequency-change obtained. (*G3SCD.*)

— To find the value of an unmarked, open-circuit resistor all you need do is to scrape clean a small area at the centre of the body, and with your test meter check from this point to either end. Wherever the break may be, you will get a half-value reading. The method is specially useful for checking burnt-out heavy-duty wirewound resistors on which the markings are frequently burnt off. (*G3IEF.*)

— The polar diagram for a beam aerial can easily be plotted by setting up the field-strength meter at a distance giving near full deflection in the eye of the beam, which is then rotated, with FSM readings taken at 10° intervals through 360°. This will give a set of values for different directions, which are then plotted as points on graph paper with the beam as centre. Joining up the points will give a good idea of the performance of the beam, and the reason for any odd shape or bulge in the curve can be investigated. For a mobile aerial installation, the reverse procedure is used—the FSM is walked round the car on the end of a piece of cord to keep the distance constant. Again, the start point and distance are that which give near full deflection. (*G3PHG.*)

Anyone got any other useful, practical ideas, worth 10s. 6d. for this feature? Remember, no diagrams—just something that can be briefly explained, and that you know works. Try it on the Editor, for
D-Y-K-T.

“DO WE SUFFER FROM OUR IMAGE”

(*Genuine comment by an observer of the Amateur Radio scene, who asks for anonymity.—Editor*)

ALTHOUGH not a radio amateur I recently read with considerable interest the article titled “Do we suffer from our Image” which appeared in your issue of April 1965. It was most surprising to me to learn that there are persons who discriminate against others simply on the ground that he or she is a radio amateur.

I personally have several friends whose hobby is Amateur Radio. Some of them hold very senior executive positions, in some cases in internationally-known organisations where the standards demanded are very high indeed.

One thing about radio amateurs, however, has always seemed odd to me. It is that although your hobby is one requiring a high degree of technical knowledge to qualify, you persist in calling yourselves “ham” operators. We all know what is meant when someone speaks of a “ham” actor. Whoever heard of a cricketer or a tennis player referring to himself as a “ham” player? Can you imagine the Australians saying they were sending a “ham” team over for the Ashes!

In his article, the writer suggested that radio amateurs ought to project a new image—a greatly overworked word these days—to the public gaze. Having reference to “image” the dictionary states in part “artificial imitation of the external form of an object”. Surely to project an artificial imitation of yourselves and your hobby cannot be a good thing. I suggest you should remain your *real* selves—no “artificial images” please—and ignore the few critics. It is more than likely that, do what you may, you would never please them anyway.

INSTRUCTION FOR THE R.A.E.

The information about Courses for the next Radio Amateurs' Examination (Subject No. 55 in the City & Guilds Examination Syllabus) is beginning to come in, and we hope to publish the first list in the August issue of *SHORT WAVE MAGAZINE*. To catch this, those responsible for arranging courses are reminded that we must have their details by *July 19* (addressed Editor, *Short Wave Magazine*, Buckingham—which is sufficient).

Readers thinking of taking the R.A.E. are also reminded that question papers for the last three examinations are available from the Sales Section, City & Guilds of London Institute, 76 Portland Place, London, W.1, price 2s. post free, with a large s.a.c.

The regulations and conditions governing the issue of a U.K. amateur transmitting licence can be obtained on application to: Radio Services Dept., Radio Branch (Amateur Licensing Section), G.P.O. Headquarters, St. Martin's-le-Grand, London, E.C.1.

TIDY STEEL TOWER

FOR SUPPORTING A ROTARY
BEAM—UP TO 40 FEET—USING
COMMERCIAL STRIP
MATERIAL

D. MORGAN (G3SM)

ONE evening whilst browsing through many years of *SHORT WAVE MAGAZINE*, the thought suddenly struck that I had never seen an article describing an aerial tower made of "Man's Meccano"—the term usually associated with anything which has been built with *Handy* or *Dexion* angle. If there had been such an article I do not really know why I should have missed it, having been a regular reader right back to No. 1 of this *Magazine*. About four years ago, I was prompted to construct a tower from these materials, to a height of 30 feet, to take an array consisting of a 10-metre beam, with a 5-over-5 Yagi on top of this for two metres.

This first tower consisted of both *Handy* angles and *Dexion*, the reason being that I had a number of *Dexion* offcuts, which I thought could be utilised for the structure. Both these products combined very successfully to achieve the purpose.

The *Handy* angle was purchased in kit form. It comes in ten 10 foot lengths of 1½ in. x 1½ in., 14 gauge steel, with 100 nuts, bolts and washers and 20 anchor plates. The bolts are cut square and surface plated, and in single shear are tested to withstand loads of up to 2,800 lb. The only thing which was at all doubtful was how this type of structure would stand up to weather conditions; although the *Handy* angles are electrostatically painted in polychromatic bronze, it was decided to apply as many coats as possible of best aluminium paint before starting to bolt the structure together and again prior to hoisting up from the "launching pad."

The tower being 16 in. square, a concrete foundation 25 in. x 17 in. and 3 feet deep was put down, and into this were set two ¼ in. angle irons, 16 in. apart—see photograph "C."

Assembly

The next operation was assembling the 10 foot lengths, and then ensuring that the footing would fit snugly to the iron angle-plates already in the foundation. For this, two lengths of angle iron, exactly similar to those in the foundation, were bolted on to the bottom of the structure, these being suitably strengthened by anchor plates and four *Dexion* angle pieces.

It should be explained that the gauge and holes of the *Handy* and *Dexion* angles are not the same, but it is quite a simple matter with an electric drill to mesh the two types together, not forgetting, however, to paint thoroughly the newly drilled holes,

as they are made; this is important, because rust soon attacks the virgin metal—and for that matter any filings left on the metal work should be painted over because these too, if ignored, will soon rust. Building the tower out lengthways across the garden was continued by putting down several lengths of timber under each section to protect the paintwork as much as possible, and also because it enabled two people to turn the structure over, making building up much easier. Whilst this was in progress it was found an advantage to soak the nuts, bolts and washers in aluminium paint before inserting. This, although a little messy, does ensure sealing and preservation.

Cross pieces of 2½ in. x 1½ in. x 16 in. *Dexion* were then built into the tower at about 5 feet intervals, suitably strengthened by anchor plates located both vertically and horizontally.

After this, the bearing pieces were constructed, consisting of *Tufnol* blocks 5 in. x 4 in. x ½ in. with 1½ in. holes in each centre block, and they in turn were then bolted into the *Dexion* 1½ in. centre pieces for the 1½ in. conduit which was to go up the middle of the tower (see photograph "D"). Conduit was chosen because transmission for turning the array was wanted at the bottom of the tower, in a weatherproof housing and also, a more important factor, to protect the coax feeder lines which were to run down inside the conduit.

The conduit was then built up with short lengths of stainless-steel tubing in each *Tufnol* bearing piece, the tubes being bolted into the conduit at



(B) A seven-foot high support cradle, or "launching pad," was made for the G3SM 40-foot tower, here seen ready to go up with the TA-33Jr. beam in position.

these bearing positions. Finally, a piece of aluminium 20in. square was bolted on to the top of the tower, leaving a 1½in. hole for the conduit to protrude through to carry the beam assembly. Four eye bolts and rings were attached at the 25 feet level for the guy wires, which consisted of pvc covered cable. Nylon rope would do as well.

The bottom of the tower was then located on to the cement base, the outer tie bolts being put loosely through to give anchorage while allowing for pivoting.

Hoisting

A wooden tabernacle was built up of timber to a height of 7 feet (see photograph "B") and the top end of the tower structure rested on this to facilitate mounting of the beams. With lifting tackle consisting of a 3- and 2-pulley block and 70 feet of rope attached near the top—and to a bolt and ring previously cemented into the wall for the purpose, the structure was hoisted into the vertical.

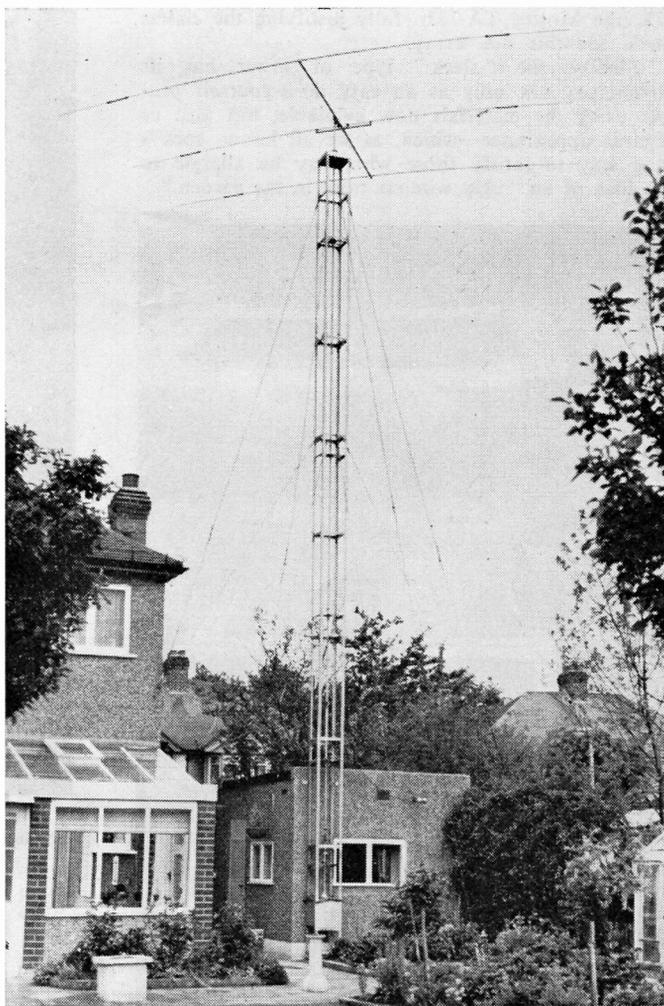
The tower as described, was up for a period of four years, and during this time no trouble whatsoever was experienced in any way with the operation of the beams.

Height Increased

It was because this project was so successful, together with the experience gained in building it, that it was decided to increase the height to 40 feet. This new venture was successfully completed last October, and in view of the approaching "cycle of good conditions," a Mosley TA-33Jr. was installed in place of the old beams. Several modifications were made for this new tower. A new "launching pad" had to be made and alterations were made to the guying distances. Four extra guy wires were used, the original ones being retained at 25 feet, with the new guys put on at 38 feet. Even with a solid base foundation as described it is always safer in the long run to use plenty of guying.

Variations to a tower of this type are unlimited from the kits available—for instance, the structure could be 8in. square or even smaller, whilst other types of non-rusting bearing surfaces could be used.

Incidentally, when the old tower was taken down no rusting whatsoever was observed on the *Handy*



(A) The completed 40ft. tower, surmounted by a Mosley TA-33Jr. as designed and constructed by G3SM, using "Dexion."

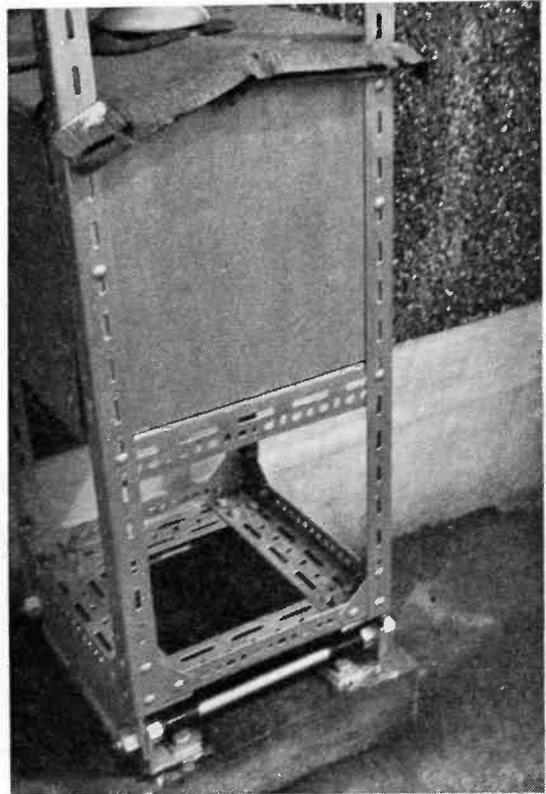
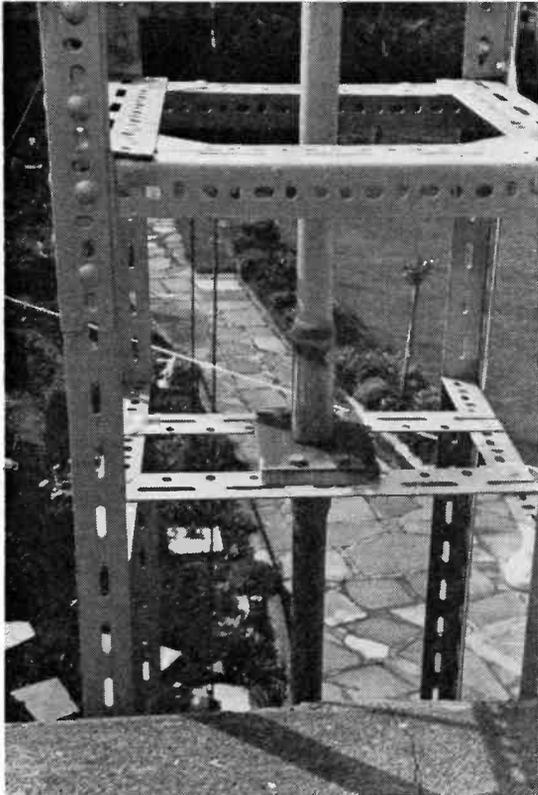
or *Dexion* angles, which certainly goes to prove that the more paint one can get on to the metal work (without knocking or scratching it in any way) the better the chance of 100 per cent preservation.

With a 7in. wheel at the operating position manual control is obtained visibly by a light indicator made (by G3SM) to sweep a ray of light round a Great Circle map, indicating direction of radiation, controlled by micro-switches situated at 16 cardinal points of the compass and located inside the gear control box at the bottom of the tower.

In respect to results, it has been found that the extra height has contributed to the working of

DX, the Mosley TA-33Jr. fully justifying the claims made for this fine array.

Finally, the "sleek" type of tower has its advantages, not only as an easy do-it-yourself project using the materials now available, but also as regards appearance—which, as we all know, goes a long way to satisfy those who may be allergic to the idea of an "ugly wireless mast in the garden."



C) Close-up (above), of the base structure of the tower, showing the anchor plate insertions and tie-bolts.

D) Top-side view (left), to illustrate the general method of construction, and the bearing positions, with cross-bracing.

OUR SUBSCRIPTION RATE

To obtain SHORT WAVE MAGAZINE monthly by post direct from us on the day of publication (in the U.K.) costs 42s. post free for a year of twelve issues, payable either by cheque or banker's order. Alternatively, you can always have a copy of the next issue for the day of publication (the first Friday in the month) by posting us a P.O. for 4s. not later than the previous Tuesday. All orders to Circulation Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. And if you are in or near London, you can call at our sales counter (9.15 a.m. to 5.15 p.m.) for a copy, at the same address.

WE ALWAYS WANT TO SEE

Material of Amateur Radio interest—articles, photographs with descriptive notes, ideas for the D-Y-K-T feature and offerings for "The Other Man's

Station"—for possible publication in SHORT WAVE MAGAZINE. All such that we can print is paid for at good rates. While the Editor is never short of material, he is always looking for what is new, interesting, well illustrated and properly presented. Anything in this category is generously rewarded.

IF YOU HAVE AN ARTICLE

In mind for offering to the *Magazine*, please look first at the note about "Authors' Mss." at the foot of the Contents page, where it has appeared in every issue for the last 20 years. Yet we *still* get eager contributors who scribe their offering in single-spaced typescript or illegible long-hand on small pieces of paper with no margins. There are good reasons for the rules as laid down—and since we do pay for what we use in the way of contributed material, we expect these simple rules to be observed.

LOOP RECEPTION ON TOP BAND

USING FERRITE-ROD PICK-UP
WITH A TRANSISTOR HEAD
AMPLIFIER

E. L. GARDINER (G6GR)

THERE are many town locations in which reception on the lower frequency amateur bands is limited mainly by local noise from industrial plant, domestic appliances, and similar sources. It is well known that this background is most intense near to ground level, and that much of it is radiated from mains wiring, or borne by earth-currents. Aerials used against earth are particularly prone to this kind of interference, and it is not until the resonant half-wave dipole at a substantial height, and using a matched feeder system, is reached that any substantial improvement in signal-to-noise ratio is to be expected. Not many amateurs living in built-up areas have space for a true dipole for Top Band, and even fewer can aspire to anything approaching an effective beam for frequencies lower than the 7 mc band. Yet the signals of interference that are common today on bands shared by shipping, navigational beacons, Service traffic and amateurs would benefit to a remarkable degree from some form of directional reception at these frequencies.

Plagued by these problems, which can be particularly aggressive when working mobiles on 160 metres in the industrial Midlands, the writer recalled his experiences in pre-War years when a common form of broadcast receiver was the "suit-case portable", general a five-valve circuit depending for signal pick-up upon a frame-aerial of comparatively low-loss air-spaced construction wound in the lid of the case, which was used open in a vertical position. In spite of the fact that DC mains were common in those days, and the levels of interference from unsuppressed equipment were very high, the ability of these early receivers to sort out stations was little short of amazing; and it was not uncommon late on winter nights, after most European broadcasting had closed down, to receive and identify many American medium-wave stations at very fair strength and intelligibility. The tuned frame-aerial was largely responsible for this performance, and it was generally recognised at the time that mains-connected receivers were noisy, and that an open aerial was *not* the way to go about achieving records in the way of foreign broadcast reception on the LF band.

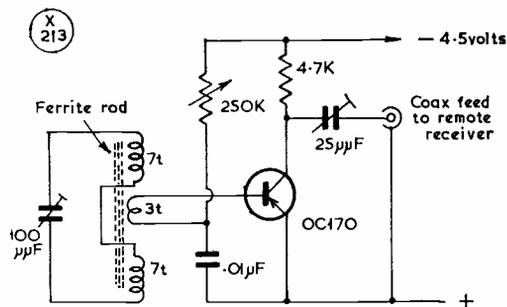
Loop aerials are common in marine and were, at one time, in airborne equipment. The ability of the modern transistor set to receive on a small

ferrite rod stations such as Luxembourg, which were at one time considered "difficult", is quite outstanding. It therefore seemed logical to try out a larger aerial of this variety as a step towards cutting down noise and interference on the 160-metre band. It had already been noted that transistor receivers provided with "trawler-band coverage" did not perform very convincingly in the shack, and generally needed the help of a telescopic whip or some form of external aerial to bring in the weaker amateur signals, although some do perform well under open-country conditions. The preliminary experiment of connecting a similar commercial ferrite-rod aerial to the home-station receiver confirmed that whilst there was an encouraging improvement in "cleanness" at times when local noise was at its worst, receiver gain had to be advanced so far for weak-station reception as to bring up "valve-hiss" to an objectionable level, thus sacrificing most of the advantages sought.

Development

The next step was to think in terms of a larger aerial, having greater signal pick-up. In the course of a junk-shop expedition, an ex-Service navigational loop, type 10AE/324, had been acquired. An imposing device of great weight, having an oval section some 5in. by 1½in., an overall length of ten inches, it contained an impressive mass of ferrite cores approaching three square inches in total sectional area. It was wound with 46 turns of stranded conductor, designed for D/F navigation in the region of 300 to 500 kc, where the MF beacons operate.

The windings were removed and it was found, experimentally, that 14 turns of a p.v.c. covered flex would tune sharply over 1.8 to 2.0 mc with a compact 100 $\mu\mu\text{F}$ trimmer. The turns were put on in two sections of seven, with a small gap between them, in which was wound a link of three turns, connected by a short length of concentric feeder to the receiver input socket. This arrangement was clearly an advance, signal strength being better, the directional characteristics excellent, and some types



A ferrite loop aerial with associated transistor head amplifier, as devised by G6GR. It is built as a single, remotely placed unit, to be convenient as regards (a) rotational control, and (b) minimum noise pick-up. A ferrite-rod arrangement of this kind can be very selective for Top Band reception, as regards both directivity and noise suppression. The ferrite rod core used and the number of turns for the three windings on it could well be a matter for experiment.

of interference easily cut out. However, during a prolonged period of test under actual operating conditions it was found that on too many occasions signals were effectively better on the open aerial, and that receiver noise was still at times objectionable. There were some signs of signal pick-up on the short feeder connection, and a degree of mis-match was suspected. Local signals were often much pleasanter to listen to, but it could not yet be said that the loop was inevitably the right answer. Moreover, it was found better to mount the loop near ceiling level, out of the way, where signal strength had been found to be improved. It would certainly be a good thing to put it in the roof space, well above the level of the worst mains-borne interference, and to rotate it remotely. This would result in a much longer lead, and whilst losses should be negligible at such low frequencies if correctly matched, the risk of vertical pick-up on the feeder-run was considerable.

A good solution appeared to lie in using a transistor head-amplifier mounted directly upon the loop terminals, the down-lead being transferred to the lower-impedance collector circuit where signal levels are higher, and any slight stray pick-up effect unimportant. The amplifier could be so small as to have negligible direct pick-up, screened if necessary, and power could either be fed up the feed lead (as in VHF mast-head amplifiers) or taken from a small local battery.

The circuit actually selected is shown in the diagram. The tuned loop in itself forms a closed high-Q circuit, and is coupled into the transistor base by the link winding. The latter is a compromise between a large inductance which will give good signal transfer but will damp the loop excessively, and a smaller one which will have the opposite effect. Three turns were found to be satisfactory, but should the loop be located in a remote position where the variable condenser is inaccessible, it might be preferable to increase the link turns in order to damp the loop and broaden the tuning (which in the writer's version is very sharp). It was not found necessary to tune the collector winding, since this is in effect achieved by the receiver aerial-input circuit. Parallel feed through a 4.7K resistor is used, and the output capacity is made adjustable up to 25 μF , so that the loading of the receiver input can also be selected to match the type of input coupling that happens to be used. The equipment described works effectively into a Top Band "Command" receiver, which in turn feeds into the corresponding "Q-Fiver."

Circuit Points

Choice of a transistor for the LF bands is not difficult, as so many types are available. The cheaply available OC170 was selected, because its performance was not noticeably inferior to that of more expensive silicon HF types available for comparison—but no doubt certain of these may give a slightly lower noise-level. To simplify the circuit and keep down bulk, no emitter bias was used, the base being biased through a 250K miniature potentiometer con-

nected as a series resistor. Using a 4.5v. battery, optimum was at a collector current of between 0.4 and 0.7 mA, corresponding to a series resistance setting of about 180K with the particular transistor used. At this low current it was not felt necessary to fit a battery switch, the supply being left permanently connected.

The simple form of biasing shown has a poor temperature coefficient and if, for example, the unit is located in a loft where there may be wide temperature variations, it would be better to include a 1K resistor by-passed by 0.1 μF in the emitter lead, and to bias the base from the usual potential-divider. It might then become necessary to switch the battery, but in the writer's shack no need for the more elaborate form of biasing has become apparent.

Constructionally, the head amplifier is assembled on a small piece of insulated board, and after soldering directly to the link terminals, is bound with its battery flat on to the loop former with p.v.c. tape, where it is hardly noticeable. Rotation of the loop unit from the operating position is a matter of personal ingenuity. At G6GR, the arrangement consists simply in attaching the loop to the top of a 3in. diameter cardboard document-tube, which stands upon the receiver case, and lifts the loop well into the clear. No doubt much more elegant forms of construction could be evolved!

Unfortunately no technical specification of the ferrite cores used in the type 10AE/324 unit is available, but as the loop is quite an old one, and intended for low frequencies, it seems likely that the ferrite is not of the best available RF grade. It performs satisfactorily, but in the writer's view amateurs intending to make a similar loop may well do better by selecting the modern long ferrite rods, which are frequently available as surplus, using the largest bundle of these that may be practicable. (Perhaps a reader with specialist knowledge of ferrites could assist by suggesting the grades and dimensions best suited to 160m. aerial construction, and in this way round off the design information.)

Results

Turning now to the results obtainable from a loop and head-amplifier on the lines described, location will clearly have a considerable bearing upon effectiveness. At G6GR, the equipment is used on the second floor of a tall house, located upon the A.41 main road. At some 30 feet above ground, the signal pick-up provided by the loop and amplifier is equal on the average to that obtained from a typical end-fed 90-foot wire. This is quite typical of the kind of aerial many amateurs have to manage with, and it can safely be said that the loop is seldom if ever weaker, and *always* far superior in *signal-to-noise* ratio. Clearly, this also depends upon circumstances, and when the band is very quiet there is not much in it. However, the loop can be set to eliminate, or at least greatly reduce, most specific local sources of noise. It will also cut down beacon jamming, and will eliminate most of Loran in the evenings, making it

possible to work stations within the usual Loran wipe-out zone.

As an example of the advantages of loop reception, a recent QSO was swamped completely on the open aerial by the sudden arrival of a local vacuum cleaner. Changing to the loop enabled this to be cut down, directionally, to such an extent that solid copy could be obtained. There is, of course, the task of seeing that the loop is not accidentally at zero-setting for the station you want—one can seldom get something for absolutely nothing! Those who have an efficient half or full-wave aerial for the 160-metre band will get much less benefit from a loop, and may find it lacking in punch. However, in a really noisy location there may still be occasions when it will solve problems.

To get the very best from the suggested system, it may be desirable so to mount the loop that it can be tilted through, perhaps, thirty degrees, because not all noise arrives in a horizontal plane, particularly that radiated from local mains wiring. It is often necessary to tilt the loop slightly to get a good zero, and it will depend very much upon local circumstances whether this is worth while or not. But do not overlook the fact that by no means all of the advantages are directional. The loop should benefit inherently from the fact that it is not an earthed system, subject to interference from earth

currents; and also because it responds only to the electro-magnetic component of a plane-polarised wave, whilst much of the unwanted noise picked up by an open aerial is vertically polarised. The loop is therefore naturally insensitive to certain classes of noise against which an open aerial will not discriminate.

There is yet one other unexpected convenience that has resulted from loop reception in the writer's station. This arises from the fact that less stray field is picked up from the station transmitter, and it is possible to select positions for the loop in which RF pick-up is too weak to be important. Previously, it was always necessary to use the usual change-over relay, or switch, from "send" to "receive." It is now found possible to leave the open aerial permanently connected to the transmitter, and because the receiver in use is selective, and has effective AVC and impulse noise-suppression, break-through from the transmitter is frequently not excessive at any but the highest gain settings. This has solved the problem of break-in operation and listening-through—although it may not apply with equal force to other stations employing a different layout. To summarise, the convenience of the receiving loop at G6GR has proved such that except when searching for late-night DX, use of the other station aerials for Top Band reception is never even thought of.

Miscellany

A LITTLE LIGHT ON SOME OF WHAT GOES ON AROUND US

Slight turmoil over in the States, caused by the suggestion that the F.C.C.'s "Incentive" proposals will mean a lot of changes in call signs. A Conditional Class operator, for instance, will have the prefix KC or WC; Technician licensees will be allotted KT or WT. First-Class licensees, as well as the existing Extra Class, will *all* be allotted two-letter calls. If they had a licence before 1932 they will only have one letter in the prefix—K or W; if later, they will be WA's, WB's and so on, but will only have two letters in the call. Naturally enough, some of the old hands who have been living with a three-letter call for forty years will not be too pleased at having to change it—even for a two-letter job. This is not yet widely known, and when it is, a real outcry would not be surprising.

— • • • —

Reactions to a whistle: The old maid goes to switch off the kettle, the Sweet Young Thing ignores a would-be QSO at the street corner, the amateur operator moves slightly off frequency, and 109 Citizens-Banders grab the switch and begin their mass confusion!

("Auto-Call," Washington)

G3OCB suggests, in *The Cornish Link*, that this argument about the resale value of commercial and home-built gear is pretty fallacious. He says: "My SSB exciter cost me about £20 to £25 to build (assuming I bought all the bits and used none from the junk box). I would lose quite this much on a new commercial SSB exciter if I sold it, and would be afraid to modify the thing at all while using it . . . I can modify my home-brew exciter as much as I like, and when it is past usefulness, all the bits are there for the next project." He advises those hovering on the brink to "have a go," starting with something simple, and to make a nice-looking job of it. You will be proud of it, enjoy your hobby more, and of course you can always exhibit it, too.

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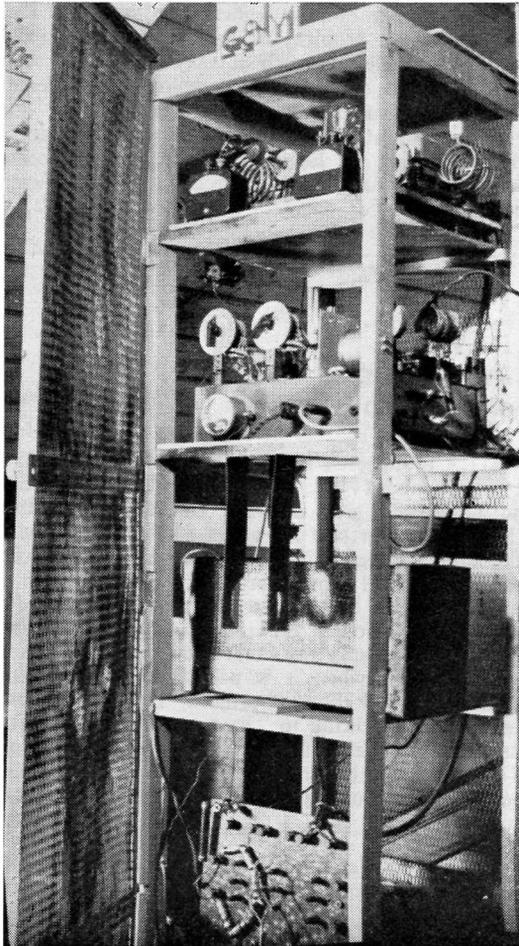
"There will come a time when the battle for available satellite channels will be as hard fought as it is on the HF bands today. Amateurs will need, more than ever before, to support their claims for a share of the allocations with exceptionally convincing arguments. We established our right to channels in the present DX bands through pioneering work in the 'twenties; what better justification for our claims to a share of the DX bands of the

future than to have played a vital and successful role in their development. History is repeating itself, and we are fortunate to have this second opportunity to contribute so much to progress within the span of our lifetime."

(G2HIF, in "QAV"—A.E.R.E., Harwell)

— • • • —

The Ultimate in Lunacy? A station (non-amateur) heard sending by hand, in the 80-metre band, a long message with every letter of every word fully spelt out in phonetics. Thus for "ABC" he was spelling out Alpha Bravo Charlie in full! Beside this, the use of CW abbreviations on 'phone, and the unnecessary use of phonetics become almost brilliant strokes of genius . . .



First transmitter built by G8NY, 1936-'37 and quite typical of the tidier designs of those days. The construction was in units, on a wooden frame, with the PSU on the bottom deck and the RF PA stage at the top, the unit immediately below being the driver/exciter. Note the wire-mesh door, to make it all quite safe.

"Criers for the abolition of the old-fashioned 'simplex' QSO should have regard for characters like me whose thought-processes are too slow for any other type. (Not necessarily less profound — just slower.) Among these are some veritable Hottentots whose first activity on acquiring an SSB rig is to administer a local anaesthetic and remove the Vox."

(Letter from G3NWT)

— • • • —

"Let me say now to anyone using Top Band and not trying CW, that they are only getting about 10 per cent of the fun to be had on 160. This is a band crammed to bursting-point with every kind of RF device ever invented, all of them fitted with a special amateur-tracking gadget so that they can come up on your frequency as soon as you have made contact. CW is the only way to play sardines with this lot and still get through."

(G3TAG, in "Cambeam," Cambridge)

— • • • —

GM3SLW, of Halkirk, Caithness, has built, among other things, a DX-100, an SB-10, a G3BDQ receiver, a G3RRK receiver, a Heathkit RA-1 receiver, several two-metre converters, some transistorised receivers, and is at present building an advanced type of oscilloscope. He also works the stuff on all bands from 3.5 to 144 mc. Not remarkable? Well, he only got his licence two years ago and is at present "a young 64." Good Health, Alex!

("GM Magazine")

— • • • —

Ever worked a penguin-mobile? It may happen, because certain Adelic penguins are now wandering over Antarctica with small transistor transmitters on their backs—just part of some research into their homing tendencies.

— • • • —

The one type of power supply that has (probably) not been exploited by some of our European friends is the Wimshurst machine. However, a modern American "home-science" publication gives details for constructing one which is in keeping with this modern age—so we can expect almost anything by the time the information has percolated.

INTERNATIONAL AMATEUR RADIO CONVENTION—BELGIUM

For the long week-end September 17/19, a group of (unofficial) ON4's plan an Amateur Radio gathering at the North Sea *plage* of Knocke-le-Zoute. What looks like an interesting programme of visits, lectures and social activities is being worked up, centred on the Albert Plage Hotel, Knocke. There are various scales of charging, depending upon the accommodation required—ranging up to 1,000 Fr.B. for the whole period, with everything included. (To work this out in real money, you need to know that about 138 Belgian francs go to the pound sterling.) For full details, apply to: ON4LV, 284 Lipperslaan, Knokke I, Belgium.

SWL ● ● ● ● ● ●

**MORE NEWCOMERS TO SWL—TVI FROM
RECEIVERS—QRP DX LISTENING—DX/TV
RESULTS AND POSSIBILITIES—ONE
THOUSAND PREFIXES AVAILABLE?—
RESULTS ON TEN METRES—READERS'
NEWS AND VIEWS**

THE continuing improvement in conditions naturally pleases the SWL's no less than the transmitting amateurs, and as an indication of just how good the bands have been, compare this current HPX Ladder with the one in our last instalment. Never before have the figures gone up by such leaps and bounds. Some listeners (even those near the top of the Ladder already) have added as many as 80 to their scores.

Now, although the number of different prefixes you happen to have heard is really a matter of supreme unimportance to anyone except yourself, and notwithstanding the fact that many very expert SWL's have never even bothered to count them, these figures *do* serve as a guide to conditions, month by month. We have the same relatively small group of people listening for roughly the same number of hours each month, and their figures on the Ladder must indicate to some degree how things are going on the bands.

Just look at the top three figures on the Phone Ladder: This time last year they were 653, 624 and 597; in January, 1965, they were 665, 648 and 641; by May they had leapt up to 806, 708 and 677 . . . and look at them this month, with the first four all above 700. Congratulations to the two leaders (for the time being!), both in Exeter, who have displaced our Scottish friends who have sat in the top seat for so long.

By the way, seldom has such a howl of anguish been heard as went up when the suggestion was made that the starting figure for the Ladder might be raised from 150 to 200. All those SWL's who had just managed to creep aboard saw themselves being dropped again, and so piteous were some of the letters that we had to relent. However, as a result, the Ladder has become much too long, with roughly 24 new entries this month and only about six deletions of people who failed to report. Next appearance, in the September issue, will be the fatal one under the new ruling—**starting figure 200**. If those who have over 150 *now* can't make the 200 figure in a couple of months, they can't really be trying . . . why, even those with scores of 600 and 700 can find another 50 to add to them in one month, which must be far more difficult.

Many New Faces

All of the following are new readers, to whom we extend a welcome and a hope that they will enjoy short wave listening and become regular correspondents, with notes and news for this column.

David Rollett (Navenby, Lincs.) had logged 89 prefixes by May 17; he realised that the deadline was near, and added another 68 in eight days—shows what can be done if you try! He has an AR-77 and 150ft. wire about 17ft. high.

G. S. Taylor (Wolverhampton) joins the Ladder with 220, although he didn't start logging calls until last November. A Lafayette HE-30 now brings them in; but he is puzzled at hearing G stations giving reports to DX of "S9 plus 40" when, although he can hear the DX, it doesn't even move his S-meter. Reason? Probably the G's concerned are using rotary beams and far more gainy receivers—and it's the beam that makes the most difference. (And maybe their S-meters are optimistic!) [over

HPX LADDER

(Starting January 1, 1960)

Qualifying Score 150

SWL	PREFIXES	SWL	PREFIXES
<i>PHONE ONLY</i>		<i>PHONE ONLY</i>	
T. R. Popham (Exeter)	851	M. Reilly (Birmingham)	256
P. A. Cayless (Exeter)	792	M. Silverstein	
D. Douglas (Dundee)	703	(London, N.W.7)	254
A. W. Neilson (Glasgow)	702	B. Smith (Hexham)	240
L. Margolis (Ilford)	643	C. G. H. Ivermee (Reading)	238
S. Foster (Lincoln)	616	W. J. Angerson (Leeds)	229
D. S. Smith (Stanmore)	572	G. Cowling (Goole)	222
P. Etheridge (Hull)	527	P. D. G. Milloy (Doncaster)	221
R. G. Preston (Norwich)	520	G. S. Taylor	
B. Curnow (Plymouth)	519	(Wolverhampton)	220
A. Huggett (Lamberhurst)	495	B. A. Jones (Worcester)	211
D. Poulter (Morden)	482	D. Nicholls (Bristol)	210
D. Dewar (Morden)	477	W. Moncrieff (Hampton)	210
K. C. Staddon (Stroud)	465	C. Freeman (Nuthall)	209
M. Woollin (Leeds)	461	P. J. Williams (Doncaster)	207
M. Vincent (Cheltenham)	457	K. F. Ballinger (Worcester)	198
P. Baxter (Winchester)	441	W. Smith (West Bromwich)	196
G. Wyllie (Elderslie)	433	A. J. Hayter (Portsmouth)	196
J. E. Hart (Leeds)	432	C. A. McKie (Worcester)	188
P. J. Lennard (Wartling)	431	D. Rogers (Wrexham)	186
M. G. Allen (Heston)	414	S. Shaw (Stockport)	181
I. A. Mackey (Dingwall)	411	D. Griffiths (Ilford)	180
B. Dale (Congleton)	398	A. T. Morton (Millport)	178
A. Dailey (Leeds)	387	R. C. Booth (Stanmore)	177
R. Turlington (Braunstone)	380	S. Hardisty (Accrington)	171
C. Pedder (Ashford, Middx.)	378	Janet I. Martin (Strood)	170
J. P. Fitzgerald		D. Watts (Staines)	170
(Great Missenden)	363	G. Beesley (Worcester)	168
A. Stone (Kidderminster)	352	P. F. Elgar (Woking)	166
A. Parker (Chesham)	340	D. M. Wilson (Roxburgh)	162
M. J. Summers		P. Edwards (Birmingham)	159
(Market Harborough)	339	D. Rollett (Newbury)	157
J. Butler (Bargoed)	310	J. Dixon (Barrow-in-Furness)	156
A. D. Jones (Chertsey)	304	P. Crust (Loughborough)	155
D. C. Parker (Redditch)	303		
M. Hammersley		<i>CW ONLY</i>	
(Newcastle-on-Tyne)	300	B. Curnow (Plymouth)	567
D. H. Foster (Rainham)	297	P. J. Lennard (Wartling)	506
R. Hooper (London, N.16)	296	V. Lindgren (Hull)	489
M. Shaw (Bromley)	292	M. Vincent (Cheltenham)	354
H. M. Graham (Harefield)	290	L. Margolis (Ilford)	323
N. Perry (Farnham)	286	R. de Buis (Felixstowe)	311
G. Christie (Gainsborough)	275	M. Woollin (Leeds)	309
D. E. Fitzgerald (Dublin)	273	P. Etheridge (Hull)	247
B. J. Turner (Westcliff)	271	D. H. Foster (Rainham)	229
A. Papworth (Over)	263	D. Douglas (Dundee)	214
S. W. Edwards (Warwick)	260	F. C. Reid (London, W.7)	172
R. V. Bruce (Norwich)	259		

(NOTE: Listings include only recent claims. Failure to report for two consecutive issues of "SWL" will entail removal from the table. Next list, September, 1965 issue—deadline July 30. And remember that the score to qualify for entry will then be 200 HPX.)

J. Dixon (Barrow-in-Furness) has a Heathkit Mohican and a CR-100 with a 100ft. wire, and has only been interested in SWL for about three months. His favourite band is 20 metres, and he is most interested in reading about what other SWL's are doing and using. He asks whether "VE3CBL/P/SU" signifies that the station is in Egypt—it certainly does. And he says he has heard Americans, in QSO with each other, referring to the "European rabble" . . . only too good a description, unfortunately.

M. Hammersley (Newcastle) joins the Ladder with a score of 300, partly collected on a home-built two-valver and more recently with another home-built TRF job (number of valves not stated). He seems to have a nice location, being 425ft. a.s.l., five miles S.W. of Newcastle.

John Kennedy, Jr. (Galway) wants to thank his "local", EI6W, for starting him off as an SWL (remember what we said last time about "locals"?). John now has an RG-1 with no mods. or accessories, and his main interest is SSB on Twenty and Fifteen. He asks for identifications on ZC4 (Cyprus), 9J2 (Malawi), 9Q1 and 9F6 (the latter two both phoney, or at least unknown to us).

P. Crust (Loughborough) is one of our chair-borne readers, but since his father and his brother put up a long wire for him he has been enjoying the DX on Twenty, and he is also keen on Top Band.

P. D. G. Milloy (Doncaster) writes: "I reckon I am a pretty average SWL, with a CR-100, 70ft. end-fed wire and a single-stage preselector, which has done most of the work in producing these 220 prefixes, because with the CR-100 only, I heard only 18 in six months!" He prefers Fifteen to Twenty, and asks whether MP4B, MP4O, MP4Q, and so on count as different prefixes. Sorry, no—they're all just MP4's, as far as WPX and HPX are concerned; just as VP2A, VP2D, VP2G and so on are all separate countries, but just VP2 for HPX purposes.

Gillies Wylie (Elderslie, Renfrew) says: "I have been an SWL for about three years, and enjoyed every minute of it" (happy chap!). He has an old Q-Max (Q5/10G) general-coverage receiver and likes SSB on Eighty and Twenty, CW on Fifteen. A hint from him—don't bother to send QSL's to DX stations who are working Europe. The returns are very poor. But if you hear two DX stations working each other, things are different—they may be surprised and pleased to know that they were being heard in Europe.

F. C. Reid (London, W.7) runs an R.107 with a home-brew preselector and listens mostly on Twenty and Top Band. He is a welcome recruit to the CW section of the HPX Ladder, which still doesn't seem to be as popular as it should be!

Keith Ballinger (Worcester) is another to come in, introduced by an SWL friend to the local club, through which he obtained his HRO. One of K.B.'s chief interests is mobile and portable operation—and he is very disappointed at QSL returns, except from the National CCF net!

John Roze (Penrith) also has an HRO, and a

two-metre converter, but he has heard nothing on VHF yet and awaits the arrival of a 4-ele. beam. He hopes to join the Ladder soon, but is actually in favour of making the 200 figure the starting mark. He says: "If some can hear nearly 1,000, surely the rest of us ought to get 200?"

So much for the newcomers, who seem to be an exceptionally keen lot. It's interesting to speculate on who and how many of them will have call signs in, say, five years from now.

TVI From Receivers

A recent remark that the HRO was about the only offender as regards TVI has brought in some comments. *Andy Parker (Chesham)* says the Marconi 52 Set "is wonderful" for this, both the third harmonic of 14 mc and the sixth harmonic of 7 mc causing trouble on Channel 1.

S. Shaw (Stockport) says "the HE-30 also fights back! Lovely criss-cross lines revolve round the screen on Channel 2 when mine is tuned to 9.6-9.8 mc. But it's mains-borne and easily cured with a mains filter."

As for TVI in reverse, meaning time-base interference on the HF bands, G3SWH drops a line to say that consultation with the local G.P.O. engineers resulted in the fitting of a resonant mains filter for time-base frequencies (price 4s.) which completely eliminated the trouble — though he adds that it probably wouldn't work if you have very near neighbours with troublesome TV's.

Under Difficulties

John Butler (Bargoed) sends in a list of 60 additional prefixes, but apologises, saying "there are limitations to what one can do with an HE-30 on AM only"—his BFO was out of action! Better news now—it's working again and he's "back to SSB and the lovely DX on Twenty."

David Fitzgerald (Dublin) wonders whether SWL's in England realise how well off they are. He says that component parts are available in EI-land, but at ridiculous prices. For instance, a 6BA6 costs 10s. 6d., compared with 4s. 9d. over here. Surplus receivers are few and far between, and if one tries to import parts the duty is terrific.

Brian Jones (Worcester), on the subject of "locals", says he has met a goodly number in the local club, "where anyone is welcome to come and meet them". And why not? They are (nearly) all normal, friendly human beings, and the SWL who assumes that the transmitting amateurs in his neighbourhood are godlike and unapproachable has only himself to blame.

Likewise, those who imagine that the R.A.E. and Morse test are beyond them should take the advice of *Alan Dailey (Leeds)*: "Start practising CW, obtain the exam. manual and get working." He, too, used to think a chap with a call sign was a kind of superman, with a status he could never achieve. As it is, he hopes before long to be a G3U --, but promises "to keep on reading 'SWL', as long as it exists." Well, thanks!

QRP Reception

Some of those very weak signals that are heard from time to time are more interesting than one might think. Maybe they are not weak because conditions are bad, or because the man at the other end has a poor location, poor aerial or even a poor transmitter. He may be using extremely low power, in which case he would be more than usually glad of a report. *Dave Douglas (Dundee)* says he has a card confirming his reception of DM2AKD, who was using 5 milliwatts at the time—the sort of input you get with 2 volts HT to a transistor Tx! He has also heard Radio “Norfolk Island”, running 10 watts on *medium wave*, to say nothing of Christmas Is., Western Samoa and New Caledonia, all on medium wave.

Stray Remarks

“Surely all SWL’s get QRM-sick at times? One-Sixty locals provide excellent rest from exhausting DX listening, and they also chat very informatively” (*Stephen Shaw, Stockport*) . . . “Hearing all these prefixes isn’t really difficult it’s just a matter of being on at the right time and on the right band . . . I learnt all my radio from scratch two years ago; until then I’d never heard of it” (*Terry Popham, Exeter*).

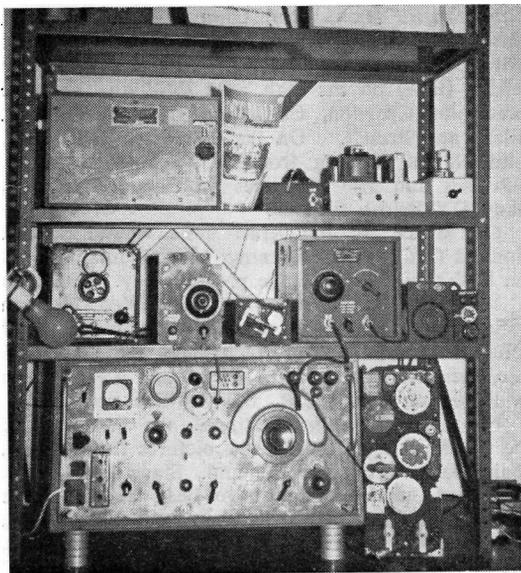
“I would recommend the 19-Set variometer to anyone trying to use a short aerial on Top Band. It will match into anything, including bed-springs!” (*Alan Dailey, Leeds*) . . . “I am absolutely staggered by the top scorers in the HPX Table. They must spend a colossal time at it, for 800 or even 700 seems fantastic to me. I still find it quite interesting when I hear a new country—like a TU2 which I got by merely switching on the receiver on Fifteen, and there he was, spot on” (*H. M. Graham, Herefield*).

“All this preoccupation with ladders and high scores bothers me a bit. I’m not saying that people should not be free to chase new prefixes as they wish, but my view of short-wave listening is that it’s only a hobby, and I refuse to allow it to rule me. There’s nothing better than returning to listening after a break of a week or so” (*John Fitzgerald, Great Missenden*) . . . “Three things account for the increase in my score—general improvement in conditions, numerous DXpeditions, and increased listening time” (*Stewart Foster, Lincoln*).

SWL Contest ?

There are several requests in this month’s mail for an SWL Contest of some sort. *Peter Cayless (Exeter)* suggests that certificates verifying the achievement would be essential; *Peter Williams (Doncaster)* thinks one should be held, if only to

Next appearance of this feature—September, 1965. All correspondence and photographs (of SWL stations and equipment) by July 30, addressed to Editorial Department, Short Wave Magazine, Buckingham, England. Head the letter “SWL”.



The SWL set-up operated by A. P. Stone, at 3 Queen’s Road, St. Annes-on-Sea, Lancs. Though only just 15, he is not going to be an SWL much longer—for Anthony has passed the R.A.E. (his C. & G. certificate for “Subject No. 55” is in the frame at top right) and he will shortly be up for the Morse Test. His favourite bands are 160m. and two metres, and he intends to start on the air with the G3RKK HF-Band Transmitter, as described in “Short Wave Magazine” for June, July and August of last year.

find out how many entries would result, and says we might be surprised (but he doesn’t say in what way !)

Another suggestion common to a number of letters is that an SWL Contest should be timed to coincide with one of the big International DX events, and this seems a good idea. On the other hand, some of the younger readers say that it would not interest them unless it came within the normal school holidays.

The organisers of “SWL” are thinking very seriously about this business, but it’s got to be right, first time. The main trouble is that it’s not practicable to insist on confirmations, for several reasons. Thus there is practically no check on phoney or mis-read callsigns (or even the unlikely event of claims for stations not properly verified). The checking of logs and the decisions to be made over individual entry would be a mammoth task, which would only be worth while if the system evolved was really snag-proof. Patience, please, and we will keep on thinking.

DX/TV Again

The season for DX/TV is with us, and there will probably be much more sporadic-E propagation this year than hitherto. When your normal TV picture behaves in some freakish way not due to faults in the set! then you can bet that the VHF boys and the DX/TV enthusiasts will be having a good time.

[over

F. Smales (Pontefract) covered Band III from March 28 to April 1, and got pictures from Black Hill (Scotland) on Channel B.10, Caldbeck (B.11), and Selkirk (B.13) on the 28th. On the 29th, the same three plus Croydon, Chillerton, Caradon Hill, St. Hilary and Preseli. On the 30th, Lille (819 lines) solid all the evening from 1830; Telefis Eireann, 405 lines and also 625 lines on Channel B.3, and many DX British stations.

On March 31 and April 1 he viewed Smilde, Holland (E.6), all the evening, Lille, Rouen and all the ITV stations logged the previous day. And then all the same lot over again, with West German stations breaking in. At one time he could see four different stations on both Channels E.6 and E.10. Receivers used are a *Bush TV.53 and TV.62*, both modified for 625, CCIR and 819-line reception.

For *Dennis Boniface (Ripon)*, the first opening was on April 19, when he saw pictures from Russia, Spain, Italy, Portugal and Poland. Since then France, Switzerland and Norway have been added to the list. He now has two 3-ele. beams and two dipoles, all fed with low-loss coax, and various receivers, one of which was purchased from the local "Steptoe" for 10s.! He would like to meet or correspond with other "addicts", and his QTH is 11 Holmefield Road, Ripon, Yorks.

More Comments

Alan Dailey (Leeds) has every hope of a G3U -- call by the time he goes to the Channel Is. for his holiday (August) and hopes to hand out some contacts on One-Sixty with a transistor transmitter; he expects to sling a 260ft. wire between a couple of trees to help the signal onwards.

Busy time for *John Hart (Leeds)*: "QRT for 'O' Levels, but when finished I shall be looking for more prefixes, studying for the R.A.E., learning Morse, probably doing some more construction work, and learning the guitar!"

Iain Mackay (Dingwall) says he seems to be unlucky when he listens on Fifteen, where his last good day was April 4, with KR6MB, CR5SP and YA1AW. He gave up Forty in disgust some time back, and now sticks mostly to Twenty for the period 0645-0715 GMT, which is nearly always good for the Pacific.

Wilfred Smith (West Bromwich) joins the Ladder and says that after many months of home-brew he is now using the Eddystone EC-10 with two 100ft. wires. His main problem (like so many of us) is that of *noise*, and he find that at weekends, when amateur-band listening tends to be most rewarding, he also has to cope with the maximum number of domestic appliances and QRM-producers. It's a sad life . . .

R. G. Preston (Norwich) sends in some nice lists of DX heard, especially on Fifteen and Ten. He now runs a full-size 15-metre beam, 30ft. up and complete with rotator, so his results ought to be really good on that band. Once the summer slump is over, Fifteen should be really hopping with DX.

Douglas Watts (Staines) sends in a goodly list of prefixes, all acquired with a "Joystick" at

SWL • • • • •

continued

20ft., an S.640 and a PR-30X preselector . . . *D. S. Smith (Stanmore)* has A-Level QRM, and is moving QTH in October, so is somewhat disorganised. Nevertheless, he recently beat his "personal record" by getting 214 prefixes in two weeks.

Michael Woollin (Leeds) is collecting counties on Two Metres, with the aid of a G3NBQ Converter (as described in SHORT WAVE MAGAZINE for September, 1963). He would like an SWL Contest during the summer holidays, but feels that it should coincide with a major international contest, of which there aren't any more until October!

The Limit?

A. W. Nielson (Glasgow) has been doing some research on the matter of prefixes, and thinks that the possible maximum falls somewhat short of 900 just at present — but that excludes all the /MM variations and the "fancy ones" like VE3/SU and so on. So it would seem that the figure of 1,000 is probably attainable, and there are always new ones coming along. He would like to see a full list of them published. (Phew!) His list of DX logged during the last month is pretty impressive and shows that Glasgow is not all that bad for hearing the stuff—despite his handicap of noise from overhead wires.

Pete Cayless (one of the high scorers from Exeter) says that Terry Popham (the other) has the edge on him with his Minibeam for Ten and Fifteen. He himself uses a whip for these bands, and finds it better than a long wire. There is a growing interest in 4-metre operation around Exeter way, so now the thing is to beg or borrow an RF-27 unit.

Mike Allen (Heston), in the course of a very long letter, says that he finds the bands much as they were last summer, but with Fifteen almost as good as Twenty, though closing earlier; the LF bands are "as noisy as ever". He would like to see the use of place-name phonetics banned, and asks whether a station signing PK1BW is genuine. The answer to the last one—definitely *not*, we should say.

James Brown (Llandaff) spends most of his time on Eighty, and enjoys listening there "even if it is only the G3 --- Net discussing the latest outrage!" And he says "let's not criticise the locals—without them the world of Amateur Radio would have lost *me!*" (His particular local, GW3IDJ, has always been most helpful.)

D. Rogers (Wrexham) is in the nail-biting stage over R.A.E. and Morse, which he is taking in July. We wish him luck. Meanwhile, he encourages fellow-sufferers by saying that there is a hump over which one must get, and this seems to occur at about 10 w.p.m. After that, progress is faster. SWL Rogers is a two-metre enthusiast and followed *Oscar III* for several orbits. But no amateur signals were heard—only the telemetry channel.

Ten-Metre Activity

Several SWL's sent in their receiving logs for May 23, the *Magazine* Ten-Metre Activity Sunday, and those from different parts of the country showed enormous variations. Listeners in southern England logged strings of DL and DM stations; some of those further north remarked on their complete absence.

Taking the general spread, though, German and Italian stations were in the majority, and the other European countries received with great ease were CT, EA, F, OE, OH, OZ, HB, SM, LA, YU and UA.

For the DX we quote individual reports: *Pete Cayless (Exeter)* logged CR6ACB, 9J2DT, VS9ARO, ZC4MO, 5Z4AA, 5H3JJ, ZS9G and 7Q7GS—some on AM and some on SSB. *Martin Harrison (Manchester)* lists 9J2GJ and 9DT, CR6ACB and 6HF, CR7IZ and 7LP, ZE2JA, 5N2KOB and 2JTB, EL2O and 5Z4AA. (Note the difference between those two lists.)

Douglas Watts (Staines) heard much of the

European activity (including 3A2CP) and also VS9ADD. *W. H. Gundill (Dewsbury)* logged the Europeans plus CR6ACB and 9J2GJ. *Chris Sparrow (London, N.W.7)* was especially strong on the DJ's and DL's, and also got 3A2CP, SV1AE, 5Z4AA and ZE1JJ. *Norman Henbrey (Northiam)*, with a similar bunch of Europeans, added ZC4MO, 5X5JK, ZS9G, CR7IZ, ZE2JA, 9J2DT, CR6ACB, ZC4TX, CR6HF, 9J2GJ, 5N2KOB, 5Z4AA, 5H3JJ, 9Q5AI in that order—mostly between 1340 and 1630z.

Further details, for those interested, can be found in "Communication and DX News". Many G's worked the various DX stations available, but, again, one's location made a big difference to what could be raised.

So this concludes another instalment, with a reminder that the next deadline will be **Friday, July 30**. Let us hear from you all again—and don't forget that we have regretfully had to adopt the minimum figure of **200** for the HPX Ladder. Good Hunting, and see you in the September issue.

TOP BAND FROM SIERRA LEONE

RESULTS AND EXPERIENCES SIGNING 9L1HX/9L1TL

From Notes by 9L1HX

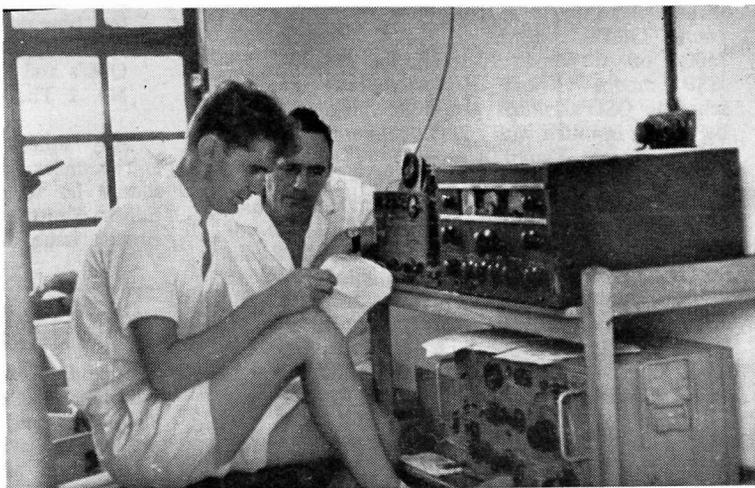
JUST 12 months ago, on 26 July 1964, 9L1HX made a 160-metre QSO with W1BB/1, at the ninth attempt. Encouraging letters from Stew Perry, W1BB, himself and useful operating and general information about Top Band by visiting John Walton, G3PLQ—a radio officer in ships trading to West African ports, and well known for his DX activities on the band—all contributed to make this contact possible.

The notes following outline what has been happening since from Sierra Leone on the 160-metre band. When 9L1TL returned from home leave, the question of a Top Band operating programme for the sunspot-minimum period was discussed. Eventually, permission was obtained from the Director, Posts & Telecommunications, Freetown, for the use of a 140ft. mast at Cortright for the aerial; the shack, near the base of the mast, was a store-room

of the school at Fourah Bay.

Early in December, the aerial was installed, working out to a length of 360ft., and 140ft. high at one end, at a location itself 1,100ft. a.s.l. Since the low end of the aerial sloped towards the north, with all mast and guy wires on the southern side, it was reckoned that the system would give some gain in the general direction of Europe.

Gear used consisted of an ex-Army 76T transmitter working off a mains PSU, modified for Top Band with a 100 $\mu\mu$ F condenser across the PA tuning circuit, and crystal controlled; the crystals had to be etched up from 1700 kc, one coming out at



Station of 9L1HX (right) and 9L1TL for 160-metre working from Freetown, Sierra Leone, where they have excellent facilities even if, in those latitudes, the static level is pretty high for most of the time. The result is that they get out far better than they can receive—in fact, the only reasonably quiet period for static is during the months of January-February. Nevertheless, a number of notable Top Band DX contacts have been made, with six European countries, and VO1BD and W1BB/1 across the Atlantic. The British Isles "Firsts" were EI9J, G3RFS and GW3NAM, achieved during the early part of this season.

1802.8 kc and the other at 1804.2 kc. The receiver was an AR88, and the aerial was resonated against ground using the ATU in the transmitter.

The first QSO was with G3RFS, 339/229 at 0005z on December 6, followed by GW3NAM, G3RAU, G3OLI and G3MYI, in that order. On most contacts, signal level was low both ways, but they were QSO's. The station was operated jointly by 9L1HX and 9L1TL, and either callsign may have been heard or worked.

Out in West Africa, the main difficulty in connection with LF-band working is the very high QRN level. Violent thunderstorms mark the beginning and end of the rainy season, when lightning can be seen flitting across the clouds most nights of the year except in January and February. This will explain why the 9L1 station appeared to be

having receiving difficulty, even though the signal seemed to get out well. As the aerial was only allowed to remain up till the end of March, the 9L1 station at Cortright has now been closed down.

In addition to the W1BB/1 contact last July, the following Top Band "Firsts" were achieved for 9L1, all these QSO's having been made during December 1964: DL7AA, EI9J, G3RFS, GW3NAM, OK1KLX, PAØPN and VO1BD.

All of which shows what can be done when a planned attempt is made, and the right sort of co-operation is forthcoming—in this case by the Director, Posts & Telecommunications, Sierra Leone, in opening the 160-metre band for 9L1 amateur operation and allowing the use of the P.O. mast at Cortright for the aerial, and the authorities of Fourah Bay College in providing accommodation.

SPECIALLY ON THE AIR

Years ago, we started this piece, under the heading of "Special Activity Stations," to accommodate those groups undertaking the responsibility of organising a public appearance locally in the interests of Amateur Radio, or to support some charitable occasion. Inevitably, the idea caught on (like many another thrown out by the *Magazine*). For the coming month we have the following:

GB2YC, July 5-10: Operated by members of the Yeovil Amateur Radio Club (G3CMH is their own callsign) as a contribution to the local Youth Centre Exhibition to introduce young people to the various activities in the district in which they can take part. It is also hoped that this effort will enthuse and encourage adult specialists in various fields to give more time to helping the young. GB2YC will be on the air daily, 0900-2100z, on all bands 10-160m., in the AM/CW/SSB modes. Those interested can arrange schedule QSO's, which would be most welcome, by getting in touch with: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset.

GB3DCL, July 4-11: The Amateur Electronics Section of the Distillers Company Limited, in co-operation with the Hull & District Amateur Radio Society, will operate from Hedon, near Hull, on all bands 160m. to two metres, on AM/CW/SSB, with 100 per cent QSL, the address being: A. Ellis, G3PJR, DCL Sports & Social Club, Industrial Solvents Division, Salt End, Hedon, Nr. Hull, Yorkshire.

GB2LS, July 15-17: For many years, the Liverpool & District Amateur Radio Society have made their appearance at the annual Liverpool Show, which draws a large attendance from the North-West. More than 2,000 contacts the world over have been made under public scrutiny. This year they will be operating on all bands from Top to two metres, in all modes, and every contact will be QSL'd by special card. QTH for skeds or

information: H. James, G3MCN, 448 East Prescott Road, Liverpool, 14.

G3MBL/A, G3MWF/A, July 17: Operating at the Finchley Carnival, Victoria Park, London, N.3, on Top Band and two metres mainly, with some activity on the HF bands. QSL address: A. G. Edwards, G3MBL, 244 Ballards Lane, North Finchley, London, N.12.

GB3MC, July 22-25: In connection with the Malvern College centenary celebration, all bands will be worked from 160m. to 70 centimetres, and contacts will be confirmed by a specially minted QSL card. It is of interest to note that, according to our records, nearly 40 years ago the School had its own callsign, 2MV, entered in the *Call Book* as "Malvern College Wireless Society," and at that time operating on 440 and 180 metres. Getting down to the present operation, the address for QSL's and reports is: G. Shirville, G8AOU, c/o No. 2 The College, Malvern, Worcs.

Any other organisers or Club groups wishing entries under this heading for the next month or two should let us have details by July 19 (addressed Editor, Short Wave Magazine, Buckingham) for the August issue of SHORT WAVE MAGAZINE.

SUMMER EDITION "CALL BOOK"

The U.K. section of the Summer edition of the international *Radio Amateur Call Book* now runs to 36 pages, and is the most up-to-date listing of licensed G's available in print. It includes all QTH's and changes of address as published in our regular "New QTH" feature up to and including the April 1965 issue of SHORT WAVE MAGAZINE, together with the earlier notifications received by us for the May issue. The U.K. amateur-station callsign/addresses appear in what is known as the "DX Listing" section of the *Call Book*, and the price is 27s., post free, of our Publications Dept.

SINGLE-SIDEBAND TRANSMITTER FOR 160 METRES

PHASING FILTER DESIGN, WITH
CONSTRUCTIONAL DETAILS—
MIXER-RF SECTION — SETTING
UP AND ALIGNMENT DETAILS—
33 dB UNWANTED SIDEBAND
SUPPRESSION

E. P. ESSERY (G3KFE)

This will be found a very useful and informative article for those interested in Sideband transmitter design and construction. Our contributor has chosen the simpler phasing-type of filter and shows that it is easy to construct and get going. He explains setting up and alignment procedures fully, rather than describing mechanical construction in detail, since it is thought that readers will want to apply the ideas and methods suggested to their own designs, rather than to attempt an exact copy. Anyone building a unit along these lines, and getting it going successfully, would have little difficulty with much more ambitious equipment for the HF bands.—Editor.

THERE are several possible approaches to the generation of an SSB signal on Top Band, or, indeed, on any other band. These may be summed up as follows:

- (a) Phasing at the operating frequency,
- (b) Phasing at a fixed frequency with subsequent mixing into the desired band, (c) Filtering at a fixed frequency of 50 kc or less, using LC filters, (d) Filtering at about 455 kc, using *Collins* or *Kokusai* mechanical filters, with subsequent mixing into the band, (e) Filtering at a fixed frequency using crystals, (f) Use of the "Third Method."

Method (a) was tried out on the bench, and it was found that the performance on Top Band was unacceptable unless a re-balancing exercise was carried out at every major shift of frequency. This effect is not surprising when one considers the width of the band in terms of a percentage change, rather than as so many kilocycles. In fact, it was found that about 50 kc was the maximum tolerable shift in frequency. Method (f) was discounted on the grounds that it was too complex for a simple one band transmitter.

Of the remainder, the use of crystals was vetoed, for the simple reason that unless a set of crystals is purchased new, one is faced with either sorting through a large flock of surplus specimens to find suitable ones — a procedure that presupposes

possession of a lot of surplus crystals in the desired frequency area; *and* the time and test gear to measure them—or of etching a set of crystals spot-on in frequency. This last process involves the use of dangerous chemicals and with a two-year old in the house and an open door to the shack it was just not on to make a crystal filter in this way.

Filter Problem

The writer has no knowledge of any amateur work on LC filters in the literature, and he therefore advanced his own education by the design, building and testing of an upper sideband filter at a carrier frequency of 50 kc using *Mullard* Type LA2303 cores; these having already had a hard life, were lying in the junk box, in sufficient numbers to make one filter. To achieve the desired performance, a "Q" of around 350 is required, and this resulted in the coils having to be wound in such horrible wires as 120- and 80-strand Litz-type; much bad language was expended in trying to get all the strands soldered to the tag at once. However the measured performance was very good indeed, and a further strip-and-rewind of the cores resulted in a very nice lower sideband filter—so much so, indeed, that there were thoughts of fitting the device in the receiver. It was the end of ideas of an LC-filter transmitter. A mechanical filter was not available in the junk box so no direct comparison is possible, but the performance of the LC filter at 50 kc carrier frequency, correctly terminated, would seem to be a cut above the published crystal filter designs. It should, however be remembered that the LC filter using this sort of core is rather intolerant of excessive input volts; if this is not watched, it will be found that the front end of the filter degrades and performance falls off. The insertion loss of the filters was measured and found to be of the order of 11 dB with the specified "Q" in each coil of a sixteen-section filter. Fig. 2 shows the sort of response that was achieved.

To turn now to the configuration eventually chosen, it will be seen to be method (b) and about the simplest possible form of phasing generator. Consider the circuit of Fig. 1A. Sideband is generated at 1.5 and, as with any phasing rig, the audio phase-shift network is the heart of the thing. In this case it uses the modified SSB network shown in the *Amateur Radio Handbook* and Fig. 1B, the bits being standard values of high-stability resistors and mica capacitors. A certain amount of seriesing and paralleling of components and measurement on a bridge will be enough to get a filter the component parts of which are accurate to rather better than 1 per cent. The high-stability, close tolerance components in Fig. 1B can be replaced if desired by a commercial network such as the B & W 2Q4, which plugs into a valve base. If a bridge is not to hand it is essential to borrow one or buy the required tolerance components as this network *must* be right.

General Design

Having built a good phasing network, the mechanical design of the rig must be such as to ensure the minimum of heat cycling; those who complain that a phasing rig needs perpetual re-

alignment are exaggerating, and most of them would not need so much as they do if their designers had done their homework on heat cycling and how to avoid it. To sum the situation up we must try to keep the network as near to a constant temperature as possible.

In the original bench model, the 1.5 mc signal was generated in an LC oscillator, in fact a high-C Hartley, but a crystal is far better and is shown. Transformers T2 and T3 are similar to each other and are of obscure origin. One of the *Radiospares* replacement types on the market would serve as well in each of these positions. In a similar manner the chokes Ch.1 and Ch.2 are out of the junk box, and it is not remembered which old TV set they came from.

In the "Mark I" version of this transmitter, output was obtained by mixing the 1.5 mc SSB signal with the output of a VFO at a frequency of 300-500 kc to give a sum at 1.8-2.0 mc, and with an output from the VFO at 2.0-2.3 mc to give a sum output for the 80m. band. The scheme came unstuck when it was found that the birdie that appeared when the VFO was tuned across the receiver IF was several dB over S9! This was attended to by putting the VFO up to 3.3-3.5 mc, and using the difference frequency. If it is desired to make the transmitter go on 80m. as well as Top Band then a switch can be fitted and extra capacity put in until the VFO comes down to the desired frequency, this being one of the nicer habits of the chosen circuit. If this is done, however, a careful selection of tuning condenser may be required to ensure enough bandwidth on one band and full coverage of the other with the same coil.

From the mixer the RF is taken to the PA which, in the prototype, is a so-called "miniature 807" the correct designation being 5B/254M, and the PA output is fed through a low-pass filter to an ATU and the G3KFE aerial system.

No precise mechanical details are given as it is not felt that anyone would want to make a Chinese copy of the innards—however a sketch of one possible chassis layout shown at Fig. 3. It may be remarked, for those who are interested in the packaging of components, that such a rig as this offers lots of possibilities, as for example the AF phasing network being put into the STC "Ministac" material. Whatever is done with this part, the main thing to remember is that it is not much sense carefully measuring all the component values in the network and then undoing all the good work by cooking them on a soldering iron, following this up by a drastic heat-cycling action in service due to thoughtlessness at the design stage. The assembly difficulty is dealt with by a heat shunt but the other one is a thing which varies with every different layout so no useful hints can be offered.

The coils for this transmitter were wound up on any old former that was found in the junk box, most of which were far from suitable. It is, therefore, felt to be best if the turns ratio is quoted where applicable, and the frequency coverage, it being left to the reader to make his own decisions, and to

get his coils on to the band with the help of the station receiver and the grid dip oscillator.

At G3KFE, power supplies for the transmitter

C1, C2, C24, C28 = 100 μ F, mica	C27 = 50 μ F max, air-spaced trimmer	R14, R15 = 18,000 ohms
C3, C6 = 4 μ F electrolytic	C33, C36 = 1000 μ F, 1K.V. moulded mica	R16, R17 = 470 ohms
C4, C7 = 25 μ F electrolytic	C38 = 360 μ F max. (nominal) vari-	R20 = 33,000 ohms
C5, C44 = 680 μ F mica	C39 = 1500 μ F, 3-gang able, wide-spaced	R22 = 22 ohms, grid stopper
C8, C9, C10, C12, C19, C30, C32, C34, C35, C37 = 0.1 μ F polystyrene	C40, C42 = 680 μ F \pm 1% silver mica	R23 = 22 ohms anode stopper
C11, C20 = 330 μ F mica	C41, C43 = 430 μ F \pm 1% silver mica (make from 330 μ F \pm 1% and 100 μ F \pm 1% in parallel)	R24 = 487.5K \pm 1%
C13, C14 = 2124 μ F, make from 1800 μ F \pm 1%, 270 μ F \pm 1%, 47 μ F trimmer, all in parallel		R25 = 777K \pm 1%
C15, C16 = 560 μ F mica		R26 = 125K \pm 1%
C17, C18 = VFO trimming capacitors, see text		R27 = 198K \pm 1%
C21, C22 = VFO trimming capacitors, see text		VR1 = 500K log potentiometer
C23, C31 = 300 μ F variable		VR2 = 500-ohm linear potentiometer
C25, C26, C29 = 0.1 μ F (Doublier type 4702A, with 4-in. leads)		VR3, VR4, VR5 = 1,000-ohm linear potentiometer
	R1, R2 = 10,000 ohms	VR6 = 10,000-ohm linear potentiometer
	R3, R4 = 470,000 ohms	T1 = 4:1 Interstage transformer
	R5 = 2,200 ohms	T2, T3 = Output transformers about 45:1 (to be similar)
	R6 = 1 megohm	
	R7, R11, R19 = 1,000 ohms	
	R9, R18 = 100,000 ohms	
	R10 = 220 ohms	
	R12, R13 = 50 ohms \pm 1%	

Fig. 1A, 1B. Circuit of the G3KFE SSB Transmitter

Table of Values

Ch1, Ch2 = 26 mH (ex-TV, width control)	V1 = 12AX7
RF C1 - V2, V4 = 6C4	
RF C10 - V3, V5, V6 = 12AT7	
inclusive = 2.5 mH	V7, V8 = 6CH6
X1 = Crystal 1.5 mc.	V9 = 5B/254M, or 807 Cathodeon

TABLE OF COIL DATA	
L1 - Primary-to-secondary turns ratio 10:1 approximately. Resonant frequency 1.5 mc when connected in circuit and tuned.	
L2 - Bifilar wound, $\frac{1}{2}$ primary-to-secondary turns ratio 4:1. Resonant frequency in circuit to be 1.5 mc when tuned up. Note: Bifilar winding is necessary to ensure the coil is adequately balanced with respect to earth. This may not be found essential in another physical layout.	
L3 - VFO coil, ceramic former, tapped as low down the coil as is consistent with good starting and running of the oscillator. Prototype coil had 8 turns, space wound one wire diameter on 1-in. o.d. former, tapped at 24 turns up, and C21, C22 and C23 adjusted for operation in the desired band.	
L4 - Primary-to-secondary ratio 1:10. Resonant on 1.5 mc with specified circuitry after tuning.	
L5 - To resonate at 1.5 mc when connected in circuit.	
L6 - To resonate in circuit with specified circuitry and C38 rotated to give approximately 250 μ F at mid-band, when the transmitter is loaded into a 75-ohm dummy load.	

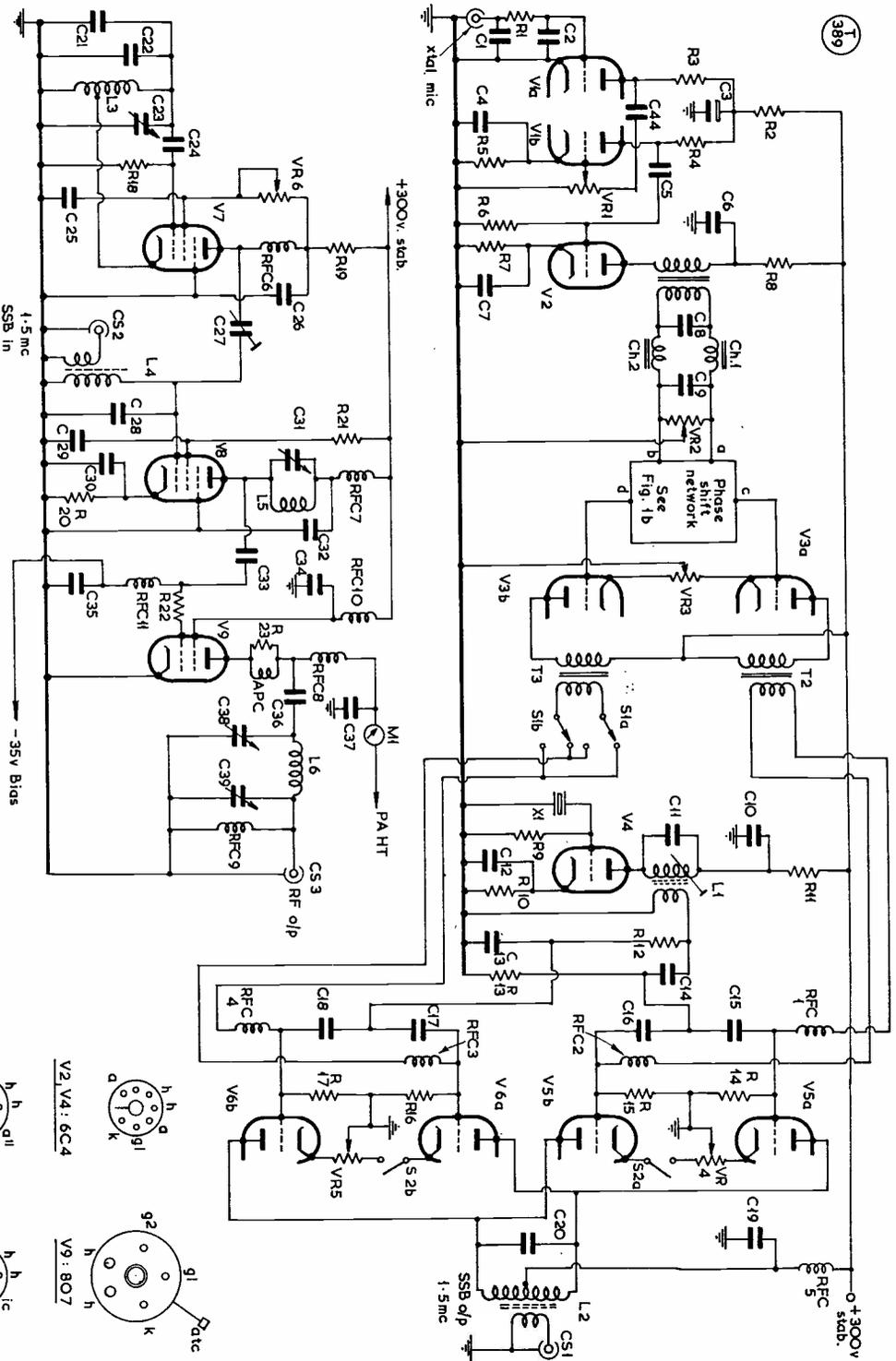
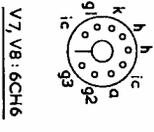
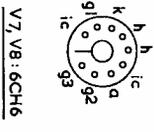
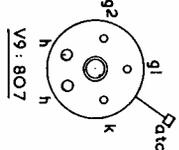
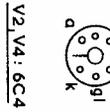
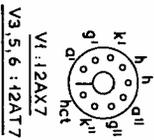


Fig. 1A. Circuit complete of the Single-Sideband Phasing-Type Transmitter for 160m., as described by G3KFE, incorporating many interesting features. The SSB generator portion gives Sideband output at GS1, and the detail of the phase-shift network is shown in Fig. 1B. Though these circuits look complicated, they are easy enough to get going. If taken stage by stage, and a phasing-type of filter can be made to work very well. In this Tx, only one crystal is involved in the grid of V4. If the SSB section, giving output at 1.5 mc, is constructed as a single unit, it follows that by suitable input mixing, the RF side could be made to go on other bands — though as shown here, it is essentially for Top Band operation.



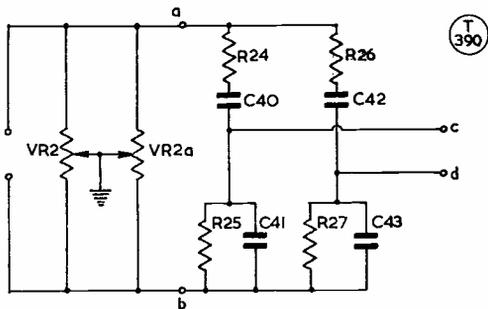


Fig. 1B. The audio phase-shift network for the G3KFE Sideband transmitter. All values are included in the main table, and it should be noted that points a, b, c and d, refer to equivalent points in Fig. 1A. VR2 here is also included in Fig. 1A, while VR2A is a "band-spread" adjustment for VR2.

come from a large stabilised PSU. This transmitter needs a stabilised HT rail if it is to be at all happy, this trait being one of the minor snags inherent in SSB operation. Any of the usual fully-stabilised circuits will do providing the output is enough to drive the transmitter without losing control.

Setting Up

To misquote the old saying, "Any idiot can build an SSB rig—it's the alignment that matters." It is therefore felt that it would help if the alignment process were to be discussed in some detail using on the one hand a method involving the station receiver, and on the other hand the use of an oscilloscope. It is emphasised that none of this is new—it is merely a culling of several British and American sources, rewritten so as to hang together a little more, and modified a bit here and there in the light of experience gained with this and other SSB rigs.

Consider the various controls: "RF Phasing" is achieved by adjustment of the trimmer which forms part of each of the two capacitors C13 and C14; AF phasing is attended to by VR2. The RF balancing is dealt with by the potentiometers in the cathode of the two balanced modulators, i.e. VR4 and VR5, while the AF balance is at VR3, the cathode of the 12AT7, V3. In addition there are the Sideband reverse switches S1A and S1B, and the carrier insertion switches at S2A-B.

The apparatus required is as follows: A sinewave generator of simple type giving output at 1,000 c.p.s.; a selective receiver, either selectable-sideband or with an adjustable crystal filter, like an HRO; and for preference, but not essentially, a 'scope.

The basis of the method using the oscilloscope is to put it to observing the signal at CS1, the Sideband generator output, then align the output end, the mixer, the VFO and the PA stage, in that order. This method is no good if the receiver is the only test instrument available because rather obviously the output from V4 will be audible at all times when the receiver is tuned to its frequency and plugged into CS1. Thus, when using the receiver the procedure is reversed and the PA, mixer, and VFO

are set up first, alignment of the exciter taking place by listening to the final frequency.

Alignment by Oscilloscope

Consider the oscilloscope method of aligning the transmitter: Connect the oscilloscope across the dummy load on CS1 as shown in Fig. 4, turn up the exciter AF gain control VR1 to maximum, and reduce the outboard potentiometer to give zero-AF into the exciter, and adjust the 'scope to show an RF envelope pattern. Close S2 and see if the RF phasing and balance controls can be made to reduce the carrier level. At the same time check that the RF balance controls are near the centre of their travel and that they have the same "feel" about their operation. The RF phasing trimmers should be checked to ensure they are not on their end-stops in either direction.

If it should be found that the RF balance controls have different behaviour patterns, the one that falls well off centre will usually be found to be connected to a faulty balanced modulator. If the leads from the RF phase shift network to the balanced modulators are reversed, the fault will either "stay put" or shift over to the other control. If the former, the culprit is the BM; if the latter the RF phasing network, as a rule.

Now turn to the input to the AF network and adjust VR2 to have the ratio 2:7, i.e. if the pot. is truly 500 ohms, the arms will be respectively 110 and 390 ohms. Set the outboard AF gain control to inject a small amount of audio and observe the output of one sideband, say the upper. The pattern on the trace will show an envelope with some ripple on

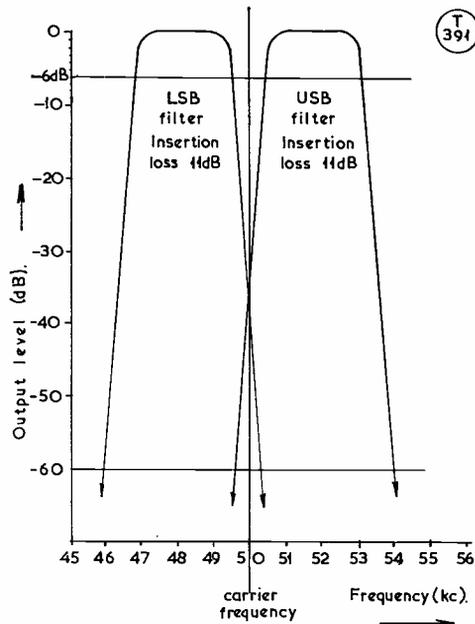


Fig. 2. The filter response obtainable using "Vinkors"—see text.

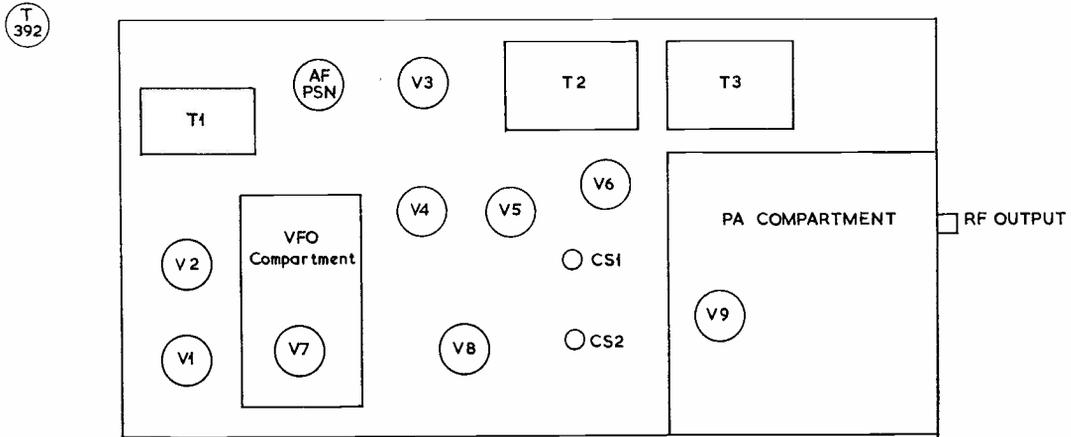


Fig. 3. Suggested chassis layout for the G3KFE Sideband Transmitter for 160 metres. Provided that the proper precautions are taken, by screening, to avoid unwanted interactions, a wide variety of constructional forms is possible. As stated in the article, the circuit also lends itself to miniaturisation.

it. The ripple is now reduced by adjustment of the RF phasing and the AF balancing, a little touch on the RF balancing control also being acceptable. When the ripple seems to be down to an acceptable amount, reverse the Sideband switch and repeat the whole exercise. This is most important, as it is essential to find the position that gives the most acceptable result on *both* sidebands even if it is not intended to use both—the reason is that if only one frequency and one sideband is checked a condition can and, by reference to Murphy's Law, surely will arise where one has achieved fine attenuation of one frequency of audio on one sideband but no others on either sideband, due to one of the networks being in wrong adjustment. The remedy is to repeat the test with a different set of conditions and of course this is achieved by the switch to the other sideband. If the original adjustment to VR2 was accurate it should be possible to reduce the ripple to about 3 per cent, which equates to about 30 dB suppression. But at this stage a ripple of 5 per cent or 20 dB will serve.

The PA Stage

Attention may now be turned to the output end of the transmitter, the VFO being persuaded to cover

the desired range, CS1 and CS2 being joined with a short length of coax and the mixer checked for correct operation, with the drive into the PA grid at alignment is tried check for stability, neutralise if maximum by adjustment of C27. Now for the PA. In the first place it *must* be absolutely *stable*. Before any necessary, and ensure that the anode and the grid but not the screen are fitted with stoppers.

If the old type of 807 is in use it might be well to try different ones, as there are large variations in the self-resonant frequencies; the more modern type specified is far more reasonable and can usually be relied upon to behave.

Only when the PA is felt to be completely tame is it time to carry out a two-tone test, as follows: Inject some AF as before, and then disable one of the balanced modulator audio inputs in some way, such as a short from one anode of V3 to the HT rail. Adjust the amplitude of the AF from the outboard potentiometer to get the desired drive. Another method, applicable also to filter-type exciters, is to turn up the carrier insertion until a suitable amplitude is seen, and then adjust the audio until the trace looks like the 100 per cent modulation picture you drew for the R.A.E. paper. The first

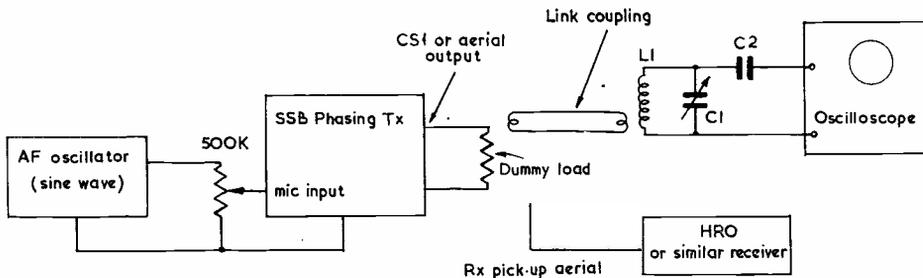


Fig. 4. The equipment layout for testing and setting up the G3KFE Sideband transmitter, as discussed in the text. The couplings are arranged to avoid overload into the scope and the monitor receiver. Since the oscilloscope input is tuned — by L1, C1, with C2 as a 100 μF isolating condenser — only the lightest coupling is required. The picture presentation to be expected is shown in Fig. 5.

method enables the use of the double-trapezoid pattern shown at Fig. 5 which, in the writer's view, is preferable to the normal patterns also shown in the same figure; all that is required with the trapezoid is to see the sides of the triangle are straight. To obtain the double-trapezoid pattern you only need to connect the oscilloscope horizontal plates to the audio (picked up preferably at the input to the remaining balanced modulator) instead of to the time-base. Whichever test is used the patterns shown in Fig. 5 apply, and the tests to obtain them should be carried out on the dummy load using the 'scope as described. If a set of adjustments is found in which the PA is taking the correct input as defined by the G.P.O. (see later) and is producing the correct pattern with no grid current appearing in the PA, then the readings can be noted and the transmitter loaded to the same input on the aerial.

Setting Up by Rx

If no 'scope is available, the process to be adopted is very much the same, except that the PA *must* be dealt with first, and monitored, to ensure that *no* grid current flows at any time, and that it is utterly stable. Dummy load tests can then be carried out to ensure a clean signal and fully to align the transmitter, listening on the final output frequency. The method of using the receiver is to switch in the crystal gate to maximum selectivity, tune the receiver to the undesired sideband, and then carefully notch out the *wanted* sideband. The receiver must be receiving a low level of signal, to avoid any suspicion of overload, and no component of the signal should be as high as S9. This is very important if one is not to be misled, and it could mean shorting out the input, pulling out the first RF valve in the receiver, listening to the image or some similar trick to get a fair sample of the signal. Alignment is then carried out by listening to the unwanted sideband and adjusting to reduce it to a minimum, checking on both sideband switch positions as before, and using the S-meter as the basis for comparison.

Such a method of alignment is OK as far as seeing an acceptable signal is concerned, but it must be emphasised that it is unlikely to achieve the maximum undistorted power of which the PA is capable; this is not really important on Top Band but it points the need for an oscilloscope with an HF-band linear if the best results are to be obtained.

Alignment as above with either the 'scope or the receiver will enable an acceptable result to be put out. However, some more suppression may be gained if the receiver is used as suggested and a series of tests run, carrying out the alignment procedure on the exciter only, leaving the PA at its existing settings. At each test a slight arbitrary change is made to the setting of VR2 as previously adjusted, the exciter realigned, and notes made of the improvement in performance. The final setting so found for VR2 will be found extremely critical. To make the adjustment of VR2 easier, in the prototype a second potentiometer (labelled VR2A

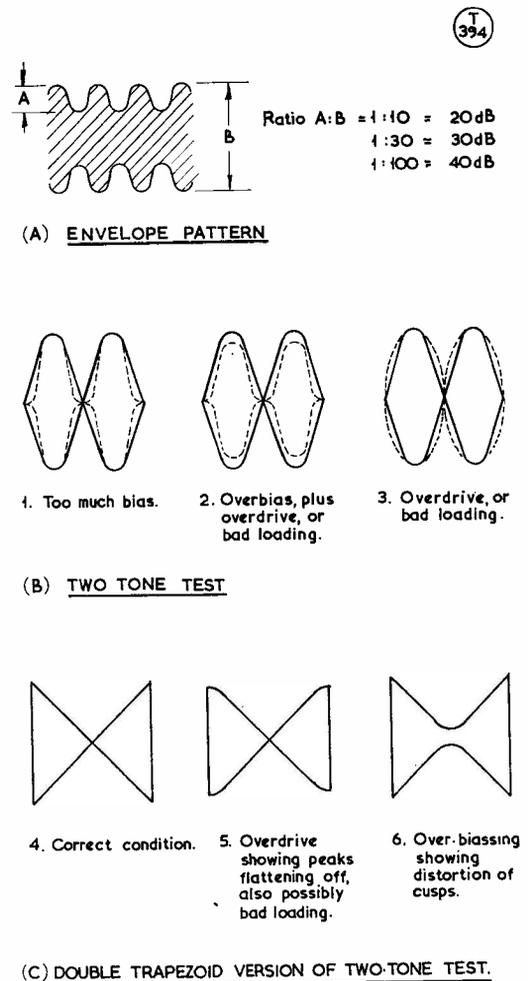


Fig. 5. Response patterns as likely to be seen on a 'scope, taken at the transmitter output, using the test set-up shown in Fig. 4 — and see text. If the outline is fuzzy, there are probably, VHF parasitic effects present somewhere in the circuit. If there is frequency instability, the trace will show a "hole" effect, as explained in the article.

in Fig. 1B and wired as shown, of value about 500K) was fitted and used as a sort of "bandspread" control.

Power Control

After finding a best position for all the suppression adjustments, the Tx was put on to the aerial for tests—and it was suddenly realised that in order to run the thing legally in accordance with the terms of the licence, it is necessary to use an oscilloscope. The authorities are quite firm in their statement and for the record it is repeated here:

"The peak RF power input from an A3A transmitter shall not exceed that obtained

from the A3 transmitter working at an overall efficiency of 66 per cent. The power shall be measured by the following process :

- (1) Apply a pure sinusoidal tone to the transmitter, and adjust the input to 150 watts DC (this means 10 watts on Top Band); the deflection on a cathode ray tube by the RF envelope shall be measured. (DC input power is the total DC input to the anode circuit of the valve(s) energising the aerial.)
- (2) Replace the tone by speech ; the maximum deflection on the cathode ray tube showing the RF output caused by the peaks of speech shall not be greater than twice the previously measured deflection for the tone input."

So there it is. The only thing to do is to borrow a 'scope, make the needful measurements, note all the meter readings for future reference—

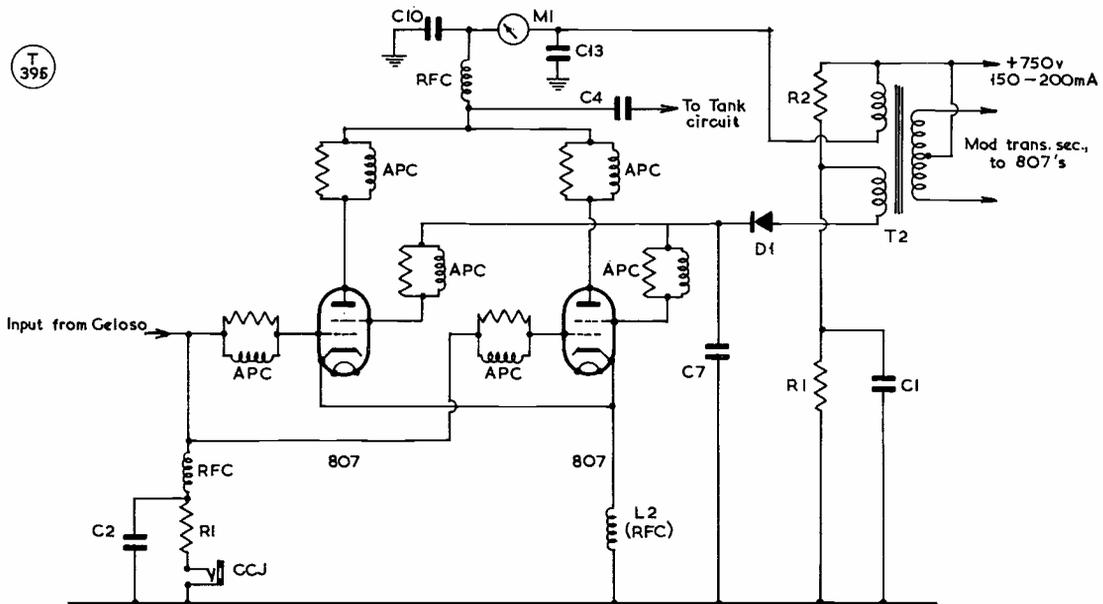
and be sure you can arrange to borrow the 'scope again if you get an inspection visit.

Results

Now, as to the results achieved. The transmitter has not had a serious air-testing, and in any case such results might be misleading as G3KFE is fortunate in having a rather good aerial. on Top Band. Much more convincing are the bench tests. The RF output was all that was asked for and the signal was of good quality, with better than 33 dB of unwanted sideband suppression, and the carrier a trifle lower, after alignment using the receiver only. Spurious outputs off the main frequency were considered to be negligible. The audio noises produced in a receiver were of quite nice quality, and the original survived a 24-hour soak test without either protest or explosion.

It is unlikely that this transmitter will be copied exactly but it is hoped that this account of the trials of a constructional "bonehead" in getting his first essay at Single Sideband going will at least encourage a few more stations to join those coming on 160 metres with SSB.

"Short Wave Magazine" is independent and unsubsidised and has a World-Wide Circulation to the Radio Amateurs of more than 75 Countries.



In the May issue of "Short Wave Magazine," G3SZC discussed modification of his original Vanguard transmitter. This has since been further altered, to give improved performance on phone. All numbered elements are as shown previously — this circuit should be read with that on p.157, May, so that the alterations are quite clear — and values for this latest modification are : C1, 32 μF, 450v.; C13, .001 μF, 2.5 kV; R1, 50K, rated 30 watts; R2, 40K, 30w. D1 is a Mullard BY100 diode in the PA screen lead, which gives marked improvement. CCJ is a close-circuit jack for separate grid-current metering; it could be replaced by a permanent 0-10 mA meter. This part of the wiring, in comparison with the arrangement shown in May, has been considerably altered. Note also the modified cathode circuit.

COMMUNICATION and DX NEWS

L. H. Thomas (G6QB)

FROM the writer's point of view, this feature has become much more interesting since its DX aspect was moved into second place. More views on more subjects are forthcoming every month. Nice little controversies blow up from time to time. Grievances are aired and pet hates ventilated. But we *still* would like to know a little more about the gear being used by correspondents — including aerials, of course.

This subject has a great fascination for most readers, and one of the strongest incentives to improve one's own station is to hear about what others are doing. So strong is it, in fact, that there have been cases of perfectly good and efficient stations being almost scrapped because old G3 --- has done so much better with his 60 watts and a Quad . . . and so on.

Ah, well—the rebuilding of stations and the re-erecting of aerials is a wonderful occupation when mere communication (including DX) begins to pall. And after that, the mere awareness that there's a new aerial up there, and some new gear in the shack, is the strongest compulsion of all to get back on the air and see what happens.

There are many, many days when a completely honest amateur, after listening around the bands for half an hour, will shake himself free of their hypnotic effect, say to himself "What a ghastly waste of time" and pull the big switch (your conductor does this about three times a day, but is so weak-minded that he always goes back again after an hour or so). These are the times when something worthwhile could be done around the place.

This leads, naturally, to another subject: How many of the people one hears on the air at any given moment are just consciously wasting time (and air-space) because they simply can't think of anything better to do? A few of the phone stations who have been

observed preaching twenty-minute sermons convince us that they are deliberately padding out their remarks in order to fill time, and that there is some hidden objection to flicking that change-over switch and listening to someone else. This is possibly one of the main causes of QRM on certain bands.

The Ten-Metre Activity Sunday

On May 23 the 28 mc band really did come to life, and the response to the invitation to all and sundry to "come on and use the band" was greater than one could possibly have hoped for. So much gen. has come in, since then, that if printed in full it would take up an entire issue of the *Magazine*. So extreme compression has been necessary, and please don't feel hurt if your long letter has been cut to a couple of lines or so.

First, the reports direct from overseas. 5Z4AA (Mombasa) made 27 U.K. contacts (two of them with mobiles) and 17 other European QSO's, and he says that the band really opened at 1430 and closed around 1800z.

9J2DT (Kasama) found conditions for Europe were good for most of the day, and heard about 25 countries—all European except for 9M4LP, KR6BQ and a VS9. He worked GC (Guernsey) for the first time, also 3A2, together with 19 G's and many Europeans.

9J2GJ (Kitwe) made 29 contacts (14 G's, but not more than 3 from any other country), but didn't think conditions were too good; all his QSO's except three were on CW, whereas 9J2DT was mostly on Phone.

9M4LP (Singapore) found the times unsuitable for Europe, but despite this he managed to work GI3IVJ (his only U.K. contact), a UV3, a UB5 and an OK1. His other QSO's were with JA, KR6 and a 9M2. Bob says "considering that I didn't hear a single European station on Ten during

1962, '63 or '64, we can say that things are looking up these days."

IIIT (Florence) was on throughout the day, and says he has been using the band consistently since 1935. DX didn't start for him until 1407, when he worked CR6ACB, ZS9G and CR6HF.

Most of the contacts made by G stations were, of course, with Europe, and the short-skip was very erratic, with different countries predominating in different parts of the British Isles. There was no lack of CW, and it is estimated that well over 200 U.K. stations took part for at least some of the time. The European contacts from the British Isles were so numerous that we will not even try to list them, but will stick to the DX—although this was not intended as any kind of DX contest.

G2DC (Ringwood), working both CW and AM, did outstandingly well with CR6ACB, CR7IZ, ZS9G, 5Z4AA, 5X5JK, 5H3JJ, 9J2DT, 9J2GJ and 9Q5AB. He found the DX easier to work than the G stations, although he wants to put his "counties" score up a bit.

G3CAZ (Burnham) raised most of his DX on SSB—EL20, VS9ADD, 5H3JJ, 5N2JEV, 5Z4AA and 4AQ, 9J2FK and 3A2CP. On AM he worked 9J2DT and many Europeans. His comment—the signals were going up and down like a yo-yo at times.

G5FI (London), exclusively on Phone, began fetching in the DX at 1320 with VS9ADD, followed by 5N2JEB, 5X5AU, EL20, 5Z4AQ and 5Z4AA. His TH-4 beam was lying flat on the roof at the time, owing to rotator trouble!

G3RFH (ex-VP8HF) put in a lot of listening time and heard most of the DX already mentioned. He makes the common complaint that several AM carriers were heard, but impossible to resolve. The SSB gave no trouble at all.

G3IDG (Basingstoke) heard

CR4AE and ZC4GB (whom few others mention) along with the other DX . . . G3OHP (Rochester) had quite a field day on his own, and worked practically all the available DX on either SSB or CW. He was interested to find, when working PAØQE, that signals were only audible when both stations were beaming SE (back-scatter?) . . . G5AO (Hove) heard a load of Europeans plus CR7IZ and a station he quotes as 9M2GJ (but we feel sure that this is meant to be 9J2GJ).

G3KMA describes himself as "an exile in Persia" and sends his log from Central Tehran. Surprisingly, he heard no European stations at all, and his loudest station was 9M4LP at 599, calling CQ after CQ but getting no replies. Other DX heard in Tehran—9J2GJ, CR7IZ and a bunch of VS9's . . . also DM3IGY, the commercial beacon on the band edge, but not a sniff of any DL amateurs.

Others who report plenty of activity, almost entirely from Europe, are G3UBI (Halifax), G3OZT (Southampton), G3RJB (Hereford), G2VV (Sunbury), G3LZZ (Shipley), G2HLU (Reading) and SWL's D. Heaton, E. Paterson, W. C. Torode and A. D. Jones, all of whose logs arrived too late for inclusion in their own feature—in this issue. Don't overlook the latter—there is some interesting gen. therein on the Activity Sunday from the SWL's point of view.

Finally, a hard-luck story: G3SGH (Ashford) had the rig all ready and "rarin' to go," but at 9 a.m. on the fateful morning he found himself fighting a fire at Dover (he's a sub-officer in the Kent Fire Brigade). He asks "When's the next one?" News of that shortly, and it will probably be in October, with a completely different set of conditions.

More Noises Off

The "battle of the pylons" continues unabated, and there isn't really the space to spare for doing it justice. However—a long and useful letter from SWL H. A. J. Gray (East Dereham) shows that persistence pays. He had the usual reply from his local Telephone Manager—if he would pay

for an investigation they would do it—but he didn't swallow that one and eventually got satisfaction. Since then a telephone message from him has produced results once again. The first fault was traced to an arcing T-junction, the second to a bad insulator. (But he is *still* suffering from bad noise, and there's obviously another one to be traced.) His fight, so far, has lasted for 3½ years and has included a letter to the Prime Minister! One can only hope that his efforts will eventually be successful.

G3RTW (Bromsgrove) is another sufferer who has really got down to it. The correspondence he encloses shows that his teeth are good and that he never intends to let go! And, an important point—he has been careful to stress the interference-to-television angle all the time. Latest news is that "things are beginning to move"—after six months! Never give up—that's the main thing.

Maritime Mobile

VP8IH, who is now licensed in this country as G3UFUX, will be

doing another tour in the Antarctic next winter, resuming his operations with VP8IH/MM. Once he is there he will be able to use Twenty and Fifteen (mostly AM, but will go on CW if conditions are poor), but on the way down it will be Ten metres only—unless there is anything in the rumour that the G/MM licence may be extended to cover the other bands. Skeds can be made *via* G3UFUX, 32 Viking Way, Horndean, Portsmouth.

Better in VK-Land

Those who suffer from the universal complaint—the swamping of the DX bands by the various Aboriginal types of signal emanating from Europe—might seriously consider emigration after hearing about G3KSL, who is now VK5GQ. Writing back to his old club (Medway) he says "It is enjoyable out here being able to listen over the bands without being swamped out by QRM all the time. One can hear, particularly on Twenty metres, only the *big* signals out of Europe. All that guffaw, snap, crackle and pop which one hears in G-land has disappeared."

[over

FIVE-BAND DX TABLE

Station	14 mc	21 mc	28 mc	3.5 mc	7 mc	Countries Worked
GW3AHN	323	297	151	21	71	333
G3DO	316	223	183	83	86	322
G2DC	307	280	169	112	166	321
G13VJ	306	259	175.	83	101	316
G6QB	284	195	143	56	117	310
G3NOF	258	190	132	39	32	280
G3KMQ	208	90	3	54	95	233
G3IGW	150	128	123	67	113	189
G3PEK	142	88	18	75	119	175
G3FTQ	118	91	46	27	58	144
G3RJB	111	19	7	1	46	118
GM3RFR	56	49	6	10	13	81
G3IDG	53	66	57	17	27	95
G3UBI	53	14	5	21	3	67
G3MDW	46	41	43	6	7	81
G3TJD	44	36	0	18	47	94
G3PLQ	34	15	1	20	6	76

Ah, what bliss . . . does one really have to go 10,000 miles to enjoy it?

QRPP

Last month's query—"Where have all the Ttx's gone?" brought back a letter from G3AM (Barnstaple), some of whose exploits could only be described as "QRPP." On a QSO with G3JOI in London, with a 579 report on 300 milliwatts, he reduced the PA voltage to 6 volts, then 4 and eventually 2—yes, two volts! Still "579" with 35 milliwatts input!

G3AM is fascinated by the things you can find out with low power and a good field-strength indicator. For instance, earthing the outer of the coax lead to a TV receiver increases field-strength, but plugging the TV set into the mains reduces it considerably.

Since his original contact with VE1ZZ on 80 metres (on the Ttx, of course) G3AM has worked him again (449) and also has worked W1IZY. Incidentally, the G.P.O. have made it clear to him that they consider it illegal to sign G3AM/TTX, but it's apparently OK to sign G3AM (pause) TTX—to make clear that it is not a suffix. The same, by the way, applies to F.O.C. members.

General Chat

G3PLL (ex-GI3PLL) will be in Gibraltar on a tour of duty by the time this is published. He hopes to be active with SSB on the DX bands. Another source of signals from ZB2 is G3JFF, who is now there. His own call is ZB2AM, but he has been operating the club station ZB2A already.

G3POB is now 9H1AB (Msida, Malta) and says that activity on the island has been boosted by the new prefix, which is in great demand by aspirants to WPX and the like. The Malta Amateur Radio Society is being revived and re-organised, with a weekly newsletter and a local net on Sunday mornings. Mobile and field day activity is being staged, and if things keep going as they are, it will become a pretty active spot. (We certainly confirm that there is more activity from 9H1 than there ever seemed to be from ZB1.)

G3IDG confesses to being a "square," on the grounds that if one runs low power, likes talking to *anyone* regardless of whether DX or not, especially on CW, uses a straight key and can only manage 66ft. of wire, one becomes quite ordinary, pretty old-fashioned or positively cuboid! (Arabackle—see last month—has enrolled him as a Brother Square, until such time as he acquires a full-size vertical for Top Band, an *Oscar III* vocabulary and a private DX news service.)

One of our SWL readers, John Fitzgerald (Great Missenden) says he finds the DX information useful but much prefers the comments of our transmitting readers. However—"One might gather that it was impossible to have a contact on the HF bands without being obliterated by illegal 2 kW linears, or deluged with dozens of breakers." Well, at certain times of day and certain seasons, that's just about true! But there are compensations . . . by changing operating times and by switching bands, one can nearly always do *something* interesting. And our SWL friend adds "Can't really see where G3RZH got his idea that *you* encourage the DX frenzy. Surely the change of emphasis from lists of DX worked to readers' views and news has discouraged the above mentality?" (Well, we hope so, anyway.)

G3RZH himself returns to the fray, to say that the mere fact that we admit to knowledge of the rat-race without wholeheartedly condemning it must be construed as "cautious apathy." Ah, well—we can't win, it seems. G3IDG comes to our assistance and says that anyone who has been a reader of this feature must surely realise by now exactly what was pointed out last month. On the subject of excess power, he comes to the defence of the 807 owners on One-Sixty, pointing out that the valve is cheap and plentiful, running equally well at 10 or 60 watts and thus making an ideal PA for all-band rigs. And here

TEN-METRE ACTIVITY TABLE

(Starting Date, June 1st, 1964)

Station	U.K. Counties Worked	Countries Worked
9J2DT	32	113
G3OAD	20	39
G2CDI	19	31
G3HCU	13	19
G3OHP	9	43
G3EHL	8	9
G3IDG	4	16
G2DC	2	14
G3SQX	2	2

we agree, of course—we're not blaming the poor old 807 but only the types who have to use *any* valve they get hold of at full rating. And one's faith in human nature certainly doesn't go along as far as seeing 813's running at 10 watts!

G2DC, checking up on commercial intruders on 14 mc, ran across a really blatant case of someone establishing himself on 14235 kc by sending at about 30 w.p.m. on tape over a period of *six hours*, during which he sent nothing but the figures 1 to 10 and the "quick brown fox" business. But before each tape transmission he called "CQ de FDX" three times. So this *could* be a French commercial, but could just as easily be a pirate station of some kind. A pest, anyway.

News from Overseas

9J2DT (Kasama) tells us that he has worked 102 countries *this year* on Ten metres; to say nothing of 100 on Fifteen and 100 on Twenty. He asks whether he can join the Five-Band Table under all his combined calls, or only his VQ2/9J2 . . . the latter is the idea.

5Z4AA (Mombasa) reports wonderful conditions on all DX bands on May 31, when he worked SSB with G3PCI on Ten, Fifteen,

Reporting the HF Bands



Station 9M2SR is run by the Gurkha Signals Club, Seremban, Malaya, for which they now have a shack air-conditioned to about 70°F, against 98°F or so outside! Their equipment consists of a K.W. Viceroy transmitter, a KW-77 for receiver, and the aerial is a three-element wide-spaced beam for 20 metres, complete with CDR rotator and remote indication. 9M2SR is on SSB or CW daily from 1200z, and round the clock over weekends. Their QSL address is: 17 Gurkha Signal Regt., c/o G.P.O., Seremban, Malaya, and the rule is to confirm all contacts.

Twenty and Forty in the nineteen minutes between 1725 and 1744 GMT. Best times for Ten, he says, are usually 1600-1800; Forty opens up around 1745. But these times will probably be all wrong for July.

WA2WOR (New York) is mostly on Twenty SSB and CW, but spends more and more time on the key because of the activities of the "break-break" boys. He makes special mention of the "smashing signal" that MP4BCC puts into New York City on Twenty SSB.

W6AM (Long Beach) has put in his DXCC claim for 338 (Phone and CW) and 333 (Phone Only). Without the "deleted" countries the figures are 313 and 306 . . . and on Phone he still needs Mali, Heard Is. and Albania. (If it were at all possible to mount a DX-pedition to Albania, we could be sure of the biggest pile-up of all time . . . even the very top DX'ers in the States mostly "need" it still.)

"CQ" Worldwide Contest, 1964 (CW)

The results of the CW half of last year's CQ Contest produced the usual very small entry from the U.K., with nothing at all from GM or GW. (W1WY says "This is an all-time low. Can't understand it—we do give an attractive certificate.")

The only G station to appear in the credit table is G3HCT, who heads the continent of Europe with his single-band score of 35,773 on 21 mc. (On the same band ZS6IW heads Africa with 405,460, which shows, among other things, how conditions vary throughout the world.)

On other bands the best scorers from the U.K. were G2DC (148,176) and G8FC (127,565)—both all-band entries; G3FKM (110,635 on 14 mc); G3HDA (43,368 on 7 mc); and G3RAU (1660 on 1.8 mc).

The top three scorers in the world for the All-Band, Single-

Operator class were PY4OD, UB5CI and W3GRF, all over the half-million mark. In the Multi-Operator, Single-Transmitter category YV9AA and UA9DN both scored over one million. And in the Multi-Operator, Multi-Transmitter bracket there were three scores over the million figure, with K2GL, the leader, making the highest score in the world for any category—1,826,046.

The highest scores from Europe, spread around the various categories, came from UB5CI and 5FJ, DJ3JZ, DJ2BW, IT1TAI, M1ZG (3.5 mc) and OK1ZC (1.8 mc).

CQ received 1305 logs from 110 countries and sent out certificates to 387 stations. (Twenty-four logs from the U.K.)

Once more we must try to impress on our friends in the U.S.A. that the probable reason for this small number of entries is the fact that contacts with the same continent are still allowed to count for points, and that many

of the Europeans pile up high scores largely by working masses and masses of other Europeans.

The average G station to enter does so for fun—which is to say in the hope of working plenty of DX while there is so much activity on all bands. What he is *not* interested in is the working of hundreds of Europeans and the writing up of scores of pages of log . . . but he simply *must* do that to have any hope of making a really high score.

Not only that—the mere fact of inter-European contacts counting for points implies that there will be the most terrific European QRM, on all bands, throughout the whole contest. If the score were made up only from contacts with other continents, some of the Europeans would have to do some listening instead of making continuous CQ calls at a frantic rate. These remarks do not apply to all European stations, of course; those who made really high scores worked the real DX and were fine operators—they *had* to be. But a vast number of real lids, who can't even hear the DX and certainly couldn't contact it through QRM, keep their stations on the air continuously and make things impossible for others.

We might hazard a guess that several hundred U.K. stations come on each year for the contest, but pick their hours and work what DX is available, without the slightest idea of working for 48 hours and then spending a week writing up the log—are we right?

Around the Bands

Nothing exactly sensational on the bands of late, and the normal summer slump in conditions seems to have put us back roughly where we were at this time last year. Twenty, during the middle hours of daylight, has been especially disappointing, its interesting periods being mostly very early or very late. However . . . plenty of DX has been reported.

GM3JDR (Twenty SSB) worked mostly the Far East, including AC4H and HS1HS; on Twenty CW a long list includes AC1H, 3H and 4H, HI8, HM5BF, HS1FJ, JA's, KH6's, TN8AF, VP4LF, YS1RFE, ZD7IP, 7Q7RM and 9M2AN. He also mentions such

phoneys as ZM7AA, a VK5 at S9 plus, and ZA1GK.

G3NOF reports little on Ten except the occasional 9G1, 9J2, CR6 and the like; a lot of short-skip on Fifteen, but with the W's coming in on occasions until 2300. But he worked SSB with KP4CMD, VP2SM and VP7CC. On Twenty, short-skip again a menace, but early-morning conditions to the Pacific pretty good. Best SSB contacts were with AC4H, DU9FB, HZ1BB, LA8FI/P, VU2ITU, W2Z1A/ZK1, ZD8PI, ZL3VB and 9M2KW/M.

G3SML (Leicester) did pretty well on Fifteen AM, and from his long list we select CE4FH and 4HL, CX2CN, HC1EL, OA4PH, PJ2AQ and 3AW, VP2GW, VP2LA, VP4DS and 4LE, ZP5EC, 5X5JK, 6Y5EM and several more, mostly in Africa. (Incidentally, he gently jogs us for referring to the latter stations as "a bunch of Africans"—liable to be misunderstood, though written in all innocence. And we do realise how sensitive the feelings can be in some areas.)

GW6YQ (Prestatyn) is doing some amazing DX with an indoor dipole only about twenty feet above ground level—it isn't even in the roof or a loft. Using his old and trusted rig he has been raising stuff like KM6DJ, many KH6's, AC1H and AC4H, ZL3VB (Chatham Is.) and many more Pacific stations. This indoor dipole, of bell-wire draped across two rooms and a landing, was put up as a quick alternative to a dummy load, but results were so amazing that GW6YQ hasn't bothered with an outside wire!

GW6AHN (Cardiff) booked in his usual collection of DX on Twenty and Fifteen, and reached his goal of 300 countries on SSB. The Pacific and Far East accounted for most of his SSB on Twenty this month. He protests about that "amateur" station UA3KAA/UA3KAB which sits on 14100 kc for long periods, churning out five-letter and five-figure groups and causing a lot of interference (obviously using very high power). There are enough commercial intruders without adding "amateur-commercial" stations to them (this one is the

official station of the Radio Club of Moscow).

G3IDG heard 28 countries on 10 metres during the month, 26 of them on CW—a big improvement on last year . . . and a few others, whose main purpose was to report on the activity Sunday, have also commented that since then the band has been rather better populated than before, despite the fact that conditions are still not good.

G2DC recommends early rising—say, 0500 GMT or so—if you want peace and quiet on Twenty. Most of the DX is W6 and W7 at first, then the KH6's take over, but you never know when the "rare" ones will show up. He worked VR6TC, ZL3VB (Chatham Is.) and VK4TE (Willis Is.), all around 14040 kc between 0500 and 0700z. And Jack asks whether anyone has a QSL from FU8AG? After many QSO's he still has no luck . . . it's one of *four* missing out of 321 worked.

The rest of the news around the bands is summed up by saying that no one at all has reported any

TOP BAND LADDER

(G3S-- and G3T-- stations only)

(Starting Date, January 1st, 1965)

Station	U.K. Countries	Countries
G3SED	72	21
G3SYS	70	14
G3SWH	68	13
G3TTK	66	11
G3TBJ	65	14
G3TYK	65	14
G3SJJ	62	10
G3TIK	58	13
G3TVW	57	9
G3SVL	50	10
G3TSS	50	7
G3SHY	47	8
G3SGC	45	12
G3SZA	43	11
G3SVW	42	8
G3TON	41	8
G3TQZ	34	8
G3SQX	33	7
G3TZM	28	6

DX on Forty or Eighty, and that Top Band (for which see under its own heading) is temporarily closed for DX.

Top Band Topics

Most notorious gentleman of the month is the type calling himself "NS1A" reported worked by most of our Top Band followers. He is said to be an amateur operating from one of the "pirate" radio ships in the North Sea—hence, presumably, as far from the reach of the P.M.G. as the gramophone station on which he works.

G3TKN (Wirral) is on Top Band CW only, with a 40ft. loaded vertical and a four-stage transmitter he built himself. Comment on CW: "After talking in everyday life, who wants to come home, put the rig on and start 'yakking' all over again?"

G3TYK (Manchester) says that the NS1A type asks for QSL's via G3SCP . . . G3TUX (Hatch End) retires from the G3S--/G3T--Ladder on account of the chronic electrical interference he mentioned last month. A "promise to investigate the matter" is still under way, but nothing happens, so for the time being he has retired hurt. We wish him a speedy recovery!

Two letters from G3PLQ, in the course of his travels down the West African coast, deal mostly with Top Band. On May 9, off Portugal, he logged a crowd of W's and VE's and quite a few G's; on May 11 he heard eight different U.K. QSO's but the call signs were gabbled and he didn't identify a single one in the QRN. He harks back to the old CW/Phone business with an acrid comment or two: "The remark that ragchews on CW are not as 'personal' as on Phone is a load of tripe. At least those on CW don't keep repeating themselves, and a QSO can be cut by three-quarters of the time instead of being the long-drawn-out drivel usually heard on Phone." And, for full measure, he suggests that the Phone boys should use the English language properly instead of using the codes devised to speed up CW communication.

If you want G3PLQ to maintain listening skeds for you, send an air



The station of G3EUR/A was installed at Avey Electric, Ltd., South Ockenden, Essex, on the occasion of their last Open Day, now an annual event, when the firm welcomes amateurs from the London and Home Counties area for an inspection of the works. G3EUR is the personal call sign of Avey's managing director, John Brown, and in this picture the operator is G3MHD, a member of the firm.

mail letter to him c/o m.s. *Kumba*, Elder Dempster Lines, Ltd., India Buildings, Water Street, Liverpool, 2.

Shorts

SWL D. Douglas (Dundee) makes the point that when he couldn't copy CW well, he used to decry it; now he's proficient, he comes out strongly in favour of its advantages . . . G3DRN (London, S.W.20) admits to using a pair of 807's in parallel for Top Band, but says they loaf along nicely on 10 watts with only 240 volts HT—so why not? But he's in favour of more rigid enforcement of power limits, if that is really possible, and he is yet another one who squirms at the verbiage from many Phone operators, including all the aitch-eye and phoney-phonetics business.

G3UDE (Cambridge) suggests that an interesting (legal) problem crops up in the case of 80-metre Phone interfering with the countless transistor portables mostly tuned to pirate stations—especially in one particular area that he mentions (the few acres of a Public School and its grounds).

G3TFX (Bexleyheath) says he wishes the G.P.O. would tighten

up the licensing regulations for our own good, and suggests accurate netting as one point needing attention (which is a pretty touchy subject, if you read the present licence carefully!). Transmitter bandwidth, which he also mentions, is a more obvious point; but when he suggests that the "gentleman's agreement" dividing the bands up should be made compulsory, he's on a very sticky wicket. Even the gentleman's agreement has just about vanished, nowadays . . . just check that so-called CW band of 3500-3600 kc!

G3NWT (Risley) isn't really serious when he says it might be a good thing if all contacts of less than 2,000 miles on the HF bands were prohibited, but it certainly conjures up visions of a new kind of Utopia. Quite apart from this, he sends first plans of a new and ingenious "secret weapon"—which, as a start, he would enjoy discussing in "the pundit-ridden part of the 80-metre band." We can't say more about it at the moment, but it's interesting, to say the least.

DX News from Far and Wide

CR8AF and 8BH were both active from Timor, but 8BH has

now left for home (VK-land) . . . JY1AU, active for some three weeks, was 6O1AU (QSL to W8HMI) . . . LA5CI/P, 4EJ/P and 5AJ/P all on Jan Mayen . . . MP4TBM will be on soon from the Oman desert coast, working under every possible disadvantage. MP4TBO is on all bands, CW, MP4TBP AM on 14 and 21 mc.

VP3JR is ex-VP3BF and 9G1BF—SSB on 14292 kc . . . VR1S on Ellice Is., 14247 kc SSB, 0700-0900 . . . YV5BIG/7 was on Margarita Island—not DXCC but OK for IOTA . . . 5T5AD has been on again (14 mc SSB) since early June . . . 9E3USA and 9F3USA were calls used by ET3USA during portable operation.

UY5 is yet another prefix to come out of the U.S.S.R.—several UY5's have been heard on 28 mc . . . VR4CR has been on 14090 kc CW (0730) but is getting Phone going shortly . . . 9M6BM and 9M8KW are two new ones to appear from those parts. 9M6BM

has a Top Band permit for the coming winter.

YJ8BG (New Hebrides) is around 14225 kc AM Phone (if you can find him!) . . . The Belgian gang (ON4QJ, 4FU and 5DO) will be operating from Monaco, signing /3AØ, July 9-11; the first two on 14 mc CW, the last on Phone, probably 14 and 21 mc . . . Plenty of activity from Aaland Island (OHØ) with many visiting OH's operating the club station OHØAB and other stations on the island.

Late Flashes

A letter from Mike Matthews (G3JFF) says that the only genuine single-letter calls in Gibraltar are ZB2A and ZB2U. New calls issued are in the ZB2AA series, and there are several, including Mike himself (ZB2AM). Calls outside this series (ZB2DX and so on) are phoney. ZB2AM will be there for two years and can be counted on for plenty of activity.

G3OAD (Dudley) reports that VK5KO has heard Europe on Ten Metres, and also that W's have been heard and worked by G's on occasions (not by him!). Recent QSO's by G3OAD—5N2AAF, 9G1FR, 9J2DT, PY3BNJ, LU5DJZ and CE3BQ, all between 1600 and 1930. Also ZC4GB at 0835. The general feeling is that there will be a big break-through on Ten one of these days . . . but when?

Sign-Off

Thanks to all those who have written in this month—a goodly number covering a variety of interesting topics. But there's always scope for more, so let us hear from everyone by the next deadline, **first post on Monday, July 19**. Send everything to Editorial Dept., *Short Wave Magazine*, Buckingham, England, and mark your letter "Communication and DX News." Until then, as always, Good Hunting, 73 and —BCNU.

THE SECOND LONDON SSB DINNER

In May 1963, the first SSB Dinner in London was held in the Waldorf Hotel. It proved to be successful and many of those who attended promised their support for future functions of this kind. The Waldorf Hotel was again chosen. Not being right in the middle of London, parking and access are easier and the hotel is spacious enough to accommodate trade film shows at the same time. Once the date, May 29, had been fixed, letters were sent to many Sidebanders in Britain and abroad. Several overseas national societies mentioned the event in their journals, as did the world's leading, independent Amateur Radio magazines.

As the date came nearer, bookings began to increase quickly and, whilst G3KZI was attending to details with the hotel and entertainments manager, G3FPK was looking after bookings and also arranging hotel accommodation for the overseas visitors.

The latter began to arrive during the week before the event and many were met at the airports by their particular friends. There were the usual last minute hitches. W6ATC and his XYL had to cancel due to business commitments, whilst TF2WJF, who planned to hitch a ride from Iceland to England, was very annoyed to find that the plane's mission had been pushed forward one day so that he would be unable to get back.

The trade show was supported by Courier Communications, Green & Davis Ltd., The Hallicrafters Co., The Hammarlund Manufacturing Co., Daystrom

Ltd., Withers Electronics and, last but by no means least, K.W. Electronics Ltd. Great interest was shown in the Hallicrafters SR-750, a five-band, 750-watt transceiver which will be available later this year. No larger than present day 150-watt transceivers, this will set a new trend in compact, high powered equipment for SSB, eliminating the need for additional linear amplifiers.

The Heathkit "SB" series was on show on the Daystrom stand but there was insufficient time to get the latest kilowatt linear amplifier over from the States. Green and Davis had the new National HRO-500 receiver on show as well as the NCL-2000 linear amplifier, whilst K.W. Electronics featured: the KW-2000A, the higher powered version of the popular KW-2000.

As an added attraction, Stuart Meyer, W2GHK, President of the Hammarlund Manufacturing Co., gave a show of slides of the company's "DX-Pedition of the Month" projects. Guest of Honour was John H. Gayer, HB9AEQ, president of the International Amateur Radio Club of Geneva.

Overseas guests included EL7B, F7CL, F7CP, F8RU, I1CL, K2HEA, K2HLB, K2MGE, K3JOO, K9AWX, OD5BZ, OE1RZ, ON4AD, 4CC, 4IZ and 4KP, PY2PA, PY2PE, SM5MC, VE3QA, VS9MP, W1BDF, WA1ASM, W2GHK, W2JXH, W2NSD, WA2TQJ, WB2NAD, W8MKZ, W8RLT, W8SS, YV5BNW, 5A1TW and 5A3TH. The total attendance was more than 200 people.

• • • *The Mobile Scene* • • •

RALLY REPORTS AND PICTURES— PROGRAMME OF FUTURE EVENTS

There has been nothing further from the Ministry of Transport since our last appearance—see pp.232-233, June issue, *SHORT WAVE MAGAZINE*, on the matter of hand-held microphone operating while on the move. Indeed, our information is that a considerable opposition, from all sorts of quarters, has built up against the proposal.

On quite another topic, here is the result of an interesting survey carried out by G3ESP/M at the N.A.R.M.S. Rally (Harewood House, near Leeds) on May 30: He asked numerous of those present the simple question "Why do you come to a mobile rally?" Almost all gave as their main reason the opportunity to meet others and "have a good natter." Some also said they liked to see the trade stands and bring the family out. One gave as his reason that he came "to study the other queer types!" Another said it was somewhere to aim at for an outing but that "a day at the seaside would suit me just as well." In reply to a specific question on the point, nobody seemed in any way concerned about raffles or competitions.

Perhaps there is food for thought here for other Rally organisers. It is certainly in accordance with your correspondent's own observations, gleaned from having visited six Rallies so far this season. It may

be that too much effort is being put into arranging competitions and not enough into providing something to watch and see—like demonstrations and equipment displays.

* * *

On May 23, the Amateur Radio Mobile Society again put on a Mobile Rally at Barford St. John—it turned out to be a successful event, though the numbers were not quite up to the attendance of previous years. A feature of this Rally is the very well-supported trade show, organised by G3AGP, whose enthusiasm resulted in one hangar (the site is an old R.A.F. airfield, now occupied by the U.S.A.F.) being fully taken up with trade stands and exhibits. Among others who work hard for the success of this event are the Margolis family, G3NMR and Sylvia; G3FPK and G3KVF; also G3BXI and G8KW—all of whom have the enthusiastic support of the U.S.A.F. authorities in providing local transport, car park marshalling and the other on-site facilities required to make the Rally successful.

The N.A.R.M.S. affair attracted a very good attendance, much the same as last year, with about 400 cars in the Rally park. This was in spite of unpromising weather, showing that this event has



* General view from the old Barford R.A.F. airfield control tower, showing some of the cars parked for the A.R.M.S. Rally there on May 23. The masts in the background support a complex of transmitting aeriels for the Barford Radio Station (Tx building in the distance, upper left) operated by the U.S.A.F.



(H)



(Q)



(P)



(G)

(H) * The R.N.A.R.S. Rally at H.M.S. "Mercury" on May 30 was opened by the Captain of the Signal School, Capt. D. Morgan, R.N. and was organised by G3ENI and G3JFF. As suggested by this picture, the Wx was not inviting. H.M.S. "Mercury" is a shore Signals Establishment with responsibility for the training of boy entrants for the Navy in the telecommunications grades. The local Amateur Radio interest is strong, and "Mercury" is the Hq. of the R.N.A.R.S., signing G3BZU on the amateur bands.

(P) The 160-metre /M aerial installation by G3GPX/M, seen at the Wethersfield Rally on June 6. A short whip length is loaded with a coil above roof-level (the only proper position for it) with a capacity hat for shortening the whip length. The system can be resonated at any Top Band frequency by means of a coarse/fine loading unit at the operating position.

(R) At the Wethersfield Rally, left, G6AB, of Holland-on-Sea, with G3GPX, who will be in MP4 by the time he sees this. G6AB mentioned to our reporter that having bought a second-hand pylon from the Electricity Board, he had no difficulty in getting the local council's permission to plant it in his garden, topped off with a six-over-six beam for two metres.

(Q) For the RSGB's Rally at Wethersfield on June 6, the 160-metre talk-in station was provided by G3PMX and operated from the boot of his car.

(G) * General view of one side of the car parking area — there were two others — for the Royal Naval Amateur Radio Society's Mobile Rally at H.M.S. "Mercury," near Petersfield, Hants., on May 30. In spite of disappointing Wx, it was very well attended, and was a "first occasion" for R.N.A.R.S. The picture gives a good idea of the very pleasant setting, at a site offering many advantages for meetings of this kind. Practically all the cars seen here were fitted /M, and more than 200 were signed in.

*Pictures marked * were taken by G3GMN. All others by G6FO.*

become well established for /M's up north.

A new Rally venture was that organised, for May 30, by the Royal Naval Amateur Radio Society at the Signal School, H.M.S. *Mercury*, near Petersfield, Hants. Though this is a most attractive setting, ideal for Rally purposes, and they had a very good attendance, it would have been even better had they had more luck with the Wx—it was cold and threatening all day. But even at that, 208 cars were booked in, of which 74 were fitted mobile, and the heads counted totalled 1,165. The R.N.A.R.S. had much willing and efficient assistance from the local Portsmouth and Fareham radio clubs. There were some good prizes, presented by Mrs. Morgan, wife of the officer commanding the School. That for the longest

distance travelled went to R.N.A.R.S. member GM3HUN, who came down from Edinburgh (!), and for the best DX contact with GB3RN control to G3IIO/M. Those with the best mobile installations were judged to be G3GMN/M (that well-known photographer!) and G3ISZ. In charge of the general organisation were G3ENI and G3JFF, who are to be congratulated on the success of the effort.

Likewise on May 30, the GI boys ran their own first-ever Mobile Rally, at Nutts Corner Airport, with the Belfast group in charge of organisation. A result of particular interest here lies in the fact that the 4-metre talk-in station, signing GB3NI, made no less than 95 contacts on the 70 mc band, fifty of these being with EI/GI 4m. mobiles actually attending the



(R)



(K)



(C)



(A)

(C) * WA6KJS operating the A.R.M.S. Rally station GB3NMS, working the DX bands from Barford on May 23. Under the new reciprocity agreement, the G.P.O. gave authority for any visiting American amateur holding a current W/K licence to operate GB3NMS.

(K) * The Top Band control station for the Rally at H.M.S. "Mercury" was equipped with an Eddystone EA-12 Rx (left), and a 10-watt home-built Tx. The operator in this picture is G3SED.

(A) G5JO (left), with G2PU, at Barford on May 23. Note the registration number of the Rover — and G5JO, who is a senior executive of Pye, Ltd., Cambridge — is /M, too! G2PU is a principal of Labgear, Ltd., a constituent company of the Pye Group.

Rally. Considering the location, an attendance of 250 people from all parts (including 100 licensed amateurs), can be rated "very good." The static displays included a fine effort by 66 Signal Regt., T.A., under G131WD, and a Civil Defence demonstration, under G131LV. A competition for the best all-round /M installation—this including signal strength, modulation quality and depth, safety and general neatness—was won by G13TOH, and, according to our report from G13CDF, their event was well covered by the local press and BBC in Northern Ireland—so, well done, Belfast.

On June 6 (Whit-Sunday), the RSGB held their usual Wethersfield Rally, the site here again being an old R.A.F. airfield now occupied by the U.S.A.F. as an operational base. The event was well supported by the local American authority—they even detailed a liaison officer to co-operate with the organisers in keeping things on an even keel—and, it being a fine holiday week-end, there was a very good attendance. Various spectacles and demonstrations had been laid on (of which the fire-fighting display was deservedly the most popular), and there was a small trade exhibition in one of the hangars. Altogether, another very successful event.

For Whit-Monday, June 7, the Saltash & District Amateur Radio Club arranged a Mobile Rally—also a first-time effort—at Calstock, Cornwall. Though rather a remote location, and a bit early to catch the holiday crowd, they had an attendance of over 300 people, including more than 50 licensed amateurs, of whom about 30 were /M. They had a fine day for it and the general opinion was that it turned out a pleasant and well-organised affair. The talk-in station signed GB3SAL, and prizes for the longest distances worked with it went to G3OIP/M for 160m.; to G3NKE/M on 80m.; G3SRL/M, using 4 metres; and G3IGV/M on two metres. The prize for the best /M installation went to G3JFH/M, from Cheltenham—who has gathered in many such trophies in the past.

MOBILE RALLY PROGRAMME

Further events scheduled are as follows:

- July 11:** Torbay Amateur Radio Society Mobile Rally at Royal Signals, Denbury Camp, Newton Abbot, with talk-in by G3NJA/A on 1880 kc, G3PYZ on 3660 kc, and by G3LMG/A on 70.25 and 144.13 mc. Attractions include a regimental band and a heated swimming pool (open to visitors) and there will be good (Army-type) catering arrangements. Some indoor entertainments will also be provided. More details from: Mrs. G. L. Western, G3NQG, hon. secretary, Torbay A.R.S., 118 Salisbury Avenue, Barton, Torquay, Devon.
- July 11:** The South Shields & District Amateur Radio Club Annual Mobile Rally, at Bents Park Recreation Ground, Coast Road, South Shields, Co. Durham adjacent to a wide expanse of sandy beach. Opening at 2.0 p.m., talk-in will be by G3DDI on 160m, from 11.0 a.m. and local 145.8 mc on stand-by. Competitions will include judging of mobiles, driving tests over a short

course, and a transmitter test. Light refreshments will be available on site. This is a well-established event and in previous years has drawn visitors from all over the country. For more information: D. Forster, G3KZZ, 41 Marlborough Street, South Shields, Co. Durham.

- July 11:** Tenth Anniversary Mobile Rally, Oxford, at the College of Technology, Headington (off the A40, on the north side of the city), with talk-in on both LF bands and on 4m./2m. A good programme is being organised for the interest of everyone, refreshments will be obtainable, with complete cover and good car parking. Further details from: F. A. Jefferies, G8PX, 1 Lovelace Road, Oxford—or RSGB Hq.

- July 18:** Mobile Picnic organised by the Worcester & District Amateur Radio Club, with talk-in on 160m., 4m. and 2m.

- July 25:** Cornish Radio Amateur Club Mobile Rally, on Pentire Headland, near Newquay, Cornwall, a very fine site, as those who were at this event last year will know. Talk-in will be by GB3CRC on 1985 kc, and 144.02 mc, and by G2BHW/A on 70.375 mc, for the 4-metre /M's. There will be various events and attractions, but the sea and beaches will probably be the main draw here. Details from: M. J. Harvey, Oak Farm, Carnon Downs, Truro, Cornwall.

- August 15:** The big Rally organised annually by the Derby & District Amateur Radio Society has now become an established event in the mobile calendar, attracting attendances of several thousand people, for which a wide variety of displays, demonstrations, exhibits and competitions is laid on, as well as a trade show and the famous "Derby Junk Sale." The location is Rykneld Schools, Derby, and there will be local sign-posting. Adequate refreshment facilities, free admission, and ample parking space on hard standings. The organiser is: T. Darn, G3FGY, Sandham Lodge, Sandham Lane, Ripley, Derbyshire.

- August 30:** (*Bank Holiday*). Peterborough Mobile Rally to be held in the large park by the River Nene, with plenty of free parking and picnic space, and a large swimming pool nearby. Talk-in will be by G3EEL, 1920 kc; G3DQW, 1980 kc; G3RED, 70.26 mc; G3KWY, 145.35 mc; and also on 144.47 mc, by G3EEL. Further information from: D. Byrne, G3KPO, Jersey House, Eye, Peterborough, Northants.

- September 12:** U.B.A. (Belgian) International Rally for which temporary licences for /M working will be issued to foreign visitors—general arrangements as last year (*more details later*).

- September 12:** RSGB Rally, Woburn Abbey, Beds. (*as last year*).

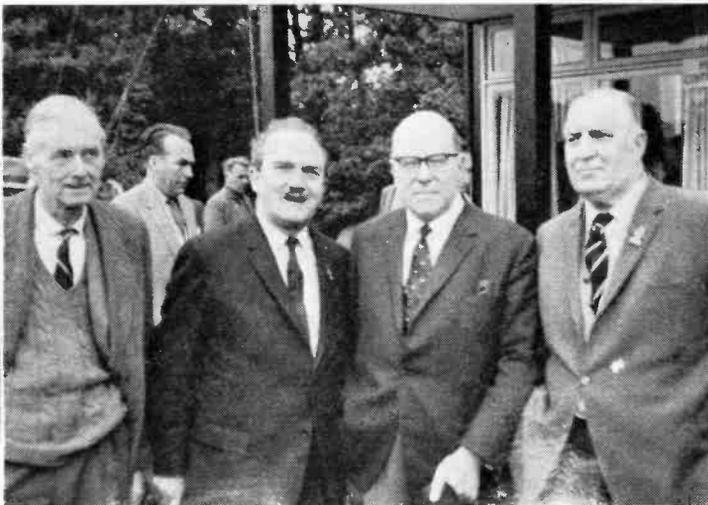
- September 26:** Harlow A.R.S., at Magdalen Laver, Essex.

- September 30:** Peterborough Mobile Rally and Treasure Hunt.

Organisers are reminded that for any further information to appear in the August or September issues, details must reach us by *July 19*—addressed Editorial Dept., Short Wave Magazine, Buckingham.



(L)



(O)



(B)

(L) * At H.M.S. "Mercury," the R.N. Signals Training Establishment at Leydene, Hants., they use an original steam waggon (in a perfect state of maintenance) for local transport. It was kept busy giving rides all the afternoon of May 30.

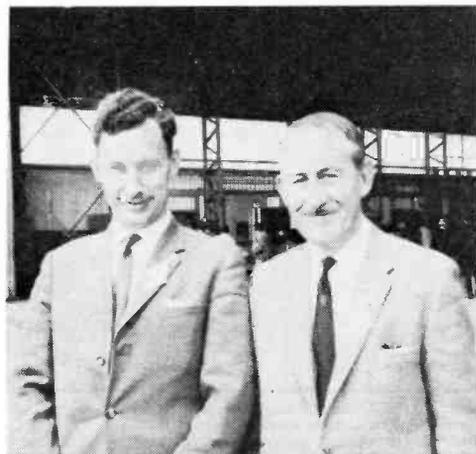
(O) Among those seen at the R.N.A.R.S. Rally were, left to right, G6HB, GW5BI, G6FO (Editor of "Short Wave Magazine") and G2DC, the well-known DX operator.

(B) Caught at the Amateur Radio Mobile Society's Rally at Barford, left to right: ZL2PG, G6VX and G3JFH, all up from Cheltenham.

(S) Two RSGB personalities caught together at the Wethersfield Rally: Left, Geoff Stone, G3FZL, a past-president, with Eric Yeomanson, G3IIR, president for the current year.

(J) * The 4-metre control station for the R.N.A.R.S. Rally on May 30 signed GB3RN, using an R.216 receiver and home-built 15w. Tx (right) provided and operated by G3TMG. The station was installed in a J-Beam caravan, which also carried the aerial.

*Pictures marked * were taken by G3GMN. All others by G6FO.*



(S)



(J)

VHF BANDS

A. J. DEVON

APOLOGIES, abject and sincere, for a somewhat attenuated offering this time—well, one page is not a lot, but your A.J.D. has been heavily pressed, apart from which there is not much hard VHF news to report.

Except that there was a remarkable four-metre opening on the evening of May 28, in character almost certainly sporadic-E, when stations all round the U.K. were making loud contacts on 70 mc. And in the 4-metre context, the EI/GI activity on that band is something to marvel at—see the "Mobile Scene" report on the GI Rally elsewhere in this issue. (Nearly one hundred contacts on four metres in one day—*cor!*)

DX-Pedition Notes

There are several of these to tie up, covering interesting VHF possibilities. First, during July 3-17, 92nd Signal Regt., signing GM3SIG on two metres, will be in the "rare counties of Angus and Kincardine," putting it out on CW and phone, with the main period of activity on July 11, from a location 1,500ft. a.s.l.

A station signing EI2AX/P on 70·20 mc and 145·3 mc, operated jointly by G3BHT and G3SKT, will be going through Eire from July 21 until August 4; during this period, they will also have a KW-2000 on 3760 kc in the 80-metre band for fixing skeds (which can be arranged direct with G3BHT, 2 Larch Way, Freshfield, Formby, Lancs.).

Then there is a trip through the wilds of Wales, to be undertaken by G3SIC/G3STW over the fortnight July 24 to August 7, with their Tx spotted on 144·33 mc. Arrangements for skeds with G3SIC, *QTHR*.

G3KXA (*QTHR*) and G3UAW will be in "the rarer counties of Scotland," on 145·98 mc and sign-

ing GM3RUF/P, starting on August 27 at 1900z and thereafter appearing daily during 0700-0930 and 1900-0001z. G3BA (Sutton Coldfield) is acting as anchor-man for this project, and can be raised over the two-metre air in connection with sked arrangements.

We now have more details covering the GB2GC expedition to Alderney, C.I., from August 17 till September 7. ("Evans and The Group"—the lucky chaps, getting away for all that time, to play on the VHF bands.) Their transmitting frequencies will be 70·405 mc for 4 metres; 144·15 mc on two metres; 432·15 mc on the 70-centimetre band; and, for the much more difficult 23 cm. band, involving accurate beam work and very careful searching on schedule, 1296·45 mc. Though many assignments for these bands have already been made, there is still plenty of sked time available

—all that they want to know is about when *you* can be there, and on what frequency. Clock times for schedules can be fixed by arrangement with G3SHZ, 19 Dorset Road, Harrow, Middlesex. These boys are organising hard to put on a really effective four-band effort over a useful operating period, and their ultimate results—in terms of stations worked from Alderney, on the various bands under the GB2GC call-sign—should be very interesting.

For our next, the date is **July 23**, and the address: A. J. Devon, "VHF Bands," Short Wave Magazine, Buckingham—by which time, all being well, your A.J.D. will have done a fortnight's cruising in the GC area, with the yacht's navigation through those waters as his only worry and pre-occupation. Till August 6, then, *73 de A.J.D.*

THREE-BAND ANNUAL VHF TABLE

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		TOTAL pts.
	Counties	Countries	Counties	Countries	Counties	Countries	
G3BNL	29	3	41	11	19	4	107
G3EDD	15	2	53	13	17	2	102
G3OWA	34	4	38	8	—	—	84
G3SKR	49	5	21	5	—	—	80
G3HRH	15	2	47	9	5	1	79
G2BJY	31	2	40	5	—	—	78
G3FIJ	21	2	31	6	14	3	77
G2AXI	22	3	40	8	—	—	73
G3AHB	—	—	38	11	17	2	68
G3LAS	14	2	38	11	—	—	65
G5UM	16	2	27	3	12	3	63
G3EKP	18	5	21	6	5	2	51
G2CIW	—	—	17	5	26	7	55
G3TKQ	12	1	27	6	2	2	50
G3TNO	—	—	38	6	—	—	44
G3TLB	—	—	35	6	—	—	41
G5FK	12	1	14	1	5	1	34
G3OHH	28	5	—	—	—	—	33
G3HWR	14	3	6	1	7	1	32
G2DHV	9	1	12	1	1	1	25

Scores are since September 1st, 1964, and will accrue until August 31st this year. Position is shown by last-column total, as aggregate of all scores. Own county and country score as one each. Entries may be made for a single band, any two, or all three. Claims should be sent in as often as possible to keep the table up-to-date. New entries can be made at any time.

NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. call signs, 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.

CHANGE OF ADDRESS

- EI6AX**, B. O'Sullivan, Cahermore, Bantry, Co. Cork.
- G3KPY**, J. Pershouse, Millstones, Beaulieu Road, Bexhill-on-Sea, Sussex. (9M2DQ.)
- G3THO**, H. R. Gelsthorpe, 39 Moorland View Road, Walton, Chesterfield, Derbyshire.
- G3TVC**, L. Rice, 86 Convamore Road, Grimsby, Lincs. (Tel. Grimsby 3478.)
- G3TXI**, J. D. Belcher, Leaside, Nazeing, Essex. (Tel. Hoddesdon 3223.)
- G3TYU**, M. J. Bredael, 205 Kenton Lane, Newcastle-upon-Tyne 3, Northumberland.
- G3TZA**, A. Riley, 60 Waverley Avenue, Bedlington, Northumberland.
- G3TZZ**, M. C. Mead, 8 Longland Road, Eastbourne, Sussex.
- G3TZZ**, J. E. Harding, 11 Osborne Park, Scarborough, Yorkshire.
- G3UAC**, (name?), 135 Waddon Road, Croydon, Surrey.
- G3UAE**, J. O. Gill, 9 Caradon Drive, Liskeard, Cornwall. (Tel. Liskeard 3136.)
- GW3UAT**, D. G. Williams, 8 Leonard Street, Fleur-de-Lys, Pengam, Monmouthshire.
- G3UBU**, E. Swinnerton, 51 Bailey Road, Heron Cross, Longton, Stoke-on-Trent, Staffs.
- GM3UCH**, W. P. Wright, 46 Braemar Drive, Falkirk, Stirlingshire.
- GM3UCI**, G. McCallum, 1 Burnbrae Street, Taifley, Clydebank, Dunbartonshire.
- G3UCQ**, J. Farrar (ex-5B4JF /VS9SJF), Delamar, St. Hilary, Penzance, Cornwall.
- G3UCU**, Amateur Radio Society, Northampton C.A.T., St. John Street, London, E.C.1. (Station at Northampton Hall, Bunhill Row, London, E.C.1.)
- GM3UDJ**, T. M. Grant, 11 High Patrick Street, Hamilton, Lanarkshire.
- G3UDM**, D. P. Wood, 250 Worpole Road, Laleham, Staines, Middlesex.
- G3UDN**, Mid - Warwickshire Amateur Radio Society, 7 Regent Grove, Leamington Spa, Warks.
- G3UDR**, A. J. Martin, East Round Down, Gomshall, Guildford, Surrey. (Tel. Shere 443.)
- G3UDY**, G. S. Bunting, 50 Newlands Drive, Blackheath, Birmingham. (Tel. WOODgate 4724.)
- G3UEA**, Radio and Electronics Club, University of East Anglia, University Village, Wilberforce Road, Norwich, Norfolk, NOR,77.H.
- G3UEB**, Newark Short-Wave Club, c/o G. Francis, 93 Balderston Gate, Newark, Notts. (Tel. Newark 4733 & 2578.)
- GW3UED**, J. M. Jones, Nantclwyd Mill, Nantclwyd, Ruthin, Denbighshire.
- G3UEE**, D. Diamond, 36 Darbys Lane, Oakdale, Poole, Dorset.
- G3UEK**, J. M. Whitehouse, 34 Montpellier Spa Road, Cheltenham, Glos.
- G3UEQ**, A. H. R. Hearn, Kirk Cottage, 8 Little East Street, Lewes, Sussex.
- G3UFL** (name?), 4 Wellington Close, Melbourn Park, Chelmsford, Essex.
- G3UFN**, M. R. Lea, 35 Southfield Avenue, Castle Bromwich, Birmingham.
- G3UFS**, C. J. Smith, 50 Grand Avenue, Lancing, Sussex.
- G3UFU**, J. L. Barry, 15 Fairlawn Court, London, W.4. (Tel. CHIswick 6931.)
- G3UGK**, P. R. Cragg, 96A High Street, Potters Bar, Herts.
- G8AHS**, T. J. Thirlwell, 55 The Wells House, Well Walk, Hampstead, London, N.W.3. (Tel. HAMPstead 9542.)
- G8AHT**, A. H. Thomasson, 17 Tadcaster Cottages, York Way, London, N.7. (Tel. NORth 3456.)
- G8AIU**, J. F. Gentry, Gailey Vicarage, Stafford.
- G2KKK**, K. J. Cook, 41 Racecourse Road, East Ayton, Scarborough, Yorkshire.
- G3BGJ**, M. A. Sandys, 52A Saxonhurst Road, Bournemouth, Hants.
- G3DQW**, Peterborough Amateur Radio Society, c/o D. Byrne, 8 Hodney Road, Eye, Peterborough, Northants.
- G3IAB**, N. R. Curtis, 25 Linton Rise, Catterick Camp, Yorkshire.
- G3IDA**, D. J. A. Appleby, 24 Preywater Road, Wookey, Wells, Somerset. (Tel. Wells 3599.)
- G3JLZ**, V. J. Ludlow, 19 Trenchard Road, R.A.F. Station, Locking, Weston-super-Mare, Somerset.
- G3KQY**, R. J. Disley, 98 Duddle Lane, Walton-Le-Dale, Preston, Lancs. (Tel. Preston 36018.)
- G3KTI**, M. V. Rees, Blue Pillars Grove Crescent, Coombs Park, Coleford, Glos.
- G3LJV**, W. G. Dolby, 98 Hunters Way, Penkhull, Stoke-on-Trent, Staffs. (Tel. Stoke-on-Trent 48490.)
- GM3LNI**, H. J. Towns, 7 Elphinstone Crescent, Murray 7, East Kilbride, Glasgow.
- G3MKQ**, F. W. Matthews, 47 Lambert Road, Fallings Park, Wolverhampton, Staffs.
- G3MWQ**, P. J. Groves, 58 Rosemary Road, Kidderminster, Worcs.
- G3NMH**, H. E. Perkins, 24 Hook Street, Hook, Swindon, Wilts. (Tel. Wootton Bassett 792.)
- G3NYE**, A. J. Taylor, 4 Kings Avenue, Gatley, Cheshire.
- G3PNU**, E. M. Clark, Wellbank Hall, Nr. Bootle Station, Bootle, Cumberland.
- G3POB**, H. S. Howells, 9H1AB, 3 St. Nicholas Flats, Ta'Xbiex Wharf, Msida, Malta, G.C.
- G3RKO**, A. J. Balmforth, 37 Kew Crescent, Sheffield, 12.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for Next Issue: Friday, July 16)

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

WE make no apology for returning once again to the subject of Club Publications, but this time for the purpose of remarking on their contents rather than the importance of their existence.

From time to time some really excellent technical articles appear in some of the publications we receive, and it strikes us as a pity that the circulation of some of this excellent gen. should be so small. A number of Clubs seem to have among their members one or two real "gen-men," and we hope that the members benefit from their experience and know-how.

It often happens, too, that the outstanding "gen-man" is also the willing horse who shoulders many other responsibilities—perhaps that of producing the News Sheet and possibly also that of building and supplying the gear for club events as well. We only hope that such people are really appreciated by those who are content to remain passive—usually the great majority!

As an example of excellent and unusual technical matter, we note a most interesting article by G6GR (in the *Wolverhampton* News Sheet) about the use of a loop aerial for reducing Top Band noises; one on home-built gear, by G3OCB, in *The Cornish Link*; and quite a lengthy effort on "Making a Start in Amateur Radio," by G3KPT, in the MARS (*Midland*) News Letter, which contains a second interesting article (by G3PJT) on "Suburbia and 160 Metres."

There are many others from time to time, which strike us as reaching a high standard, and we hope to be able to pass on their contents in abridged form, in future issues of the *Magazine*.

Congratulations, then, to all the gen-men; long may their clubs continue to benefit from their enthusiasm and energy.

And on the subject of club activities generally, see the interesting article about Harrow on pp.310-311 of this issue.

ACTIVITY REPORTS

Blackpool & Fylde will hold a Questions and Answers session on July 5; no details to hand of their meetings on the 12th and 19th, but the 26th will be an Open Evening, and on July 24 they will be visiting the ITV station at Winter Hill. Numbers will be limited.

Mid-Warwickshire, now comfortably installed in their new headquarters, which were opened on May 10 by the Mayor of Leamington, will hold an Open Meeting on July 12 and henceforth will gather regularly on Mondays. The new premises are on the

top floor of 7 Regent Grove, Leamington Spa, whence a 130ft. wire runs to the Town Hall clock tower at a height of 100 feet—surely a unique set-up for any club! The club Tx is now licensed as G3UDN, and will soon be active on two metres and the HF bands.

Chesham held an Open Day on May 23, and for a first attempt it was pretty successful, despite losing first a balloon aerial and then a kite affair! Eventually a 350ft. wire was slung between trees and the battle commenced. The club plans to publish a newsletter, which we look forward to receiving.

Northern Heights paid tribute to the late G2SU, a founder member, both by hearing his tape-recorded lecture on Microphones and by acquiring his callsign as the official Club call. It was used for the first time from the Warley Gala. One of the younger members with a /M licence was actually in the Gala procession, fully operational. On July 7 there will be a display of members' gear, and on the 21st a Ragchew. The August programme—a full one—starts off on August 4 with a talk on D/F equipment by G3LGN.

Cheshunt voted the Belling-Lee lecture on Interference and Suppression a great success with members at all stages of experience; their July meeting will be on the 2nd (publication date) and will be a Junk Sale, at the C.D. Headquarters, Turners Hill, Cheshunt, 8 p.m.

University College of North Wales (Bangor) now boasts 50 members of the Amateur Radio Society, nine of whom are licensed, and they have just acquired the call GW3UCB. The president is GW3JGA, chairman GW3PMR, and secretary/treasurer GW3SWL. At the moment they are unable to put up an aerial, but they will have a stand at the Northern Radio Societies' Convention in Manchester next October.

West Kent will hear a talk on Seventy Cms., by John Gould, on July 9. This is aimed at nothing less than "getting all members on 430 mc, *ab initio*." Meetings are on the second and fourth Fridays at Culverden House, Tunbridge Wells, 7.30 p.m.

Halifax will hear a talk on Transmitters, by G3SJG, on July 27, and at their August meeting (on the 24th) will be visited by the Huddersfield club for a lecture by G3MAX. **Harlow** will be holding a Junk Sale on July 13 in their new headquarters, Mark Hill Barn.

South London Mobile Club, meeting fortnightly at Clapham Manor Baths, will have a talk on Radar by G3MFB on July 3; a talk by G4KD on July 17; a weekend camp (provisionally fixed) on July 31; August 14 is booked for Part 2 of G3OLM's talk

on SSB. **Spen Valley** hold their AGM and inaugurate their new session on July 8.

Wimbledon, at a recent meeting, saw a demonstration of how to align a receiver, by G6QN and G3EPU. This was so popular that the secretary has now been instructed to find some more "demons" to give demonstrations. The club also ran a station at Wimbledon Hobbies Exhibition, and, during June, had a "Hints and Kinks" night; on July 9 their lecturer will be G2MI. **Torbay**, at their May meeting, heard G3TRW (ex-DL2DW) on the subject of Telecommunications in Germany.

Worcester expect to run a station at a good many fetes and similar events during the summer. On July 18 they hold their own Mobile Picnic (everyone welcome), and club meetings continue on Saturday evenings at the headquarters, 35 Perdiswell Park, Droitwich Road, Worcester.

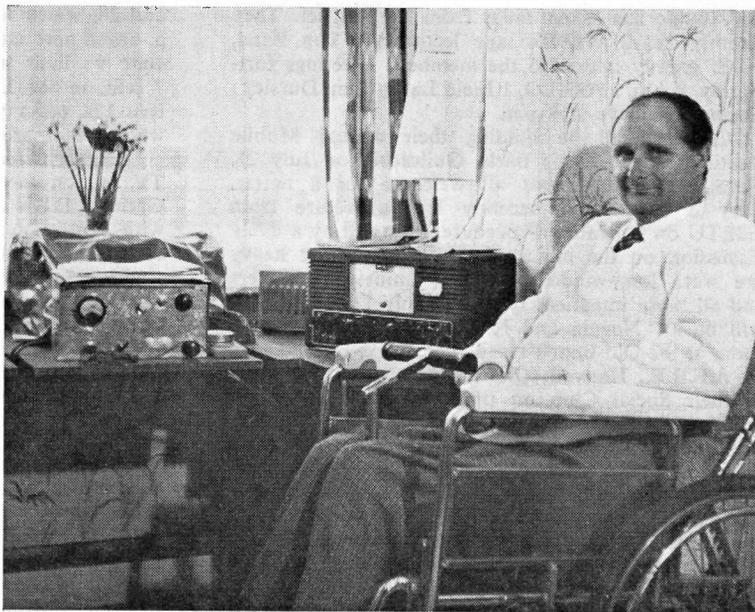
Cornish (*The Cornish Link*, June) are looking forward to the Mobile Rally at Pentire Headland, Newquay, on July 25, and offers of help will be welcomed. Their July meeting will include the showing of a film—"Electromagnetic Waves." The talk at the August meeting will be on Frequency Measurement, by G3OFN.

Derby (*Newsletter No. 1*, 1965) report good progress and a fully-paid membership of nearly 170—a fine figure indeed. In June they held an Extraordinary General Meeting, its main purpose being to ratify the various recommendations made at the earlier AGM. Among other changes, it is hoped to arrange some "social natters" for those members who do not take part in the frequent D/F practice runs and events.

Loughborough hold their fourth 144 mc Portable Contest on July 4; a Mobile Night Out on the 9th; a Components Sale on the 16th; a Night on the Air on the 23rd; and an SWL Night on the 30th. Then they close during August, as far as the fixed programme is concerned, resuming full activities in September.

South Birmingham will meet on July 15 for a talk and demonstration of the KW-2000 transceiver by G3NXV. Recent meetings have covered such subjects as Electronic Organs, 14 mc Conditions and Operation, Film Shows and Mobile Events. **Southgate** recently heard G3OLE on the subject of his mobile Tx using audio-derived HT, and their Mobile Treasure Hunt was even more successful than last year's event. On July 8 they will be meeting at Atlasta Lodge, but the subject is not yet settled. Future talks will be on RTTY and Moonbounce.

Scunthorpe now meet every Tuesday evening, regular items on the programme being talks on Basic



G3TIO is Ken Eddy, of 29 Longfield Lane, Cheshunt, Waltham Cross, Herts. A victim of polio, he gets about in an electrically-operated wheel chair and has to sleep in an artificial respirator. He is regularly on the air, in connection with which he has been much helped by members of the Harlow & District Radio Society.

Radio, VHF and Construction. D/F hunts are also popular, and new members and visitors will receive a warm welcome. **Reading**, at their July meeting (on the 31st) will explore the age-old topic of SSB versus AM. And they are getting ready for their stand at the Silver Jubilee Reading Show on August 20-21. A station will be operating, and there will be a display of members' gear.

Peterborough will meet at their Windmill clubroom every Friday evening (and also on Sunday mornings) during the summer season, and the monthly lectures at the Technical College will recommence in the autumn. **North Kent** (*Newsletter No. 90*) will gather on July 8 and 22 at the Congregational Church Hall, Bexleyheath, but the subjects are not yet announced.

Magnus Grammar School Radio Society works in close co-operation with the Newark Club, though in no way connected. During May the boys arranged and carried out a very successful D/F expedition (on bicycles); photographs of their various activities have been taken; and one evening was spent talking about, and demonstrating tape recorders. During July they hope for a talk by a police officer on the use of radio—including, it is hoped, radar speed-traps.

Harrow report that their constructional contest was won by G3HBW with his Tx for 70 and 23 cm. Some of their members will be operating GB2GC from the Channel Islands, as already announced, and they hope that the club station G3EFX will soon be back on the air again on Friday evenings. They are also involved in a demonstration at Gayton Fair, an annual fete.

Dursley carry on, despite having lost some members—not through lack of interest, but because

their work has taken them from the district. They recently heard WIBB's tape lecture on Top Band, which greatly interested the members. Meetings fortnightly, 8 p.m. at G3ILO, 1 Field Lane, Cam, Dursley; alternate Fridays at 8 p.m.

Crawley will be holding their annual Mobile meeting on the Hog's Back, Guildford, on July 21. Nothing organised, but all welcome for a natter. **Bury & Rossendale** recently had a lecture from G3ETU on Operating Procedure, followed by a lively discussion on the ethics of operating. Under heavy fire were long-winded natters, uninvited breakers and all those impatient types. On July 13 the meeting will be a "Noggin and Natter Night" in a private room at the Old Boar's Head, The Rock, Bury, 8 p.m.

A.E.R.E., Harwell (QAV, June) continue to meet in their Social Club on the third Tuesday of the month. At the June meeting the technical sub-committee were on hand to answer questions, which all members were invited to put to the experts. **Cray Valley (QUA, June)** meet on July 18 for a ragchew and station activity from G3RCV. This will be at the Sea Cadet Hq., Ruxley, Sidcup. On August 5 they will assemble at 1 Court Road, Eltham, S.E.9, for a Mullard Film Show.

Yeovil will be operating as GB2YC from the Yeovil Leisure-Time Exhibition, July 5-10, so no club meeting on the 7th. The club station (G3CMH) will be on the air as usual during the meetings on July 21

and 28, which will be general ragchews. **Wakefield** is a brand-new club which met for the first time on June 9; their next get-together will be on July 6, 7 p.m. in the Lings Road School. Membership will cost 12s. 6d. a year, with a reduced fee for Juniors, who, in fact, are free until the age of 15.

Reigate (Feedback, May) recently visited the ITA TV station at Croydon, and also had a talk on Green & Davis equipment. Next meeting is on July 17 with a talk on Transistors for Transmitters by Mr. Hilling (7.30 p.m. at the George and Dragon).

Manchester have their R.A.E. and Operating Night on July 7, and a discussion on the 14th. The 21st will be devoted to CW practice and operating, and on the 28th there will be a lecture (subject as yet unknown). **Norfolk**, instead of their normal monthly meeting, will hold a Treasure Hunt, arranged by G3TLC, on July 12. At their August meeting G3PTB will talk on "How to Build a Top-Band Tx for 1s. 6d."!

Wolverhampton will devote July 12 to Station Visits (meeting at Cheapside, 7.30 p.m.). On the 17th there will be a combined Sports Meeting, at the B.P.A. Ground, Marsh Lane (2.30 p.m.), and after that they will be "in recess," as far as regular meetings are concerned, until September 20, but with many outside events to keep up the interest.

Verulam (News Sheet No. 14) continue their meetings on the third Wednesday with a talk, on July 21, from Mr. Turner of the G.P.O. (on BCI and

Names and Addresses of Club Secretaries reporting in this issue :

A.E.R.E. (Harwell): V. J. Galpin, Building 347.3, A.E.R.E., Harwell, Didcot.
BADEN-POWELL HOUSE: A. Watts, G3FXC, 8 Thornycroft Court, Kew Road, Richmond.
BLACKPOOL & FYLDE: J. Boulter, G3OCX, 175 West Drive, Cleveleys, Blackpool.
BURY & ROSSENDALE: K. Drinkwater, G3RHR, 16 Linddale Avenue, Accrington.
CAMBRIDGE: F. A. Porter, G2CDX, 37 Metcalfe Road, Cambridge.
CHESHAM: D. Kind, 19 Hollybush Road, Chesham.
CHESHUNT: B. B. Charge, 16 The Green, Church Lane, Cheshunt.
CORNISH: M. J. Harvey, Oak Farm, Carnon Downs, Truro.
COVENTRY: W. F. Hahn, 11 St. Patrick's Road, Coventry.
CRAWLEY: R. G. B. Vaughan, G3FRV, 5 Filbert Crescent, Gossops Green, Crawley.
CRAY VALLEY: S. W. H. Harrison, G3KYV, 30 Plaistow Grove, Bromley.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
DERBY: F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby.
DURSLEY: T. G. Spencer, G3ILO, Field Lane, The Quarry, Cam, Dursley, Glos.
EAST KENT: D. Williams, G3MDO, Seletar, New House Lane, Bridge, Canterbury.
HALIFAX: J. Ingham, G3RMQ, Lambert House, Greetland, Halifax.
HARLOW: G. O'Donald, G3TLJ, Great East, Roydon Road, Harlow.
HARROW: C. J. Rees, G3TUX, 17 Colburn Avenue, Hatch End, Pinner.
LOUGHBOROUGH: G. P. Bateman, G3LCG, 24 Farndale Drive, Loughborough.
MAGNUS GRAMMAR SCHOOL: R. Wallwork, G3JNK, Magnus Grammar School, Newark on Trent.
MANCHESTER: K. Kahn, G3RTU, 12 Cliffdale Drive, Manchester 8.
MEDWAY: M. J. Winter, G3OHP, 47 Watling Street, Strood.
MIDLAND: C. J. Haycock, G3JDJ, 29A Wellington Road, Handsworth, Birmingham, 20.
MID-WARWICKSHIRE: H. C. Loxley, 51 Guy Street, Warwick.
NORFOLK: A. Marcantonio, G3TLC, 24 St. Lawrence Avenue, Norwich, NOR.86.Z.
NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax.

NORTH KENT: P. G. Wells, G3UFR, 25 St. Davids Road, Hextable, Swanley.
PETERBOROUGH: D. Byrne, G3KPO, Jersey House, Eye, Peterborough.
QUEEN'S UNIVERSITY, BELFAST: D. V. McCaughan, B.Sc., G3RTS, 69 Galwally Park, Belfast 8.
RADIO CLUB OF SCOTLAND: A. Barnes, GM3LTB, 7 South Park Terrace, Glasgow.
R.A.I.B.C.: Mrs. Frances Woolley, G3LWY, 10 Sturton Road, Saxilby, Lincoln.
READING: N. C. Taylor, G3TOQ, 83 Stoneham Close, Reading.
REIGATE: F. D. Thom, G3NKT, 12 Willow Road, Redhill.
SCUNTHORPE: H. Holmes, G3MSB, 69 Crosby Avenue, Scunthorpe.
SOUTH BIRMINGHAM: J. Rowley, G3TQO, 195 Castle Lane, Solihull.
SOUTHGATE: R. E. Wilkinson, G3TXA, 23 Ashridge Gardens, London, N.13.
SOUTH LONDON MOBILE: J. R. Doughty, 17 Hookham Court, Patmore Estate, London, S.W.8.
SPALDING: D. Hoult, G4OO, Chespool House, Gosberton Risegate, Spalding, Lincs.
SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, Leeds.
SURREY (CROYDON): R. Morrison, G3KGA, 33 Sefton Road, Addiscombe, Croydon.
TORBAY: Mrs. G. Western, G3NQD, 118 Salisbury Avenue, Barton, Torquay.
UNIVERSITY COLLEGE OF NORTH WALES: P. D. Symes, GW3SWL, c/o Dept. of Electronic Engineering, U.C.N.W., Dean Street, Bangor.
VERULAM: G. Slaughter, G3PAO, 5 Leggatts Wood Avenue, Watford.
WAKEFIELD: E. Price, G3TQV, 23 Elmwood Grove, Horbury, Wakefield.
WESSEX: J. F. Squires, 18 Wakefield Avenue, Northbourne, Hants.
WEST KENT: H. F. Richards, 17 Reynolds Lane, Tunbridge Wells.
WIMBLEDON: E. N. Hurler, G3RZN, 156 Monkleigh Road, Morden, Surrey.
WOLVERHAMPTON: J. Rickwood, G3JJR, 852 Stafford Road, Fordhouses, Wolverhampton.
WORCESTER: G. W. Tibbets, G3NUE, 25 Greenford Gardens, St. Johns, Worcester.
YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil.

TVI). This will be at the Service Dept., Hedley Road, St. Albans. On August 18 a meeting at the same place will be devoted to the SWL's and to 70 cms. and the "G8 plus 3" members.

East Kent have lost their chairman (G2JF) and secretary (G3TMI) owing to extra pressure of work and so on, so G3MDO has temporarily taken over the secretary's job once more. Between now and the AGM (September) he will act as both chairman and secretary. The Williams Trophy for construction will be awarded at the meeting on July 7—Toc H, Vernon Place, Canterbury, 7 p.m.

Queen's University, Belfast, who will be closing for the summer, suggest the starting of a Universities' Net in the autumn, and will try September 7 at 1200 GMT on 3650 kc—or, alternatively, October 12, same time and place. Other University clubs, please note these dates. The club has decided to install an EA-12 receiver, which will be used with various converters and so on, possibly for *Oscar* co-operation. Most of the members are now involved in exams, but some good VHF field day work has been carried out.

Baden-Powell House (Summer Newsheet) operated from Gilwell Park as GB3BP during May (Father-and-Son's Camp) and June (International Weekend), and the installation of their permanent Club Station is well under way. Next meeting will be on July 15, 7.30 p.m. at B.P.H., with a special invitation to Scouts to visit and to find out what it's all about.

The new club formed in Lincolnshire has now got well under way; known as the **Spalding & District Amateur Radio Society**, they already have 20 members, with six licences, and more in prospect

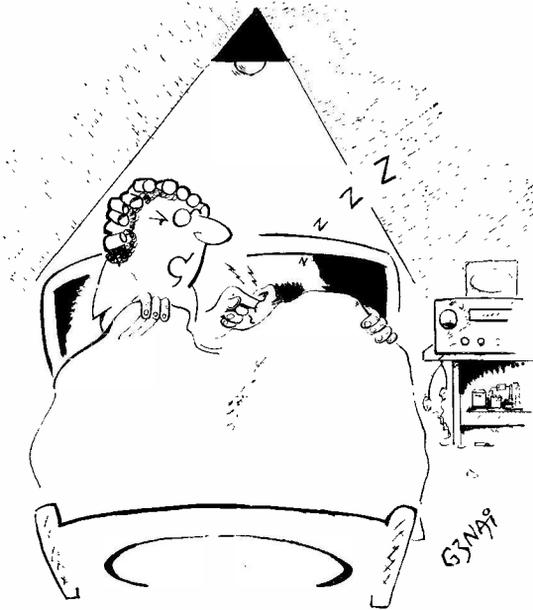
following recent R.A.E. successes; one of their keenest members is only 12, and is said to "have the makings of a good AT-operator." While still in the process of feeling its way, Morse classes are being held, plans are in hand for a club station—and they intend to be in on this year's MCC. Meetings are on Friday evenings, 7.0 p.m., at Spalding Grammar School.

G3LWY reports that **R.A.I.B.C.** is in good shape, continuing its excellent work in the interests of radio amateurs afflicted by some permanent incapacity, and that the club's finances (touched upon in this space in our May issue) are now on an even keel again, thanks to the generosity of readers. Their new vice-president is G2BSA, of Looe, Cornwall, and well known on the air.

Coventry, one of the several strong and well-organised Midlands club groups, now has a new hon. secretary, and their neighbours (and keen but friendly rivals) **M.A.R.S.** keep the flag flying in Birmingham, the next meeting being on July 20, at the Midlands Institute, to which the group is affiliated.

For **Crystal Palace**, one of the stronger clubs in the London area, the next meeting will be on July 17, when G3GWD will talk on his visit to Poland. They have a YL member, G3SGN, who puts out a very nice signal on the LF bands.

In addition to those mentioned in the text, we acknowledge receipt of Club Publications from **Cambridge (Cambeam, April)**, **Medway (MARTS Newsletter, May)**, **Radio Club of Scotland (GM Magazine, May)**, **Surrey (SRCC Monthly News, June)**, and **Wessex Group (QUA, June)**.



"... Wake up, Freddie—it's time for your skeddie ..."

I.E.E.T.E. NOW HAS 5,000 MEMBERS

The new body known as the Institution of Electrical and Electronics Technician Engineers (Ltd.), launched last April, is said to be making headway, and a strong council is being formed. The intention is eventually to publish a journal, and to arrange technical lectures and meetings at regional centres, to cover the country. All this seems to be cutting across the established institutions already in the field (of which there are three, two of them with examination standards leading to qualifications accepted throughout the world of radio and electronics). However, if you are interested in knowing what it is all about, the address of the Secretary of the I.E.E.T.E. (Ltd.) is: 26 Bloomsbury Square, London, W.C.1.

PRICE OF "QST"

The ARRL has recently put up the cover price of *QST*, so that with the increased postage, the annual subscription is now 60s. for a year of twelve issues. *QST*, which is one of the world's leading Amateur Radio periodicals, can be obtained through our Publications Dept. A new subscription takes about two months to activate—since publication is, of course, in America, and delivery is by surface mail—so that this should be allowed for when ordering. Though odd back-number copies are sometimes available, we cannot in the ordinary way supply specified issues.

A CLUB-REVIVER PROGRAMME

HOW ONE GROUP HAS
OVERCOME APATHY

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(Chairman, Radio Society of Harrow)

We commend this useful and interesting article to the particular attention of all Club officials.
—Editor.

THERE comes a time (maybe most of the time) when the committee is desperately casting round for new ideas. The same old round of speakers, film shows, junk sales and so on is beginning to pall. The same old faces, the same old talk; Joe's antenna troubles, Charlie's Modulator, conditions, the weather, the unbearable cost of it all. The same old difficulty of finding someone to serve on the committee; staleness, where do we go from here? Is it all worth while? Attendance falls, even the stalwart supporters begin to flag and it looks as if the club may have to fold.

This was the situation at Harrow a few years ago, and the newly elected (press-ganged?) committee—same old faces—had to do something about it. Eventually, it was agreed that some form of constructional activity might provide a much needed stimulus and eventually be a continuing means of keeping interest at a high level.

We have always held weekly meetings at Harrow, the programme alternating between "formal" and "practical" sessions. These so-called practical sessions were the occasions when a moth-eaten TCS transmitter, with a lethal power supply, was connected to a few yards of bell-wire in a vain attempt to work 40m. DX. We usually ended up chewing the rag with the nearest local on 160 metres—usually a club member who had stayed at home!

First Steps

We decided, as a first step, to improve the club gear, by purchasing a kit of parts from which a low power rig could be built at the club during our "practical" nights. The existing receiver was tolerable, but we hoped to improve this by getting something better in due course. There were three main difficulties: First, lack of cash; secondly, lack of tools; and thirdly, a procedure for putting the kit together so as to ensure the interest of everyone, while at the same time producing a finished article which really worked to specification.

Money was raised by raffles, junk sales, gifts and so on, and by means of a strong propaganda campaign members were kept reminded of the scheme, and the money began to roll in. Of course, we had a

little capital, and with this we obtained a stout lockable tool chest and an initial purchase of tools. We placed the tool kit in charge of a committee member, who was instructed to make a list of the tools available, and to purchase additional items as funds allowed. We began with socket punches and a bench vice as well as the more usual things such as screwdrivers and pliers, the object being to encourage members to bring along their own chassis to "bash," using club tools which they might not have available at home. Facilities for drilling, soldering, sheet metal cutting and bending soon followed, and each was announced and publicised as immediate evidence of progress. Thus were purchased over a long period, a multi-range meter and other items of test gear, and now we have a pretty useful range of facilities which any member may avail himself of on alternate Friday nights.

Of course a careful check had to be kept and everything has to be examined and packed away at the end of each session. Damaged or broken tools are recognised as an occupational hazard and are replaced from club funds with no recriminations.

Kit Work

Having chosen the kit, we wrote to the manufacturer and arranged for his representative to bring it along on the night of our Christmas party just one year after the idea had been conceived. In retrospect, we think it might have been better to have persuaded him to give us a demonstration during the early stages of the campaign as this would have given more impetus to the fund. However, the money was raised and we were the proud possessors of a lovely kit of parts!

To ensure that all participated in the constructional work, the instructions were broken down into a series of small groups, and each group numbered. This was done to give us a large number of small jobs all about equal "size." Member were then allocated numbers by drawing lots, and each person had to carry out the work according to the instructions associated with his number. At first the work could proceed on several aspects simultaneously, but later only one person at a time could be involved. This was a disadvantage, but the knowledge that everyone from the oldest old-timer to the youngest SWL had taken part in building the club rig was well worth it. In any case, by this time there was sufficient members' own constructional work going on separately to keep everyone interested. As regards the club kit, a couple of committee members were detailed to check parts and ensure the correctness of the work before proceeding to the next step.

Bonus

These activities alone provided plenty of opportunity for lecturettes and demonstrations on the proper use of tools. However, an unexpected bonus was that a small group became so enthusiastic that they got together and built a matching power supply



The scene at any "practical evening" meeting of the Radio Society of Harrow. As explained in the article by G2TA, chairman of the club, a planned programme of constructional work has been of tremendous value in reviving enthusiasm and attracting new membership — Harrow now has about 100 members on its books, and the average attendance at meetings is around 40-50. All sorts of projects have been put in hand and carried through to a successful conclusion. These photographs show a corner of the club-room, and those identified, left, are G3RZK and G3KDL busy with the drill, while G3RIU studies the circuit. In the other picture, left to right, are: G3RZK, G3KDL, G3KOE, G3KRT, G2UV, G3SM and G3RIU.

from scrounged and donated parts so that the rig could be tested and used as soon as it was finished.

Nett Result: We now have an all-band Tx of modern design with matching power supply which works well and which we built ourselves!

By this time, some eighteen months after starting the scheme, it was obvious that we were on the right road. New members were rolling in, membership approached the one hundred mark (yes, 100!) and regular attendances of forty or fifty were being obtained every week. On junk sale nights sixty to seventy people attended. This in turn meant that money was no problem, and the field was open for further activity.

Club Programme

We seriously thought about similar projects to provide test gear, or even receivers from kits of parts, but eventually realised that what was wanted was something to keep everybody busy all of the time. So the club constructional projects were born. First a two and 4-metre converter, of which about a dozen were built; now a GDO, with *thirty* under construction and soon we hope a simple CR bridge and an HF-band crystal controlled converter.

Through the good offices of G3HBW—a well-known member of Harrow—designs are worked out

and a prototype built and tested. With a working model for inspection members are easily persuaded to participate. Those who wish to build are issued with a parts list so that they can cross off items which they already have. The lists are collected again, and a mass order placed with the appropriate supply stores. Meanwhile circuit diagrams, chassis templates and wiring layouts are prepared and copied in sufficient numbers for everyone to have one. As soon as the parts become available work can start, with each member at his own pace with the use of the club's special tools and with the help and advice of more experienced members. Of course, there is some queuing for tools to start with, but after a while the jobs get spread out in time, and this together with the fact that a good many people are prepared to bring along some of their own tools enables things to go with a swing. A careful record must be kept for cost purposes and each individual has to pay for the parts he needs as required. Mass ordering leads to economies, and although the club is wealthy enough to stand the loss if anyone defaults, we have had no troubles of this sort.

The photographs give a good impression of the enthusiasm and comradeship that these ventures have engendered. This could be *your* club if you are prepared to make the effort.

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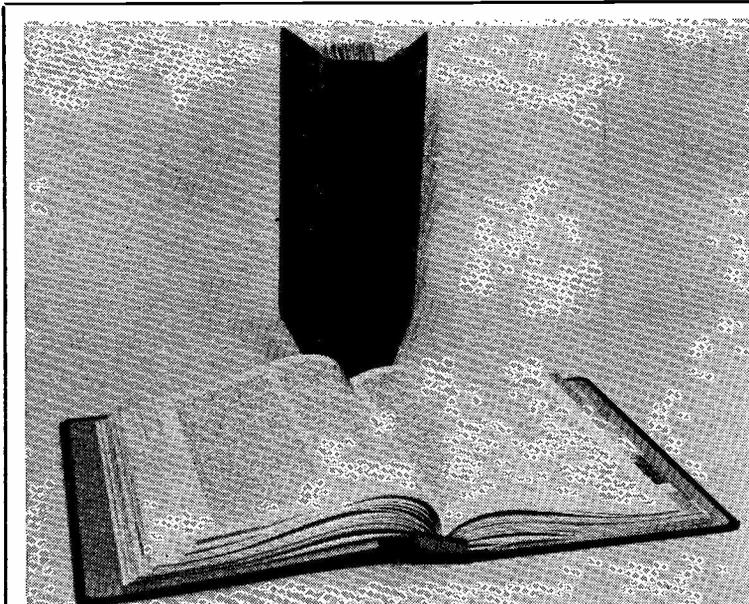
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Eddystone EC10	...	48	0	G. & D. Mk.IV Conv.	...	14	10
Eddystone Edometer	...	19	10	Codar AT5 TX	...	16	10
G. & D. 3N70 Conv.	...	16	0	AT5 P.S.U.	...	8	0
G. & D. Mk. III Conv.	...	8	19	Codar Pre-Selectors, etc.	...		
Semi-Auto "Bug" Keys	...	4	10	TK20A Test Meters	...	1	19

USED		£ s. d.		USED		£ s. d.	
Olympic T100 (TT21)	...	55	0	Heathkit RG 1, as new	...	45	0
Minimitter 120w. TX	...	35	0	R 1155 Top to 20 "S"	...		
KW Topbander (as new)	...	22	0	meter	...	9	0
Eddystone 840A	...	22	10	R 206 .55 to 30 mc/s.	...	16	10
Mosley CMI with Q	...			APQ 9 VHF TX	...	5	0

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SMALL ADVERTISEMENTS, READERS—continued

SELLING: A Linear Amplifier by Green & Davis, 1965 model, perfect, nearest £70. A Sphinx AM /CW/SSB Tx, 20-80-160m., few months old, £58. Communications Rx Minimitter MR.44/II, perfect, £40. Heathkit GD-1U Grid Dip Meter, as new, £7 10s. Green & Davis two-metre Converter, IF 28-30 mc, £5. Minimitter TR-7 transistor Top Band mobile receiver, £7 10s. Minimitter mobile whip, with 160m. coil, £3. Labgear low-pass filter, Type E.5034, £3. Olympic Z-Match Coupler, 250-watt, £7. All items in good condition and unmodified. Prefer buyers inspect and collect.—G3OCY, 56 Lumley Crescent, Ferryhill (311), Co. Durham.

AN American "Echophone Commercial" communications Rx, 100v. type, with six valves and coverage 550 kc to 30 mc in three bands, having electrical bandspread, speaker built in, BFO and stand-by switches, headphone socket, and in the compact size of about 10in. cube. Including separate 110v. isolation transformer, price £10. Buyer inspects and collects, or pays carriage.—Jeapes, G2XV, 165 Cambridge Road, Great Shelford, Cambridge.

WANTED: National HRO-5T (or would consider HRO-Mx). Must be in FB condition and unmodified. Can collect.—Jackson, 8 Longmeadow Road, Orchard Hills, Walsall, Staffs.

WANTED: Good general-purpose and coverage Rx, Airmec C.864 or similar. Details to—Cox, 110 York Avenue, Hayes End, Middlesex.

COMPLETE STATION For Sale: K.W. Viceroy Mk. II; Hammarlund HQ-170; K.W. Match and SWR Indicator; crystal microphone (Cardioid); TA-33 Beam Aerial; CDR rotator. All hardly used and complete with all cabling; in excellent condition and perfect working order, price £230 complete. Would also consider, in part EXCHANGE, a suitable Transceiver.—Roy Hodges, G3SUR, 71 Crescent Drive South, Brighton, Sussex. (Tel. Rottingdean 2888.)

SALE: Kokusai mechanical filter, 455/15K, B7G xtal u/s, cost £14 10s., accept £10 10s. B.44, with mods. to aerial circuit only, £2. Two QOV06-40A, new and boxed, £5. Or EXCHANGE BC.221.—Box No. 4143, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SELLING: A 70-centimetre Converter by Green & Davis, tunable IF 12-16 mc, fully working and only few weeks old, offers to—Box No. 4144, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: G2DAF-type Rx, good condition, fully labled, £45. HRO Rx, new front end, four bandspread and two general coverage coil sets, with PSU, £16. AR77 receiver, £10. An "Elizabethan" Tx, 120 watts 10-80 metres CW only, with PSU, £16. AM modulator with 2/807, £2. Top Band Tx, with T/R switch and PSU, for CW only, £4. Carriage extra.—G3HIW, 60 Auckland Road, Ilford, Essex.

FOR SALE: HRO-Mx, with nine general-coverage coils, mains PSU and manual, in mint condition, £20 o.n.o.?—Almond, 21 Wembdon Rise, Bridgwater, Somerset. (Call evenings.)

SALE: Eddystone 888A, with matching S-meter, £60. A Grundig TK.830/3D, with microphone, £30. No offers. Buyers collect.—Box No. 4145, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE Due to Bereavement: Marconi CR-100 Communications Receiver, with instruction book, £15. Other items of radio equipment, details on request.—Wilkinson, School House, Great Preston, Woodlesford, Nr. Leeds, Yorkshire.

Offering a Minimitter Tx, 40-80-160 metres, complete with remote control unit and AC power supply, £20.—G3JOL, "Jolly Old Landlord." The Silver Plough, Pitton, Nr. Salisbury, Wiltshire. (Tel. Farley 266.)

SMALL ADVERTISEMENTS, READERS—continued

SALE: R.107T, in excellent condition, with S-meter and muting built in, circuits available, £13. Delivered within 50 miles of Epsom, or carriage extra.—G. J. Knights, Ashar, Cross Road, Tadworth, Surrey. (Tel. Tadworth 3247.)

FOR SALE: Table-Top HRO, with PSU and ten coil sets, BS on 20 metres, realigned and in FB condition, including spare valves, speaker and handbook, price £20. Eddystone 888A, mint, with S-meter and speaker, £55. One 1CP31 CRA, few hours use, £2. G3HSC Morse record, 30s.—G3TJQ, 51 Heathfield Square, London, S.W.18. (Tel. VANDyke 1227, evenings.)

WANTED by VK5NK, by mid-September, two HRO-60 Rx's, or similar, with full set coils, circuit diagrams, etc.—Beekay Electrics, 1 Charnwood Drive, Leicester Forest East. (Tel. Kirby Muxloe 3708.)

SALE: HRO in FB condition, enclosed rack model, with S-meter, complete with five coils in box, but no PSU. Price £12 plus carriage; s.a.e. for details.—Box No. 4146, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: KW-160 Tx, self-contained, high level modulation, break-in facility for CW, first-class electrical and mechanical condition, case unmarked, £20 o.n.o.? Carriage extra.—G3KJY, 12 Dickens Avenue, Barnoldswick, Via Colne, Lancs.

WANTED: AR88; Joystick; Joymatch No. 3. **SALE:** KW-77 receiver and speaker, £80. RX-60, £17.—Westwood, 114 Pettits Lane, Romford (47577), Essex.

FOR SALE: Heathkit Transmitter DX-40U, complete with Heathkit VF-1U VFO, and manuals; both perfect, £27 10s. o.n.o.?—G13TJJ, 6 Westland Street, Londonderry, Northern Ireland.

EXCHANGE: Eddystone 680X, perfect condition, for best Mobile Rig offered. LM-14 with calibration book and PSU, or McCoy filter, for CDR rotator, or W.H.Y.?—Eley, 14 Warmington Road, Hollywood, Birmingham.

WANTED: Circuit for Minimitter Rx MR-33; buy or borrow.—Cutter, 124 Briercliffe, Scarborough, Yorkshire.

GOING VHF. Complete HF station for sale, comprising: HQ-170 receiver; Viceroy Mk. II, with anode modulation facility; G2DAF linear PA; and 3-ele 15-20m. Vee-Beam; including all manuals. First £150 secures. No offers.—G3OOB, 12 Newton Park Drive, Leeds, 7.

WHAT OFFERS? Tiger Tiglet, miniature 80-160m. AM/CW Tx, with matching AC PSU. Army W.S. No. 62, ideal mobile/portable 40-80-160m. AM/CW Tx/Rx and includes 12v. DC PSU. Marconi CR-300 Rx, 15 kc to 25 mc continuous, with LS and xtal calibrator. Also large quantity junk, QRO Tx and Rx gear. **WANTED:** R.216 VHF receiver.—G3IGG, 26 Hooton Way, Hooton, Wirral, Cheshire.

EXCHANGE for Receiver, or W.H.Y.? Fifteen volumes "RSGB Bulletin," 1947-'61; 15 vols. "Short Wave Magazine," 1946-'60. Unbound.—G3CGQ, 94 Alexandra Avenue, Luton, Beds.

SELLING: Rodiovision "Commander" double-superhet receiver, general coverage and amateur bandspread, with speaker and PR-30 pre-selector, £20. Johnson Viking "Challenger" AM/CW Transmitter, with home-built VFO, £25; or both together, £40, delivered to 50 miles. "Short Wave Magazine," Aug. 1956-Feb. '64, £3. "Bulletins," Nov. 1957-Dec. '63, £2. I.S.W.L. "Monitors," 10s. ARRL "Handbook," 10s.; or £5 the lot. All items o.n.o.?—118 College Hill Road, Harrow Weald, Middlesex.

SALE: HE-30, little used and in good condition. This receiver is all-band, with bandspread on amateur ranges, £27 o.n.o.—G3OWQ, 12 Robin Hill, Bedford.

WANTED: HRO Rx, with manual, and BS coils desirable. Liverpool area preferred.—G3PNL, 203 Molyneux Road, Anfield, Liverpool, 6.

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		OC72*	6/6 OC171 8/6
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K.W. Corner No. 11

(A monthly review of news, views and advice)

The KW2000, KW2000A SSB Transceivers and KW600 Linear Amplifier are now available on short delivery. Our increased production facilities are getting into full stride. This year the Works are not closing for summer holidays but we are carrying on under a staggered holiday programme. We shall be pleased to arrange easy terms with one fifth deposit and balance payable over 12, 18 or 24 months if required. Why not enjoy the use of new KW equipment NOW!

A NEW KW MATCH is now available. This permits S.W.R. readings to be taken with both 52 or 75 ohm co-axial feed. A switch is provided on the front panel for a quick change-over from one impedance to the other. Price £8. 10. 0 plus 3/- p. and p.

HAMMARLUND. We have now in stock the latest Hammarlund receivers including the HQ 170AE, HQ 180A, HQ 145X and the HQ 170A-VHF which covers all Amateur Bands 10-160 metres plus 2 metres. Again easy terms can be arranged if required, and we shall be pleased to quote against your trade-in equipment.

BARGAIN CORNER. The Mechanical Filters, TR11A Rotators and Walkie-Talkies offered in K.W. Corner last month at special prices are still available. The offer is being kept open while supplies last or until 30th July, 1965. If you are looking for good quality second-hand equipment write for our list. We frequently have trade-in equipment and all too often equipment from "silent keys." Such receivers as HQ 170's, 2B's, KW77's, SX 101A's and "Vanguards," "Viceroy's," etc., in the transmitter range and all are K.W. tested and adjusted where necessary, before despatch.

STAR BARGAIN—HALLICRAFTERS SX117 Receiver, Brand new and unused. Current model with crystal controlled 1st mixer and triple conversion. A really "hot" amateur band receiver £142. (Current price £190).

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HALLICRAFTERS HT 33A LINEAR AMPLIFIER. Up to 1 kilowatt, 80 to 10, very little used	150	0	0
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EAGLE RX 60. 550 kcs. to 30 mcs., bandspread	17	10	0
NATIONAL NC270. Amateur bands, Xtal controlled 2nd Oscillator. Calibrator, 'S' meter, Notch filter	75	0	0
FT 241A CRYSTALS. Channels 0-15, 17-33, 36, 39, 40, 41, 61-68, 71-79, 273, 275-279 each	4	0	0
LABGEAR LG 50 TX. 60 watts CW, 40 watts AM	29	0	0
LABGEAR TOPBANDER TX. Excellent condition	18	0	0

New Equipment

RX 80 RECEIVER. 535 kcs. to 30 mcs. Amateur bandspread, Q multiplier, S meter, AM/CW/SSB	52	10	0
SPHINX SSB TX. Ex stock	75	0	0
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EDDYSTONE 940	133	0	0
EDDYSTONE EC 10. New transistor receiver	48	0	0
EDDYSTONE EA 12. New Amateur bands receiver	185	0	0

Carriage extra on all the above

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Radio Control gear by Grundig, REP, MacGregor, O.S., etc. Models by Keil, Veron, Frog, Graupner, Ripmax, etc.

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SMALL ADVERTISEMENTS. READERS—continued

FOR SALE: Geloso G.209 receiver, modified Top Band, £40. BC-312, with power supply, £12 10s. New Kokusai mechanical filter, £7 15s. Police-type Tx/Rx, suitable four metres, £5. New TV turret tuners, 15s. T.1540 two-metre Tx, £5. All plus carriage. Also valves, meters, xtals, transformers.—G3IDW, Orchard Cottage, Hook, Swindon, Wilts.

FOR SALE: Heathkit SB-10U SSB Adaptor, as new, £25, plus carriage.—P. Odell, 20 St. John's Grove, Redcar, Yorkshire.

WANTED. K.W. Vanguard, Victor or Viceroy Mk. III. Reasonable distance from Bristol. Cash-and-carry offered.—Hill, 37 Kingsley House, St. Phillips, Bristol, 2.

ONCE-IN-A-Lifetime Parcel: QQV03-10, 5763, EF95, EC91, 6BH6, ECC81; all brand new; 35s. plus post and packing. Satisfaction guaranteed.—Box No. 4147, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SALE: Brand-new modulation transformer, as fitted K.W. Valiant, cost £3 10s., sell 40s. H.M.V. push-button car radio, very good, £5. Carriage extra.—Kellow, St. Dominic, Callington, Cornwall.

FOR SALE: Minimitter "Mercury" transmitter, 10-80 metres AM/FM/CW, 150 watts input. No modifications, perfect condition, with key, Acos xtal microphone and spare valves, £60.—D. H. Willoughby, ex-DL2YU, 29 Mackenzie Drive, Shorncliffe, Kent.

SELLING: Minimitter Mobile Transmitter, complete with control box; covers 40-80-160m., for 12-volt operation, £9. Panda PR-120V transmitter, 10-80 metres, 120 watts AM/150 watts CW, £50. Buyer collects.—Wyse, 36 Wilmslow Crescent, Thelwall, Warrington (64178), Lanes.

SPECIAL OFFER: IF Amplifier Units, 3-stage using three OC171 transistors; made to rigid specification and are of communications quality, IF being 10.7 mc, tuned by six high-Q circuits. Ideal for VHF, mobile or portable use. Tested, and with circuit, 20s. post paid. Also available: 8 mF 800v. electrolytic condensers, T.C.C. tubular, brand new, 5s. 6d., post 1s. each; key switches, brand new, 4s., post 1s. each.—James, Shalimar, Post Office Road, Frettenham, Norfolk.

WANTED: AR22 Beam Rotator, or similar. **SALE:** CR-100/2 Rx, excellent condition, S-meter, manual, price £28.—Thurlow, 19 Gravel Hill, Croydon, Surrey. (Tel. ADDISCOMBE 2761.)

FOR SALE: Two LM-13 frequency meters (Navy BC-221), with calibration books, £13 each. Marconi CT.218 Signal Generator, 84 kc to 30 mc. FM/CW/AM, mint condition, £15. Cossor Type 343 Ganging Oscillator, £4. Creed Type 7B Page Teleprinters, 110/250v. DC, cleaned, oiled and tested, working, £15. All items plus carriage.—G3LSD, Netherton Cottage, The Elms, Stoke Damerel, Plymouth, Devon.

SALE: AR88LF, excellent condition, with S-meter, manual, trimming tool, some spare valves; recently overhauled, realigned and resprayed, price £32. Q-Multiplier to suit (with "Electroniques" coils), £3. TCS-13 Tx, with speech amplifier and circuit details, in excellent condition, £7. A PSU giving 850v. 250 mA, 400v. 150 mA, 12v. AC, 6v. AC, 10v. DC, metered and fused, £6. PSU Type 243A (with meter), £2. A PSU giving 350v. 200 mA, 150v. stabilised, 6.3v. 5A LT, £2 10s. Sig. Gen. (120 kc to 84 mc, and audio, £2 10s. Oscilloscope (uses VCR-139A tube), needs attention £3 10s. Z-match unit, with ARRL-type Monimatch, £2. Aerial loading coil, 53 Set, 10s. Transformers: 1100-0-1100v. 500 mA, 25s.; 1000-0-1000v. 150 mA, £1. TCS mod. type, 10s.; Woden UM3, £4; 10v. 10A., 2.5v. 5A. type, 15s.; 10v. 10A., 7s. 6d. GU50's, two (one new), 15s. Two new 866A's, £1. Two 8 mF 1500v. wkng condensers, 10s. Carriage extra all items.—G. R. Sutherland, 18 Caiystane Terrace, Edinburgh, 10, Scotland.

SMALL ADVERTISEMENTS, READERS—continued

FOR SALE: Heath "Cheyenne" and "Comanche" matching transmitter and receiver for fixed or mobile operation, 10-80 metres, 90 watts, complete with "Electro-Voice" cardioid microphone, and manuals, perfect pair, £50. Also AR88D, with S-meter, speaker, tools and manual, £25. (Contact after July 19).—G3TUA, 114 Beechwood Gardens, Ilford, Essex. (Crescent 0012.)

CHEAP AF Transistors, similar OC71, all tested, at only 9d. each or one doz. for 7s. Experiment the easy way. P.O., with s.a.c. to—E. Chikken, G3BIK, 52 Marlborough Avenue, Gosforth, Newcastle-on-Tyne, 3, Northumberland.

EXCHANGE Eddystone S.840 receiver for K.W. Valiant Transmitter modified for Top Band. Will deliver for test reasonable distance Bedford.—G3RFG, QTHR.

WANTED: Vibroplex key, Vibro keyer, electronic bug.—G3RCO, Westleigh, Fore Street, Beer, Devon.

GOING QRT: Tiger HF-200 Tx, 10-80 metres, modulator needs attention, otherwise perfect; also CR-100, good condition. Best offer over £45 for both.—GW3VL, Ty-Melyn, Blackbrook, Caerphilly (2054), Glam.

SELLING UP: Geloso 4/102, with dial and pi-coil, £3. Medium-wave "Command" Rx, with PSU, £2. Q5'er, less valves, 20s. Bendix TA-12C, £2. 400v. PSU, 20s. Transformers: 1000v., 600v., 40v., 20s. each; Woden DT-1, 10s. Dials: Eddystone 598, Jackson "Caliband," 10s. "Short Wave Magazine" and "RSGB Bulletin," 1948-'60, offers? —Gordon, ex-G3MGV, 19 Moredown House, London, E.8. (Tel. CLIssold 5850.)

MUST SELL on move to VK6: Pye "Ranger" two-metre portable (transistorised PSU version) Tx on 145.3 mc, fully working and complete with handbook, £20. Pye 4-metre base station assembly, Tx on 70.6 mc, complete and working, £17. "Reporter" 4-metre mobile, unmodified and complete with handbook, £7 10s. R.208 Rx, with 2-metre converter, IF tuning 16-18 mc, with handbook, £6 10s. **WANTED:** Discarded G2DAF-type Mk. II SSB Tx project, prefer Kokusai filter version, must be new components. Inquiries and offers to—P. Smith, G3LWO, 24 High Street, Orford, Woodbridge, Suffolk.

SALE: Eddystone S.750 Rx, with phones and speaker, excellent condition and performance, £35 o.n.o.? "Elizabethan" LZ-29 tape recorder, £18 o.n.o.? RSGB and ARRL "Handbooks." Consider PART EXCHANGE for either Heathkit Mohican or Eddystone EC-10.—Mortimer, 17 Springfield Avenue, Lye (2649), Stourbridge, Worcs.

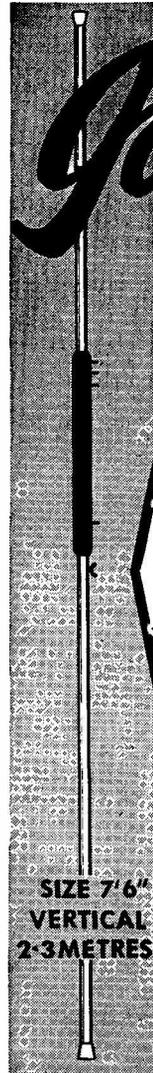
FOR SALE: Minimitter MR-44 Mk. II receiver, November '63, £45 o.n.o.?—Bance, 126 White Hart Lane, Tottenham (3951), London, N.17.

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