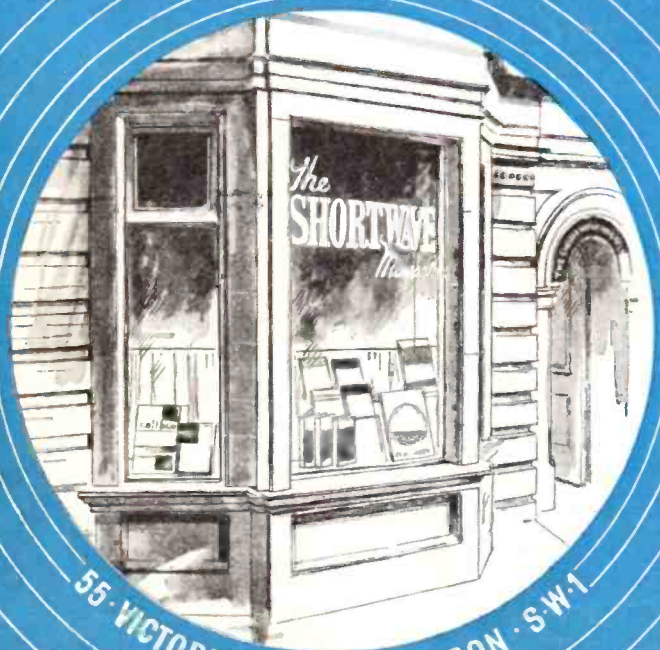
The SHORT WAVE Magazine

25p

VOL. XXXI JUNE, 1973 NUMBER 4



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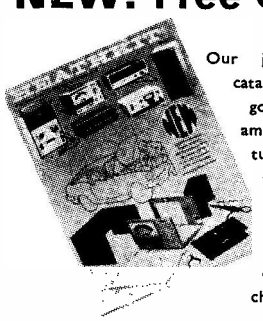

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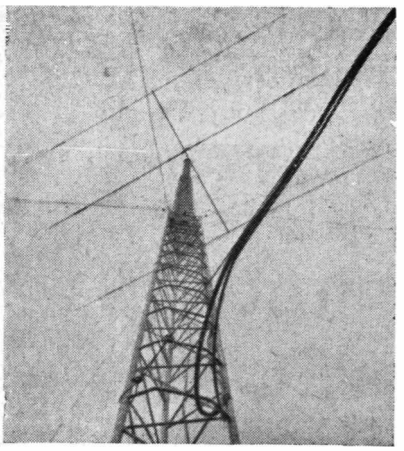

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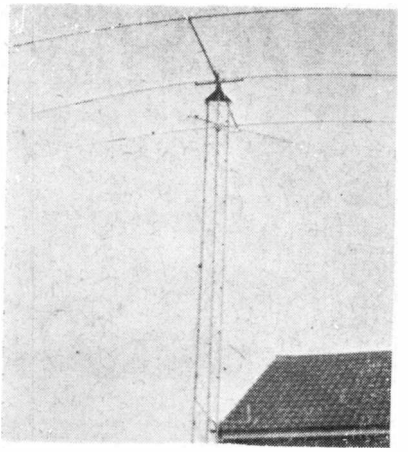

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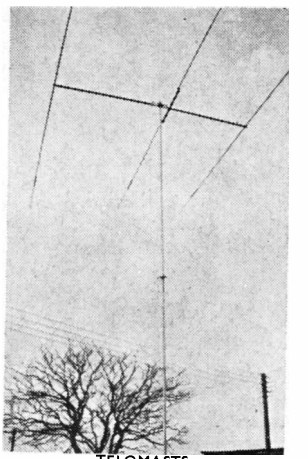

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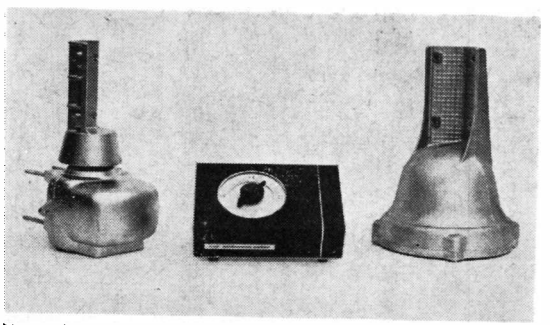

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(GB3SWM)

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CONTENTS

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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. Photographs should be lightly identified in pencil on the back with details on a separate sheet. All drawings and diagrams should also be shown separately, and tables of values prepared in accordance with our normal setting convention—see any issue. 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.

FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT WAVE Magazine

EDITORIAL

Sharing

Proceeding from the basic assumption that the ether is free for all to use subject to reasonable safeguards reached by mutual agreement—a principle which needs constantly re-emphasising—we should look at the conditions under which amateurs are at present operating. Briefly, on virtually all HF bands except perhaps ten metres, they are "working in the cracks." That is to say, our rightful allocations are being trespassed upon by illegal commercial stations, to say nothing of noises emanating apparently from idling jammer transmitters. Though these encroachments have been increasing steadily and the whole situation gets progressively worse, the challenge is nevertheless being met in the sense that more and more amateurs are coming on the air and a great deal of DX is being worked, world-wide, on both CW and Phone.

What this means is that amateurs are quite capable of operating under shared-band conditions, if they must. But it also implies that a shared band means sharing—in other words, commercials have no ground for complaint if they are being interfered with by amateurs. Nor does it necessarily follow, if a complaint is made, that in all circumstances a commercial station's operations are more important than the amateurs'. It could be shown that a great many commercials waste ether space and spend many hours transmitting merely to "hold the channel." In any case, the apparent threat of amateur interference on a shared band is more imaginary than real; the commercials competing with us (on our bands) are always much higher-powered and practically never use their own frequencies for reception.

In the same way that amateurs—as a body, the most experienced, capable and progressive communicators in the world—have long since ceased to expect their own frequencies to be clear of interference by other amateur stations, so the commercial users of the spectrum must accept the same limitations.

The present level of amateur activity, with the high state of development of the art of Amateur Radio, has become its own justification for a proper share of the ether. This is not a matter of "privilege," or even a "right" (in the moral sense), but simply a requirement by virtue of sheer weight of numbers! Moreover, since radio amateurs are primarily concerned with and interested in Communication, they must have frequency areas available which are capable of carrying their DX traffic—that is to say, any suggestion that amateurs can be compensated for HF bands lost by making fuller use of the UHF or SHF areas is completely unacceptable.

* * * *

Much of the foregoing has been said before in this space. We hear quite a lot about the meritorious work being done—in Europe and the U.S.—in the Intruder Watch context, by which invaders on the amateur bands are identified. But the gross infringement of our bands continues, apparently beyond the administrations concerned with Amateur Licensing either to control or restrain. Russia and China are the prime offenders, though it can be shown that some Western signatories to the I.T.U. Agreement are equally culpable.

Austin Forsyth
G6FO

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

QUITE definitely an up-and-down month, this last—it would have been interesting to have spent a little time when conditions were peaked and at their troughs, to take a look at the state of the sun, and to correlate the events there with the goings-on on the bands—that's the snag about this Amateur Radio, there are so many interesting things that one just doesn't get time to look into them all!

As may have been gathered from the tailpiece last time, the writer had to complete his story early; and, naturally enough, Murphy's Law made quite sure that many interesting notes and comments which would have rounded out the piece landed on the mat a few minutes too late! However, it also means we have a bumper crop for this time, even as we begin this offering. This being so, let's get on with it!

Ten Metres

There were few excitements, but few days when it was not open to somewhere or other, says G3USF (Keele) who noted that at this stage of the sunspot cycle the openings tended to be rather local, as for instance to the Eastern Mediterranean, then one day to 4X, on another to ZC4, or on a third to Turkey, but rarely to all three. By the time this piece comes to be read, of course, there will be the normal level of short-skip European activity that abounds at this time of year. G3USF worked SSB to A4XFE, A6XF, A6XP, CP1JV, CT3BD, CX6AM, CX9AAK/4X, EA8FF, EL2DG, EL8I, EP2WB, OA6BJ, RD6DIF, ST2SA, VP8KF, ZD9BM, 5U7AZ, 5U7BA, 5X5NK, 5Y4XLW, 9G1AR and 9H1C.

The band has even on occasions been open to America, says G3NOF (Yeovil) although Don did not work one; he settled for CR6JT, ET3DS, LU8AJG, ZS1FH, ZS6BLK, 5B4AO, 9G1DY, 9J2AY, and 9J2DT, with 5X5NK, 9G1AR and 9G1DY as gotaways. However, Don comments that there were often periods of complete deadness.

G3VLX (Chislehurst) seems to have been quite active this time, spread across most bands, and on Ten he found PY5AQM, CX4BT, LU2HCO and CR6PR.

Although he reckons it is his favourite band, GW4BLE (Newport, Mon.) neglected it this time, and can therefore only report working 5B4ES and 9G1HO both on SSB, and with 240 watts and a ground-plane.

QSL Matters

Here, as usual, G3NOF has a string to offer. *7Q7AE* cards go to P.O. Box 24, Blantyre, which is also the 7Q7 QSL Bureau address; *ET3DS* to VE2DCY; *5X5NK* to DJ3JV; *HS4A1A* to VE6AKV; *M1D* to I4FTU; *ZD7SD* and *ZD7SS* to P.O. Box 16, Jamestown; *HS4AGZ* to the Bureau; *ZD7BB* to P.O. Box 17, Jamestown; *9G1AR* and *9G1HO* to P.O. Box 194, Accra; *EL2DI* to the American Embassy, APO 09155, N.Y.; *VP2KF* to VE2DCY; *EP2GW* to W2REB; *EP2SP* to the EP Bureau or via ISWL; *SV1DB/A* to SV1DB; *W9JFE/VQ9* to his home QTH, or through the W9 bureau; *7P7AZ* to VE2JH; *9X5JC* to P.O. Box 198, Kigali; *JY9VO* to W7JHO; *VK9XW* to VK6RU; *YA1GJM* and *YA1LM* to P.O. Box 279, Kabul; *3B6CF* to JAØCUV; *EA3URE* to P.O. Box 188, Badalona; and *CN8MC* to P.O. Box 5210, Casablanca. G3UOL mentions that *TE2CF* cards should go through TI2CF.

Fifteen

It was perhaps on this band that the oddity of the conditions during the month was most marked, as our various correspondents make clear.

G3YRR (Grimsby) latched on to a couple of interesting ones, in W4CYZ /MM2 on a weather ship off Newfoundland, standing by the tanker *Rio Calas* which had been stranded with engine trouble for eight days and was therefore running short of basic supplies; the other was WA2QUF/AM at 27,000 feet above the Humber and heading North.

G3DCS (Ipswich) is still actively pursuing RTTY and getting a lot of fun out of it, although on Fifteen his only offering was the hearing of XW8BP on CW, which one suspects is still Enver's favourite mode.

Another one with time spent on the band but not much to show for it was G3ZDD whose best DX was ELØS/MM, in the Caribbean, and asking for his cards to be sent to YU2RCZ. However, Derek was just unlucky in picking the wrong times to come on the band.

Deep in the lair of the dreaded G3ZPF (Dudley) we are assured, a fiendish device is being brewed up which will result in instant response from all DX signals; it should be in use by the time this is to be read—always assuming it *works*, of course! On a more serious note David found his CW to yield only Europeans and 4X4CO, but SSB did rather better to raise PY2AQG, PY6BM, PY8RW, A6XF, CR6SM, 5Z4NH, PH1AS, 9J2DT and EA6BG.

He is far too busy these days to come on the air regularly, says G3UOL (Coventry) who has a K.W. Viceroy 111A into a K.W. trap dipole. Nonetheless, the rig was dusted off now and again, and on 21 MHz SSB worked EL9C, VP2MYA, XX7IK, ZS's, 9G1HE and 9Y4EH.

Quite a long list of stations fell to the RF out from G3RFG (Henlow), including CX5CB, JA1RKW, JA3ADN, JA4AVO, JA6WGE, JA7DUI, JA8EYJ, JR1FVW, K1SWK, K8EEM, K6TE/MM/KZ5, LU3DSI, UAØFAM, UW9TK, VE1AUE, VE3ALL, VE3BV, VE3BHZ, VE3FVV, W1IXI, W2PSY, W4ZMR, W5WPB, W8JKM, W9WGE and WAØVKF.

G4BKI (St. Ives) celebrated reaching the ripe old age of 15 by getting the aerial up from 35 feet to sixty, which improved his results on 21 MHz somewhat, so that now he has a countries-worked score of 166. The SSB side yielded YB1CR,

Does anyone seeing this remember working George Fisk, AC2FF, Tientsin, China, about 1927-'28? If so, here is his station as it was then. He was a very keen radio amateur, building all his own gear, and could be worked on the 45-metre band. The Tx was xtal-controlled, using home-ground crystals, and the Tx tank coils were made of silver-plated copper petrol pipe, as was the fashion in those days. During the famous Byrd Expedition to the Antarctic (when radio was used seriously for communication for about the first time) he was able to relay traffic between Byrd's advance camp on the South Polar ice and the U.S. All this was, of course, years before China went Maoist and erected the bamboo curtain. According to our 1927 "Call Book" there were no less than six European-owned AC2 amateur stations in Tientsin alone during the late 1920's.

TU2DF, JY6VMM, VP1BH, ZVØWH and ZS3AV, while CW accounted for FL8HM, JY9FOC, KH6ERN, XW8BP, UH8CW, UK8MAA, SU1MI, MP4BHM, 5X5NK and lots of W, PY and JA's.

Because of the mail difficulty last time, we have two letters from G3DNF (Leeds) to deal with; his first, for the previous period, commented on the three-week attack of the sulks which 21 MHz displayed after the ARRL CW contest was over. Having "tasted blood" on the band with his QRP, Gordon was anxiously awaiting the right conditions, which returned on April 4, after which, up to the time of his letter, the 1½ watts and collinear aerial had collected WN2KMM, WN1RCE, W1JNV, WN4ASO, K1CSB, 9H1DP, UB5FAM, YU5DN, SV1AA, WA1KVM, WA8EIV, WN4AJM, WN4ZXJ, WA1QQQ and WA3SYO. The technique seems to be to watch the Novice band; if the WN's are coming in well, it is worth trying for them. Try for a signal head and shoulders above the rest, indicating the path is open and the chap has, if not QRO, at least a gainy aerial. A good time is, as so often happens even with high power, the period when the band, to the States, is just going out. In the subsequent letter, the story continues, with WA2MOG, W3GTL, and W9CTT worked on the evening on which he wrote (using the 1½ watts QRP, of course) while 90 watts to the "big rig" managed SQ5Z, 5B4AM, WP4DQL and ET3USC.

Likewise two letters from GW4BLE (Newport, Mon.). In the first he notes SSB contacts with CN8BO, 9L1MF, 9G1HO and some 4X4's, while the second mentions TU2DF, 3B6CF and 4X25IX.

For G3VLX things seem to have gone quite well; we see he used SSB to work HI8LC, ZP9BL, HK4BVV, JH6DQJ, JF1IUA, JA2KWL, JE1XHN, JE1HQM, JH1XYG, JA5LDD, CR7CH, EA8IS, ZS3GH, LU1DLM and 6W8AL.

Although he has a TVI problem on 15m., G3NOF listens, and his summing-up shows little from JA during the period, no VK/ZL signals heard, and a poor path to North America, but as some sort of compensation, the early-evening conditions to Africa have been quite bonny. The few contacts Don had were with JA3NTE, ZS1JJ and 7P7AZ.

Another user of the Heath HW-7 for QRP is G3VWF, who told G2NJ that he had mastered the technique enough to record his first Trans-Atlantic contact with it, to W1TF.

Twenty Metres

G3UZ (Goring-by-Sea) comments on our SWL friend, E. Parker of Hove, whose wife calls the shack Ernie's "playroom" and says that his, G3UZ's wife, calls *his* shack "The Hovel!" Hovel or not, it has provided G3UZ with entertainment on Twenty CW all right, by way of lots of UF6's, UL7's, UI's, UJ8, UK9, UA9, UV9's, VE1's, VE2's, VE3's, ZP3CA, ZP9BG, FP8FU, PY1MCC, PY5LS, PY7VLS, VU2IN VU2UR VO1HP, OX3JW, JH1CQX, 9H1BD, 9H1DP, UZ3RV and TA1MB and 4X4LC. The UZ station, when asked if his was a new series of calls, did not seem to understand; but the TA chap gave his name as Kadri, QTH Istanbul, and G3UZ reckons a lot of people will be a bit downcast if he turns out to be a pirate.

G2HKU (Sheppey) reckons it is a good thing the island is well anchored, else he would be adrift, or sunk, with the wind and rain they have had of late! However, without /MM facilities(!) Ted worked UF6CX on CW and a couple of new

ones on SSB in XT2AA and SV1DB/A, not to mention EA9EJ, ZL1VN and ZL3SE.

G3WW and G3DOX are both on SS/TV, and apart from working Twenty would like to set up slow-scan TV skeds on Forty, where QSO's are a bit harder to come by in this mode. G3WW says his "real DX" score is now 301, counting Mount Athos.

Twenty for G3DCS was a mixture of modes with RTTY contacts to WAØYDJ/4, UW3HQ, W2LFL, W4CQI, SM2BYC, UK3DAA, IT9ZWS, K5ARH, I5MFK, UK4FAD, SMØASW, SM2EKM, OK2MP, I1BAY and PY6FI. CW was also used, for working UAØCBR, HK7UL and W1DB, with JT1AO heard on CW right through the middle of an RTTY contact.

Twenty for G3ZDD meant CW, of course, and contacts with JH3NMU, KL7CZ, UA9CBH, TG4SR, ZM2AFZ, KV4FC, W6DJW, W6SO, VK5NO and PY7IE.

On the other hand SSB was the mode for G3ZPF, who accounted for VE8RCS, VP2MYA, VP2MQB, EA6BN, 9Y4EH, VP9GE, 9V1RN, VO1CU, CR7LE, EA6BP, YV4AOF, VP2KH, VE8ML, CI1ADV, WA1NGK/TF, UO5BZ, 5Z4NT. VQ9HCS (back on Mahé), OHØAB, SV1DB/A, 5B4KP, WB4ZQX/VO1, EU's, W's and QRM.

G3UOL took the odd look in the pot to see what was going on under the seething, and withdrew with his fingers sticky after catching CQ6LF, FL8BH, MP4TEE, PJ9BN, PY's, TE2CF, VE8CK, VP2MYA, VP9's, VQ9R, YV's, ZP5EH, ZX7AAD, and 4W1AD all SSB.

G3RFG has changed his home-build all-band vertical for a commercial job—as he says, now he is retired he doesn't much fancy going outside to change bands and so the home-constructed one, though more efficient, just had to go. However, one way or the other Stan's CW connected with JA4HM/5, JA8FDA, JE1LPZ, JH8NMU, JT1AO, K1EJO, K4CBB, K7NHG, LU1HDC, PY2CZX, PY7BOW, PY8ABC, UV9DX, VE2LI, VE3BKA, VE6AVO, VK2EO, VK6ZE, VP7BA, W1PL, W2HXI, W3FVB, WB5CLE, WA6HWR, W9WR, YB3CW, ZL2UV, ZL4IE, ZM4NH and ZS2AG.

Both modes were in use at G4BKI; CW was enough for LU2EN, KP4DLC, HI8LPN, CO2DC and ZP3CA, but he had to take SSB to make it with FM7AP, 8P6AY, DL2GG/YV5, FY7AF, FY7AG, TI2FCD, VP2LGH, VP2AZA, FG7XC, VP2MKE, PJ2MI, VP7BA, VP2KH, VP2SU, ZD7FT, 8Q6AC, VP2VAM, OA4AKL, XE1YS, 4S7AB and VP8KF—all new countries for him.

Although in the previous month the decorating season was upon him, G3DNF did find time for a spot of on-the-air activity; elated with his success on 21 MHz with fleapower, Gordon now intends to tackle 14 MHz and at the time of his letter was building a 1½ watt transmitter for and band.

The earlier letter from GW4BLE mentions contacts from the home station with CN8BO, ET3DS, EP2DO, VP2MYA, TE2CF, ZX7AAD, 4M5BPG, VQ9R, 4L3Z, ZD7FT, VE8ML, CI1ADV and MP4TEE (under the latter's new call of A6XF). The latter letter indicated a certain lack of interest in Twenty, but did mention working A6XF, CN8BO, A2CCY, CI1ADV, VE5IT, VE8ML, 9G1HE, 6W8DY, 3B6CF, VK's, an "IT57ZGY" and HA100KDW, all of the contacts being SSB.

For G3VLX, the increased activity seems to have been well spread over his aerial farm. Twenty saw SSB used to work to 4KØBKX (San Andres), PA6GRL/A (an exhibition station at Leeuwarden), 6Y5ED, VK2OQ, HC2HM, EA8IS, SP5ATV/MM, G3ZEL/MM, 9G1AR, HR3AC, CN8MC, 5T5BY, HI8XFC (in schoolboy French) and PZ1AW. Incidentally, SP5ATV/MM was near the equator and due to arrive in Plymouth about the time of writing, in the course of a single-handed sail round the world in his yacht *Polonez*—Chris left Poland on May 1, 1972.

By far the best this month, was Twenty, in the view of G3NOF. Don found it on occasions affected by solar activity and all but dead, while at other times it was full of short skip G's. North America has

BRIEF DX DATA

A2CCY Reported on 21296, 21317 kHz, also around 14193 kHz, 1700 GMT. Says QSL's *only* via P.O. Box 298, Francistown.

FYØAV reported on 14147 kHz, SSB around 2100z. QSL *via* Box 508, Cayenne.

3B6CF Agalega—counts as St. Brandon for DXCC purposes. Look around 14225, 21220 kHz, 1600-1700z, or in SEA Net, 14320 kHz, 1200z.

HW3UIT World Telecomms Day commemorative station, was F9OE, to whom QSL's should be addressed.

A4X.. As A4F is used for aircraft, stations are now being given A4X prefixes, *e.g.* A4XFE, to be found daily on 21316 kHz at 1000z. QSL to Steve Christmas, Box 981, Muscat, Sultanate of Oman, Arabia.

A51PN Usually operates SSB weekdays, CW weekends. Try 14205 kHz 1130z for SSB, or 14070 for CW.

DT New Prefix. Commemorates 25 years of East Germany; certain stations will use this prefix till the end of the year.

YK1AA Rasheed, 14004 kHz CW, 14225 SSB, around 1500-1600z, now asks for QSL's to his call-book address.

ZK1 Manihiki. Now scheduled to start June 30 from Tongareva; may later go to VR3 and KP6.

VR6TC Tom is QRV 21350 kHz from 2100 on Tuesdays. Skeds may be arranged *via* W5RG, Tom Christian, Box 1, Adamsville.

Reporting the HF Bands

not been too good during the day, but often picked up well later on, to midnight or beyond. It added up to A6XF, CN8MC, EL2DI, EP2GW, EP2SP, ET3DS, G3ZEL/MM (100 miles off Lisbon), HK3TS, HV3SJ, JA6YG, JY9VO, K4PWC/AM (at Orlando, Florida), M1C, M1D, MP4BJS, SV1DB/A (Mt. Athos), VE8ML, VK's, VK9XW (Christmas Is.), VP2KF, VP9BY, VP9HH, VQ9D, VQ9HCS, VQ9M, VS6GA, YA1GJM, W1FXD/MM, W7RS, WB5GQB/MM (in the Bay of Bengal), ZC4EJ, ZD7SD, ZD7SS, ZE1DP, ZE6JP, ZF1JA, ZS's, 3B6CF (Agalega Is.), 8P6FB, 9G1AR, 9K2AM, 9M2CW and 9Y4VT.

Snippets

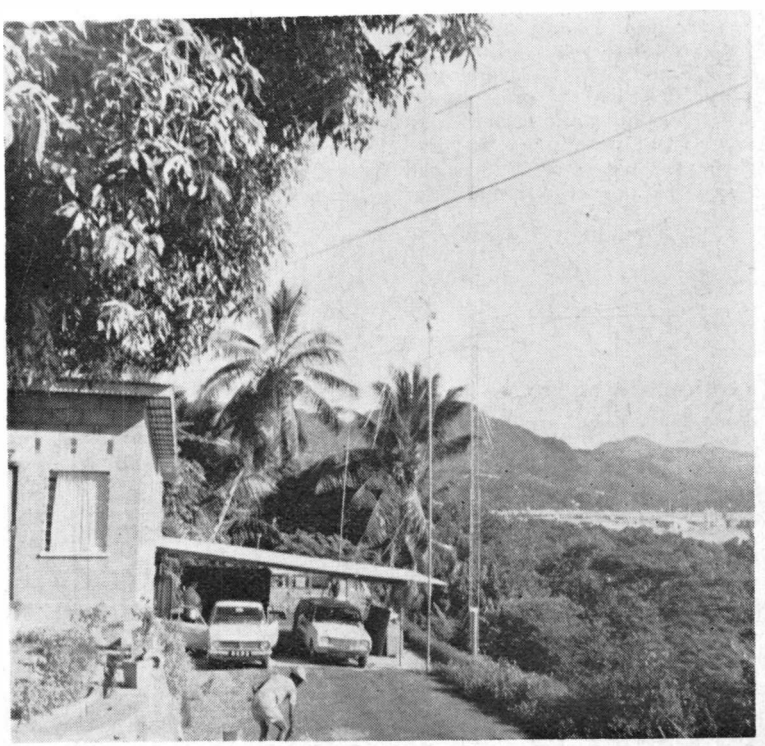
Interference from television seems to be a growing problem on the bands of late years, particularly the UHF-only and colour sets. G3YYD (St. Albans) suffered from one such nuisance, a colour set by Telefunken. The mains was suppressed on the TV set by fitting a $\frac{3}{8}$in. ferrite road, *ex*-MW transistor portable, 6in. long, with a bifilar winding of 22 or 20 gauge wire wound along its length to act as a choke in each leg. Then the aerial had to be tackled, and this was done by cutting the coax feeder to the TV aerial terminals and putting in each leg a capacitor made of $1\frac{1}{2}$ inches of twisted 32g. wire; the whole was then wrapped in a sleeve of plastic and bound tight with wire. This has no observable effect on the TV picture, but acts as a high-pass filter *and* braid-breaker in one. As for results, the timebase QRM on 3·5 MHz dropped from S9 in the KW-2000B to half an S-point above band noise on a quiet day—an effective improvement of about five S-points, making the difference between being able to operate or QRT from TV set interference.

G3ZXH/MM and G3TZL/MM are now separated one from the other; G3ZXH is now serving aboard s.s. *Darina* (GRYF) and only awaits permission from Shell to be back on the air, with an FT-101 plus VHF gear. As a matter of interest, Les will be operational as GM3ZXH/MM and reckons to be the first *GM* maritime mobile station on the air.

G3UOF, in his other hat as ELØN/MM, will be aboard t.s.s. *Fairstar* (5MXH) and on his present trip will be using an FT-101, Osker Block Power/SWR bridge and Joystick aerial system. His first report on this round-the-world trip gives details of contacts with EI9J and GW3UCB when ELØN/MM was near Tenerife, 1803 kHz and S6 reports. The Joystick Ae. is mounted on the monkey-island, vertically, and some trouble is mentioned from the fluorescent lighting generating local QRM picked up by the feeder.

G4AXQ writes in to say that he is being pirated—it seems the real G4AXQ only operates 21 MHz at present, on CW, but the phoney uses Top Band AM, with a rubbishy, poorly-modulated signal. Our G4AXQ, be it noted, does not even own a mike, so you can safely brand a phone G4AXQ on any band as being dud—indeed G4AHT is understood to have already told him just that.

Talking of AM, but this time in the eighty-metre context G8RY comes up with a plea for the AM chaps to stay where they belong, HF of 3·6 MHz. Frank is keen on RTTY, and justifiably feels a bit niggled when his RTTY QSO is



An impression of the station of Carl Reder, VQ9R, P.O. Box 191, Port Victoria, Mahé, in the delectable Seychelles Islands out in the Indian Ocean. He has quite an antenna array.

wiped up by AM—after all 3·6-3·8 MHz is for phone, whether AM or SSB, and 3·5-3·6 for CW and RTTY. Play fair, you AM wallahs!

Followers of G3WUW (Cambridge) will be interested to know he made around 5000 contacts during his trip to 9M6, 9M8 and VS5. He says there is little operation from those parts now, with the residents mostly inactive; but it is easy enough from there to work into U.K., provided one could beat one's way through the local JA QRM. On the QSL front, matters were handled by JA2KLT, but if anyone wants one direct, Allan is *QTHR* as G3WUW.

A tale of woe comes from G3YJS (Maidstone) who seems to be getting a taste of what it might be like among the California Kilowatts, as far as local QRM goes. He moved into his present QTH in 1965, nice and clear, and no problems. Two years later G3ZHZ moved in *next door*. They manage, by hanging a card on the shack door to say which band they are on, to keep tolerably out of each others' way. Then, 18 months ago, G3ORH came in about three doors along in the next road. Now, G3ZSU has appeared a couple of doors from G3ORH, putting *four* stations within 75 yards radius—*plus*, of course G3TRF and G4BNI a quarter-mile away, all using the same bands! What does one do in such a situation? But at least you have an "out" if you get accused of TVI! It can always be one of the other five fellows! (Six active operators within a $\frac{1}{4}$-mile radius is about the highest density of which we've ever heard! —*Editor*).

Talking of TVI, G2HKU has been on a "course" recently, and has some details of the new TV sets coming in from Germany. It seems that over there, new TV receivers are required by the law to be screened—but, for instance the Korting has the fittings for the foil screens *but not the foil* on the ones imported into the U.K., the importers feeling the screen is extra cost and unnecessary! It really is getting to the time when an active pressure-group should take up the case of pollution of the ether.

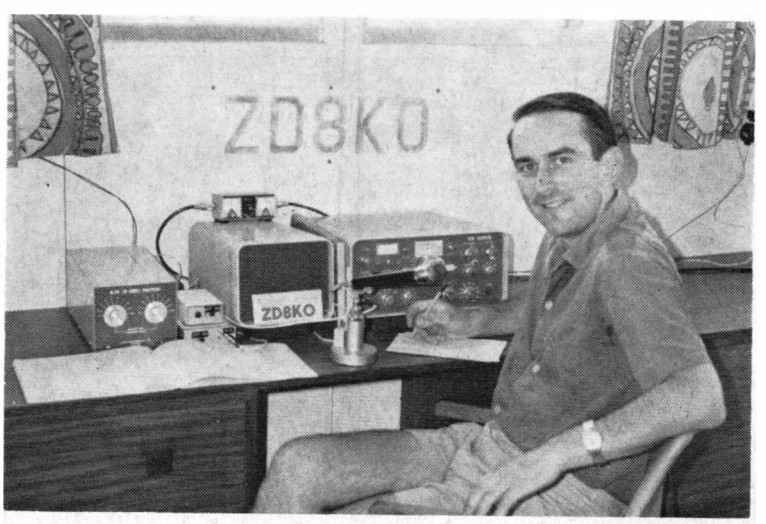
Vale

Readers will be saddened to hear that G3NMR, well-known on the DX bands, and active in the A.R.M.S. group, died on April 9, after a long illness, at the early age of 50. Maurice was in the top flight as a DX operator, and in his earlier years formed and all but ran A.R.M.S. through the stage of being a little, almost a local group to the international entity it now is. G3NMR will be missed in many spheres.

On May 7, died Frank Robb, GI6TK, of Holywood, Co. Down, who was first licensed as a 'teen-ager and was 53 at the time of his death. Frank was active to the last, and was a cheerful soul, despite the handicap of blindness. One of the writer's happiest memories is of a good old natter at the Club with Frank, which ended with GI6TK pulling out QSL cards from his pocket, borrowing a pen, and signing one for all those who were round the table. A sorrowful farewell to a personality who will be much missed in Northern Ireland.

* * *

From June 30 to July 7, the City of Belfast YMCA Club will be running a special-activity station at Ballycastle, where the Marconi-Kemp Memorial is to be opened, as part of the GI6YM Golden Jubilee celebrations. They will be operating GB3MKB on CW on 3520, 7010, 14050, 21020, and 28050 MHz and using SSB on 3775, 7070, 14150, 14190, 14300, 21250 and 28600 MHz. In addition, GI6YM will be active over the same period, on all VHF/UHF bands from Rathlin Island, off the N. Antrim coast. Special postmarks, bearing the call-sign of the stations at Ballycastle and Rathlin will be used, detail on the obtaining of which can be had from "Marconi-Kemp Commemoration," Urban District Council Office, 61 Castle Street, Ballycastle, Co. Antrim. For one postmarked "special cover" the fee is 3 or 4 IRC's, 15 or 20p depending on which stamp is used; for both postmarks on separate covers, 25p, 35p, 5 or 7 IRC's, depending on which stamp is chosen, and all receipts will go to the Corrymeela Project, an inter-denominational organisation to give holidays to children deprived and disburbed by violence. Applica-



Keith Orchard, G3TTC, is also ZD8KO, c/o The BBC, Ascension Island, in the South Atlantic. The rig is a KW-2000B into a Mosley V-3Jr. vertical for 10-15-20m., with a "5RV" sort of aerial for 40m. He works SSB only and, like the several ZD8's on Ascension, is always glad to QSO the U.K. His tour of duty out there ends in September, when Keith will be getting back home to the U.K.

This is the station of Isaji Shima, JA3AA, 7-4-8 Furuichi, Habikino, Osaka. He has an outstanding DX record on Top Band (freq. 1910 kHz) for which he is able to run just the kilowatt. The gear is "Japanese various" with a hefty linear using a 450TH, one of the biggest bottles available for amateur operation.

tions should be in by June 16 from overseas, or the 23rd from the U.K., address as already given.

A DX-pedition to Andorra is in the pipe-line, from June 29 to July 14-15, covering all bands from 3·5 MHz upwards. Further info. and skeds, contact G8DNF/A, Christopher Eley, 101 St. Mary Abbots Court, Warwick Gardens, London W14-8RD. In case of problems arising, G3XFA will be the link-man who will obtain daily reports from the base camp and relay these to enquirers either on Eighty or Two on request, from his new QTH in Heathfield, Sussex.

Low power enthusiasts may be interested in taking part in the July QRP-contest, sponsored by DL-AGCW. The last one showed G3TZQ, G3JKY, G3VDW and G8PG listed. The July one will be from 1800 GMT on July 7 to 1500 on July 8, with a six-hour break which must be split into two parts at most. Single-operator CW on 80-40-20 metres, input below 10 watts to the PA. Exchange RST, three-figure serial number, and a number indicating power in watts, 1 to 9, plus an X if crystal or VXO-controlled. Score 1pt. for own country; 2pts. another country in one's own *Continent;* 3pts. per DX country. Multiplier, for each country in one's own Continent one, for each DX country two. Three extra points for working another QRP station; and double your points score if the QRP station was crystal-controlled or below 3 watts input. Send log, summary sheets with total score, times of the pause in operation and some data on the station, to Hartmut Weber, DJ7ST, D-3201 Derneburg, Am Walde 83, Germany. Countries all-same DXCC list but counting DM as a *separate* country.

Eighty

Alas, space begins to press upon us. G2HKU clicked with 9H1BX on SSB, as a small part of his delight at being home again after his training course.

G3YYD prefers to use the early-morning hours, during which time he found, during a period of two weeks, the following SSB callsigns being entered in the log: CI1ADV, CI1ADI, CN8BO, CN8BF, CT2AK, DL3ZM/YV5, EA8ET, EP2WB, EP2BQ, FP8DH, HR3AC, KG4CB, KP4AN, KZ5CL, OD5GC, PJ2CW, PY2ANC, TI2GI, VE's, VO's, VO2AW, VP2LI, VP2SAF, VP2VAM, VP5RF, VP7NO, W1-5, W8, YA1OS, 3A2EE, 4J9B, 4M5BPG, 4X25IH, 5X5NA 5X5NK, 5Y4XKL, 5Z4LW, 8P6CX, 8R1UGF, 9Y4VU, 9Y4EH and 9Y4MH.

In his weekend lair at Ipswich, G3CDS played his RTTY machine on Eighty, and swapped copy with G2PB, G3YKB, G3RDG, PAØCJS, F5XM, DK2XV, PAØSCH.

The key at G3RFG came into play on all the bands where contacts were obtainable; on Eighty, Stan made his number with K3NPV, KZ5BH, SMØPM, VE1AWN WB4PNY, W4ZMQ, WA8TBQ and YV5CKB.

G4BKI as has already been recounted, spent most of his time on Twenty, but he did look at Eighty, and managed SSB contacts with OD5BA, GC5BCM and OHØMA.

In his earlier letter, GW4BLE mentions that during the contest operation from GW6GW they managed among others, CN8BO, IT9JT, 4M5BPG and 9H5D. In the later letter, nothing was mentioned about the band, but one gathers that the whole question of aerials for Eighty and a tower for a beam is under active consideration, rather than mere operation.

Top Band and Forty

Strange bedfellows indeed, but lumped together because of a dearth of reports on either of them!

W1BB reminds us of the Trans-Equatorial Tests on Top Band, of which full details were set out in last month's piece. It will be interesting to see what the participants report, next time, when the deadline will at least be late enough to give them a chance to indicate how the show started.

Looking at Forty, G2NJ remarks now nice it was in these troubled times to hear no less than three GI stations on one Sunday afternoon, namely GI4ALM, GI3OLJ and GI3ZAD, all with good signals.

A letter from G3WKM (Colchester) indicates that he has been

posted to Benbecula in the Outer Hebrides, for a couple of years, and will therefore be operational from the rare NF-72 WAB area. While he does not intend to "do a G3SVK" while he is there, GM3WKM is quite definitely going to make Benbecula heard on the HF bands, with his Anglian transceiver and linear amplifier.

Hardly DX, but maybe some sort of a record: G3ZPS and G3ZYY have managed a non-stop 24-hour QSO! They intended to use mainly Top Band, but in the event nearly twelve hours were spent on Eighty—the next thought is a sponsored QSO, like the sponsored walks organised for fund raising, with the proceeds to go to RAIBC. We will be interested to see how their first try at a sponsored QSO comes along.

G3ZDD says he is a 100% CW operator—and then gives the lie to it by admitting that the QRM on Forty broke his spirit, so that he had to take to SSB mode to obtain his contact with CR4BS on the band!

G3VLX and G3XMD plan to operate as GW3VLX/P from the Welsh counties of Merioneth, Montgomery and Cardigan on June 15, 16, and 17. Frequency 1862 kHz SSB in the evenings, and in the daytime 80 and 40 will be used from rare WAB areas. G3VLX also reports the odd SSB contacts on Forty, like CT3AR, CR4BS, CN8HD and UV3GW.

G2HKU stuck to CW on Top Band, and was rewarded by working DK4KK/P, OK1IBF and OK5BHT. On Forty his key worked further afield, to LU3EX, PZ1AV and UL7HD.

Forty for G3RFG meant QSO's with K4VE, PY1DTV, PY2FRW, PY2FQP, VE3BVD, VK2EO, VK2QL, VK3MR, W3DQZ, W2JIT/4, W7YTN, W8KYA, WA9TZD, ZL1SV, ZL4IE, ZL4NH and 5B4PW.

Winding-Up

That about covers the mail for this time, and we hope no-one has been left out. Your deadline for the next time will be to arrive first post **June 12,** addressed to "CDXN," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ. For those further afield, the forward deadlines are *July 10*, *August* 14 and *September 11*. Meanwhile, good DX'ing, whatever your mode. *73.*

APPEAL FOR THE GEAR

A Westland Lysander aircraft at the R.A.F. Museum at Hendon is in process of being restored to full flying condition. These aircraft were used for a variety of what might be called "fringe duties" during Hitler's War, including air-sea rescue and the landing and collection of agents behind the enemy lines. On the radio side, the need is for specimens of the following equipments: TR.1091, R.1082, T.1083, R.3060, R.3002, TR9D (of blessed memory!) and TR.1133. Condition is immaterial as u/s items can always be cannibalised for spares. Payment will be made for anything usable offered. In the first instance, write R. J. Wilson, G3TBS, 52 Westmead, Windsor, Berks.

SOME SWR POINTERS

—It is questionable whether some of the fancy multi-band aerials can ever work "as advertised". The test is the SWR, band-to-band. Anything worse than 2 : 1 should be rejected (or suspected). If you are getting 3 : 1, it means that 25% of the power is being reflected back-and-forth between load (aerial) and source (PA), doing nothing but warming up the feeder and the PA . . .

—When using high power, 400w. p.e.p. or so, a bad SWR can burn up your PA. Most tank circuits in amateur QRO transmitters will not tolerate an SWR approaching 3 : 1. In commercial transmitting stations, running kilowatts into aerials connected as balanced resonant loads, there is an automatic Tx shut-down facility if the SWR (due to some antenna failure or disconnection) goes worse than 2 : 1 . . .

—You should never succeed in getting 1 : 1 on your SWR indicator. If you do, there is something wrong somewhere because there is *always* a degree of feeder loss or slight Ae. mismatch at the actual radiating frequency, to make the SWR just less than perfect . . .

—If you can get 1 : 1·2 you are doing well and about as near in practice as it is possible to get. There will in any case be, or there should be, a variation in SWR across a band, from, say, 1 : 1·2 to 1 : 1·6, representing a power loss of about 5%, which is quite tolerable and can be ignored.

—What it is essential to avoid is a large standing SWR of 3 : 1 or worse under normal operating conditions. While in QRO rigs it can do actual electrical damage in the PA section, when using moderate inputs it means that, even if you *can* work W6's on 21 MHz, a large proportion of your RF power is being lost though you are not actually burning up your PA.

B.A.R.T.G. CONVENTION

Inspired by the success of last year's event the British Amateur Radio Teleprinter Group will be holding their next convention at Meopham Village Hall, near Gravesend, Kent (as last year), on Saturday, June 30, 11.0 a.m. to 6.0 p.m. There will be lectures on RTTY topics, demonstrations of teleprinter equipment suitable for use on the amateur bands, with G4ATG, on 14090 kHz, conducting live RTTY contacts. There will also be a trade exhibition and a bring-and-buy stall. Full details, with maps and other transport information, from G. Shirville, G3VZV, 2 Orchard Close, Toddington (*2470*), Dunstable, Beds.

ACF/CCF ACTIVITY

We are informed by G4BTW (Chester) that it is hoped soon to have G4CCF on the air for the purpose of working operators who have been at any time connected with ACF/CCF activities on the special frequencies reserved for these stations. He has a list of about 150 G's known to be, or who have been, in this category and hopes that they will get in touch with him—Ian Jolly, G4BTW, 68 Liverpool Road, Chester.

THOUGHTS ON END-FED AND CENTRE-FED AERIALS

AND SOME PRACTICAL CONSIDERATIONS

AS a good area is available at the writer's QTH, with trees, poles and other possible supports, together with an interest in trying to evaluate the performance of various aerials, very many different antennae have been used over the years. These notes are an attempt to compare some of the good and bad points of end-fed and centre-fed aerials, both for transmitting and receiving purposes, and as likely to be used on the LF bands 80 and 160m.

End-Fed Wire

This is ideally like Fig. 1, with the horizontal top as high and clear of earthed objects as possible, the down-lead also being well away from walls. The aerial length is the whole way from the transmitter, receiver or tuner, to the far insulator. Suitable materials are 14g. enamelled hard-drawn copper wire, a pair of insulators, and a reel of polypropylene cord.

Erection: This is probably the simplest extended-wire aerial to put up. Cord A can probably go to a high point on the house. The anchor point might be a strong staple or eye at the eaves or on a chimney, or at the top of a light, relatively short post or mast fixed to house or chimney. Failing this, a post or mast is needed this end. If the anchor point for cord A is difficult to reach, as is probable, it is useful to let cord A run through an eye-bolt or staple to a fixing point within reach of the ground or an upstairs window.

A second support is needed for cord B, such as a tree, pole, mast or post fixed to another building. Bring the cord down into reach, as for A. With care and possibly the aid of a long, light pole or stick, the wire can usually be manoeuvred above the tops of small trees or other obstacles. It can then be tightened and positioned by pulling cords A and B.

Length: An enormous advantage is that any length will work on any band! For 80m. and other bands it would be usual to try to get up about 136ft. but provided a suitable tuner is used the exact length is unimportant. Typically, the 136ft. would be parallel tuned for 80m. and series tuned for 160m. There would never be any point in taking down one end of the aerial to change its length by a few feet.

Coupling: Where an end-fed wire is involved, a tuner or coupler ought to be considered as part of the system, to be built at the same time.

The coupler is between the aerial and Tx and presents a suitable load to the PA so that the latter can be correctly adjusted. It will also help reduce possible harmonics, which the system would otherwise radiate with (unnecessarily high) efficiency!

Despite this, with some equipment, such as a low-power Tx for 80m. and 160m., the aerial could load the PA properly without a tuner. If so, the radiated signal will be as good as with the tuner (though the possible advantage of harmonic rejection by the tuner would, of course be lost).

Reception: Where the aerial is used for receiving, and its end impedance is reasonably near that of the receiver aerial terminal, a tuner or coupler is not necessary. Where aerial impedance and receiver are very dissimilar, a tuner or coupler could give a maximum improvement in signal strength of about 2 or 3 S-points. The receiver coupler can be as used for transmission) or one of the *pi*-matching circuits with an inductor and two variable capacitors.

A high end-connected wire will pick up most signals likely to be heard but also considerable noise. In fact in reception tests on 80m. and 160m. it was found that in bad conditions some signals could be comfortably copied with a balanced or centre-fed type of aerial while most were being severely broken up by interference when using an end-fed type of aerial.

Earth: An end-fed aerial is incomplete in itself, the earth system being part of the whole. A good earth is thus necessary—preferably one which provides a low-resistance RF return from quite a large area or body of soil. The rule is to earth down to everything you can—pipes, wire fencing and such.

As the result of a considerable number of tests made, it has been found that an end-fed aerial without a good earth system does not give as good signal results on transmission as a centre-fed dipole erected in the same position. Variations in signal strength, with a top length A-B in Fig. 1 equalling the top length of Fig. 2, have varied from zero or barely readable to about $1\frac{1}{2}$ S-points. Whether this is of much importance is problematical—if a signal is S9, does it much matter if it is S8 or a bit above or below, instead?

(*over*

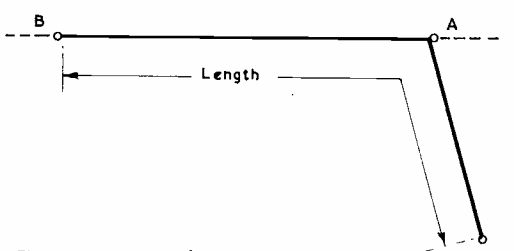


Fig.1 End fed aerial

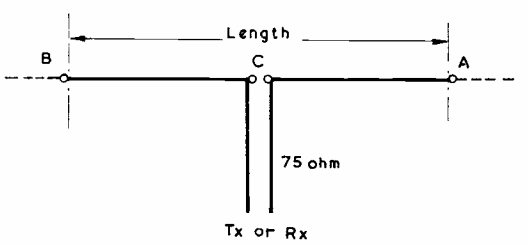


Fig.2 Half wave centre fed aerial

A 564

Half-Wave Centre Fed

This is shown in Fig. 2, and is cut for one band. As 160m. and 80m. are in view, and full space for 160m. is unusual, an 80m. dipole with a top of about 126ft. (A-B, Fig. 2) is the basis for these notes.

Erection: If A and B are house and a pole, as for Fig. 1, the middle, C, may be some distance from the transmitter, making necessary a longish feeder. The weight on the centre C will make this drop several feet, unless the top is very tight. It is better if there is a high support at C. Not much is lost if the ends A and B droop a little.

Length: This can be found in feet from 468/Frequency (MHz) and is usually some 124ft. to 132ft. Typical chosen middle frequencies may be 3·55 MHz (132ft.), 3·65 MHz (128ft.) or 3·7 MHz (126½ft.) according to needs. But it may well prove necessary to lower the aerial and cut equal portions from ends A and B, or add equal portions. As example, if the SWR is satisfactory at 3·5 MHz (and the Tx is properly loaded) but the SWR is too high at 3·6 MHz and gets worse at 3·7 MHz (and fails to load the Tx properly) the top length is excessive and about 1½ft. can be cut off each end, and another test made. This depends on height and other conditions. A low SWR the whole way from 3·5-3·8 MHz is just not to be expected so the aerial is best adjusted for the wanted section of the band.

Coupling: Often the 75-ohm feeder is co-ax and is plugged directly into the Tx. This has attractive simplicity, especially as the co-axial lead can run along roofs and walls. But where the feeder is 75-ohm balanced twin, a balance-to-unbalance coupler is required for the usual Tx co-axial outlet.

The aerial itself tends to suppress 2nd and 4th harmonics. Unfortunately, it cannot be used with any reasonable degree of efficiency for transmitting on other bands (except that a 40m. aerial can be used on 15m., though these bands are not those considered here).

If of suitable length and reasonably high, the aerial is certain to give good results on the band for which it is cut.

Reception: Many communications receivers have a 75-ohm or similar co-axial or balanced input, and taking the feeder directly to these points will give excellent reception on the chosen band.

Reception on frequencies far removed from that for which the aerial is cut may well be better than might be expected, though this depends somewhat on the length and type of feeder.

Difficulties: These are mainly concerned with the supports, and a sound and weatherproof junction at C. Here, a co-axial lead must be adequately sealed against moisture, and a proper dipole centre-piece is best used.

Tuned Doublet

This is shown in Fig. 3, and the top may be as in Fig. 2, but the feeder is an open-wire line. This fact completely changes the method of using the aerial.

Erection: Supports are needed as for Fig. 2, with the possible addition of a few anchor points for the feeder. When suitable poles are available, and the feeder can descend neatly to a pair of well insulated lead-in tubes, the whole thing is fairly easy to put up. But in awkward circumstances, and with a feeder which has to go round obstructions, yet be kept clear of them, this type of aerial can become a tiresome thing.

The open-wire line frequently has a spacing of about 4in. to 6in. between wires, and this is not important. A flexible wire, such as 7/26g., with ceramic spreaders at about 2ft. intervals, seems relatively easy to handle. A minimum of insulation is wanted, to avoid losses in wet weather. (In the old days, wooden dowelling was boiled in paraffin wax). A silicone water-repellant on the spreaders will help here. Home-made spreaders should be chosen for low RF losses under all Wx conditions.

Length: Some top lengths are handier than others, but as the *whole* is tuned, the *exact* top length does not matter much. The aerial need not be lowered to prune the top length. For 80m. (and higher frequencies) the top can be around 125ft. to 135ft. or so. The same top length can be used satisfactorily over a wide range of frequencies, and even on those where the top is shorter than a half-wave.

The feeder *length* greatly influences tuning, or coupling at the coupler end, which is found by experi-

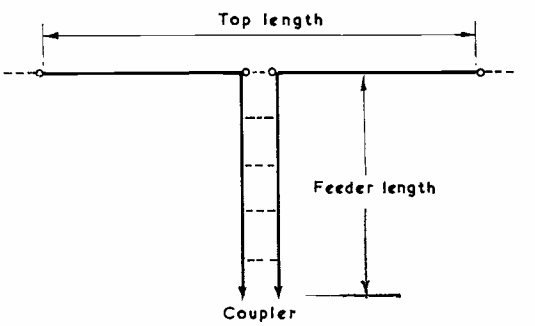


Fig.3 Tuned doublet

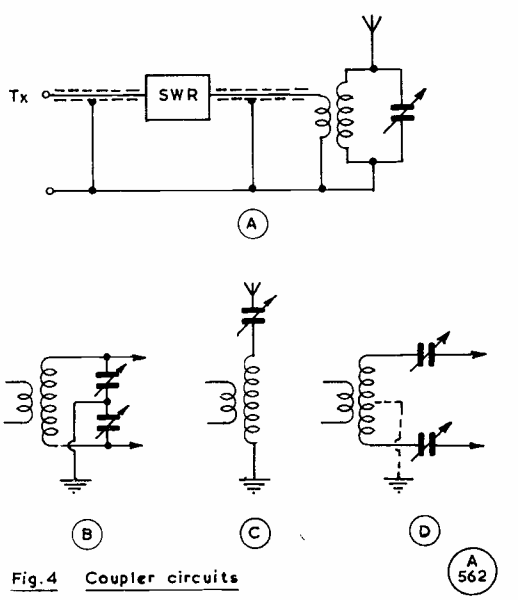


Fig.4 Coupler circuits

ment. A non-resonant length, such as about 42ft. is probably best, but this can be changed as circumstances make necessary.

Coupling: A balanced coupler is essential for proper working. This may consist of a parallel tuned circuit, with link, where the feeder plus one half the top is around a half-wave (or multiple of ½-waves when used on higher frequencies is contemplated). If the feeder length plus one half the top is a ¼-wave, or odd multiple of ¼-waves (¾, etc.) series tuning is required.

Input to the coupler is usually *via* a length of coax lead from the Tx, and a device to show the SWR should be in this circuit.

Reception: Advantages similar to those of Fig. 2 can be expected, plus the ability to use the aerial at maximum efficiency on any frequency where the top is a half-wave or more, and with good efficiency where the top is shorter than ½-wave. General reception is good with one feeder taken directly to the aerial terminal, and the other connected to earth, or floating. But a tuner can be expected to give up to three S-points improvement, except on those frequencies where the feeder impedance chances to match the receiver. Using the aerial as a balanced system can give a noticeable increase in signal strength, and at the same time a drop in certain kinds of interference.

Summary

It would seem that the end-fed wire is easiest to put up, and can work well, while having the advantage of easy operation on any band. But it does not quite approach other aerials in some ways.

The single-band dipole with low-impedance feeder is an excellent aerial, and works well on its optimum portion of the band. Unfortunately, it is virtually a single-band system.

The tuned doublet seems to have the advantages of the dipole and the added advantage of being operable on several bands—but its feeder and tuning system can be a bit of a nuisance.

Tuners or Couplers

These have been dealt with in detail in various past issues. In brief, a tuner for reception need only be made from components chosen with a view to their RF efficiency—air-spaced capacitors and an efficient inductor.

For transmitting, the power handling capability of the items becomes important. So wide-spaced capacitors and a coil of heavy-gauge (14g. to 16g.) wire will be necessary, except for low power. Inductors and capacitors which resemble in size and spacing those in the Tx PA will usually suffice.

Some basic coupler circuits are shown in Fig. 4. A is for feeding Fig. 1, where the total length is near a half-wave (or number of ½-waves).

B is a balanced coupler, for the open-wire line in Fig. 3. Sometimes a single capacitor is used. The centre of the coil can be earthed or not, as found best.

C is for series tuning an end-fed aerial, as when using a quarter-wave on 160m. (Fig. 1). D is a similar series-tuned circuit for the feeder in Fig. 3. These and other circuits can be considered to be adjusted correctly when the SWR indicator in the coax lead from the Tx to the coupler shows a low SWR—ideally better than 2 : 1 at the working frequency.

BOOK REVIEW —

FIELD EFFECT TRANSISTORS

IF JUGFETS, MOSFETS and IGFETS are familiar terms in your daily conversation, depletion and enchancement layers commonplace chit-chat and Y parameters for forward and reverse admittances as easy to understand as the ABC, then read no further. However, if, as many of us are, you are more familiar with devices which glow when supply voltages are applied and give some warning of impending catastrophic failure—and if you wish to get up-to-date with the functions and applications of these electronic components, which are rapidly replacing valves and bipolar transistors in many respects—then the Mullard book on *Field Effect Transistors* is for you.

Opening with a survey of the associated jargon and a description of the mechanical and electrical construction of the devices, the static and dynamic operation of the FET in its various forms is elaborated and typical circuitry demonstrating the superiority of the FET over other devices is developed. Examples include impedance matching networks, a DC-300 MHz amplifier, switching circuits, current sources and differential amplifiers.

Perhaps of greatest interest to the amateur are the chapters on the application of the FET to communication receivers—as RF amplifiers and as mixers—and to transmitters in the 100-500 MHz range, several examples of their use as amplifiers, high level mixers and oscillators being given.

While the authors of this manual have obviously credited the reader with superficial knowledge of solid-state devices, the exposition is such that, even though some of the mathematics is pretty formidable, the logical application of the principles involved can be followed without undue pain and strain, and one is left with the impression that all but the most moronic will cope with the complexities of this most useful electronic tool.

This book is available from the Publications Dept., Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF. at £1·95 post free.

A.H.D.

INCIDENCE OF VAT

Because several readers have enquired, we can say that this new tax, VAT, does not affect the business of Short Wave Magazine, Ltd., in any way beyond the fact, that, being zero-rated, we can claim back VAT on the vast range of supplies that we have to buy in as publishers. It is the first time in many years that we have not been hit by some new tax or imposition. So, to coin a phrase, vat's vat.

PYE "VANGUARD" CONVERSION FOR TWO METRES

ADDITIONAL VFO TUNING UNIT

S. L. BLEANEY (GW3VPL)

THE Pye Vanguard boot-mount radiotelephone has become increasingly available on the surplus market in recent years, and although less attractive than the smaller, lower consumption, all-transistor equipment can nevertheless form the basis of an efficient mobile rig for two metres.

The modifications to be described were carried out on a six channel, high-band model, type AM25B, being the more easily obtainable version with a valve front-end to the receiver. The other main type is the AM25*T* which has an all-transistor receiver. Despite the obvious attraction of lower consumption, which the latter model offers, the AM25B has an extremely well designed cascode RF stage, and at the expense of a couple of amps. extra consumption on "receive," will, in the writer's opinion, show a better performance than the AM25*T*, particularly in terms of cross-modulationl

It is assumed that the reader is already familiar with the circuitry of the equipment so component references other than to the receiver VFO unit are hose used in the official manual, but if the circuit or manual is unobtainable the coils and transformers referred to in the text should still be identifiable by their component references which are actually marked on the equipment chassis. No extensive alterations to the original circuit are involved, and the original specification was found perfectly adquate for amateur service. Reports of around 80% modulation were consistently received with no changes whatever in the modulator.

If the equipment has been well maintained there should be no difficulty in achieving satisfactory performance after re-tuning to 145 MHz. Equipment in a poorer condition may need careful re-alignment to restore it to its original specification, and it is emphasized that this should be the first step before thoughts of any extensive modifications are considered. It would seem that a lot of ex-commercial R/T equipment is considered useless for amateur service without the necessity for extensive modification. The writer was pleasantly surprised to find this was *not* the case with the Pye Vanguard.

Transmitter

In the high-band versions the transmitter line-up for 145 MHz operation is as follows: 6BH6 Osc./Multiplier tuned to 24 MHz; 6BH6 Buffer Amp., 24 MHz; QQV03-10 Multiplier/Driver, 1st half 72 MHz, 2nd half 145 MHz; QQV03-20A PA.

Owing to the fact that the first stage is tuned at 24 MHz either 8 or 12 MHz xtals can be used, the difference in obtainable drive between either type being negligible. The degree of additional capacity needed to resonate the various stages will depend on the original working frequency, which will usually be somewhat higher than 145 MHz. The correct total parallel capacity across each multiplier for operation on 145 MHz is as follows: *L.291*, 24 MHz, 33 pF; *L.293*, 24 MHz, 33 pF; (*T.201* (primary), 72 MHz, 6·8 pF; *T.201* (secondary), 145 MHz, 15 pF.

In the writer's case with an original Tx frequency of 165 MHz it was found that both L.291 and L.293 would resonate at 24 MHz without any additional capacity when their cores were nearly fully in; similarly T.201 primary resonated at 72 MHz without additional capacity. T.201 secondary needed an additional 5 pF parallel capacity to bring it to 145 MHz. If resonance cannot be achieved without extra capacity the maximum additional capacity to be added in each case should not exceed the following: *L.291*, 10 pF; *L.293*, 10 pF; *T.201* (primary) 3·3 pF; *T.201* (secondary), 6·8 pF

The foregoing values are for models originally working between 148—174 MHz.

No difficulty should be experienced in achieving resonance at the PA grid and anode circuits, and will be found with the tuning capacitors at nearly full mesh; no extra capacity was needed but a slight adjustment of the spacing of the coil windings was found to give a better match.

No modifications were necessary for the modulator, but to ensure that no limiting takes place on speech peaks the feedback line to the audio limiter can be disconnected (the connection to pin 6 on the Mic. Amp. Board, above chassis). Audio gain can be increased by shorting R253 on the Mod. Output board, and the pre-set gain control should then be adjusted for a satisfactory level of modulation.

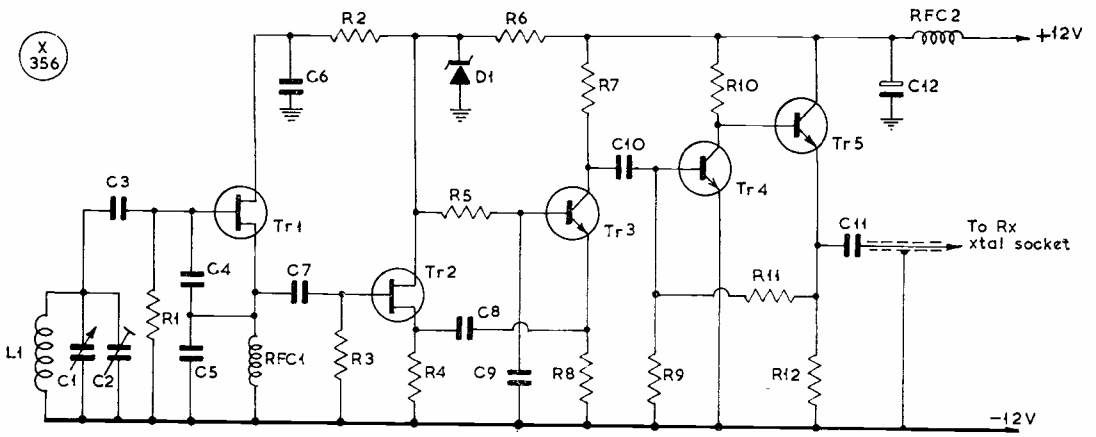
Receiver

It was considered beneficial for mobile operation to retain xtal-controlled channels on "receive" in addition to providing Rx tuning facilities. Ideas for elaborate changes to the local oscillator were thus rejected in favour of retaining the original xtal controlled oscillator and multiplier for fixed-channel reception and driving this with a suitably amplified transistor VFO when tunable reception was required. Initially, varicap tuning of the VFO was considered, using the squelch control on the control unit for tuning. This idea was abandoned partly because of inadequate bandspread, voltage stabilisation difficulties and also because it was thought worthwhile to keep the original squelch facility for use when monitoring the xtal-controlled channels.

The final arrangement decided upon was to place the original control unit in a slightly larger case with sufficient room to accommodate a small diecast box for the VFO/amplifier and a vernier dial. The VFO output is fed to the main unit *via* coaxial cable taped to the main control cable. This arrangement proved most satisfactory and no modifications were needed to the original oscillator. The amplifier VFO output is connected directly to one of the receiver crystal sockets, thus giving the tune facility on one of the six channel positions, leaving the others free for crystal controlled operation.

The output from the local oscillator of the Vanguard is at 10·7 MHz below the desired frequency, this being obtained by multiplying the original crystal frequency by twelve. Thus, for operation on 145 MHz (the mobile calling channel) a crystal of 11·1916 MHz is required.

The multiplication sequency of the first conversion is



RX VFO/AMPLIFIER

as follows:—6CB6 (Oscillator), *T3*, x3, approx. 33·5 MHz; EF95 (Multiplier), *L10*, x4, approx. 134 MHz.

If the receiver has been used on frequencies above 150 MHz a small amount of capacity may be needed to achieve resonance at 33 MHz. About 5 pF across primary and secondary windings of T3 should suffice. In the writer's case, the primary tuned without additional capacity and the secondary needed on additional 4·7 pF. The multiplier coil L10 should tune to 134 MHz without any alteration, resonance being achieved by adjustment of the trimmer C29.

The RF stages should tune to 145 MHz with their trimmers at nearly maximum capacity and no further alternations were needed once alignment had been completed. Careful alignment of the RF stages should ensure an adequate performance but although giving an excellent signal-to-noise radio the RF gain may be considered a little low for weak-signal working. A conventional signal FET pre-amp. was used to remedy this and it was then found that on weak signals readability was at least equal to that achieved on the main station set-up, consisting of an AF239 converter into an AR88.

VFO

The VFO unit can conveniently be built with its amplifier in a small diecast box. The circuit is not critical and providing normal precautions are taken to achieve mechanical rigidity of the tuned circuit, stability should be quite satisfactory after initial warm-up drift. To reduce any tendency towards drift the VFO is kept running continuously, even during "transmit" periods. As any drift in the VFO itself will be multiplied in the local oscillator-multipliers, the total multiplication is reduced from x12 to x8 and the VFO is adjusted to tune 16·66—16·91 MHz. The original xtal oscillator thus acts as a buffer doubler in the tunable position, or by switching from the VFO back to the xtal it will immediately revert to its normal multiplication sequence. Once the multipliers have been set up as described on a crystal controlled channel no extra alignment should be required for use with the VFO. The drive and consequently the local oscillator injection is slightly down on that obtained with a crystal but as it was not enough to detract from the receiver performance extra amplification has not been considered necessary.

If the VFO is built as an addition to the original control box, power can conveniently be obtained from the function switch, but the supply must be filtered, as shown (by RFC2 and C12) to prevent the VFO being modulated by the inverter oscillations. It must also be remembered that as the VFO is built as a negative-ground circuit, the equipment which normally has a floating or isolated earth line can then only be used on a negative-earthed supply. In order to improve earthing and avoid instability by creating earth loops, the coaxial cable feeding the VFO to the main unit should be firmly tied down to the negative line and the chassis at both ends and the main negative supply lead inside the main unit should also be earthed as directly as possible to chassis.

Table of Values

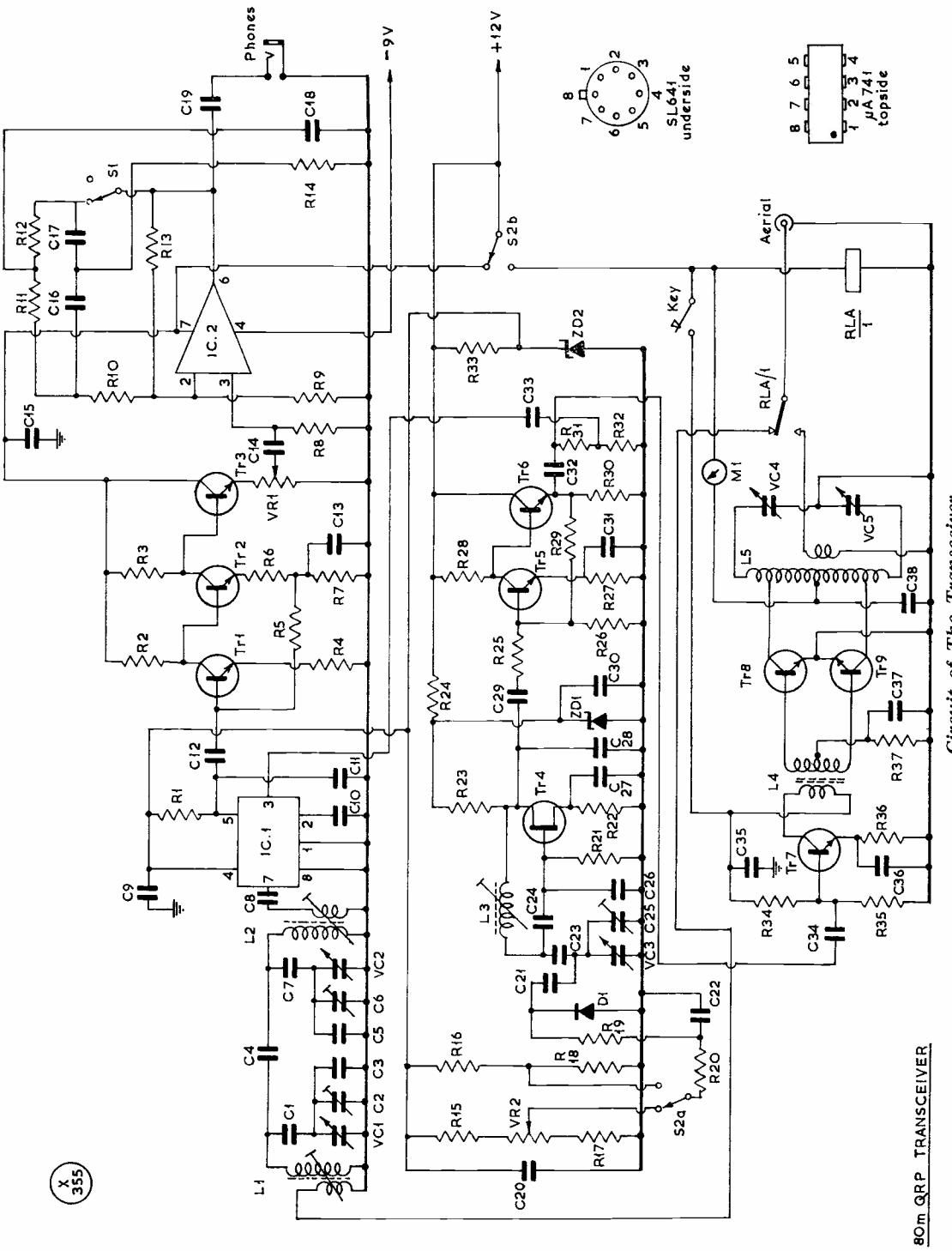
Circuit of the VFO/Amplifier Unit

C1	= 5 $\mu\mu$F, var.	R4, R8	= 2,200 ohms
C2	= 15 $\mu\mu$F, trimmer	R5	= 4,700 ohms
C3	= 50 $\mu\mu$F, silver mica	R6	= 270 ohms
		R7	= 1,000 ohms
C4, C5	= 120 $\mu\mu$F, s/m	R9	= 12,000 ohms
C6	= 470 $\mu\mu$F	R10	= 1,500 ohms
C7	= 18 $\mu\mu$F	R12	= 680 ohms
C8	= 100 $\mu\mu$F	RFC1, RFC2	= Min. RF chokes
C9, C10, C11	= ·001 μF	D1	= 6·8v. zener
C12	= 2500 μF, elect., 25v.	Tr1	= 2N5245
		Tr2	= 2N3819
R1, R11	= 47,000 ohms	Tr3	= BC107
R2	= 330 ohms	Tr4, Tr5	= BC109
L3	= 2·2 megohm		

Note: Coil L1 is of about 20 turns of 24g. enamelled on quarter-inch former.

Results

The results obtained with this VFO unit exceeded expectations and being built as part of a separate control box-tuner necessitated only minimal alterations to the original receiver circuitry. If fitted to a single-channel Vanguard a simple two-way switch would enable the receiver to be switched between crystal socket and VFO.



Circuit of The Transceiver

TRANSCEIVER FOR EIGHTY METRES

COMPACT, QRP — DIRECT CONVERSION ON THE RECEIVER SIDE

R. GOULDSTONE (G3TAG)

THE recent surge of interest in QRP working prompted the construction of the small transceiver described here. The operating band was chosen for two reasons: First, because an 80-metre VFO had been constructed some time ago and was available and, secondly, because most operating is done in the evenings when the HF bands tend to dry up a little.

Although it is doubtful if a direct conversion receiver can attain the same high standards as a modern conventional design, nevertheless results are pretty good. The only way an order of improvement can be obtained is to violate the basic simplicity of the system by using phasing techniques.

Results on the air were far better than had been expected. It is doubtful if, by using any other system, a transceiver giving similar results could be built for less than four times the cost.

The Receiver

In the interest of simplicity a direct conversion circuit is used. There are no RF or IF amplifiers to worry about, all the amplification and selectivity being provided at *audio* frequencies. The sensitivity has not been measured but seems to be more than adequate, the gain control never being more than about "half-cock" at any time. Selectivity given by the bandpass filter is very good, enabling signals to be singled out of the crowd quite effectively. On "receive" the IRT allows the VFO to be shifted above or below the signal frequency by about 1 kHz, enabling the side with the least QRM to be selected. With the filter switched out of circuit good SSB reception is possible despite the lack of AGC. No doubt those interested could rig up an audio-derived system round the AF amplifier to provide this facility if the need arose.

RF Stage

During experimental work an RF amplifier was tried at the front end of the receiver. It was found during tests that this was very rarely used to anywhere near full advantage, a 25 dB aerial attenuator being switched in most of the time. The amplifier was therefore scrapped. Radio frequency selectivity at RF is provided by L1 and L2 and their associated capacitors. The coils are separated by a screen and top coupled by C4, consisting of two pieces of insulated wire twisted together for an inch or so.

Mixer

Almost any kind of balanced mixer can be used in a direct-conversion receiver of this type. The conventional arrangement is a diode-ring bridge or one of its derivatives. These give first-class results but do require the winding of balanced transformers and also call for a good deal of carrier power. The mixer used here is a *Plessey* SL641 integrated circuit. This is a low-noise double balanced modulator designed to replace the diode ring. It can be employed at frequencies up to 75 MHz and its carrier and power requirements are a modest 100 mV into 1K and 6-9 volts at 10 mA respectively. The only precautions to be taken when using this unit are:
(1) The decoupling capacitors C9 and C10 should be mounted as close to the pins as possible, and (2) The power supply must not exceed +9 volts.

(over

Table of Values

Circuit of The 80m. Transceiver

C1, C7	220 $\mu\mu$F, s/m	R5	300,000 ohms, high-stab.	
C2, C6, C25	30 $\mu\mu$F Philips trimmer	R6, R36, R37	82 ohms	
C3, C5	70 $\mu\mu$F, s/m	R7, R14, R22, R23, R28	1,000 ohms	
C4	*see text*	R8, R9	56,000 ohms	
C8, C31, C33, C35, C36, C38, C38	·01 μF, disc	R10, R25	4,700 ohms	
		R11, R12	2,000 ohms	
C9, C10, C11, C12, C13, C20, C22, C27, C30, C32, C34	0·1 μF, disc	R24, R33	330 ohms	
C14	0·2 μF, disc	R26	15,000 ohms	
C15, C19	10 μF, elect., 15v.	R27	270 ohms	
C16, C17	0·1 μF, poly.	R29	22,000 ohms	
C18	0·2 μF, poly.	R30	820 ohms	
C21	22 $\mu\mu$F, s/m	R31	3,600 ohms	
C23, C24	50 $\mu\mu$F, s/m	R32	560 ohms	
C26	120 $\mu\mu$F, s/m	Tr1	2N3391A (BC109)	
C28	470 $\mu\mu$F, s/m	Tr2, Tr3, Tr5, Tr6	BC108	
C29	100 $\mu\mu$F, s/m	Tr4	2N3819	
VC1, VC2, VC3	50 $\mu\mu$F, 3-gang	Tr7, Tr8, Tr9	BFY50 or 2N2219	
VC4, VC5	500 $\mu\mu$F, 2-gang	IC1	*Plessey* SL641	
R1	2,200 ohms, high-stab.	IC2	741 Op-Amp.	
R2	30,0000 ohms, high-stab.	D1	BA111	
R3	6,200 ohms, high-stab.	ZD1	5·6v. 400 mW zener	
R4	47 ohms	ZD2	7·5v. 400 mW zener	

TABLE OF COIL DATA

L1: 50 turns 34g. enam. on $\frac{1}{8}$in. dia. former, input winding 5 turns over earthy end.

L2: As L1, but with mixer input winding 8 turns at earthy end.

L3: 55 turns of 34g. enam. on $\frac{1}{8}$in. dia. former.

L4: *Primary*, 15 turns 34g. *Secondary*, 9 turns with centre tap, all on former consisting of $\frac{1}{4}$in. ferrite ring.

L5: 33 turns of 30g. enam. on 1in. dia. former, centre-tapped with collector taps $2\frac{1}{2}$ turns each side of centre. Output winding six turns of insulated wire over centre of L5.

Pre-Amplifier

Since there is no gain in the RF or mixer stages all the amplification must be done at audio frequencies. It will be realised from this that the noise-performance of the receiver will depend mainly on the first stage of the AF amplifier. The circuit shown is about the best that can be achieved using bi-polar transistors. Some of the more recent FET's could give a slightly better noise-figure but are at present rather expensive. Transistor Tr1 is a 2N3391A low-noise type; its collector current is set to about 350 micro-amps to achieve optimum results; this transistor could be substituted by a BC109 if desired. The output of the amplifier Tr1 and Tr2 is DC-coupled to an emitter follower Tr3. Emitter resistor VR1 forms the AF gain control. It will be noticed that a moulded-track component has been specified in this position and also for the IRT control. An ordinary carbon-track potentiometer can become noisy in operation in these positions owing to the DC current flowing through it.

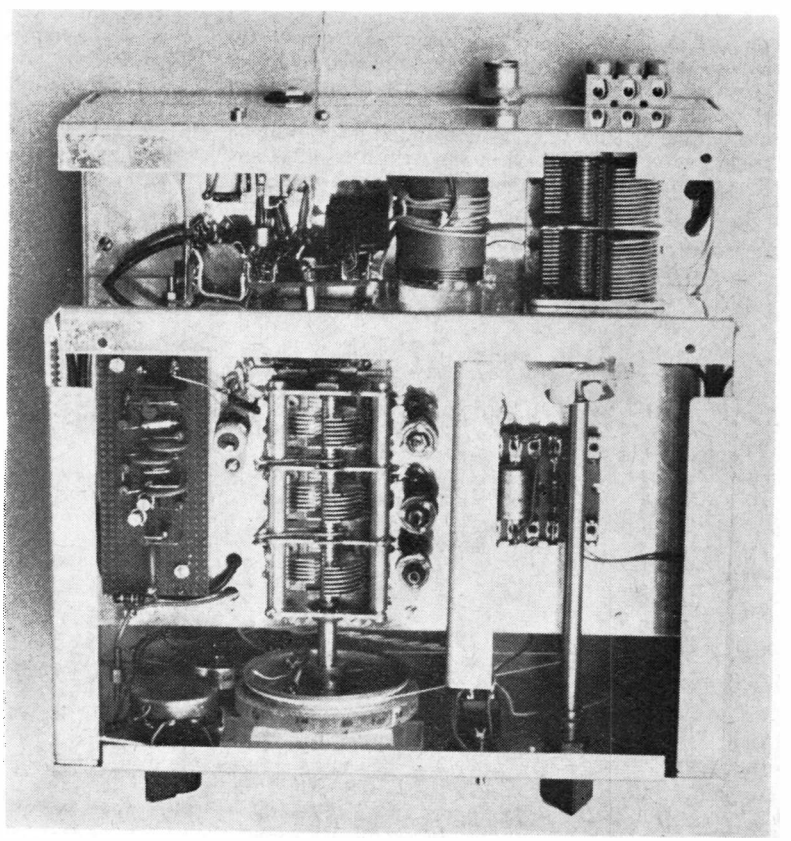
Filter Amplifier

The final stage of the receiver performs two functions, that of a bandpass filter and output amplifier. An integrated-circuit operational amplifier is used in this position. Bandpass characteristics are obtained by switching a bridged-T network into the feedback line by means of S1. With the components shown (R11, R12, R14 and C16, C17, C18) the pass-band is centred around 800 Hz. If desired R10 could be made a pre-set component of about 10K. The selectivity of the filter can then be adjusted to suit the user. Output from the 741 amplifier is sufficient to drive headphones of between 100 ohms and 1K.

The VFO

The field-effect transistor VFO is similar to the one used by the author in a 160-metre TTx (described in the April 1972 issue of SHORT WAVE MAGAZINE) and found to be very reliable. Apart from the frequency the only change is the inclusion of a by-passed 1K resistor in the FET source to obtain certain starting. Following the two-stage buffer amplifier is a potentiometer R31, R32 to provide approximately 100 mV r.m.s. *via* C33 to the receiver mixer. The output from the VFO is very clean and free from harmonics, an important factor in avoiding interference from out-of-band signals. Independent receiver tuning (IRT) is provided by VR2 and variable capacity diode D1.

With VR2 in its mid-position the oscillator is on the same frequency for "transmit" and "receive". In this position the calling station is netted zero-beat with the main tuning control. VR2 is then shifted either side of centre to achieve the required beat note. This facility



Top chassis view of the G3TAG 80-metre Transceiver

General appearance of the Transceiver

also enables a drifting signal to be tracked without shifting the transmitting frequency.

Tx Driver

This is a simple Class-A amplifier using a wideband output transformer. Almost any ½in. ferrite ring core will do for L4. The centre tap on the secondary of this transformer is taken to ground *via* R37 and C37 to give Class-C bias for the output stage. Keying is achieved by switching the +12 volt line to this stage.

RF Power Amplifier

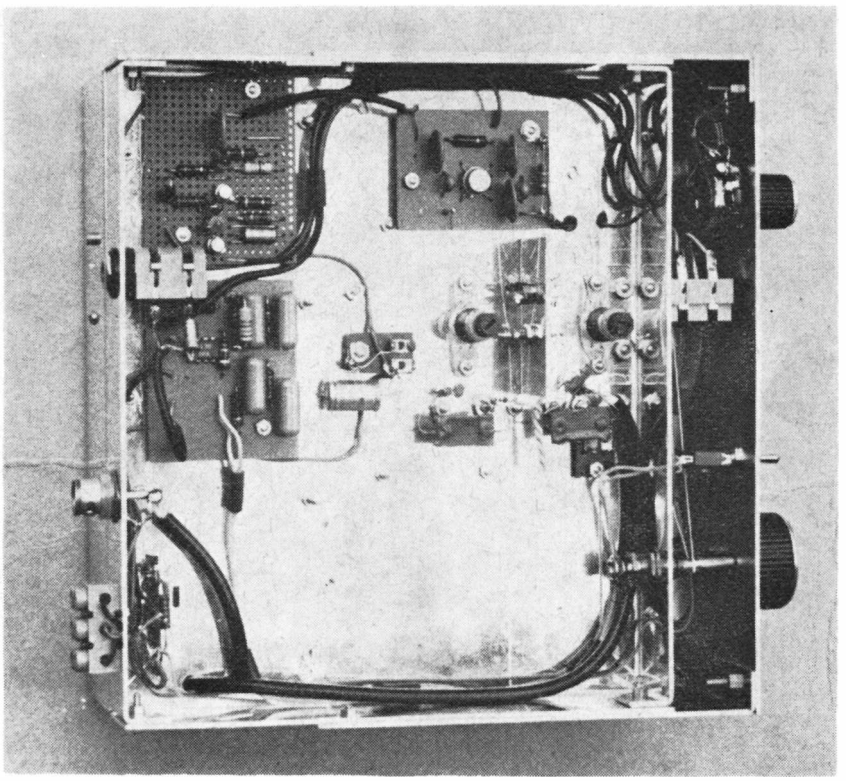
A push-pull Class-C amplifier has been adopted for this stage. Some thought was given to using a *pi* tank circuit but this was rejected on the grounds of complexity and the fact that these circuits can be a little tempermental. The forfeit to be paid for simplicity is increased harmonic output but it was found that this could be overcome by using an ATU or simple low-pass filter. Power input is around 3 and 4 watts and efficiency between 55% and 65%. It must be remembered that as the transistors used are not specifically intended or selected by the manufacturers as RF amplifiers, performance will vary a little with transistors from different manufacturers or batches. The circuit seems to be free from the usual suicidal tendencies of most transistor PA's, being quite stable with or without a load. A simple change-over circuit is employed, RL1 operating when the PA supply is energised *via* S2B. The other section of this switch S2A selects the appropriate bias to D1.

Construction

Layout of most of the transceiver is not very critical. In the prototype the various stages were built on both P.C. board and *Veroboard*. These modules were then connected up in a logical sequence using screened cable for all the RF and AF signal routes. One point is however very important: The PA and driver must not be able to "see" the VFO, or a nasty chirp will result. (This careful isolation is even more necessary in this sort of circuit, where the VFO runs at the radiating frequency). The PA is in a separate compartment at the rear of the chassis and power supply and keying leads are decoupled where they enter this compartment.

Alignment

After checking the wiring for obvious faults connect the output to a 75-ohm load, put S2 to Rx and connect a supply of +12 and —9 volts. (The —9 volt line only takes about 1 mA so a small battery would last almost as long as its shelf life). Next, set VR2 to its mid-position and adjust the VFO by means of C25 and L3 to give coverage of the 80-metre band using a receiver or wavemeter. Now switch S2 to Tx and check that the VFO remains within a few cycles of the Rx position. If wildly out check the voltages at the slider of VR2 and junction of R16, R18—they should be equal at about



3·7 volts. Once the VFO is satisfactory, switch to Tx and key the PA. Tune the tank for a dip in collector current; this should be between 250 and 250 mA. Measure the output power in the load and ascertain that the efficiency is reasonable. Also listen to the note on a receiver—if worse than T9 suspect instability. If chirpy, examine screening and decoupling, add more if necessary. Remove the 75-ohm load and connect an antenna through an ATU. With S2 at Rx signals should be heard in the 80-metre band. Peak up the receiver input stage, L1 and L2 at the LF end, C2 and C6 at the HF end. All being well you are now ready to join the milliwatts-per-mile Club.

Results

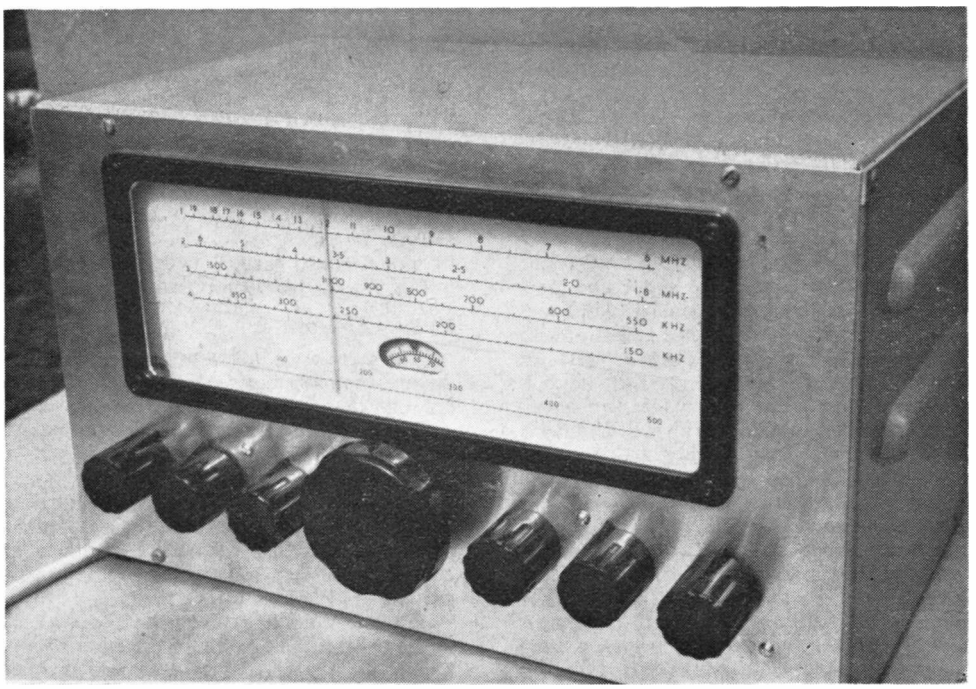
Using a half-wave end-fed aerial at about 15 feet some 50 stations were worked in the first few evenings of operating. Reports vary, some being rather surprising considering the distances and power involved. The most pleasing so far came from UR2JIO, 579 and UP2PBY, 569 and the most depressing from DM2DHN/A, 359. The usual rule seems to apply even at these low powers: "If you can hear them you can invariably work them".

Other prefixes worked on this 3-watt rig include SM, SP, various DM, DK, DJ, PAØ, ON and F—all at between 569 and 579. It remains only to say that the exercise has been most enjoyable and satisfying.

SOME ATTRACTIVE OUT-OF-PRODUCTION ITEMS

From many years' experience and the watching of Readers' Small Advertisements in SHORT WAVE MAGAZINE, it is evident that what might be called the "attractive items" in the second-hand category could be classified roughly as follows: **Eddystone** receivers S.640, S.750, 888A and 770R; RCA Rx types AR77 (if you can get one!), AR88, AR-8516L; also **Hallicrafters** receivers in their SX-range. Another good receiver in the out-of-production category is the old Radiovision Commander, which comes up occasionally in the second-hand offerings. On the VHF side almost anything under the **T.W.** marque could be a good buy. Of the ex-Govt. types, the R.216, also a VHF receiver, has acquired a high reputation. Any out-of-production **Heathkit** items (provided they come as "factory-built") are usually worth consideration.

Foregoing are only some of the possibilities in the way of obsolescent equipment generally offered as second-hand. Of course, there are others—and, naturally, the real value of any used apparatus depends largely on how it has been maintained, its general condition and on-the-air performance.



GENERAL COVERAGE RECEIVER

FOUR BANDS USING COIL PACK UNIT CRYSTAL FILTER CIRCUIT— UTILITY DESIGN FOR EASY CONSTRUCTION

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

WHEN looking into circuit possibilities for an easily built general coverage receiver, the idea of using a home-built coil-pack for the front end soon presents itself. The receiver shown here uses this.

Fig. 1 is the coil-pack circuit. L1, L2, L3 and L4 are the aerial coils, with trimmers T1 to T4. L5, L6, L7 and L8 are the oscillator coils, with trimmers T5 to T8, and padders P1, P2 and P3. (The HF range has no padder.) The great advantage, from the viewpoint of the constructor is of course that the whole can be ready-assembled as a compact unit, requiring only a few external leads to be connected. This is an enormous simplification.

The coverage in 4 bands is given below but the third range is readily adjusted to cover from 1·8 MHz (for Top Band). This means that if there is an interest in frequencies higher than 15 MHz, other means of covering these will be required.

A possible disadvantage is, that the pack has no provision for an RF stage. Viewed in the least favourable light, this means that the receiver will be subject to 2nd channel interference, which will become increasingly apparent as the frequency increases. On the other hand, there are in quite general use various all-wave and multi-band commercial receivers which tune these and higher frequencies, and which have no RF amplifier or pre-mixer tuned circuit to reduce 2nd channel interference, and which despite this give a useful performance. There is also the possibility of using an ATU of the type having a resonant tuned circuit, and this helps to reduce 2nd channel interference, though not so much as wished on the higher frequencies. Results can in any case be improved over those obtained just by taking a random wire directly to the aerial terminal.

So provided these points are kept in mind, a receiver using this type of circuit is practical. The pack is intended for an ECH81, so there is nothing "solid state" about this receiver. Actually, a number of receivers of different kinds have been built using this coil pack, and all have performed well at once.

Coil Pack

This uses the circuit on p.228 and has four pairs of aerial and oscillator coils, for four ranges. It would be possible to use three ranges (omitting the LW range) or to fit a pair of extra coils for five ranges. The coils are *Denco* miniature types, coded *blue* for aerial and *red* for oscillator positions. The listed coverage with a 39-352 $\mu\mu$F capacitor swing is as follows:

Range 1, 150-500 kHz; Range 2, 515-154 kHz; Range 3, 1·67-5·3 MHz; Range 4, 5-15 MHz.

Actual coverage depends somewhat on the core positions, and Range 3 can be adjusted to cover about 1·8-6 MHz, thereby allowing Range 4 to tune approxi-

mately 6-18 MHz, the upper frequency limit depending on stray capacitances and setting of the parallel trimmers. (A further range is available, Range 5, covering 10·5-31·5 MHz).

Aerial Coils: Tags 1 and 9 of all the *blue* aerial coils are earthed to the coil-pack chassis. The first switch pole (coded black) transfers the aerial to tag 8 for each range. The second pole (green) is similarly wired to tag 6 for each range. Each coil has its own trimmer from tag 6 to chassis.

Oscillator Coils. The third section (*blue*) selects the tuned windings—tags 1 of Ranges 2, 3 and 4, and tag 7 for Range 1. Each oscillator coil employs a different pin and padder value, as follows: Range 1, 110 $\mu\mu$F to pin 5; Range 2, 350 $\mu\mu$F to pin 2; Range 3, ·0011 μF to pin 3; Range 4, ·003 μF to pin 4. A ·001 value is suitable for Range 3, while the Range 4 padder is not essential. The last switch section (*red*) is wired to tag 8 for each range, and tags 9 are all joined with a *yellow* lead taken to chassis. Each range has its own trimmer.

Fig. 3 shows how the switch, coils and trimmers are placed on an aluminium chassis which is later mounted by the switch bush. Switch tags, etc. are easily reached by wiring as a unit, inserted when completed. All leads can be 22g. tinned copper with sleeving. Connections to the HF ranges should be reasonably short. A trimmer bank is most easily fitted, but the small trimmers listed are easily mounted by soldering them all to a stout wire bus run between two tags. The remaining tags then go to the circuit points in Fig. 1. Identify the tags or solder on coloured leads for the circuits as shown.

The easiest way to reach the coil cores for adjustment is to cut a slot in the tag end of each core, and locate the pack so that the higher coils are reached from above. Trimmers are adjusted at the HF end of the band, and cores at the LF end, in the usual way.

The listed coverage is with a gang of about 300 $\mu\mu$F, the extra quoted being trimmers etc. and the *Jackson* 2 x 310 $\mu\mu$F gang is ideal, though there is nothing against an alternative capacitor or value such as 365 $\mu\mu$F or even 500 $\mu\mu$F, each section.

Pack Connections

In this circuit oscillator coil feedback windings are earthed by connecting the "yellow" circuit in the pack, near L5, to an adjacent metal chassis tag. "C" is the pack chassis, and is in contact with the receiver chassis. A lead is also added from pack chassis to one of the bolts securing the tuning gang.

Other points, A, B, D and E, go to the same points in Fig. 2, leads being short and direct.

Receiver Circuit

Fig. 2 is the complete circuit, and is one easily subjected to modification. In view of its flexibility, a few notes on changes which can be made may be useful.

The 1st IFT has a centre-tapped secondary, and uses two crystals having a separation of about 1·5 kHz, in a simple band-pass arrangement. This gives adjacent-channel selectivity very much better than with many popular receivers. As a compromise for CW, AM and SSB, crystals with a separation of about 1·5 kHz to 2·5 kHz seem very successful. Any crystals of around 463 to 467 kHz or so can be tried.

If the crystal filter is not wanted, omit X1 and X2, and take 4 or 6 on IFT1 to R7, or use an ordinary IFT here. Should the aim be general usage it is practical to omit IFT1 and V2, and take V1 directly to 3 of IFT2.

VR1 is the IF gain control, necessary since SSB *must* be kept down in level if V5 is to provide enough carrier for the single diode of V4. Again, for general usage, V5 can be omitted, but the receiver is then for AM only.

S1/S2 switches on the BFO V5, and disables the AVC. V4 has contact potential bias—hence the large value for R15.

VR3 is a top-cut "tone control" which can reduce the apparent presence of HF whistle. If it is not fitted, shunt T1 primary with a ·01 μF or ·02 μF capacitor, or

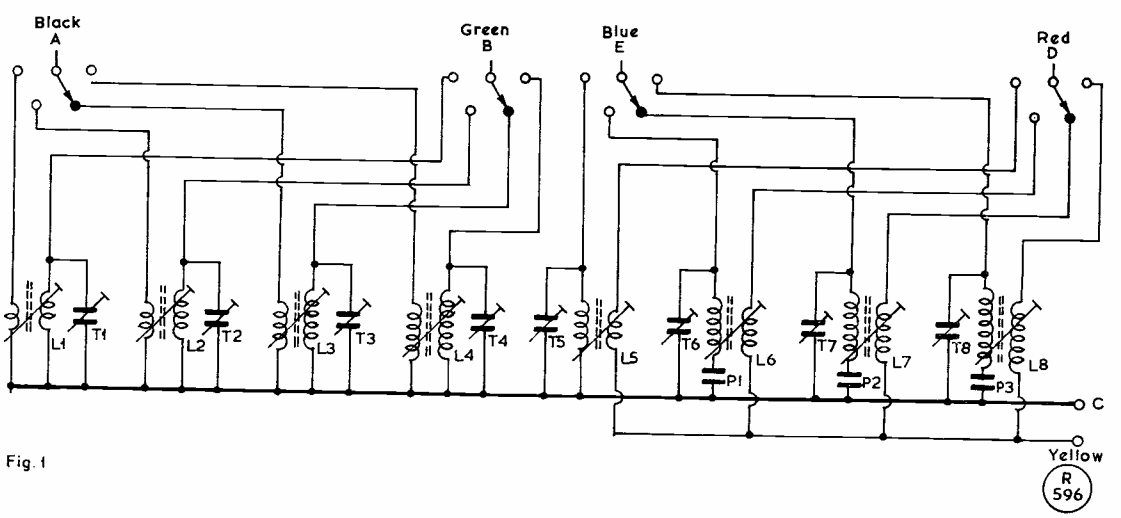


Fig. 1. Coil pack unit

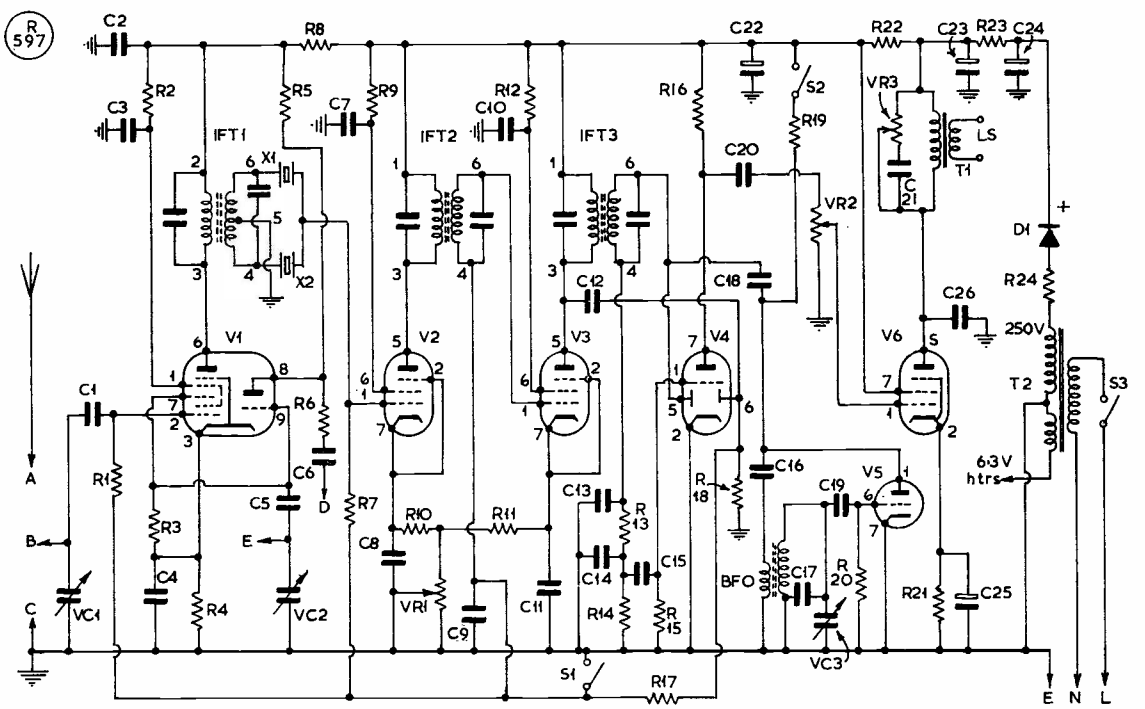


Fig. 2 Complete circuit of the Receiver

Fig. 2. Circuit of the Receiver

Table of Values

R1	1 megohm ¼w.	C10	0·01 μF
R2	22,000 ohms 1w.	C11	0·01 μF
R3	47,000 ohms ½w.	C12	20 μμF
R4	220 ohms ½w.	C13	200 μμF
R5	33,000 ohms 1w.	C14	200 μμF
R6	120 ohms ¼w.	C15	0·01 μF
R7	100,000 ohms ¼w.	C16	100 μμF
R8	1,200 ohms 1w.	C17	150 μμF
R9	33,000 ohms 1w.	C18	2·5 μμF
R10	68 ohms ½w.	C19	100 μμF
R11	68 ohms ½w.	C20	0·01 μF
R12	33,000 ohms 1w.	C21	0·05 μF
R13	47,000 ohms ¼w.	C22	16 μF elect.
R14	470,000 ohms ¼w.	C23	16 μF elect.
R15	8·2 megohms ¼w.	C24	8 μF elect.
R16	270,000 ohms ½w.	C25	100 μF elect.
R17	1 megohm ½w.	C26	0·002 μF
R18	1 megohm ¼w.	VC1/VC2	*Jackson* E2, 2/500 μμF
R19	68,000 ohms 1w.	VC3	*Jackson* C804, 15 μμF
R20	47,000 ohms ½w.	Drive	*Eddystone* E898 or to choice
R21	680 ohms 1w.	IFT1	*Denco* IFT11/465CT
R22	2,700 ohms 2w.	IFT2	*Denco* IFT11/465
R23	1,000 ohms 2w.	IFT3	*Denco* IFT11/465
R24	100 ohms 1w.	X1	Crystal about 464·5 kHz
VR1	10,000 ohm 2w. wire-wound	X2	Crystal about 466 kHz. Two holders
VR2	470,000 ohm or 0·5 megohm log. pot with switch	BFO coil	*Denco* BFO/465
VR3	25,000 ohm pot.	V1	ECH81
		V2	6BA6
C1	100 μμF	V3	6BA6
C2	0·1 μF	V4	6AT6
C3	0·01 μF	V5	6C4
C4	0·01 μF	V6	6AM5
C5	100 μμF		
C6	100 μμF		
C7	0·1 μF		
C8	0·01 μF		
C9	0·1 μF		

Components for Coil Pack

Denco miniature valve coils: BLUE, Ranges 1, 2, 3 and 4; RED, Ranges 1, 2, 3 and 4; 8 off 60 pF trimmers, *Home Radio* Cat. No. VC29LC; 4-pole 4-way rotary switch; Shaft coupling and ¼in. rod; capacitors, silver mica, 110 pF, 350 pF, 1100 pF and 3000 pF.

Notes: Also required are T1 Output transformer ratio approx 60 : 1 to 70 : 1 (for 3 ohm spkr.). T2 Mains transformer, 250v. 45mA, 6·3v. 1·5A. Rectifier: 250v. 50mA contact cooled or 800 p.i.v. silicon, etc. S1/S2 2-pole "on" or 2-pole 2-way. *H. L. Smith* 12 x 7 x 7in. Type W case and 10½ x 6½ x 2in., Type I chassis. Knobs, coupling, tag-strips, etc. B9A skirted holder. Five of B7G skirted holders.

change C26 to this value. For broadcast reception, the tone control circuit does allow a little compensation for top audio frequencies lost in the crystal filter.

V6 is an economical valve type, but others would do as well, if current is available. The power section uses readily available items. Actually, any well smoothed supply of about 200-230v. or so at 45mA or more will do equally well.

Layout

This is not *too* important, provided leads to VC1/2, V1 and the coil-pack are short, and that layout or screening prevents stray coupling round the crystal filter.

Due to the shape of the coil-pack, it is necessary to mount it above the chassis, use a deep chassis, or place it in an opening cut in the chassis. The latter method is preferred, with the eight trimmers on top. It is mounted

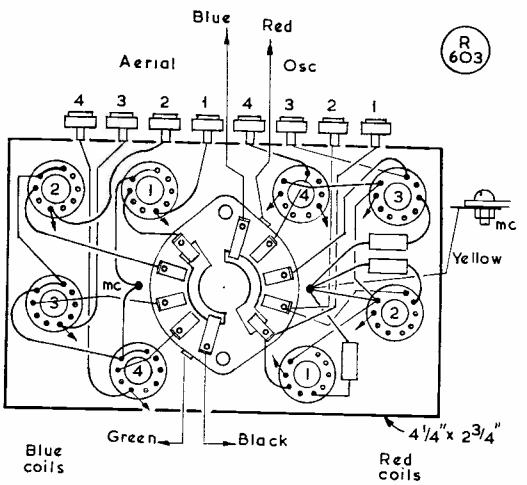


Fig. 3. Wiring of the Coil pack

on a bracket, to clear the drive, and this brings the switch spindle level with the other controls.

The mixer V1 and IFT1 are behind the coil-pack, followed by the crystals and V2 in the corner. IFT2, V3, IFT3 and V4 then run along the rear of the chassis. The BFO coil is near the panel at the left, with V5 and V6 a little behind.

Looking at the receiver from the front, controls are, left to right: VR2 with S3, VC3, VR3; main tuning; VR1 gain control; bandswitch; switches S1/S2.

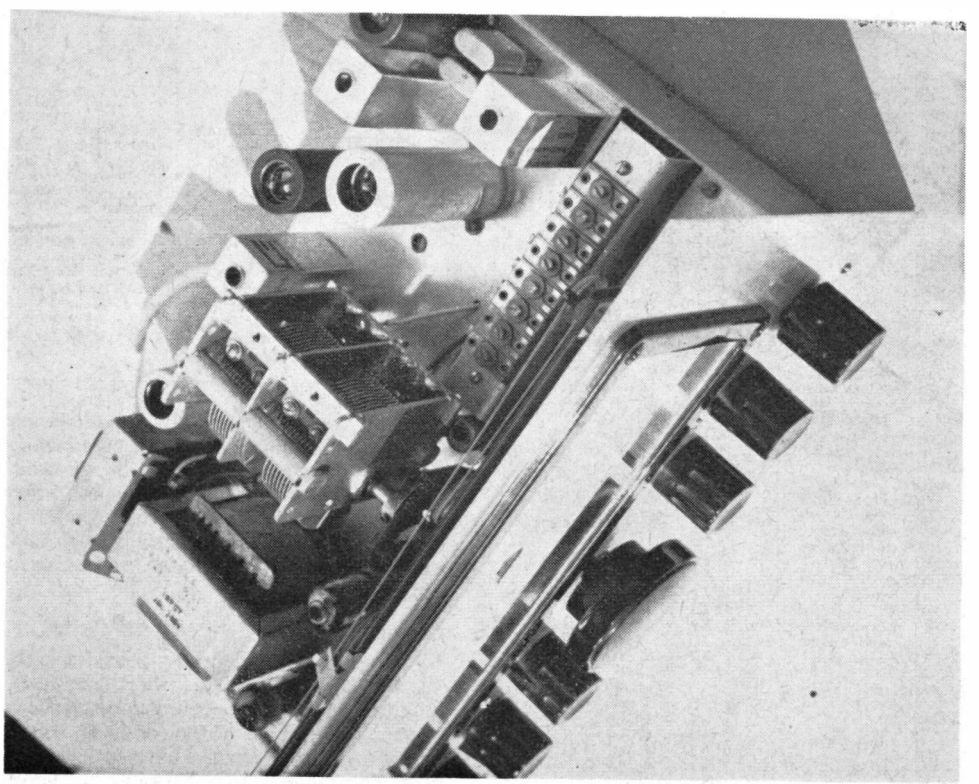
The receiver could be constructed in cabinets other than listed, but this does give a compact piece of equipment, without crowding components. If wished, building cost can be reduced by using one of the ball-drive or other types of tuning mechanism.

Some ventilation is necessary for the cabinet. It can be raised on rubber feet, and have a number of $\frac{1}{2}$in. holes in the bottom, and back, in addition to slots, cut-outs or openings for the mains lead, aerial, earth and speaker connections.

IF Alignment

If no crystals are used, peak the cores of the IFT's for best results. A meter can be temporarily clipped from chassis to the junction of R10 with R11, with VR1 turned back somewhat. Adjustments can then be with any stable signal, and are directed towards securing the lowest current reading, S1/S2 being open. The second core of IFT3 is peaked for maximum volume.

(To be concluded)



Interior view of the Receiver

* * * THE MOBILE SCENE * * *

The fact that there are now about 3,800 U.K. amateurs licensed for mobile is only one of the reasons why—given reasonable weather—mobile rallies these days attract large attendances. For one thing, the trade stands are a great attraction; secondly, a Rally makes a good focal point for a social gathering and, thirdly, many people just like to make it a reason for a day out with the family.

It is probably fair to say that the measure of the real mobile interest is the number of /M stations worked on the talk-in channels. A walk round the car parks will also soon indicate the proportion of vehicles actually fitted mobile, and their antennae usually make it obvious which bands they work.

Where organisers' reports on Rallies are received, we shall be glad to cover them in this feature—and, course, we also like to see good Rally pictures for possible reproduction here.

THE RALLY CALENDAR

May 27: Maidstone Mobile Rally at YMCA Sports Centre, Melrose Close, opening at 11.0 a.m. All main events under cover, talk-in by GB3YSC on 2-4-80-160m. Contact A. S. Walter, G3WXL, 4 Oak Farm Gardens, Headcorn, Kent.

May 27: Hull & District Mobile Rally at Bishop Burton, East Riding College of Agriculture, on the A.1079, York-Beverley, with entertainment and attractions for the whole family, trade stands and a raffle. College grounds will be open from 12 noon, and the talk-in stations, G3AMW/A on 1981 kHz and G8GBY/A on 145·5 MHz come on the air at 11.0 a.m. Rally organiser is L. D. Colley, G3AGX, 13 Ferry Road, Wawme, near Hull, East Yorks., HU7 5XU.

May 30-June 2: Rally to be held in conjunction with the Bath & West and Southern Counties Show at Shepton Mallet, a well known and very popular event in the West Country. GB2BWS will be on 3710 kHz or near, depending on QRM, and it is hoped to have talk-in on two metres as well for the period of the Show. Operator assistance is invited, with free car/caravan entrance and parking for helpers. It is proposed to have a dinner for radio amateur visitors on Friday, June 1. Contact: R. B. Holman, G2DYM, The Old Saw Mills, White Ball, Wellington, Somerset.

June 10: The fourth Elvaston Castle Mobile Rally in the grounds of the Castle Country Park, off the B.5010 south-east of Derby. Talk-in on 2-4-160m. by G3EEO and G3ZBI. A bring-and-buy sale and various other attractions.—I. Cage, G8GBV, 25 Petersham Drive, Alvaston, Derby, DE2 0JU.

June 17: The Amateur Radio Mobile Society's Rally will be held at R.A.F. Station, Cosford, on the A.41 about eight miles north-west of Wolverhampton, with talk-in on Top Band (G4AMS/A, 1925 kHz) and two metres (G3BXI/A, 145·00 AM/FM and G3BHT /A. 145·41 MHz SSB). Of particular interest is that the R.A.F's own Historic Aircraft Museum is at Cosford, and will be open to Rally visitors. The Wrekin Gliding Club also operates from Cosford. A large trade show is being organised and will be accommodated in a big hangar—business men interest in the Amateur Radio trade are invited to get in touch immediately with the A.R.M.S. exhibition manager, S. Barwick, 34 Malvern Road, London, N8 OLA. For further details: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2 1EZ.

June 24: West of England Mobile Rally at Longleat House, near Warminster, Wilts. This will be the usual good show, put on for many years now in a particularly attractive setting—the house and park alone are well worth a visit.—Rally details from A. H. Williams, G8CKJ, 58 Britannia Road, Kingswood, Bristol.

July 8: Upton-on-Severn Mobile Rally, organised by the Worcester & District Amateur Radio Club.

Mexborough A.R.S. coach party for the White Rose Rally.

Details: B. A. Jones, G8ASO, 12 Woodside Road, Larkhill, Worcester, WR5 2EG.

July 15: Annual Mobile Rally organised by the Scarborough Amateur Radio Society at Burniston Road Barracks, Scarboro', as in previous years. Details: P. B. Briscombe, G8KU, Roseacre, Irton, Scarborough, Yorkshire, YO12 4RL.

July 29: To be put on by the Wessex Amateur Radio Group at Breamore House, near Fordingbridge, Hants., with talk-in on 160/80/4/2 metres. Trade stands and refreshments.—A. G. Emery, G3YWG, 7 Brunel Drive, Preston (*3177*), Weymouth, Dorset.

August 12: Torbay annual Mobile Rally at Newton Abbot Rugby Club ground, with talk-in, the usual stands and competitions.—L. H. Webber, G3GDW, 43 Lime Tree Walk, Newton Abbot, Devon.

August 12: The 1973 Mobile Rally at Derby, organised by the Derby & District Amateur Radio Society, to be held at the Rykneld School in Bedford Street, as in previous years. Ample accommodation if wet, free entrance and plenty of parking space, many attractions for all comers. This is a well-established annual event, which regularly attracts a large attendance.—F. C. Ward, G2CVV, 5 Uplands Avenue, Littleover, Derby, DE3 7GE.

August 19: Preston (North Lancs.) Annual Mobile Rally at Kimberley Barracks, Deepdale Road, Preston, Lancs., with free car park, trade stalls, refreshments and a bring-and-buy offering. Talk-in will be given on Top Band and two metres.—Contact man G. W. Earnshaw, G3ZXC, 12 Withy Parade, Fulwood, Preston, Lancs, PR2 4JN.

August 26: Town & Country Festival Rally, National Agricultural Centre, Kenilworth, Warwickshire

September 23: Harlow & District Mobile Rally, this year at Netteswell School, Harrow, to give more space and scope for their activities.—V. Heard, 106 Vicarage Road, Harlow, Essex.

SPECIALLY ON THE AIR

Following is the latest listing for special-event stations, rules and conditions for which were outlined under this heading on p.172 of the May issue of SHORT WAVE MAGAZINE.

GB2OCC, Till June 15: To be operated by Keele University Amateur Radio Society, in co-operation with other North Staffs. groups, for the Newcastle-Under-Lyme Octocentenary Charter Celebrations. Operator and SWL assistance is requested for station manning. Contact G3COY or G3UOK, *QTHR*, telephone *Stoke-on-Trent* 44875 or *Keele Part* 371, *exten.* 128.

GB3HCF, May 25-June 3: For the Hereford Cider Festival, mounted by the Hereford Amateur Radio Society, running all HF bands (but mainly 20m. and 80m.) also RTTY. Enquiries: S. Jesson, 181 Kings Acre, Hereford, HR4 OSP.

GB2FJE, June 13-14: From the Shefford Community Centre, put on by the Shefford & District Amateur Radio Society, operating 2m. and 160m. AM, 10-15-20m. SSB. Contacts to be QSL's by special card.—D. Pike, G3VMI, 11 Hazel Grove, Stotfold. Hitchin, Herts.

GB3PRC, June 16: From Patshull Hall, near Wolverhampton, Staffs., for the local fête.—J. Pearson, G3SNY, 79 Belle Vue, Woldsley, near Stourbridge, Worcs., FY8 5DB.

GB3JLS, June 16: For the Lucas Sports Day, with activity on 80, 20 and two metres, also 70 cm. They will have a loaned Versatower and also J-Beam antennae.—J. H. Butt, G3GVN, 90 Mereside Way North, Olton, Solihull, Warks., B92 7AZ.

GB3HCW, June 30-July 7: Operating all bands Top to two metres, with three stations on the air. This event is in conjunction with the Hanworth Carnival Week.—V. W. Higgs, G3VWJ, 205 Commercial Road, Staines, Middlesex, TW18 2QT.

GB3MKB, June 30-July 7: At Ballycastle, Co. Antrim, to commemorate the 75th anniversary of the Marconi link to Rathlin Is. operating all bands 10-80m., with a special QSL card. (This station should be worked for the "GI6YM Golden Jubilee Award").—J. Beattie, GI3NQH, 170 Lower Braniel Road, Belfast Northern Ireland.

GB3SFG, July 12-14: Finchley Carnival at Victoria Park, Ballards Lane, London, N.3, operated by the Southgate Radio Club, all bands 2-160m.—A. C. Edwards, G3MBL, 244 Ballards Lane, London, N12 OEP.

GB2SCW, July 19/21: Put on by the Stowmarket District Amateur Radio Society for the local carnival week, running 20-160m. and 2m./70cm., CW and phone, from the Recreation Ground, Stowmarket.—K. J. Bertrand, 35 Cuewen Road, Stowmarket, Suffolk, IP14 1JX.

GB2GB, August: Station to be operated from Brunel's famous old steamship *Great Britain*, now dry-docked, at Bristol, for the City's charter anniversary celebrations. GB2GB will be available for operation by visiting licensed amateurs during the entire month. Contacts will be QSL'd by special card. Information from G. Mather, G3GKA, 8 Hills Close, Keynsham, Bristol.

GB3RAF, August 10-27: In conjunction with the R.A.F. Exhibition, Billesley Common, Birmingham, operating on HF and VHF from the exhibition site, 10 a.m. till 8.0 p.m. daily. Operators will be R.A.F. personnel.—Hon. Secretary, R.A.F. Amateur Radio Society, R.A.F. Station Locking, Weston-super-Mare, Somerset. (*Call GB4CES may also be used*).

VHF BANDS

A. H. DORMER — G3DAH

Auroral Reflections

MOST of the comments on the April 1 aurora were included in the synopsis of last month but here are a few which arrived too late for inclusion in the May issue.

Perhaps of greatest interest is the report from G3LTF that he *worked DK1KO on 70 cm.* at 1615 BST on April 1. Reports were 55A both ways on CW and Peter also exchanged SSB signals with him. As mentioned last month there are very few authenticated reports of auroral contacts above 144 MHz, and these have come only from America, so this is probably the first *Ar* EU/QSO on 432 MHz, and is also an indication of the high intensity of upper atmospheric ionisation on that day. On 2m., Peter had *Ar* contacts with SK6AB, SM7CHX, SM7FJE, SM7DRK, SM6PU, SM6ESG, SM6EVP, SMØDRV, SM6CTP, DK1KO, DK2OY, DL7FQ, DL7AL, DL7QY (the DL all in Berlin), DJ2XW, GB3ZBE, GM3ZVB, GM3OXX, GM2DRD, GW2HIY, GW3WRE, G4BCL, G3BJD, G3JYP, G3NHE, OZ1OF, OZ4EM, OZ7LX/A and LA5UG. As if that weren't an impressive enough list, he also worked UR2CQ, UR2CO, UR2HD and recorded UR2BU as a "got-away"! But we have come to expect nothing less from G3LTF!

Also on April 1, GM3WOJ in Glenluce had nine CW contacts on four metres via the aurora and just failed to make it with G3RKL in Sheffield on SSB. GI8EWM in Co. Antrim worked three G and one GM station on SSB on the same day. As he was running only a 3-10 linear and a Skybeam at the time, this is further evidence that high powers are not always required for this type of propagation.

Oscar VI

Waning interest is the factor on the Oscar theme. The on/off switching fault persists, the solar panel and associated cell are continuing to give trouble and lead to many silent orbits, and now it appears that the internal temperature is showng a steady rise and it seems likely that this will be a determining, indeed limiting, factor in the life of the device, which may well be shortened significantly from the planned one year.

GW3FSP seems to have taken over from F9FT the title of "callsign most often heard". There are very few orbits when Dewi is not to be logged with that swinging CW fist of his. He has added SV1 and OE6 to his list of prefixes worked and has heard FC6ABP, although he seems to be doubtful if the FC6 really was in Corsica. (Don't see why not—he has been reported there by others.) His contact with WBØCOJ in Colorado must be very close to the limiting distance. He complains about the number of operators who call him, and other U.K. stations, when the W's are coming through, and the number of SSB types who come up right on top of the W's and call "CQ" for minutes on end, some of them with over-driven linears which cause the Oscar signals to vary up and down in sympathy with their speech modulation! Nevertheless, 'FSP has managed 964 contacts *via* Oscar, of which 344 are trans-atlantic. See the Oscar Table for the breakdown of his prefixes worked.

Tony Bailey G3WPO (Burgess Hill, Sussex) adds DC, DJ, K, SK, UB and UY to his total and raises a point about the American prefixes and call areas. Since these are on a geographical basis, and in view of the distances involved—there is a vast difference between working a W2 and a W6—it would probably be a better indication of performance if *American and Canadian* contacts only were reported by districts rather than by alphabetical and numerical prefixes for the same areas. A report could read, therefore, K1, W2, WA3, WB4 and so on, noting that K and W count as one prefix only. Where possible, reports have been amended accordingly, but

OSCAR VI TABLE

Operating Results

Station	Total	Prefixes
GW3FSP	51	DJ, DK, DL, DM, EA, EI, F, G, GI, GM, GW, HB, HG, I, LA, KL7, LZ, OE, OH, OHØ OK ON, OX, OZ, PA, SM, SP, SV, TF, UA, UAØ, UB, UG, UK, UR, UT, UY, UW, VE1, VE2, VE3, VE6, WA1, WA2, W3, W4, W5, W8, W9, WØ, YU (*964*)
G3BHW	43	DC, DJ, DK, DL, DM, EA, EI, F, G, GI, GW, HB, HG, I, LA, LZ, OE, OH, OK, ON, OX, OZ, PA, SM, SP, SV, TF, UA, UB, UG, UK, UR, UT, UY, VE2, VE3, W1, W2, W3, W4, W9, YU, 4X4. (*498*)
G3WPO	38	DC, DJ, DL, DM, EA, EI, F, G, GI, GM, GW, HB, HG, I, K, LA, LZ, OE, OH, OK, ON, OZ, PA, SM, SK, SP, SV, UA, UB, UF, UG, UK, UR, UT, UY, YO, YU, VE. (*431*)
G6RH	35	DL, DM, EA, EI, F, G, GI, GM, GW, HB, HG, I, LA, LZ, OE, OH, OHØ, OK, ON, OX, OZ, PA, SM, SP, SV, TF, UA, UG, UK, UQ, UT, VE, W, YU, 4X4. (*326*)
EI6AS	32	DL, DM, EA, F, G, GI, GW, HB, HG, I, LA, LX, LZ, OE, OH, OHØ, OK, ON, OZ, PA, SM, SP, UA1, UA9, UG, UK, UR, UY, VE, W, YO, YU. (*329*)
G3NHE	32	DL, DM, EA, EI, F, FC, G, GI, GM, GW, HB, HG, I, LA, LZ, OH, OHØ, OK, ON, OZ, PA, SM, SP, SV, TF, TF, UA, UG, UK, UR, VE, W, YU. (*400+*)
G3JVL	28	DL, DM, EA, EI, F, G, GI, GW, HB, HG, I, LA, LZ, OE, OH, OK, ON, PA, SM, SP, SV, TF, UA, UG, UR, UT, VE, W. (*300*).
G3IOR	26	DL, DM, EA, EI F, G, GI, GW, HB, HG, I, LA, LZ, OH, OHØ, OK, ON, OZ, SM, SP, UG, UK, UR, VE, W, YU. (*198*)

This Table has been compiled from the information available. It is appreciated that with the inclusion of VE and W call areas, the totals increase and it would be appreciated if your next submission could include the relevant details. Total of QSO's made in brackets. Starting score has been set at 26 and all claims should be sent to "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ each month.

as full details are not available in all cases, it is requested that detailed claims, taking the foregoing amendment into account, be submitted for the July issue.

Contests

Reports: Conditions for the 144/432 MHz contest during the weekend of May 5/6 were patchy. The appalling weather over much of the country not only affected propagation, but also must have deterred many groups who had been planning portable forays, and a combination of the two factors brought about a noticeable reduction in DX potential. However, Saturday night saw a bit of an opening into France—the South Coast stations were making good contacts well beyond Paris—with a smattering of PAØ for good measure. CW contacts were made with DL on Sunday morning, albeit with difficulty. Conditions on 70 cm. were poor and activity low. Despite these handicaps, two stations at least made more than 200 contacts on two metres. The improvement in operating procedures and techniques noted earlier was maintained with but few of the bad HF bands practices being carried over on to VHF.

General opinion has it that activity was low for the 70 MHz portable event on April 15. Unusually, there appeared to be rather more groups out in the South than in the North. It seems likely that the bad weather had much to do with this. GM4BYF/P operating from Broadlaw in Peebleshire (2,700ft. a.s.l.!) was a consistently good signal in the Midlands, as was GD2HDZ, although the latter has been suffering from a bad attack of the "dreaded Indians," which has cramped his style more than somewhat. G3JEQ/P with 65 QSO's near the end of the contest seemed to be doing well from his Hindhead site and GW3WAS/P in Pontypool, running a *nine*-ele. beam, provided some welcome DX. For the county chasers G3PLL/P was offering Rutland although he was difficult copy in the South.

Results: Congratulations go to the Golden Valley VHF Contest Group, operating in Montgomery as GW4ABR/P, who carried off the February 70 MHz Open with a lead of 63 points over GW4BUC/P, in spite of the fact that they made ten fewer contacts.

The lead in the 432 MHz Cumulatives, bedevilled though many of the sessions were by poor propagation, brought victory to G8EOP in Dewsbury, Yorks, who led G3KMS, the runner-up, by the staggering margin of 215 points. Worthy of special mention also, is the achievement of G8APZ/P in reaching third place in spite of his comparatively low power (25 watts) and simple antenna (18-ele. beam).

Forthcoming Events: 144 MHz Portable on May 27, 70 MHz Open on June 9/10 Microwave Field Day on June 16/17 and the WAB VHF Phone contest on June 17.

VHFCC Awards

Certificate No. 186 for two metres goes to Ron Harris GW3DUP of Swansea. Most of his contacts were made with a Pye Ranger running at 25 watts DC input, but since January this year he has been using a G2DAF Mk. II Tx as a driver on 21 MHz for the 4CS250B SSB linear, with a modified GW3ZTH transverter. The antenna is a 6/6 slot at 33ft. at the 200ft. a.s.l. QTH. He receives on a home-built dual-gate Mosfet converter with an AR88 as the IF/AF strip. His experience with QSL cards has been pretty unhappy as he reports several instances in which 2-3 applications, with s.a.e., have been made without result. He finds Club stations to be particularly negligent in this respect, and indeed one has heard the same story from other correspondents. Many Clubs find it an advantage to appoint a QSL manager to avoid this sort of criticism.

Arthur Williams, GW8FKB of Anglesey, is the recipient of Certificate No. 187, again for Two. He runs an FT-200 into a valved transverter finishing up with a '6-40A but hopes to follow this with a pair of 4X150's in the near future. The beam is a 10-ele. at 46ft.

Beacons

GB3VHF seems to have lost its ripple which has plagued it for so

About The VHF Spectra

OSCAR VI — Prediction Data

Orbit	Date	Time	Position	Direction
2875	June 2	0719	38°E	N/S
2876		0914	09°E	N/S
2877		1109	20°W	N/S
2881		1825	21°E	S/N
2882		2020	07°W	S/N
2883		2215	36°W	S/N
2888	June 3	0814	24°E	N/S
2889		1009	05°W	N/S
2890		1204	33°W	N/S
2893		1725	36°E	S/N
2894		1920	08°E	S/N
2895		2115	21°W	S/N
3051	June 16	0838	18°E	N/S
3052		1033	11°W	N/S
3053		1228	39°W	N/S
3056		1749	30°W	S/N
3057		1944	02°E	S/N
3058		2139	27°W	S/N
3063	June 17	0738	33°E	N/S
3064		0933	04°E	N/S
3065		1128	24°W	N/S
3068		1649	45°E	S/N
3069		1844	17°E	S/N
3070		2039	12°W	S/N
3071		2234	41°W	S/N

Times shown are for crossings at 52°N. Orbits beyond 45°E or W are not included. To calculate later orbits, deduct 5·15 minutes and add 1·29°E each 25 orbits. Orbits shown are for weekend operations only in view of tne revised AMSAT procedure. Time in GMT. East-West positions in degrees relative to Greenwich, 0°.

long. The long dash is a bit of a short dash if one wants to use it for lining up converters, but the more rapid keying is an advantage when using the signal for checking propagation.

ZB2VHF on 70 MHz is off the air at present. It is apparently being moved from the Club premises into a private shack, although just whose no one seems to know at the moment. TF3VHF is also QRT.

Events

The BARTG Convention will be held this year, as last, at the Meopham (Kent) Village Hall. Date is June 30 and show opens at 11 a.m.

The Maidstone Mobile Rally takes place at the YMCA Sports Centre, Melrose Close, Loose, Maidstone, Kent on Sunday, May 27. Talk-in stations (GB3YSC) on 70·26 MHz and 145·0 MHz. Further information from the organiser, G3WXL, *QTHR*.

The next meeting of the South East UHF/VHF Group is in the Electronics Building, University of Kent, Canterbury, on June 15, when Tom Douglas, G3BA, will be talking about expedition equipment.

Remote Operations

G4BIA, G8DNF and G8FFG are planning a trip to Andorra between July 1—13. They will have gear for 2m. (CW/SSB) and 70 cm. (CW) and are aiming to set up the station at 8,700ft. a.s.l. on the Pic de la Serrera. Callsigns and frequencies not yet received, but full information from C. M. Eley, G8DNF/A, 101, St. Mary Abbot's Court, Warwick Gardens, London, W14 8RD. The anchor man on 80m. and 2m. will be G3XFA.

A "VHF White Horse Net" has been started up by G3TYJ, G8EEN and G8GBV. They operate each Monday evening from the famous White Horse landmark on Westbury Downs, Wiltshire. Net frequency is 144·41 MHz (for AM, FM and SSB) but they will tune Zone A at regular intervals for those who cannot net in but who would like a contact. To carry the idea a little further, they have arranged that on the first Tuesday of every month, the net members will foregather for a jug at "The Angel", Upton Scuddamore, near Westbury, and will welcome vsiitors.

[*over*

THREE BAND ANNUAL VHF TABLE

January to December, 1973

Station	FOUR METRES Counties	FOUR METRES Countries	TWO METRES Counties	TWO METRES Countries	70 CENTIMETRES Counties	70 CENTIMETRES Countries	TOTAL Points
GD2HDZ	19	3	55	8	16	4	105
G3NHE	11	2	50	11	25	3	102
G4BEL	8	2	47	11	29	4	101
G8FUI	—	—	57	9	16	2	84
G8EOP	—	—	49	6	27	2	84
G3OHH	32	4	31	5	8	2	82
G3FIJ	20	3	28	5	14	1	71
G3DAH	14	2	40	8	5	1	70
G2AXI	20	2	33	3	6	1	65
G8DNK	—	—	53	10	—	—	63
G8FMK	—	—	36	2	22	1	61
GW8FOL	—	—	50	8	—	—	58
GW3ZTH	—	—	48	9	—	—	57
G8CKZ	—	—	45	9	—	—	54
G8FQE	—	—	45	7	—	—	52
G8GNE	—	—	35	4	12	1	52
G3BW	—	—	43	8	—	—	51
GM3ZVB	—	—	40	8	—	—	48
G8BXX	—	—	28	2	15	1	46
GM3ZVL	—	—	34	7	4	1	46
G4AEQ	—	—	25	2	13	3	43
G3XDY	—	—	35	8	—	—	43
G4AJE	—	—	32	6	2	1	41
G4BKG	—	—	34	6	—	—	40
G3SMU	10	3	5	2	16	3	39
GW8DUP	—	—	31	7	—	—	38
G8DGR	—	—	28	2	6	1	37
G8BKR	—	—	25	3	6	2	36
GW8FKB	—	—	27	7	—	—	34
G8GPR	—	—	28	4	—	—	32
G8CBU	—	—	23	2	5	1	31
G8GNC	—	—	28	2	—	—	30
G8DOT	—	—	25	5	—	—	30
GI8EWM	—	—	25	5	—	—	30
GW8EHK	—	—	20	7	—	—	27
G8COG	—	—	23	3	—	—	26
G8EMS	—	—	20	2	2	1	25
G4AEZ	—	—	22	1	—	—	23
G3VWI	—	—	19	2	—	—	21
G8GBV	—	—	14	2	3	1	20
G3WHK	—	—	17	3	—	—	20
G8GJB	—	—	17	3	—	—	20
GW8CMA	—	—	14	3	—	—	17
GW3CBY	—	—	11	5	—	—	16
G8FUL	—	—	13	2	—	—	15
G8GXE	—	—	13	1	—	—	14
G3EKP	4	2	2	1	2	2	13
GW8CGH	—	—	7	2	—	—	9

The Table shows claims to date from January 1, 1973 and runs through to December 31, 1973. Your claims should be sent to:— "VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ each month.

THREE BAND ANNUAL VHF TABLES

TWO METRES

Station	Counties	Countries	Total
G8FUI	57	9	66
GD2HDZ	55	8	63
G8DNK	53	10	63
G3NHE	50	11	61
G4BEL	47	11	58
GW8FOL	50	8	58
GW3ZTH	48	9	57
G8EOP	49	6	55
G8CKZ	45	9	54
G8FQE	45	7	52
G3BW	43	8	51
G3DAH	40	8	48
GM3ZVB	40	8	48
G3XDY	35	8	43
GM3ZVL	34	7	41
G4BKG	34	6	40
G8GNE	35	4	39
G8FMK	36	2	38
G4AJE	32	6	38
GW8DUP	31	7	38
G3OHH	31	5	36
G2AXI	33	3	36
GW8FKB	27	7	34
G3FIJ	28	5	33
G8GPR	28	4	32
G8BXX	28	2	30
G8DGR	28	2	30
G8GNC	28	2	30
G8DOT	25	5	30
GI8EWM	25	5	30
G8BKR	25	3	28
G4AEQ	25	2	27
GW8EHK	20	7	27
G8COG	23	3	26
G8CBU	23	2	25
G4AEZ	22	1	23
G8EMS	20	2	22
G3VWI	19	2	21
G3WHK	17	3	20
G8GJB	17	3	20
GW8CMA	14	3	17
G8GBV	14	2	16
GW3CBY	11	5	16
G8FUO	13	2	15
G8GXE	13	1	14
GW8CGH	7	2	9
G3SMU	5	2	7
G3EKP	2	1	3

THREE BAND ANNUAL VHF TABLES

70 CENTIMETRES

Station	Counties	Countries	Total
G4BEL	29	4	33
G8EOP	27	2	29
G3NHE	25	3	28
G8FMK	22	1	23
GD2HDZ	16	4	20
G3SMU	16	3	19
G8FUI	16	2	18
G8BXX	15	1	16
G4AEQ	13	3	16
G3FIJ	14	1	15
G8GNE	12	1	13
G3OHH	8	2	10
G8BKR	6	2	8
G8DGR	6	1	7
G2AXI	6	1	7
G8CBU	5	1	6
G3DAH	5	1	6
GM3ZVL	4	1	5
G8GBV	3	1	4
G3EKP	2	2	4
G4AJE	2	1	3
G8EMS	2	1	3

THREE BAND ANNUAL VHF TABLES

FOUR METRES

Station	Counties	Countries	Total
G3OHH	32	4	36
G3FIJ	20	3	23
GD2HDZ	19	3	22
G2AXI	20	2	22
G3DAH	14	2	16
G3NHE	11	2	13
G3SMU	10	3	13
G4BEL	8	2	10
G3EKP	4	2	6

The Scottish Scene

GM3ZVB and GM3ZVL continue to monitor the CW end of the 2m. band at 10.30 p.m. each evening, beaming South. Although conditions have been no better than average, they have heard G3XWZ in Nottinghamshire and he has heard them at S5, although deep QSB has prevented a complete QSO. G3MOT and G3CCH have also been heard. Incidentally, GM3ZVB is now equipped for Four.

GM3OXX, as promised, spent Easter on the mountain tops of Arran, and although conditions were not too good, he returned with spirits undampened, even if the same could not be said of his exterior!

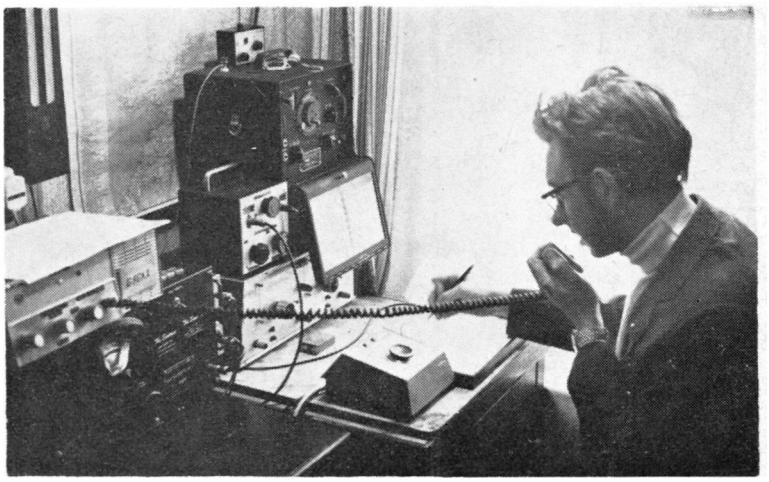
Back on the 2m. air, after convalescing from a nasty car accident, is GM8DOX. He has moved QTH to Bridge of Alan, and is putting an S9 signal into the Lothians. Also back is GM6SR who, after a spot of trouble with the 2m. Tx found the beam rotator had gone u/s, but all is well once more, and Sid is looking for the daytime contacts on this band and on 4m. GM8GXY is a welcome newcomer to 2m. He runs a home-built Tx with a 6/6 and FR-DX400 Rx. The QTH is at the Lake of Monteith which, as his QSL reminds one, is the only *lake* in Scotland.

GM3ESJ is moving QTH to Thornton in the Kingdom of Fife. He found VHF operation from Glenrothes pretty hairy in view of the terrain. He runs a "Cambridge" and, with the co-operation of GM3OLK, has developed an auto-scan unit which seems to be working out very well. Also mobileering is GM8GEC who now has a Liner-2 in the car. As a professional radio engineer specialising in business mobile radio, the change of mode must give him much to think about. GM3BQO has also acquired a Cambridge, and is savouring for the first time the pleasure of mobile operation. GM6XI has now been mobile with a Cambridge for some time and will be operating /P from the Kintyre peninsula for three weeks from June 14. (Congratulations to Jack on reaching the good old age of three score years and ten!)

No piece about Scotland would be complete without a mention of the activities of GM3BQA. He has a new toy in the shape of a trailer complete with telescopic antenna operated by a compressor. This replaces the fire escape which used to support his famous HF Quad Tri-band aerial. One frequently hears about Jimmy going higher and higher with his antennae but he also goes lower and lower at times. He is a proficient aqualung diver, and was recently appointed as one of the official divers at the North Berwick swimming pool on the occasion of the BBC "It's a Knockout" contest between the locals and Peebles.

GM3WOJ brings news from the South-west of Scotland. He operates from Glenluce in Wigtownshire with 200 watts of SSB and 50 watts of CW, both necessary in view of the local terrain if he is to make other than local contacts. He and G3FDW have revived the idea of a long-distance net on 4m. and hope to have it established by the summer. Any South Coast operator interested in joining them should contact him, *QTHR*. He has recently been having a go at M/S with G3ZRH and G4BEG. To date, they have only managed to exchange callsigns, although 'ZRH has raised GM3UAG. They estimate the daily "ping rate" at around 80/90 per hour, which should be enough for a QSO on 70·1 MHz. Chris also raises the question of a calling channel for SSB on Four, and suggests that 70·41 MHz seems a natural in view of 145·41 MHz for 2m. This QRG is far enough removed from the mobile calling channel to avoid mutual QRM, and is also inside the EI frequency allocation. Comments would be welcome. Incidentally, he says that G4BEG now has a *13-element* beam for 4m. That must take a bit of supporting!

Finally, the Scottish VHF Con-



David Nicholson, G8GKX, 4 Woodlands Road, Halton, Leeds 15, has been licensed since May '72. He now runs a Pye "Cambridge" as Tx, the receiving side consisting of a Solid State Modules converter with pre-amp., tuning 4-6 MHz on a BC-348 as IF/AF amplifier. His beam is an 8-ele Yagi, 40ft. up, at a QTH 320ft. a.s.l. He is well known on two metres in the Yorkshire area.

vention in Edinburgh on September 29: Vic Stewart, GM3OWU, has done much of the spadework, and a committee has now been appointed to take it from there. More details nearer the time.

News Items

GI8EWM, Co. Antrim, is now QRV on 2m. SSB. He runs 40 watts input to a Skybeam at 50ft. and the Rx is a DL6SW converter into father's (GI3ZJR) Swan 350. He should have a pair of 4CX250B's going soon and would welcome skeds, *QTHR.*

G8GMR (Luton) seems to be making a bit of a name for himself in the Midlands with the big signal he puts in there. He is 530ft. a.s.l. with a 14/14 at 30ft. Tx runs 20 watts output only from a '3-20A and the Rx is a dual gate Mosfet into an RA-1. It's that height a.s.l. as does it! More active of late is G3OSS (North London) who has 80 watts p.e.p. on SSB with a ten-ele. at 65ft., and who was heard working into Stockport and surrounding area on April 13 with great effect. Another successfully getting out is G3RIK (Rochdale) who currently runs a mere 300 milliwatts from a 2N3866, but who has made it with 21 counties and three countries. He even worked two GM during the April aurora! A welcome return to 2m. also by G3MED (Banstead, Surrey) who was heard working the DX on April 27, and also in contact with old chums G3LBA and G3SHK.

An indication of the potency of the "Liner-2" when operated mobile was given when G3NEO (Sheffield) and G3ZYC (Derby) worked G8EYO/M all the way down the M1 to Harrow, some 200 kms. or so. Signals ranged from *nil* to S4 with bursts to S5. That wouldn't be on with push-button NBFM!

During official E-M-E listening tests on March 31/April 1, the following stations were logged as active: On 1296 MHz—OZ3FYN, PAØSSB, PAØMB, W2NFA, G3LTF, PAØKT, VK3AKC and W9WCD. On 432 MHz—G3LTF, WA6EXV, W4NUS, K2VYH, W9WCD VE7BBG, VK2AMW and W6FZJ. On 144 MHz—PAØMV, DK2LR, W6PO and WA2WOM. Of interest also is the observation that, at the end of the session on Two numerous 144 MHz auroral signals were copied.

Deadline

Deadline for next issue is **June 8.** The address for news, views and comment is:—"VHF Bands," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ. Cheers for now and *73 de G3DAH.*

SUN ECLIPSE EXPERIMENT

On June 30, a total eclipse of the Sun will be observable as a narrow strip rushing across Africa from Mauretania (N.W. Africa) in a general south-easterly direction. (This will be much to the alarm of the natives, who will be doing *poojah* wherever the darkness strikes!) During the period of the eclipse, it is proposed to operate, as a beacon station, 5T5SOL from Akjoujt (19° 44′ N., 14° 25′ W.) on 14050 kHz and 21050 kHz, for two hours from 0930 till 1130z, covering the time of the eclipse in Mauretania, totality being around 1030z. The form of the transmission will be c/s 5T5SOL every 20 seconds, followed by a dash.

The purpose of the experiment is to observe propagation effects—hence, it will be a *listening* test and therefore it is asked that these two frequencies be kept clear. Reports, immediately after the event, should be sent to us for forwarding to F8SH, who is acting as co-ordinator. World-wide publicity is being given to the tests and it is hoped that something significant as regards propagation at these frequencies may emerge.

THE MONTH WITH THE CLUBS

By "Club Secretary"

(Deadline for July issue: June 7)

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

EACH month, for years past, your conductor has sat at this machine and wondered what phase of the Club Scene he should comment upon; this time he is triggered off by noting the different attitudes taken by Hon. Treasurers to their duties. Some groups seem to run with a total credit balance of as low as a tenner, using any sums over and above this to finance—partly or wholly, as the case may be—some service to the members, such as a coach to a Rally. Others seem to believe in building up the maximum possible reserve and insist that each year the balance must rise; and yet again there are Clubs where the accumulation of a large balance is done with a definite end in view, such as the purchase of equipment for a Club station, or the provision of a new Hq.

But in all the years he has been "Club Secretary" your scribe has never, heard of a Club "going bust." That seems to argue that Hon. Treasurers are a pretty canny lot—for which the Clubs concerned should be thankful!

The South

For **Verulam** the date each month is the third Wednesday; there is always something in the nature of a lecture laid on and on June 20 it is a discussion on Three Centimetres. led by G8AZU. The venue is the Market Hall, St. Albans.

Dunstable Downs have their Hq. at Chews House, 77 High Street South, Dunstable. They have "between weeks" down for June 1, 15 and 29; on June 8 G3HAL talks about "The Non-Professional Approach" and on June 22 comes G3WBC's Annual Fun Night when *anything* can happen, and most probably will! The only other date we notice is June 24, for a 144 MHz D/F Hunt.

Now to **Cray Valley** where they get together in the United Reformed Church Hall, Court Road, Eltham, London S.E.9. Western Electronics visit them on June 7, no doubt to demonstrate some of their range of gear. Then, with unconscious irony, they have, on June 21, a Surplus Sale.

At **Echelford** they meet at St. Martin's Court, Kingston Crescent, Ashford, Middlesex, on the second Monday and last Thursday of each month. This gives us June 11, for a Surplus Equipment Sale, and June 28, for G3DAC to lecture on Air Traffic Control.

June 14 is the date when G3IAV will talk to **Mid-Sussex** on "Modulation", and on June 28 there is the Windmills Social Evening, when we understand it is intended to present the prizes for the constructional contest. Hq. is at Marle Place, Leylands Road, Burgess Hill.

A membership around the 100 mark, with new enrolments coming in at a steady rate bespeaks a thriving **Surrey** club organisation, based on the Swan and Sugar-loaf, South Croydon. June 19 is given over to G3OJV, of Waters Electronics, who is coming along to talk about interference to both TV and the new curse, audio equipment, and how to set about curing it.

It looks like June 14 for the **Southgate** lads, at their usual place in the Civil Defence Hut opposite Arnos Grove Piccadilly Line station, and it is understood that this event is to be a Junk Sale.

66 High Road Chiswick is the home of the **Acton, Brentford and Chiswick** group, who on June 19 will be hearing Mr. R. Dickins talking about the latest variety of testmeter to come from the famous AVO stable.

Brighton Tech. College is of course closed during the summer; but the lads are keeping in touch and on June 4 have a trip to Falmer Waterworks to see the Pumping Station and Control Room. On June 18, the Club room, Room B.7, will be opened up, from 7.30 p.m. and G3TCB will be activated.

Not many groups are as lucky as **Chiltern,** who have their Hq. at the canteen behind the Ernest Turner works in Totteridge Avenue, High Wycombe—cars may be parked in the Works park, the entrance to which is in Gordon Road. June 12 is an Informal, when the Club stations will be activated, and on June 27, a well-known manufacturer will be sending a representative to discuss the Application of FETs.

A right rarity is on the bill at **Crystal Palace** on June 16—no less than G6CJ, Dud Charman, on HF Aerials. This should be enough to ensure that Emmanuel Church Hall, Barry Road, S.E.22 will be well and truly filled with members and visitors.

Another "special" will be on June 4, at the Adult Centre, Orchard Road, **Stowmarket.** The fare for the evening is a couple of NASA films, showing for the first time in England; and there are hopes of having some of the Apollo and Skylab recovery teams based on Bentwaters U.S.A.F. station also at the meeting. Members of other Clubs are invited to this meeting, or to a public showing which will be on June 18 at the same venue.

Quite a long time since we heard from **Wessex.** All is well though, with the regular assemblies taking place on the first Friday in every month, then the Monday 17 days later, at the Cricketers Arms Hotel, Windham

Chairman of Mexborough & District Amateur Radio Society is G3MWN. His wife is G8FQU and the two junior ops., Carol and David, are keen SWL's—so they are a real Amateur Radio family. As a party, they were at the White Rose rally in April

Road, Bournemouth, near the Railway Station.

June for the lads at **Edgware** means June 14 and June 28, the first one formal, with programme yet to be settled, and the second, as usual, informal; both are at the Watling Community Centre, 145 Orange Hill Road, Edgware.

The **Bishops Stortford** meeting for June will be, as usual, on the third Monday in the month June 18, at the British Legion Hq. in Windhill, Bishops Stortford. Visitors welcomed.

Nationals

Our first call under this head is to **A.R.M.S.** who, as most readers will know, cater for the interests of those amateurs and SWL's who are interested in Mobile operation. The current copy of *Mobile News* contains an obituary for Maurice Margolis, G3NMR, who did so much for the society in the early, formative years. There is an interesting piece by G3BID on the use of an RF "sniffer" and a length of copper braid as aids to the detection and then suppression of interference paths in the car.

Then there is **R.A.I.B.C.**, active in the interests of blind or invalid amateurs and SWL's, both by way of the newsletter *Radial* and the more practical help given by the supporters, of who more are always needed. If you know of any invalid or blind amateur in your district, it would be a very good idea to make sure he is a member of this group.

Westerlies

Yeovil are top of the pile, and advise that they assemble every Thursday evening at the Youth Centre, 31 The Park, Yeovil, where visitors are always welcomed.

Pembroke write to mention their Bucket-and-Spade Party, at Regency Hall, Saundersfoot, on June 10. There will be talk-in, on 28·55 MHz, 144·35 MHz, and, for the SSB merchants, on 145·41 MHz. If you want to go to this "do" drop a line to the Secretary, GW4AKO, *see* Panel, so that they can get an idea of the catering arrangements to be made; and if you are going to arrive early, it is possible to book lunch with GW3TUD, Coles Cafe, Saundersfoot. Let us hope that the weather will be right to bring out lots of visitors to this annual event—which will make the members all feel their work has been worth while.

The **Cornish** crowd seem to be surviving quite happly after some ups and downs; they have their "main" meeting at the SWEB Clubroom, Pool, Camborne, on June 7, when the talk will be by John Guite on the Training of Guide Dogs for the Blind. There is also a Newquay group, meeting at Treviglas School there, and other activities. Full details can be obtained by reference to G3XTF as shown in the Panel, p.240.

Find the Fernhill Hotel at Charmouth, on the first Friday of any month and you have found the **Axe Vale** gang's hideaway. They say they have a nice warm place to meet, and all they now need are some more members to fill the room up—why not go and join them?

Hereford will be at the Hereford Cider Festival at the start of the month—the Festival runs May 25 to June 3, and they plan to have GB3HCF operational during that period. The meeting proper follows on June 15, with a nice restful Hi-Fi demonstration. June 22 is down for a Skittles Match with the Worcester Club, and on June 26 they have a trip organised to the Nuclear Power Station at Oldbury-on-Severn.

At **Torbay** they have just run off the Annual General Meeting with a few resulting changes, one of which is the Hon. Secretary, reflected in the Address Panel. For the session on June 30, G3NBR will be talking about Solid State Transmitters, at the club Hq. in Bath Lane, rear of 94 Belgrave Road, Torquay.

(over

The Midlands

First we have to notice the activities of the Amateur Radio club associated with the **Joseph Lucas** companies; we understand they are putting on a show for the Lucas Sports Day, with GB3JLS active on 432 MHz, 144 MHz, 3·5 MHz and 14 MHz, which should give visitors a good insight into most aspects of our hobby. The next meeting to look forward to after the Sports Day on June 16, is that on July 3, the details of which are not yet settled, albeit G3GVN says it will be a good 'un.

The **Nottingham** publicity wallah was in a bit of a dither when he wrote, to meet the deadline, insofar as the Club committee meeting to work out the details was not until the following night. Never mind, you can always get the latest details from the Secretary (*see* Panel) but it is still possible to say that meetings are on Thursday evenings, at Sherwood Community Centre, Mansfield Road, Nottingham, starting at 7.30 p.m. A regular item each week is Morse practice later in the evening—a good idea indeed.

Midland and the Midland Institute are inseparables, from the days when the Institute was in Digbeth, long before the move to the present building in Margaret Street. This month's date is June 19, when G6KQJ/T takes the stand to talk about Digital Integrated Circuit Techniques.

Now to **Cheltenham** (RSGB) from whose newsletter we gather that yet another group is in process of formation in the area, this one being for schools. As far as the regular group is concerned, the Hq. is at the Royal Crescent Hotel, Clarence Street, Meeting on the first Thursday in the month—details of the talk are not at the time of writing to hand.

Up North

South Manchester have two venues. The main one is at Sale Moor Community Centre, Norris Road, used on Friday evenings, and the other is the club shack, at "Greeba" Shady Lane, Manchester 23, where the VHF/UHF element foregather on Monday evenings. The formal programme, based on the Community Centre, shows June 1 for the second part of a talk on Batteries, and June 8 for a review of progress on the Club Project, a QRP transmitter. June 15 is merely specified as "Something Completely Different," and June 22 sees G3WFT talking about Regulated Power Supplies using Transistors. Finally, June 29 is down for a Mini D/F Contest.

Names and Addresses of Club Secretaries reporting in this issue :

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, London, W3-8LB.
A.R.M.S.: N. A. S. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, CR2-1EZ.
AXE VALE: J. W. Cross, Coverdale, Woodmead Road, Lyme Regis (*2882*), Dorset.
BARKING: H. G. Davidson, G3FZP, 223 Salisbury Avenue, Barking, Essex.
BISHOPS STORTFORD: E. P. Essery, G3KFE, 17 Ascot Close, Parsonage Lane, Bishops Stortford (*52501*), CM23-5BP.
BRIGHTON (Technical College): R. J. Henley, G2CMH, 35 Wilmington Way, Brighton, BN1-8JH.
CHELTENHAM (RSGB): E. Janes, G2FWA, Hillside, Bushcombe Lane, Woodmancote, Cheltenham, Glos. (*Bishops Cleeve 2229.*)
CHILTERN: F. S. G. Rose, G2DRT, 84 Cock Lane, High Wycombe, Bucks. (*Pen 4240.*)
CORNISH: H. Webster, G3XTF, Crandale, Gillyfields, Redruth (*6905*), Cornwall.
COVENTRY: G. A. Whenham, G3TFA, 33 Chapel Street, Bishops Itchington, Warwickshire.
CRAY VALLEY: P. F. Vella, G3WVP, 78 Hurst Road, Sidcup.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London, SE23-3BN. (*01-699 6940.*)
DARTFORD HEATH: Mrs. M. Worbey, G3XVC, 13 Havelock Road, Dartford (*22889*), Kent.
DUNSTABLE DOWNS: C. G. Powell, G8BPK, 1 Wenwell Close, Buckland Wharf, Aston Clinton, Aylesbury (*630600*), Bucks.
ECHELFORD: V. Higgs, G3VWJ, 205 Commercial Road, Staines (*57021*), TW18-2QT.
EDGWARE: A. J. Masson, G3PSP, 62 Coldharbour Lane, Bushey, Herts., WD2-3NY. (*01-950 6827.*)
HARROGATE & KNARESBOROUGH: R. Troughton, G4AZJ, 2 King James Road, Knaresborough (*3494*), HG5-8EB, Yorkshire.
HEREFORD: S. Jesson, 181 Kings Acre Road, Hereford (*3237*).
HULL: F. Moss, G8GDD, 334 Ings Road, Kingston-upon-Hull, HU8-ONA, East Yorkshire.
KINGSTON: R. S. Babbs, G3GVU, 28 Grove Lane, Kingston-on-Thames, Surrey. (*01-546 2801.*)
LICHFIELD: H. Wilson, G3ZIF, 20 Brownfield Road, Lichfield.
LINCOLN: F. Day, G4BXL, 5 St. Marks Avenue, Cherry Willingham, Lincoln (*51058*), LN3-4LX.
J. LUCAS: J. H. Butt, G3GVN, 90 Mereside Way North, Olton, Solihull, Warwickshire, B92-7AZ. (*021-706 7992.*)
MAIDENHEAD: H. A. Willis, G3ZPK, 207 The Parkway, Iver Heath, Bucks., SLO-ORQ.
MEXBOROUGH: J. Rolley, G4MBJ, 143 Sheffield Road, Warmsworth, Doncaster, Yorkshire.
MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham 32. (*021-422 9787.*)
MID-SUSSEX: E. J. Letts, G3RXJ, 87 Meadow Lane, Burgess Hill (*3552*), Sussex.
NORTH BUCKS: R. J. Pye, G8AAT, 7 Meadow View, Potterspury, Towcester, Northants. (*Yardley Gobion 640.*)
NORTHERN HEIGHTS: A. Robinson, G3MDW, Candy Cabin, Ogden, Halifax (*44329*), Yorkshire.
NOTTINGHAM: S. F. Claringburn, 49 Fernleigh Avenue, Westdale Lane, Nottingham, NG3-6FN.
PEMBROKE: J. Hogg, GW4AKO, Pembroke Road, Pembroke Dock, Pembs.
R.A.I.B.C.: Mrs. F. Woolley, G3LWY, Woodclose, Pensell wood, Wincanton, Somerset.
REIGATE: F. H. Mundy, G3XSZ, 2 Conifer Close, Reigate (*43130*), Surrey.
SHEFFIELD: S. Illman, G6VF, 134 Baslow Road, Totley, Sheffield, S17 4DR, Yorkshire.
SLADE: J. Drakeley, G8GRC, 186 Conway Road, Chelmsley Wood, Birmingham 37.
SOUTHGATE: J. Batchelor, G3XMV, 22 Faversham Avenue, Bush Hill Park, Enfield, Middx. (*01-360 6537.*)
SOUTH MANCHESTER: D. Holland, G3WFT, 7 Alcester Road, Sale, M33-3GW.
STOWMARKET: A. P. Ashton, G3XAP, 30 Ford View Road, Stowmarket, IP14-2BL.
SURREY: S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon, CR2-8PP. (*01-657 3258.*)
TORBAY: M. Yates, G3UIQ, Top Flat, 23 Waverley Road, Newton Abbot, Devon.
VERULAM: H. Young, G3YHY, 93 Leaford Crescent, Watford, WD2-5JQ, Herts.
WESSEX: A. G. Emmery, G3YWG, 7 Brunel Drive, Preston, Weymouth, Dorset.
WEST KENT: H. Richards, 17 Reynolds Lane, Tunbridge Wells, Kent.
WIRRAL: A. Fisher, G3WSD, 34 Glenmore Road, Oxton, Birkenhead, Cheshire.
WORCESTER: B. A. Jones, G8ASO, 12 Woodside Road, Larkhill, Worcester (*29208*), WR5 2EG.
YEOVIL: D. L. McLean, G3NOF, 9 Cedar Grove, Yeovil, Somerset.
YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

Thames Valley Amateur Transmitters Society is one of the oldest Clubs in the country, now celebrating 50 years of continuous existence. They meet each first Wednesday in the month at St. George's Hall, Esher, Surrey. The hon. secretary (at left in this picture) is G3AFT, QTHR, and with him are G3TDR and G8SM, their chairman (right).

A good idea appears in the **Hull** information this time. They had a poster printed, red lettering on a yellow ground, giving details of the Club and its meeting-place, and space provided for the current programme to be typed in, so that the posters can be put on show in suitable places. From that sent to us, we get it that on June 1 the preparations for Field Day will be dealt with, and on June 8 there will be a talk on Aerials and Aerial Circuits. G3AGX takes the stand on June 15, to discuss Getting on 144 MHz with Transistors. A general Natter Night is down for June 22, and on the 29th G3WWD will give an Introduction to 432 MHz.

Another good point comes up from **Lincoln.** It will be recalled that they are still looking round for a different place to meet; they have, to this end, been in touch with the County Education authority, who are actively assisting them in the search. Perhaps other Clubs who are in need of a QTH could try a similar ploy with hopes of success. For the moment, the Lincoln get-togethers are in the Lecture Room of the Lincoln Astronomical Society, in Westcliffe Street, off Burton Road, every Wednesday, visitors being welcome, of course.

The Club call of the **York** lads will be heard more often than before, since they have just acquired a KW-2000A transceiver. Their R.A.E. class has now finished, and at the time of writing it looked as though there would be at least a couple of candidates. From what we can glean it looks as though their get-togethers are at the British Legion Club, 61 Micklegate, York, on Friday evenings'

Now to **Mexborough** who have lashed out, in their case for a Swan 500C transceiver, to be used during the Friday evening sessions. Also, there is a regular news-

SHORT CLUB NOTICES

CLUB NAME	HEADQUARTERS LOCATION	MEETING MONTHLY
Barking	Westbury Recreation Centre, Ripple Road	June 7, 14, 21, 28
Coventry	Baden-Powell House, St. Nicholas' Street, Radford Road	June 1, 8, 15, 22, 29
Dartford Heath	Scout House, Broomhill Road, Dartford	June 1
Kingston	Scout Hq., Stirling Walk, Raeburn Avenue, Surbiton	June 13
Lichfield	Swan Hotel, Bird Street	June 4, 19
Maidenhead	Victory Hall, Cox Green	June 4, 19
North Bucks	Wolverton Youth Club	June 11
Reigate	St. Marks Hall, Alma Road	June 19
Sheffield	Sheaf House Hotel, Bramwell Lane	June 18
Slade	Church House, High Street, Erdington, Birmingham	June 1, 15
West Kent	Adult Education Centre, Monson Road, Tunbridge Wells	June 1, 15, 29
Wirral	Community Centre, Carr Bridge Road, Woodchurch	June 7, 21
Worcester	Old Pheasant, New Street	

N.B.—In each case, the Secretary's name and address appears in the Panel, opposite.

letter, which they are prepared to exchange with any other groups who might be interested. Club projects have been in the D/F field, and at the time of writing there were thoughts about a two-metre transceiver project. For all the details, venue, and so on, we must refer you to G4BMJ—*see* Panel p.240.

Harrogate and Knaresborough seem to have had a successful year, by and large, if the report of their recent AGM is anything to go by. They have their sessions to an unusual routine, namely the second and third Mondays of each month, at the Women's Institute, Scriven, Knaresborough, where they are regaled with lectures, film shows, junk sales and whatever, as arranged by the committee.

Another recent AGM was that for **Northern Heights,** where G3MDW found himself, for yet another year, doing the secretary chore. He tells us that on June 6, G8CHN and G3TQA will combine forces to expound on Digital Techniques, followed on June 20 by a talk by G3BLL on Amateur Television, both at the Peat Pitts Inn, Ogden, Halifax.

Conclusion

We have reached the end of yet another pile of reports. The next batch with your news and views for July club meetings should be posted to reach here by first post on **June 7,** the following deadlines, for the record being *July* 5 and *August* 9. The address is, of course, "Club Secretary," SHORT WAVE MAGAZINE, BUCKINGHAM, MK18 1RQ.

MASTS AND TOWERS

AND THE PLANNING AUTHORITY

FROM time to time, we hear of readers who find themselves in difficulty with their local planning authority about the erection of a lattice tower or a beam array. Refusal to grant permission, or an order to remove an existing assembly for which planning permission has not been obtained, is almost always on the grounds of "amenities" or "complaints from neighbours"—with a complete disregard for the unsightly mass of TV aerials which nowadays disfigure built-up areas, and the lines of pylons which can be seen in country districts.

On these grounds alone, any refusal to give permission should be vigorously contested, if necessary to the extent of an appeal to the Dept. of The Environment. This will involve an Inquiry, conducted by the representative of the Minister, who will be neutral; if the case is a reasonable one, he will more often than not allow the appeal and reverse the decision of the local authority.

It is impossible here to cover all contingencies that may arise, as no two cases are the same, but the following are the main points to be borne in mind where conflict with the local authority does arise: They are entitled to demand that the proposed structure should be a sound engineering job, and safe; you should have a properly drawn plan of the site, showing shape and full dimensions of the assembly, and materials used; give its height in relation to neighbouring structures and a few photographs with its position marked in to scale; make sure that nobody locally is complaining about TVI (it is advisable to ask the MPT to give the transmitter a TVI check); obtain the agreement in writing of a few well-disposed neighbours; support the application with a statement that you are a licensed radio operator doing, as a hobby, technical work which is recognised as being of value and importance to the nation.

If the local authority refuses the application, give notice of appeal and consult a solicitor. There is little use in your conducting your own case at the Inquiry unless you are well acquainted with the relevant Acts and are accustomed to giving evidence and cross-examining hostile witnesses. Your solicitor will represent you at the Inquiry, and it will help him to have the support of willing neighbours with, if possible, one or two local amateurs of standing who can give technical evidence. It is wise to be able to make some concession at the Inquiry—such as agreeing to reduce the height of the tower or beam by 10 feet, or undertaking to fit suppressors in neighbouring receivers if TVI is caused.

After hearing both sides, the Ministry's inspector will probably want to visit the site and see for himself exactly what is involved. His decision and recommendations will be made to the Minister, and the findings will be communicated to your solicitor.

The whole process may take anything from six to nine months. And if you already have your beam up *before* the local authority says it must be removed because planning permission has not been obtained, you can make formal application for permission; if this is refused, and you give notice of appeal, it can stay up until the Inquiry is held and the Minister's decision is made known.

Generally speaking, under present-day conditions there is hardly any reason why a local authority, urban or rural, should refuse to allow the erection of a reasonable beam structure, or radio masts of moderate height—in any event, they are usually a good deal more elegant and sightly than the TV erections to be seen in residential areas, and much less obvious than the lines of pylons disfiguring the countryside.

" . . . believe in keeping things compact, OM . . . "

NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. callsigns, as issued or changes of address of transmitters already licensed. All addresses published here will be 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.

G3BMM, J. W. Lymer, 9 Mapledene Crescent, Wollaton, Nottingham. (*Tel. Nottingham 283693.*) (*re-issue*).

G4BMY, B. Mundy (*ex-G8DJX*), 12 Grasmere Avenue, Ramsgate, Kent.

GW4BTM, J. Jackson, 25 Old Pant Road, Newbridge, Mon., NP1 5BZ.

G4BUV, P. J. Dyer, 2 Camden Road, Ellacombe, Torquay, Devon, TQ1 1NZ. (*Tel. Torquay 25652.*)

G4BUW, K. G. Lamb, 62 Celia Crescent, Ashford, Staines, Middlesex, TW15 3NP. (*Tel. Ashford 59853.*)

G4BVI, G. A. Chenery, 44 Belstead Road, Ipswich, Suffolk, IP2 8AZ.

G4BWF, R. D. Johnson, 8 Southdown Road, Loughborough, Leics. (*Tel. Loughborough 68877.*)

G4BXV, S. P. A. Smith (*ex-G8GXL*), 38 Ramsden Street, Barrow-in-Furness, Lancs., LA14 2HH.

G4BYA, P. A. Braham, 5 Larkdown, Wantage, Berks., OX12 8HE.

G4BZQ, J. F. Richardson, 19 Colman Avenue, Wednesfield, Wolverhampton, Staffs.

G4CAG, T. C. Hicks (*DJØBU, ex-ZC4TH / VS9ATH / MP4BFW*), 125 Leas Road, Clacton-on-Sea, Essex. (*Tel. Clacton 27690.*)

G4CAJ, M. B. Farr, 23 Waterfall Way, Barwell, Leics., LE9 8EH. (*Tel. 0455-42823.*)

GI4CBG, R. A. Smyth, 122 North Road, Belfast, BT4 3DJ.

G4CBH, J. Roberts, 156 Sneinton Boulevard, Nottingham, NG2 4FY.

G4CBP, A. Brignull, 67 Middleton Gardens, Gants Hill, Ilford, Essex, IG2 6DX.

G8HCF, J. A. Frost, 36 York Gardens, Braintree, Essex, CM7 6NF.

GW8HCZ, P. J. Ireland, Drummond Lodge, Conway Road, Llandudno, Caerns.

G8HFV, J. W. Brockett, 2 Thistlecroft, Boxmoor, Hemel Hempstead, Herts., HP1 1PB.

G8HGB, A. Mercer, 42 Malvern Crescent, Springview, Wigan, Lancs., WN3 4QA.

G8HGO, B. H. Naylor, 10 Yonge Close, Radcliffe - on - Trent, Nottingham, NG12 2EE.

GI8HHB, W. Adamson, 12 Greenland Walk, Larne, Co. Antrim.

G8HHK, P. J. Cadman, 21 Scotts Green Close, Scotts Green, Dudley, Worcs., DY1 2DX.

G8HHX, J. H. Richardson, 18 Kingswood Road, Copthorne, Shrewsbury, Salop., SY3 8UX.

G8HIA, A. M. Love, 3 Gay Street, Bath, Somerset, BA1 2PH.

GI8HIE, D. J. Lee, 33 Melrose Street, Lisburn Road, Belfast, BT9 7DL.

G8HIW, B. L. Scott, 16 Tanyard Drive, Hale Barns, Altrincham. Cheshire WA15 OBS.

G8HJT, D. J. Husband, 27 Granville Road Pokesdown, Bournemouth, Hants., BH5 2AH. (*Tel. Bournemouth 45260.*)

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G3DRN, E. G. Allen, 30 Bodnant Gardens, London, SW20 OUD. (*Tel. 01-947 3914.*)

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GW3IGG, J. P. G. Jones (*ex-G3IGG*), Heywood, 40 Lower Quay Road, Hook, Haverfordwest, Pembs.

G3KII, G. D. Lively, 131 Mandarin Way, Wymans Brook, Cheltenham, Glos.

G3KRR, C. M. Freer, 105 Greensward Lane, Hockley, Essex. (*Tel. Hockley 3771.*)

G3LK, P. Williams (*ex-EP3H /VS1JU*), 13 Brookfield Road, Haversham, Wolverton, Bucks.

GI3MMF, B. W. McAleer, 90 Gortin Park, Belfast 5.

G3NAI, R. Norman, 50 Bloxcidge Street, Oldbury, Warley, Worcs.

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G8ATA, J. P. Chettle, Chippings, Underbarrow, Kendal, Westmorland, LA8 8HH.

G8ATB, S. A. Chettle, 87 Bollington Road, Bollington, Macclesfield, Cheshire.

G8GIA, D. J. Surey. 12-A Barton Place, London Road, Guildford, Surrey, GU4 7JT.

G8GJP, G. J. Pankhurst, 38 Station Road, Whitstable, Kent, CT5 1LG.

AMENDMENT

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SALE: Codar AT-5 with PSU, £15. WANTED: DX-100 or similar 150-watt all-band CW Tx.—Ring Thomas, G4AXR, 01-452 3376 extn. 6054 daytime, or Farnborough 56122 (Kent) evenings.

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SELLING: Codar 70A Rx, PR-30X preselector, phones, excellent working order, £18. Buyer collects.—Pallatt, 28 Deaconsfield Road, Hemel Hempstead, Herts. HP3 9HY.

SALE: Heathkit RA-1 amateur bands receiver, with manual, £27 or near offer; Hallicrafters SX-24 Rx, working but needs alignment, with manual, £5; No. 19 Set, Rx only, with built-in PSU and speaker, £3.—Kemp, 43 Sackville Close, Cambridge CB4 2ST.

FOR SALE: Excellent VHF QTH on high ground, good take-off to the continent; complete with modern 2-bedroom bungalow, garage, good garden and shack, with view across Sussex village and sea, price £15,500. Less 2½% for quick sale.—Ring Baird, Lancing 2637.

SELLING: FT-401 with FV-401, as new, only receiver used, £265; KW-2000B complete, good condition, £180; Trio 9R-59DS with matched speaker, good condition, £45.—Montgomery, 23 Larkham Lane, Plympton, Plymouth. (Tel: 0752-37003).

FOR SALE: KW-202 receiver, as new, little used, with Trio headphones, £90; Joymatch Mk. III ATU, as new, £6.—Wilkinson, 104 Falkland Road, Greatfield Estate, Hull, Yorks. (Tel: 0482-791168).

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SELLING: KW-202 with speaker, £110; KW-204, £120. Hardly used.—Richardson, 25 Constance Crescent, Bromley, Kent, BR2 7QH.

FOR SALE: Trio JR-310, purchased Sept. 1972, hardly used, now surplus to requirements, perfect, £55. Can deliver up to 40 miles radius.—Ring Monson, 051-427 7592, evenings. (Liverpool).

SALE: Trio TS-500 and power supply, with speaker, excellent condition, £120.—Butt, GC2FZC, QTHR.

WANTED: Marconi TE-137 Ganging Tool.—Jones, Brook House, Amerton, Stowe-by-Chartley, Stafford.

FOR SALE: K.W. Atlanta with PSU, immaculate condition, £160 or near offer. (Kent).—Box No. 5145, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

WANTED: Electroniques amateur bands converter, 1·62 MHz IF, £5/£6 offered.—Carter, The Coppins, Totnes Road, Paignton (56243), Devon TQ4 7PW.

SELLING: KW-2000B and PSU, £165; Heathkit OS-2 oscilloscope, £15. Both mint condition, could deliver up to 40 miles from Huntingdon.—Wiseman, 3 Squires Close, Somersham, Huntingdon, (Tel: 04874-489).

FOR SALE: Icom IC-21 2m. FM transceiver, with VFO and crystals, £140. WANTED: Inoue IC-2F 2m. FM transceiver.—Kemp, G8EYI, QTHR. (Tel: 07-917 3448, Sussex).

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SALE: Trio 9R-59 receiver, coverage 0·5-30 MHz, in original packing, £25. Demonstrate/deliver within reasonable distance.—Hammersley, 91 Moss Bank, Crumpsall, Manchester 8. (Tel: 061-740 3978).

SELLING: FT-101, latest model, 160m. etc., 12v. DC or 240v. AC, complete with mic. and fan, 2 months old, £260. Delivered reasonable distance.—Hayes, G3JBU, QTHR. (Tel: 0604-43020).

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SALE: "G2DAF"-type 160-10m. SSB Tx, needs attention, £10 or near offer. Buyer collects.—Ring Cleeton, Wythall (0564) 826072. (Birmingham).

SALE: National NCX-5 Mk. II transceiver with NCX/A PSU, coverage 80-10m., as new, original cartons, £165; B.44 transceiver in Philpotts case, separate PSU, 3-channel Tx, Rx tunes 70·0 to 71·0 MHz, £12·50. Both "or near offer".—Moxey, G3MOE, 11 Westbury Road, Cheltenham (0242-24217), Glos.

SELLING: Two-metre transmitter, 144 MHz, £15 Four-metre transmitter, £8.—Seymour, 6 Chiches ter Buildings, Swan Mead, London SE1 4RY.

WANTED: FT-DX150 or FT-101 transceiver for fixed/mobile use. State condition and price, please.—Linney, G3VQL, QTHR. (Tel: Shrewsbury 51733).

WANTED: Early Morse keys, to purchase for exhibition station at the Northern Horse Show. Details please, call or write. Club meetings every Wednesday at 8 p.m.—Star Radio Club, New Inn Hotel, Bramley Town Street, Bramley, Leeds 13.

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FOR SALE: Heathkit IO-12 oscilloscope, professionally built, £35 or near offer; 405/625-line colour television cross-hatch generator, £20 or near offer. Both in perfect order.—Edgecock, G4AZD, 1 High Street North, West Mersea, Essex. (Tel: West Mersea 2184, after 6 p.m.).

SELLING: Yaesu FR-400SDX, coverage 160-2m., with speaker, beautiful condition, £150. Buyer collects.—Ring Worrall, Penkridge 3099 (Staffs.), after 6 p.m.

SALE: Eddystone 680X, £60; Eddystone EC-10 with mains PSU, £40; Trio JR-500SE and speaker, £42. All in as-new condition.—Ring Knox, Bradford (0274) 630266.

SALE: Two Redifon GR-286's, VHF/FM, Tx's immobilised but excellent monitor receivers, fully serviced, fitted for Ch. 6, 8, 10, 12, 16 and 26, £25 plus carriage. Assistance with delivery could be arranged. (Lincs).—Box No. 5146, Short Wave Magazine Ltd., 55 Victoria Street, London, SW1H-0HF.

SELLING: Hy-Gain Quad., 10-15-20m., two-element, unused and in original packing, £50.—Allaway, G3FKM, 10 Knightlow Road, Birmingham, B17 8QB.

FOR SALE: Inoue transceiver, 120 watts, with LP filter, SWR meter, Katsumi keyer monitor, easy tune-up with 6146B's, excellent performance and condition, £105.—Duncan, GM2HFV, QTHR. (Tel: 0382-25839, Dundee).

SALE: Eddystone 680X, good order, £65.—Moser, G3HMR, The Glen, Oxenholme, Kendal, Westmorland. (Tel: Kendal 22421).

SELLING: FT-200 with AC/PSU, bought Feb. '73, £150. (Buyer collect only). Also KW-107 tuning unit, £35; Shure 401A mic., £4; Heath V7-AU valve voltmeter, £14; Heath GD-1U GDO, £12; Avo signal generator, 50 kHz-80 MHz, £12; Medco LPF, £4. Buyers collect or carriage extra. Illness causes sale.—Culling, 11 Fen View, Toftwood, Dereham (2790), Norfolk.

FOR SALE: HW-32A less PSU, in mint condition, only a few hours use, £42. I prefer CW.—Farleigh, G4RJ, 22 Hillhead Park, Brixham (51696). Devon.

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URGENTLY WANTED: German ex-Services valves: two RV2 (4-P700) and one SD-1A.—Ring Murrell, G8CXG, (Haslemere 51394).

OFFERING: FT-101 and FT-2F with xtals for 7 channels, both units in original packing and in excellent condition. Will sell for first reasonable offers?—Ayres, G3UNP, 76 Derby Road, Watford, Herts.

WANTED: CV-253/ALR convertor. Please state price and condition.—Laverty, 231 Connaught Road, Luton, Beds. LU4 8ET.

WANTED: Codar A.T.5 transmitter and PSU.—Hocking, 2 Boxgrove Road, Guildford, Surrey. (Tel: 01-589 5111, extn. 1777, office hours).

WANTED: Spares for R.390A/URR and R.217/TRC receivers, sub units, etc., in any condition.—Laskaris, 4 Alpine Copse, Woodlands Road, Bromley, Kent. (Tel: 01-467 0162, after 7.0 p.m.).

WANTED: Prop pitch motor. Top price paid for unmodified machine. (Ireland).—Box No. 5147, Short Wave Magazine Ltd., 55 Victoria Street, London SW1H-0HF.

FOR SALE: GR-289 Mk. II, 12-volt operation, fair condition, £20. Also GR-289 Mk. III, 24-volt, excellent condition, £40 or near offer.—Elsworthy, G4AYG, QTHR.

WANTED: Creed Type 7E teleprinter with PSU's and preferably including tools and manual. Must be in good working order.—Shewan, G3UZB, 30 Greenlands Road, Redcar, Tees-side, TS10 2DG.

SALE: Eddystone EC-10 Mk. II receiver with aerial, new condition and only used once, price £70.—Mountford, Low Habberley, Kidderminster (4484), Worcs.

WANTED: BC-454, for 3·0 to 6·0 MHz. Also a Muirhead dial.—Williams, G3RSJ, QTHR, or ring Pakenham (Suffolk) 30675.

OFFERING: ICOM IC-21 two-metre Transceiver, including VFO and four extra crystals, in as-new condition, listed approx. £190, offers around £130 with guarantee.—Ring Nigel, Stratford-on-Avon 4418, day time.

SALE: Eddystone EA-12 receiver, with matching speaker and the handbook, £140.—Sharman, G8DYF, 39 Kechill Gardens, Hayes, Bromley, Kent.

FOR SALE: Trio receiver 9R-59DS with VR tube, operating and servicing manuals, 50 hours' use only, as new in original packing, £39·50. New Valves: In B9G, B9A, B8B, B7G and 10 fittings, also meters, s.a.e. for lists. BPL signal generator, 100 kHz to 30 MHz in six bands, £5. Following for Callers Only: Two-metre 6-element Yagi complete with rotator and remote control unit, £5. PSU giving 350v. 200 mA, and 4/5/6·3/12·6 volts, £5. Unstabilised PSU, £5. Printed circuit stab. PSU, 250-350v. 100 mA, £5. Also capacitors, transformers, chokes, speakers and lots of other items going cheap.—Mealor, 8 Fir Grove, off Melling Road, Liverpool, L9 0LJ. (Tel: 051-525 9103).

WANTED: Compact single-band low powered CW transceiver for 10 or 15 metres. (London area).—Box No. 5150, Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

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SALE: Eddystone 770R receiver, £60. Pye Vanguard AM25B in good condition, working on 145 MHz, £25. T.W. Twomobile, tunable IF 4-6 MHz, £16. Sentinel two-metre converter, IF 4-6 MHz, £10. G8AEV two-metre converter, £6. JXK 2m. converter, not working, £3. Crystals two-metre: 8013, 8025, 8027, 8030, 8073 (FT-243), £1 each; HC/6U 48.120 MHz, £1·50. WANTED: FT-2F, Liner-2.—Perrin, G4AFY, QTHR, Tel: Kidderminster 61752.

EXCHANGE: Codar CR-70A receiver together with Codar PR-30 preselector FOR FR-50B receiver, with cash adjustment. (Essex).—Box No. 5149, Short Wave Magazine, Ltd., 55 Victoria Street, London, SW1H-0HF.

SELLING: CC/TV monitor, 21-in. 625-line, £10. Pye valve SPG, £8. Waveform monitor, £3. Test signal generator, £3. Pye VDA, £3. Window generator, £3. Vidicon yoke, £1·50. B.47 Tx/Rx, £9. Three-phase inverter, 115v. 400 Hz, 600 VA, £15. Exponential horn speaker, £9. WANTED: CCU for E.M.I. Type 207 camera.—Ring Summers, G8GQS, Gainsborough 3940 (Lincs.).

FOR SALE: Eddystone EC-10 Mk. II receiver, mint condition, £50.—Ring Crayden, West Drayton 44759 (Middlesex).

SELLING: Eddystone 888A receiver with Eddystone S-meter, £45. Also Heathkit 10-18U oscilloscope, as new, £30. Buyers collect.—Grigg, G3PRX, 72 Elmstone Road, Rainham, Kent.

WANTED: Oscilloscope Type TS-34/AP, with handbook. SELLING: Home-built PCR.3 type Rx with RF gain, noise limiter and S-meter, £13.—Walker, 63 Harbridge Avenue, Roehampton, London, SW15 4HA.

SELLING: R.C.A. AR88D receiver, in very good condition, with S-meter, £45. Pye Ranger Tx, transistor modulator and PSU, working on two metres, £8.—Bleaney, GW3VPL, 102 Commercial Road, Taibach, Port Talbot (5459), Glam., South Wales.

EXCHANGE or SALE: Trio JR-500SE at £45, or would exchange for Eddystone EC-10 Mk. II or Trio JR-310, with cash adjustment.—Holland, 4 Gilbert Road, Malvern, Worcs.

FOR SALE: K.W. Atlanta Transceiver, with matching VFO and PSU, in mint condition and less than a month old. Would prefer buyer to examine and test. Present retail price (including VAT) £230 but would sell for around £175. Genuine reason for sale.—Ring Best, G3HGD, Queensbury 88 2542 (office hours) or High Flatts 502 evenings, weekends. (Yorkshire).

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(ENGLISH AND AMERICAN)

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