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The SHORT WAVE Magazine

December 1985

Volume 43 Number 10

G3 RJV builds a TRF Receiver

G4 QK looks at Single-Valve Transmitters

SHORT WAVE MAGAZINE

(GB3SWM)

ISSN: 0037-4261

VOL. 43 DECEMBER, 1985 No. 506

ADVERTISERS' INDEX

COVER DESIGN:
Allan & Co. Ltd., Welwyn

CONTENTS

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Published at 34 High Street, Welwyn, Herts. AL6 9EQ, on the last Friday of the month, dated the month following. *Telephone: 04-3871 5206 & 5207*

Annual Subscription: *Home: £16.00, 12 issues, post free*
Overseas: £16.00 ($21.00 U.S.), post free surface mail

Editorial Address: **Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ, England.**

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E. & O. E. VAT Reg. No. 239 4864 25

FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT WAVE Magazine

EDITORIAL

Christmas

As the festive season fast approaches, have you thought of giving a radio friend a subscription to *Short Wave Magazine* for Christmas? (Or perhaps dropped a few hints that you'd like one yourself!) The cost is £16.00 for twelve issues, each delivered promptly through the letter box with all postage expenses borne by us. There is still time to take out an annual subscription starting with the January 1986 issue, so just send us the name and address to which each copy is to be sent, together with a cheque or postal order for £16, and we'll do the rest. And you know you'll be thought of warmly at least *twelve* times a year by the recipient!

Books, of course, also make very welcome Christmas presents. We hold good stocks of most titles listed by our Publications Dept., and we always despatch orders by return — but remember that very soon the mails will start to be delayed, so order early. Of particular interest, and 'present-worthiness', are three recently published books, two by RSGB and the other by ARRL; *see* the October issue for a review of RSGB's "Radio Data Reference Book" and this issue (p. 424) for reviews of RSGB's "Amateur Radio Software" and ARRL's "Antenna Compendium, Vol. 1". We should have taken delivery by the end of December of the new-format 1986 editions of the "U.S." and "DX" Listings (now called "North American Callbook" and "International Callbook") for which we will accept advance orders — although we cannot of course guarantee despatch in time for Christmas — at a postage/packing included price of £17.90 for the "North American Callbook" and £17.20 for the "International Callbook". The 1986 edition of ARRL's "Handbook for the Radio Amateur" should be available sometime in January.

Because of the national Christmas holiday, the January 1986 issue of *Short Wave Magazine* will be published on Tuesday, December 31st, instead of the usual 'last Friday of the month' date.

It just remains for everyone here at *S.W.M.* to wish all our readers, advertisers and trade friends a Merry Christmas and a Happy and Peaceful New Year.

WORLD-WIDE COMMUNICATION

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

FOR your scribe the month under review was very active — but not particularly in the radio field! Such preparations for moving QTH as emptying the junk out of the loft, clearing cupboards, ditching the rubbish out of the garage have been the order of the day, in the hopes that all this activity will bring us to the new QTH that much quicker. My natural pessimism hints that we shall probably complete on Christmas Day!

In fact, about all the *real* activity has been the odd listen on the QRP frequency on Eighty.

However, while the sunspots are rather conspicuous by their absence, the bands in general have shown the classic pattern — HF bands dead and lower bands better; *but* the much increased activity on Ten has demonstrated very clearly that much of the 'deadness' of that band is down to the absence of activity. Had we, in past minima, called CQ in alternation with listening periods, we would have recorded far more contacts. Unlike VHF, the presence of FM on Ten, and the need to get rid of the intruders on the band, have both proved beneficial simply by the increased activity they have engendered.

Let us take a wander round and see what is to be seen. Firstly, there is no doubt from the letters, though no one mentions it specifically, that the autumn peak has been quite visible. Secondly, there can be little doubt that the prolonged high pressure over the U.K. for much of October produced some VHF-fashion paths on Ten; so let's start by looking at the 28 MHz picture.

Ten Metres

The first letter on this pile is from G4OBK (Chorley) who notes that his aerial has had to be put up yet again after vandals cut his guy-wires — but thanks to G4IYP, G4VDX, G4YWG, G4ZCG, and SWLs Fred and Andrew, the aerial is now lengthened and working well again. On 28 MHz, though, the contacts were few, with YU2CRM, K2TR, VE1BNN and HG19HB on SSB, plus DL9MAX on CW; We have to admit to a little surprise that Phil found time to get on Ten at all, to judge by his activity level on the other bands!

The Argosy 2 at G2HKU (Sheppey) continues to give a good account of itself, and indeed was used for most of the contacts, among them W6KG/ZS and LU2BC on Ten CW; oddly enough, LU2BC who is Swedish, indicated that he found the Argosy a fine rig for both mobile and portable activity.

Ten was a very patchy band, says G3NOF (Yeovil) with some openings to Europe during the day, and to South America around 1600-1700z; for Don the 'big one' was October 26 on which day the North Americans were in between 1330-1515z followed between 1630 and 1900z by Central and South America. G3NOF made SSB contacts with CE3AA, K2TR, K3KG, K3OO, K1DG, KG1E, N2RM, P44B, PJ2FR, PP2ZZD, TI2KD, VE1BNN, VP9MU, VP9AD, W3BGN, 8P9AG, and 8R1Z.

Turning to G2ADZ (Chessington), we find Bill writing two letters this time; in the first, on October 10, he noted a new beacon on the band — EA6VQ on 28223 kHz — and worked his Morse key to PY7EI, PY7AJT, PY7SW (this one on the Wonder Wire), PY7XC, PP5OV and LU2DSL, plus lots more heard; September 22 in particular noted as being good during the evening. In the second letter, on 25th, Bill noted openings from noon to late evening, and heard the following beacons: LU1UG, PY2AMI, PY2GOB, Z21ANB, ZS6PW, 3B8MS, 5B4CY and DL0IGI. In the way of contacts G2ADZ noted DJ9ON/S9 complete with a little pile-up, J28EI, 4X6IF, TR8IG, HK1AMW late of the evening of October 19, LU5HJD, and W6REC/VP2M; and of course there were the usual crop of gotaways. Finally, just before Bill posted, he noted the openings to W on October 26/27.

We turn now to G4HZW (Knutsford) who continues with the TS-820 but now has the 'Mark 4' Quad up and running, even though at the time of writing his letter it seemed to have its lowest SWR at around Channel 34 on the CB rig, rising to 2:1 on 28.6 MHz. However, this aerial is somewhat higher, and electrically rotatable, which is an advance on the earlier versions. Tony went to the Leicester Show and bought a 'GW' Morse key, which he says he intends to try and use, even if it is a thing of beauty in the shack. Contacts were noted with 3B8DB, 9U5JB, 4U1ITU, A4XRS, CX4HS, OD5SM, PA0KHS, PY5EG, EA, I, UR2, UQ1, UV6, RA9CVC, YU, YV5JEM/6, ZS4PB, VE1BNN, VE1NG and N4WW, not to mention the usual crop of gotaways. Finally, on November 3, the month was nicely rounded off when the band opened to Scandinavia, with propagation reaching as far as the north of Finland so that Tony worked OH8NI, OH3GD, OZ1BGP, SM7PGA, LA5F — and on CW GM4LER in Lerwick up in Shetland, for a rare county in the Cumulatives to add to G4BLX and GM3YOR in Fife.

Next we turn to G4ZZG (Warrington) who says he doesn't really see the point in the idea of working counties on Ten, either by super ground-wave aerials or short-skip, but he would like to see a *calling* channel in use at least during the sunspot minimum years. As far as the 'calling channel' idea is concerned, there is a lot to be said for it, always provided people will QSO off it immediately; as for the counties thing, the point here is, we feel, simply to provide a stimulus to activity regardless of what that activity may be. Charles may not have been around in previous minima, but your scribe can well recall the 28 MHz band being *totally* deserted for years on end. G4ZZG in fact uses a vertical half-wave on 28 MHz with which he has worked some 28 countries, all outside the U.K. G4ZZG noted HB9WQ/P, at Visp in the valley below the Matterhorn, being worked by a GW, but to G4ZZG he remained a gotaway. Various ZS stations were noted, and beacons — but hearing a beacon was no guide to whether a CQ would prove fruitful!

Next we have Steve, GW4BLE (Newport); his main activity was in the RSGB contest where a multiplier of 20 was made, plus the CQ WW contest in which the multiplier was 48 — it would have been 50 but for the escape of YB0 and UG6. Among those worked were XQ0ZFZ on 'Robinson Crusoe Island' (otherwise CE0Z-land), 3D6DZ, 8R1Z, VP2VCW, 8P6, T77, ZC4, EA9, ZS6, J28, 5H3HM, JY, CE, EL, P48, FM5WD, plus Europeans such as 4U1ITU, GU, GJ, and over 100 Ws all in Zone 5 — nothing was heard further West.

Top Band

Firstly we must hark back to the business of the DX-Window, discussed at some length last time around. G3BDQ raises a lone voice against the idea of the Window and the resultant split-frequency working, basically because it is, he feels, a lost cause as so many people have taken to simplex working; as John says, "Try to get the Russians out of the tiny JA segment of the band!" However, G3BDQ is the lone voice — all those who have commented have been in favour of the DX-Window scheme. Perhaps it is unimportant to us in

Europe, but there is little doubt that many Ws have a serious problem. Anyway to turn to the G3BDQ activity, we note CW contacts with DJ0PK/MM at Port St. Cyprien in the Mediterranean, EA6NB, EA6DZ, HW4SM (a French 'special'), HZ1HZ (Ahmed, first worked some 35 years ago on Twenty), PY1RO, ZB2EO, RL7LCT, UL7BS, UA9s, UA0AG, UA0AF, UA0AKN, VE2FYR, AA1K, KH8AC/1, W2JB, W2FJ, W2LT, W3OV, K3JLT, W3RCQ, W3YOZ as early as 2253z, K4CEF, W4DHZ, K4PI, KY9W, K9AB, K0CS (Missouri and a new state on 160), ZL3GQ at 0628 on October 18, and KH6AT/MM at 2345 on 3rd near Chagos Is. On SSB there was OH0BA, EA9EU, ED6MDX, 4U1ITU, RR2RR, LX9BV and K7NJ/4X, all worked during the evenings. Finally we note that John has his nomination in for the RSGB Council, and we can but hope such an active DX-er will receive enough support.

A new signature appears on the next letter, from Dick Pascoe, G0BPS (Folkestone). Dick was started on the band by his involvement in a test with G3ROO while the latter was evolving his FT-77 conversion. G0BPS is in a 'hole' as far as VHF goes to Ian's, so it was quite a revelation to get 100% copy on Top Band. Then he heard the G3ROO talk on the band at the local club, and decided to give it a whirl. Interestingly enough, Dick learned Morse for the 'A' licence because of his poor VHF spot, and now finds that CW accounts for 90 per cent of his activity. So far, in one month some 14 countries have been worked, starting with OL0CRG and U.K. stations up till the CQ WW contest when the CW got to UP1BZZ, LX9BV, F1ITU, GI3OQR, IO4YSS, CT1AOZ, DL0VHF, LX1EA, GJ6UW, plus LA8BC the day after the contest. Sounds good, and the temporary wire rigged for the contest needs to be kept warm by the injection of RF in this cold weather!

GW4BLE (Newport, Gwent) found the band a disappointment during the CQ WW contest; Steve has only the 40-metre loop aerial available, fed as a bent end-fed quarter-wave. This yielded nine countries and one zone only, although it was known that there were over fifty countries on the band, including at least three ZL stations.

Now G4OBK. Phil's CW got out to sundry Europeans, 4U1ITU, G0/ON4WD, WP4L, W3OV, N0DH, FM5WD for a new one, Ws, G3BDQ for a nice chat, 4X4NJ, UF6FDR, RF6FFW and some W2s. SSB — mainly in the contest in which Phil put in a Top-Band-only entry — gave another chat with G3BDQ, HB9AMO, LZ2CJ, OG2TI, EA9EU, EA8s, VE1ZZ, W1-2-3-4-5-8-9-0, HB0AON, LX9BV, HH7PV, 4U1ITU, K7NJ/4X, EA6NB, GU2FRO, Y28AL, ZL2BT, ZL3GQ, GJ6UW, plus four new ones in VP9AD, VP2VCW, P44B, YV2IF, for a contest total of 47 counties in nine zones. Tiring, though; CW is easier for contesting, says G4OBK.

G2HKU is another one with comments on the retention of the split-frequency arrangements — in favour — and to note his contacts with OY7FRA (OY7ML driving), T77C, and EA6NB.

Finally we may note the Fijians have received some improvements to their allowed bands; they now have 1800 to 1850, 7000-7150 kHz (an extra 50 kHz), 10 MHz on a secondary basis and use of 144/432/1296 MHz. So — yet another country appears on Top Band, and we dare bet that very soon someone will demonstate just how easy a contact on Top Band it is!

New Bands

Firstly we have G3EKP (Belthorn) who writes again on the new bands. Nothing was worked on 18 or 24 MHz, due to aerial problems, but on 10 MHz, several VKs were worked, including VK3CP, VK3MR, VK3DQ, VK3QM, VK6ZE, VK6RQ, VK6AKG, VK5FE, VK5VI, VK5GZ and VK7DQ. Interestingly enough, VK6ZE was once G3GZE in Blackburn. The ZLs were noted, ZL1HY, ZL4QO, and ZM4QY being booked in, and some W8s noted around 1100 — until the clocks went back and then it all stopped happening! Must be a moral there!

G4VDX (Leyland) also notes this phenomenon of W8s coming in early, by way of W8EGB, Clyde, raised at 1308z on October 27 — Clyde has been worked before but only in the late evenings. Others were TR8DR for the star turn, and N4IXM, KA2YRM, WA2IKR, K7GN and VE1ALZ.

Nice to hear again from DJ6FO (Bad Bodendorf) who just scraped in on the deadline despite having mailed as early as November 4. On 10 MHz there was VK2IS, VK3DQ, VK2QM, VI5GZ, ZL4QO, ZL3ADR, VK2BKH, W8ZCK, VE2EKS, VE3CPO, W1FZY, KU1H, K8TVG, W1CCN, ZS5BH with just two watts, and G4WQN. It sounds as though Dieter has a better site radio-wise than Norfolk from where he last reported.

There was just one to be reported on 10 MHz as far as G2HKU was concerned — he managed ZL3AAM on the key.

August 8 was an odd day, reckons G2ADZ — on 10 MHz G2BY was much stronger than normal while 18 and 24 MHz were blank of radio signals but full of solar noise. In his first letter he was working VKs and getting a report lower than he was giving — to VK7CH, VK3IM, VK3BGH, VK3AZT, VK3MR, VK2DUY, VK2DNH, VK2BKH, VK2QM, VK8RQ and ZL4QO; after his first letter things reversed in the report line as Bill was higher than these VKs: VK2QM, VK5FE, VK3BW, VK5AWC, VK2BKH, VK3MJ, VK2CSB, ZL4QO, and JA3HZT for a rare morning QSO on October 23. On 18 MHz there was DJ2TI and G3GRJ, and Bill reckons the band needs livening up a bit. 24 MHz was better, with ZS6BMS, LU6EF, KV4AD, PY2HT for a band new one, and W6REC/VP2M. That ZS6BMS was a bit of a shock when it turned out to be ex-G3HBW — a pioneer VHF/UHF station from North London, back in the days when G5BY, G6FO, GW2ADZ and G3HBW were all 'band markers' for budding VHF-ers.

Odd Bits

Firstly we must refer to that invaluable Contest Calendar of W1WY; Frank has been passing these on to us for two decades now, and to G6QB before that. This time Frank mentions the ARRL 160 DX Contest, 2200z Friday to 1600z Sunday, December 6-8. DX-DX contacts are not permitted, so we have to work the Ws. The multiplier is the number of ARRL sections worked. The DX Window scheme is in the ARRL Band Plan and we read it that this is a 'must' if points are not to be lost for rules violation. Over 200 QSOs include a dupe sheet. Entries postmarked no later than January 4, posted to ARRL Contest Committee, 160 Contest, 225 Main Street, Newington, CT 06111, U.S.A.

"CDXN" deadlines for the next three months:

January issue—December 5th
February issue—January 9th
March issue—February 6th

please be sure to note these dates

Next we must mention the CQ WW 160 Contest, over the last full weekend of January (*i.e.* 24-26) for the CW, and February 21-23 for the Phone show. Rules seem to be as last year, and entries go to Don McClenon, N4IN, 3075 Florida Avenue, Melbourne, FL 32901, U.S.A. by mailing deadline of February 28 for CW and March 31 for Phone, indicating which on the envelope. Also, include good photographs for possible publication — black and white preferred of course.

And, before we leave this contest, we must offer congratulations to GW3YDX as winner of the Don Busick, K5AAD, European Plaque in last year's contest, both on CW and Phone.

Of interest to SWLs will be the UBA SWL Competition, to run throughout 1986. Write for the special log forms and further details to UBA Contest Manager, Marc Domen, ONL 6945, Gebr. Blommestraat 14, Borgerhout, B-2200, Antwerpen, Belgium, and include three IRCs from EU or four from the rest of the world. There are lots of certificates and trophies to be collected in this one.

QRP enthusiasts won't need reminding of the G-QRP Activity Period between December 26-31, frequencies and times each day as follows: 0900-1100z and 1400-1700z, 14/21/28 MHz; 1100-1300z, 1700-1900z and 2100-2300z, 3.5 and 7 MHz; 1300-1400z around 10106 kHz, and 1900 to 2100z on 14 MHz. Frequencies are 60 kHz up from the bottom (*i.e.* 14060 kHz) except on 7030 and 10106 kHz. Reports (this isn't a contest) to G4BUE, Alamosa, The Paddocks, Upper Beeding, Steyning, West Sussex, BN4 3JW.

The JYs are having a 'do' between November 7 and 21, according to the announcement in the JY Newsletter, which was sent to us by courtesy of G4WFZ as QSL Manager for JY5CI. It is understood there will be an award for working ten stations during the period signing with the suffix /JY50 from Europe, or five from elsewhere. It is understood that JY1 himself will be active, signing JY50.

Some other snippets, by courtesy of *DXNS* and *TDXB;* That BY operation by JA1BK and the others in the SSB CQ WW contest netted a few EU stations around 1830z on the Saturday. The CT2 stations are now to have prefixes indicating the island: CU1, Santa Maria: CU2, Sao Miguel; CU3, Terceira; CU4, Gracioso; CU5, Sao George; CU6, Pico, CU7, Faial; CU8, Flores; and CU9, Corvo. French clubs may now sign FF.

HG4SEA/MM is the call of Nandi in his home-brew boat *St. Jupat* currently in the Med. and working on a world trip over three years. Christmas will see him in the ZS area, and VK5 at Easter. He is on 7040 kHz SSB at around 1030z working to HA5DW. He QSLs *via* HA5PN.

EL stations were to be heard using the 5L prefix in November, to honour Radio Liberia.

Another station reported from 7Q7 is 7Q7DX, who is said to have gear with him but to be using 7Q7LW's station, and to be there for several months.

Nice to hear that 1Z9A is still QRV, although it doesn't count for DXCC. And of course Albania; DJ0UJ has given up on this one at least for the moment. Frankly we doubt anyone in the foreseeable future coming up from that unhappy spot with a legal call.

80 and 40

G2NJ (Peterborough) brings us various items of news, the first of which is that G3KPO is now sporting a better, higher, aerial for the LF bands, thanks to the cooperation of a sea-angler on the one hand and a tall tree on t'other, at the Ryde, I.o.W., home QTH. Incidentally, we hear that G3KPO is to repeat his Russian visit and follow up with a trip to China. An interesting contact on the band was with G3LQI/M, crossing Hammersmith Bridge and heading for Worthing, operating CW and working G2NJ in turn at a time when Horsham was looming up on the horizon. On 40m., quite a lot of the lads took part in the TOPS CW Club DL Straight Key party on October 5; there is to be an Eighty-metre version of the event in February, on 1st in fact. Details on this and TOPS from GW8WJ, G4GBG, or G2NJ, on receipt of an s.a.e.

Turning to G2HKU, Ted had CW contacts on 80m. with C31LBR, W2BA, W1CCN, YK5XN, YV4AU, WB2DHY and K2POF, while on Forty the tally — again on the key — mentioned HP1XKR, HB0/DL5SAF, OA4JR, YV1AD, W9GW/EA9, K4YF, K7GN, and CO7HC.

Now we have the letter from Dieter, DJ6FO, who only spent a small amount of time on the band, but did manage to find JA3YBF and UL7TX.

During his single-op all-band entry in the CQ WW contest, Steve, GW4BLE, managed 62 countries on Eighty, the best being J87J, EA9KF, VP2VCW, P44B, 9Y4VT, VP2EC, KP4BZ, RL8PYL, WB7RFA/V2A, VP2MW, TG9VT and lots of W/VE. Sadly the BY and the HS0 stations were missed. On 7 MHz, Steve made it to 69C on this band; overall the month, the best included VK9NH/Lord Howe Is. VP2EC, CE8ABF, 6Y5RP, AA4VK/J6L, OH1RY/C56, ZY5EG, ZS6G, KL7s, W6s, TG9VT, VKs, VP2MU, YS1RRD, 8P6AG, P48K, P44B, 9Y4VT, HC8X, HP1XXO, VP2VCW, TI2CC, FM5CL, VP9AD and J87A.

Now for G4OBK. Phil worked 4U1ITU and UA2FP on 80m. CW, plus SSB to CT2CQ, YV5A, HP1XXO, 9Y4NP, CN2AQ, AP2SQ, 9H31HQ, VP2EC, WB7RFA/V2A, PJ2FR, N2AA and LX9BV. Going to Forty, the CW was used for SV1RP/7, UG6GBD, UF7VWG, and ZS1HV; SSB accounted for 4M2NY (a YV), 9Q5MA, CT2CQ, VP2EC, VP2MW, VP2ET, TI2CC, 9Y4VT and VP9AD.

G0BPS didn't spend much time on Eighty, but did contrive to snaffle VE2HQ for a starter.

On to G3BDQ who says he spent just half an hour on 80m. CW to work JA1OND, JA2EPW, JA3FYC, JA4GI, JA6JPS, and UA0LT. SSB on Eighty meant AP2SP and VK2AVE, while on Forty CW went to ZL2LI, ZL4AW, ZM2BIU and CO6ER; on Phone there was nothing of interest.

Now we must mention G3ZPF (Kingswinford) who says his girl moved into her own flat so David got lumbered with laying the carpets! Then the garage door frame had to be rebuilt, and various other chores; but despite all, G3ZPF was on 7 MHz CW, working ZL2LI, ZL2FS, ZL4AW, VK3CVT, and VK9NM/LH on Lord Howe Is. for this month's treat; others included SV1NY, EA9KD, W1MK, XE3AAF and a gotaway W0RLX/HC8. On 27th, the aerial was altered for Eighty, and so contacts resulted with (SSB) VP2EC, K3ZO, VP2VCW, WB7RFA/V2A, CQ0NH (in Portugal), VE3BVD, HB0AON, W0MJ, KZ2E, OH0BA, plus CW to JW0A and UP2BCW. On a different tack, G3ZPF has promised us a piece on the Gray Line propagation . . .

14 and 21 MHz

G3NOF found several good openings to the States between 1300 and 1900z on 21 MHz, plus the odd VK in the 1000 time-slot, YB/YC stations either side of noon, and a few Africans around 1500, but nothing from Asia or the Pacific. SSB contacts were completed with A4XZF, EA8SF, G4CNY/VP9, HC1MD/8 (Galapagos Is.), HK6GBJ, J88BK, K1OQX/M, K5BZO, K6PVM/PJ5, KE5IV, KF5DA (Oklahoma), N3RD/VP9, N5AU, N7ERR (Arizona), NR5M, VP2MU, VP2VCW, East Coast Ws, W3MA/VP9, W5GX (New Mexico), XE1JIW, 8P9AK, and 9Y4CK. Conditions were a bit umpty on Twenty, but Don managed to hook CT2CQ, G4BWP/VP9, HB0/DF1JC, HH7PV, J88BK, N3RD/VP9, N8ET/VP9, N6RO, UO5GQ, V44KL, VK3AH, VO2CP, VP2VCW, VP2V/KQ2M, VP9AD, W5XZ, 6Y3M, 8R1Z and 9Y4VT, even though Don was limited by the fact that his beam cannot be rotated as the rotator is u/s.

G2HKU found on Phone DL1FZ/SV9, KL7Y, K3ZO, K2WK, W8TWA, CN8ES, W3LPL, and VP2MW, plus CW with N7DF/TT8, W9GW/EA9 and W1ZW, all on 14 MHz. On 21 MHz, it was all CW, including W1CCN, W3VT, VE3NKX, 3X0NAB, W9GW/EA9, KA3DRR/DV2, and OK4YCQ/MM aboard *MV Praha* at 42°N and 23°W. On a different tack, Ted notes that Peter, G3PDL, got home from a visit to Rochdale to see G3RJV, and found that his son who is also licensed had completed a 2-watt rig; Peter and Ted had a near hour of perfect QSO on Eighty with the 15-year-old's home-brew rig.

GW4BLE next; Steve pruned his list severely and only mentions his contacts with TR8JLD, KA8GVS/KH2, KB6DAW/KH9, VK9XZ, 9U5JB, HC8X, JW5E, 8R1Z, AP2ZA, C6AEY, plus some JAs, long-path, outside the contest period. All this on 14 MHz; on Fifteen, there was activity in the RSGB 21/28 MHz contest and the CQ WW Contest. In the RSGB 'do', VK4 VK6, UH8, DK9KX/S9, J28E1, Z21, A92, 7P8CM, 3D6AK, JY, A4, ZF2FJ, YC, 5N2S, V44, ZD7, and all W call areas bar 6 and 7 were worked. In the CQ all the W call areas were worked, plus 6Y3, H50A, ZS3, 8P, V3FB, P48, HC8X, FS, 9U5, A71, and 3B8 among a total of some 1300 QSOs.

We now go to G4OBK; his CW on 14 MHz got over to W6KG/ZS, UA9SEX, TU2FI and N7DF/TT8, while the same

mode on 21 MHz gave FM5WD, 6W1AE, N3RD/VP9, 3B8CA, UJ8JA, 9J2BO, 5B4DN, 3D6AK, ZSs, UO5OO, ZB2EO, G6ZY/EA6, CP6IB, G4BWP/VP9, 6Y5HN, V2ACW, HP1XKR, W9GW/EA9, FG5DL/FS. On the Phone front, the 14 MHz SSB accounted for ZD7BJ, JY5CI, 9H3BG/9H4, EL2CL, N8GQY/DV1, VP2EZ, WB8VMN/HR1, K6PVM/PJ5, VP2MW, JW0A and CT2CQ. On 21 MHz contact was made with CX3AAM, J28EL, W6KG/ZS, ZD7JAM, PZ1DV, PJ7A, VP9AD, VP2CW, P43A, UG7GWL, 6Y3M, HH2WL, 9Y4VU, J87DX, W8HRV/6Y5, W5WMU/C6A, P48K, HB0BHA, CO2BB, HC8X, YB3DAI, JA4BVH/MM, UV9XD, UH8EA, ZC4AK, UJ9JWI, DK9KX/S9, 3D6AK, JY9MG, A4XYX, ZP5CF, 9J2BO, JG1FVZ/5N25, V44KK and some ZSs.

G0BPS had a play in the J-O-T-A event and managed to find TA1C on 21 MHz — worked him first with his own call and then with the Jamboree call!

Finally, G3BDQ; John went on Twenty CW to rake up YV5ANE, VE7AOP, VE7FJV, FY5YE, and CO7JC, while a stint on Phone on 21 MHz resulted in contact with VP2VCW, VP9AD, 4X5NM, HZ1HZ, and HC8X.

Finale

Note the deadline for next time, and please make an allowance for delays in the mails and the start of the Christmas rush. Those dates in the box are for *arrival* here, addressed as always to your conductor, "CDXN", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6 9EQ.

And, of course, MRI XMAS and HNY to all readers of this column!

Amateur Radio Computing

A Bi-monthly Feature for All Those with a Radio Station and a Computer

PAUL NEWMAN, G4INP

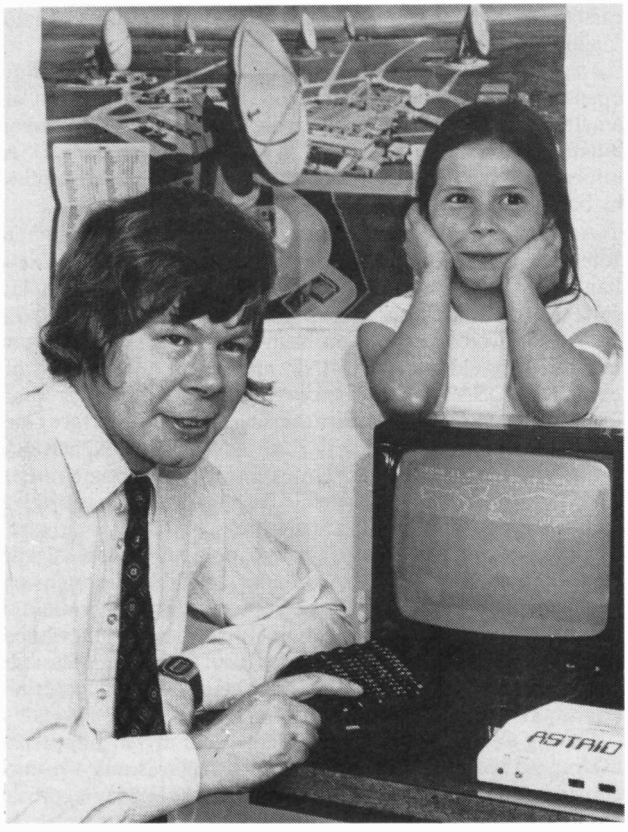
IN his first article, Richard G4NWH, mentioned that the micro enables us to run various modes hitherto the privilege of the technically expert (or rich!) among us. Most of these modes are available to users of most popular micros at modest cost, with minimal technical difficulty.

I must issue two exceptions here; due to severe technical difficulties it is unlikely that practical SSTV or packet radio systems can be implemented on the ZX81 and, secondly, packet radio has not yet been fully demonstrated on the Spectrum although I do expect to see a system sooner or later.

Most of the popular micros place a small barrier between their "workings" and the outside world: the selection and provision of a suitable interface. Let's look briefly at what we mean by the interface between any micro and any transceiver. I'm excluding interfacing for control purposes like band changing since this is normally specific to the particular transceiver. (For those interested, a system of controlling digital Icom rigs with the ZX81 has been described in SARUG.) For normal purposes we are concerned with the transfer of information as either audio or logic-levels both to and from the transceiver. So our first interface line is the extension-speaker socket or phones line to carry audio from the receiver to the tone decoder, modem or terminal unit (all the same thing!) which converts audio tones to logic-levels.

We also have a line in the reverse direction; from interface to transmitter mic-line or auxiliary audio input. This carries tones generated by the audio frequency shift-keying unit and these correspond with RTTY mark-space, SSTV grey-scale, Helleschreiber tones, FAX tones etc., and are generated by the AFSK unit in response to logic generated by the computer. Some transceivers (like the IC-701) have provision for logic input/output for RTTY and this therefore bypasses part of our hardware requirement externally when operating this mode.

Thirdly we can include a switching line to activate the PTT line for transmit-receive change-over. We could easily use VOX control instead of course. Note that the above hardware is largely independent of the choice of micro and generally will work just as well with one as another.



Steve Webb, designer of ASTRID (*see* text), pictured here with daughter Jenny, aged 8, who with his other two children helped to inspire its development when boredom set in with endless space-invader games.

And finally comes the interface between the foregoing hardware and the computer itself. This provides us with one or more ports (locations in the computer) which we can read or write. These handle the incoming or outgoing information and are controlled by the program in computer memory.

This part of the interfacing is dependent upon the micro in use; so one designed for a Commodore is unlikely to work with a BBC etc. It may be based on simple input/output ports, USART devices, Centronics or RS232 devices, or even another micro. This all depends upon the application in question. In general however, most applications will use the USART or UART devices and we'll consider this in particular at a later date.

To complete the picture, we require suitable programming for the use in question. Remember that good programs take a great deal of work and testing, and that almost without exception the first program for a particular application is always the worst!

Many of you will have seen the advertisements for the UOSAT-1/2 satellite telemetry system ASTRID (Automatic Satellite Telemetry Receiver Information Decoder)[1]. I've had the privilege of a review system and must say that I view it with great enthusiasm.

ASTRID provides a fixed channel high-sensitivity 2m. receiver (for UOSAT-1 and 2 otherwise known as OSCAR 9 and 11) together with a built-in audio-to-TTL decoder which is used to feed your computer's RS232 socket. The unit also has provision for remote switching of your domestic cassette recorder so you can record those early-morning satellite passes which can be played back through ASTRID's decoder. The system even provides a dipole antenna and with this in the roof-space I succeeded in recording several satellite passes without any problems at all.

ASTRID is designed to be a complete self-contained satellite 'earth station' and is suited to all micros having a standard RS232 serial port. The package comprises ASTRID receiver and decoder unit, power supply, all leads, a dipole antenna, demonstration cassette (with a simple BBC program on as well as example satellite transmissions) and instruction booklet.

I was tremendously impressed with ASTRID. It works well and opens up exciting new avenues of interest for the radio and amateur-science hobbyist. I heartily recommend it to anyone interested in using the UOSAT system either for the UOSAT information board on UOSAT1 or the scientific data transmitted by both satellites.

A word to Spectrum owners is called for. Although the Interface One contains RS232 facilities it is not capable of handling directly the 1200-baud ASCII put out by the satellites since no handshaking is provided by the ASTRID. A software system for overcoming this problem is now available and anyone interested should contact G4INP with an *s.a.e.* for details of a complete UOSAT-1/2 telemetry decoding and display program. The UOSAT-1 news bulletins are also displayed. Interface One is still required. I understand that AMSAT have BBC telemetry display programs available. This seems an appropriate point at which to remind you that satellite tracking software is available through AMSAT or, for the Spectrum, *via* SARUG.

The recent price-cut on the QL will, no doubt, boost sales and lead to more radio software becoming available although some problems stand in the way of progress. Little is known about the hardware and very few programmers are conversant with the assembler language. SuperBasic is far from a beginner's Basic and so far the only amateur radio program of any length I've seen for it has been G4NKE's excellent locators package[2].

Having had the QL for only a few weeks myself I appreciate even more what a complex machine it really is and I'm more convinced that it will be quite some time before we see a significant amount of radio software. On the brighter side, however, I'm pleased to say that more QL material is coming our way in SARUG and this is a favourable sign. I shall be very pleased to hear from anyone who has written QL radio software.

I enjoyed the letters generated by my first article and I look forward to continued feedback from this series. A number of you wanted software reviews although I admit to being puzzled by the request for "above all, honest reviews". There seems very little point if they're not! I shall, however, resist the temptation to make reviews the mainstay of this column; that's too boring!

My first "mini-review" concerns the now well known G1FTU RTTY for Spectrum 48k[3]. This is a full transmit/receive RTTY program requiring *no* interfacing other than two audio leads from computer to transceiver. Although many amateurs and SWL's use this program already it is well worth mentioning to those who maybe want to try out RTTY without getting involved in hardware.

The program receives RTTY as audio and decodes it with special software, displaying the text in split-screen format with type-ahead on transmit. Several well designed features like 'tuning LED's' to make tuning easier and a choice of demodulator routines suited to different Spectrums all add up to one of best RTTY programs of its type I've ever seen on any micro. Although the limitations of the 'direct audio' method of decoding with respect to noise-immunity are quite severe, it must be said that this program exceeds all expectations in this direction.

G1FTU RTTY copies all amateur and commercial RTTY at speeds from 45.5 to 100 baud and includes unshift-on-space, reverse shift, tone-frequency control and memory facilities. For both licensed and SWL use, this program provides an excellent *entrée* into the world of RTTY and can be heard in use on 14 MHz almost anytime from as far away as Brazil and Australia! In my next article I hope to review G1FTU CW, which, from advance information received promises another high quality program for the Spectrum.

Jim, G4RGA, wrote with items of interest to AMSTRAD users. Firstly, he has written a 'fast duplicate check' for contesting entirely in MicroSoft Basic. Send him (QTHR) an *s.a.e.* for a free listing or a computer-grade cassette tape plus return post, for a 'save'. The listing should be suitable for Dragon and BBC micros too. Most of the *Radcom* GM4ANB programs are also available as is a Morse keyboard/practice program using the printer port. All for the cost of postage plus a tape! Thanks for your interest, Jim!

I shall be pleased to pass on information about radio software exchanges for any home micros as well as your opinions concerning the commercial software on offer.

A number of correspondents have said they find Sinclair Basic rather limited in scope and power, and asked if I had any suggestions. I urge you to get details of BETABASIC 3.0[4]. Of all Basic extensions on the Spectrum I have found this the most powerful and easy to use.

That's all for this time. I look forward to more letters from you (preferably sent c/o *S. W.M.* at the usual address) over the coming weeks; in the meantime 73.

References:

[1]MM Microwave Ltd., Thornton Rd Industrial Estate, Pickering, N Yorks YO18 7JB. (Price £149.00 incl.)

[2]SARUG issue 19 (part of reprint service, program not published)

[3]Pearson Computing, 42 Chesterfield Rd., Barlborough, Chesterfield, Derbys. S43 4TT

[4]BETASOFT, 92 Oxford Rd., Moseley, Birmingham B13 9SQ.

As a postscript to my remarks on UOSAT decoding, I'm very pleased to say that a system for decoding UOSAT news broadcasts and telemetry via the Spectrum's EAR socket is now available and should interest those wishing to sample satellite "listening" prior to investing in hardware. Details, as usual for an s.a.e. from G4INP.

Top Band Indoor Receiving Antenna

Simple and Effective

RICHARD MARRIS, G2BZQ

IT is many years since the writer operated on Top Band, and recently there was the urge to look at it again.

It was decided to monitor the band, with a receiver, for a few weeks before contemplating building a suitable transmitter. The first problem was a suitable antenna, which is a difficulty when living in an apartment, with no facilities for putting one up outdoors.

Presently operating on the 20 and 80 metre bands, an indoor antenna of length 23 feet is used, with suitable loading/tuning devices, for transmission and reception. This antenna was described in the November 1984 issue of *S.W.M.* The 23-foot indoor antenna was tried on the Top Band Rx with indifferent results. A simple conventional L-network ATU was made up, with slightly better results, but still far from satisfactory.

It was therefore decided to try winding a coil on a piece of ferrite rod, and put this in series between the 23-foot antenna and the Rx. The turns were adjusted to peak the antenna at about 1900 kHz (mid band), and the results were much better, though falling off towards the band edges at 1800 and 2000 kHz. A few turns were taken off the coil, so that it peaked a little higher than 2000 kHz, and a 100pF variable capacitor was connected across the coil. It would now resonate over the whole of the band with adjustment of the variable capacitor. The final simple circuit is shown in Fig. 1.

The results were so impressive that it was decided to build the unit into a finalised form to become part of the station equipment.

The circuit components were assembled onto a piece of plain circuit board (size 5¼" x 4⅜"). Onto this were mounted the variable capacitor VC and the ferrite rod inductance plus suitable sockets for the antenna and earth connections; 15" of coaxial cable was anchored to the board for connecting the unit to the Rx.

The layout is shown in Fig. 2a (front view) and Fig. 2b (rear view). Wiring up the few items involved is very simple indeed.

The inductance (L) is wound onto a piece of ferrite rod. The ferrite rod is grade F14 with a diameter of ⅜" and a length of 3¾"; this piece was broken off the full length obtained from Cirkit (type FRA and stock no 35-14147).

For the winding PVC-covered 7-strand wire is used, the o/d of the wire being 1/16". The wire used had been earlier purchased from Bi-Pak (PAK No. VP19) and a 40-metre roll cost £1 and is currently used for many antenna/inductance projects. 36 turns were close wound straight onto the ferrite rod, with PVC insulating tape holding the ends secure. The winding width is 1¾". The ferrite rod inductance is secured to the circuit board with a *Terry* clip at either end.

The results were startling: signals were received from all over Europe and from the U.S.A. during the first couple of days. Selectivity is excellent, and a bonus is that it is often possible to resolve the desired signal from the QRM by slightly detuning the tuning capacitor VC under or over the resonant frequency of the desired signal.

The amateur band receiver being used covers from 1700 to 2000 kHz and the unit described comfortably covers this range.

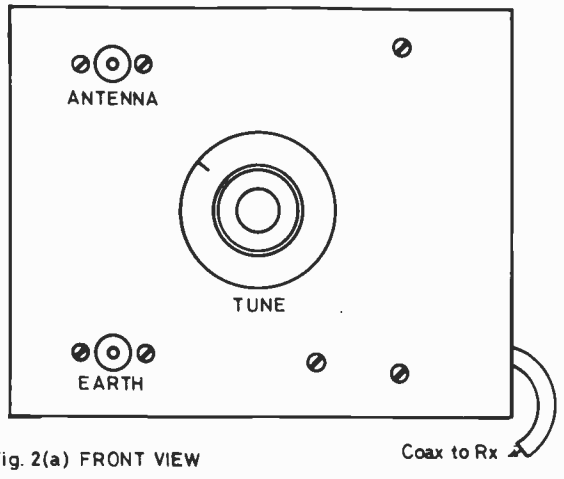


Fig. 2(a) FRONT VIEW

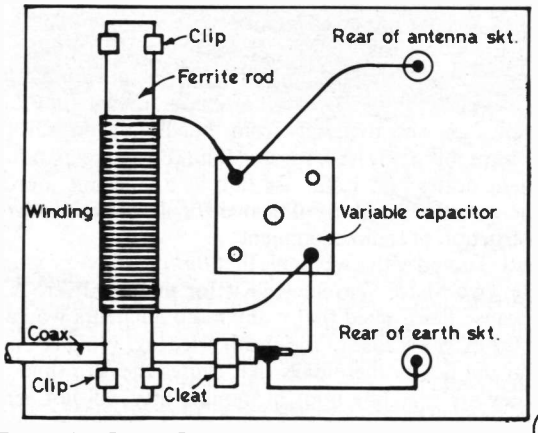


Fig. 2(b) REAR VIEW

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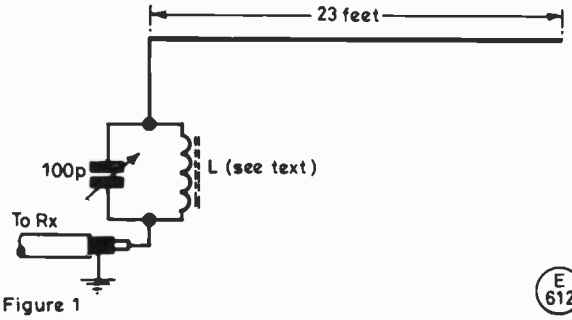


Figure 1

E 612

January issue due to appear on Tuesday, December 31st.

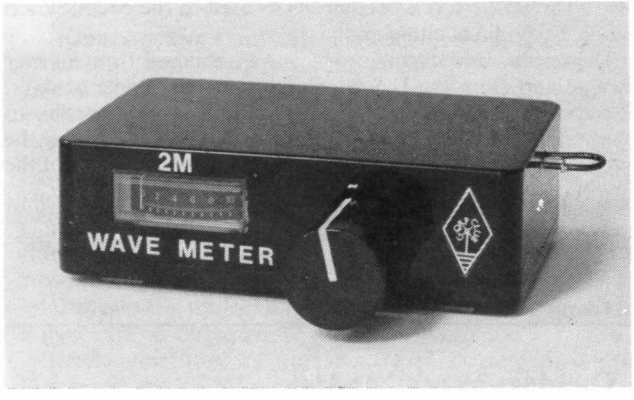
G3RJV's WORKSHOP NOTEBOOK

TWO BLACK BOXES

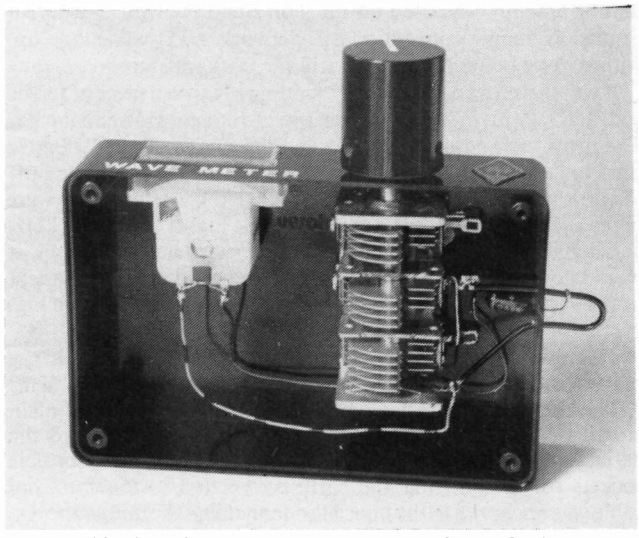
Two-Metre Wavemeter Kit

WITHOUT doubt the finest piece of Gothic architecture in England is Lincoln Cathedral. I know — I used to live there! More years ago than I care to recall, I completed my excursions in academia as a student of Lincoln Theological College. Every morning I threw back the curtains of my room and there before me was the magnificent west front of the cathedral. But the little city had other attractions, for at that time down The Strait (the street of a thousand antique dealers) was a small lockup shop rented by one, John Birkett. It was one of the genuine radio junk shops of that era, full of appealing piles of radio *bric-a-brac*. Several of my home construction attempts of that time found their inspiration and materials from that little shop. Over the years I have been pleased to see John Birkett expand as a component dealer and I still use him as a constant source of components and items, some of them difficult to get elsewhere, in my construction of radio equipment.

Recently I noted with a wry smile that *Birkett's* have produced a complete Two-Metre Wavemeter Kit for under a fiver. A wry smile because I suspected that many radio amateurs would not take up the offer because of the cheap price tag. What is it about people in the hobby these days that causes them to think that unless they are spending a lot of money, they will not achieve results? Here we are — a simple little piece of equipment, cheaply offered, that we are required to have by law. A good combination and worth a look at, I thought. I suspect that although most radio amateurs in the U.K. seem to have some sort of equipment, usually fancy stuff, to work the two-metre band a fair number of them do not have the required frequency checking equipment. Perhaps this is a simple inexpensive way to become legal?



The made-up two-metre wavemeter kit from *J. Birkett.*



Inside view of the two-metre wavemeter. *photos: Jo-Anna.*

Not only is a wavemeter an essential item around the shack, it is probably the simplest little piece of equipment to build. No need to spend much hard earned money on this one, there is very little in the circuit of a wavemeter and the construction is well within the capacity of the novice builder of equipment. What does the *Birkett* Kit contain? Well, it is good value for money because everything is included to build the unit, even a box to house it. This is not one of your "up market" kits because it is prepared to simply give the bits, show the circuit and map out how to build it.

The circuit of the Wavemeter is shown in Fig. 1. That's all it is! A tuned circuit (L1 and C1) a diode (D1) to detect the signal, a capacitor (C2) to bypass radio frequencies and a meter. Remember your first crystal set? Well this is it with a meter on the output. The components must be from cheap sources because the

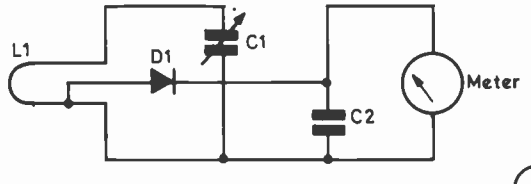


Fig.1 144MHz WAVEMETER CIRCUIT

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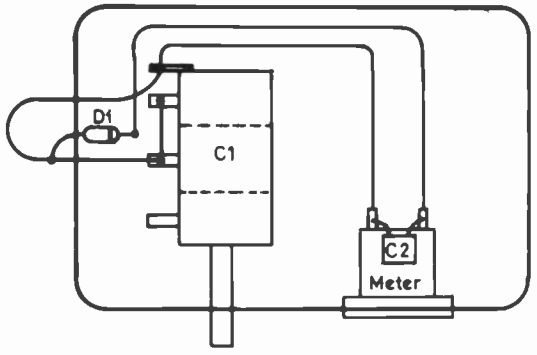


Fig. 2 144MHz WAVEMETER LAYOUT

E 639

total cost of the kit could easily be translated into buying a meter or even the variable capacitor for C1, if the components were being bought from some places. One of the problems some people seem to encounter in VHF construction is being able to get the tuned circuits onto the right frequency. Certainly at these frequencies homemade inductors can be a long way from the expected frequency even with the slightest variation in their fabrication. This circuit uses a hairpin type inductance for the tuned circuit. This has the advantage that is is easy to duplicate and can also serve as the RF pickout element in the meter. In the finished Wavemeter, L1 sticks out of the side of the case and picks up the signal by placing it close to the source.

L1 is very easy to make because the provided wire can be bent around the full sized drawing of the layout of the Wavemeter. I just bent the bit of wire around the drawing provided and cut it off to fit and it was on frequency at the first attempt. A little care is required in laying out the components in the box because the correct length of wire on L1 has to be soldered directly onto the tags for the fixed plates of C1. I played around with the layout on paper first then mounted the components. The box is plastic and is supplied undrilled. Drilling the soft ABS plastic is no problem at all but the position of the hole for the shaft of C1 and the three holes for wires of L1 are critical and should follow the layout exactly. But is is a simple layout as can be seen from Fig. 2. A hole is also required for the meter. This is an easy drill-and-file job. Follow the layout diagram and there should not be any problems.

There are no markings on the case, so these have to be added by the constructor. Mine, shown on the photograph, are white Letraset rubdown letters with a little class added in the form of a G-QRP Club logo. The meter is clear and easy to read and I was really taken by the knob supplied with my kit. A lovely thing: big and bold and easy to handle! The only cheating I used in this project was to glue the capacitor, C1, in place inside the top of the box. The lid for the box becomes the base plate to which I added small rubber feet. Other constructors may prefer to make the lid the top of the case but I think this arrangement looks smarter.

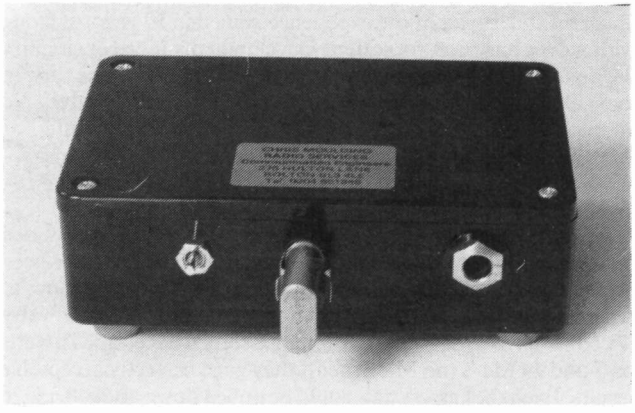
There your are — simple, easy to build and cheap, what more could anyone ask of a constructional project? Why not have one in case the knock comes on the door!

The CHRIS MOULDING 80-Metre CW Transmitter

Another little black box this one, in fact it is the same box as used in the project above. In this case it houses a little CW transmitter for the 80-metre band. This transmitter is not a kit but comes complete and ready to use. I saw the transmitter when eagle-eyeing some stalls at a radio rally and the company lent be one to play with for a while.

Within the small case there is a complete CW transmitter for 80 metres with a low pass filter and a CW sidetone for monitoring the keying. All that is required is a 12 volt supply and a Morse key. The unit also contains a diode aerial change-over network. So anyone with an existing receiver can soon be on the band. The RF output is a minimum output of 10 watts; a harmonic rejection on all spurious outputs of – 40dB is claimed. A crystal is supplied to get onto a frequency on the band.

On test mine proved to have an output in excess of 14 watts used with my 13.8 volt bench supply. It keyed nicely and the sidetone, which comes from a little ceramic resonator built into the lid of the box was adequate, if not beautiful, for monitoring the keying. I crept quietly onto 80 metres with the most power that I have used for many years! Carefully avoiding members of the G-QRP Club (the club's power limitation is 3 watts of RF out), I set about calling CQ. No problem at all: on one evening I had worked several European countries, with good reports on my full sized G5RV aerial. Nice little thing!



The *Chris Moulding* 80-metre 10-watt CW transmitter.

The crystal supplied as standard is the common 3576 kHz TV item. This can be a useful frequency but for adequate work on the band some frequencies lower than this are really required. I worked on a variety of frequencies using crystals previously bought from *John Birkett* (he of the Wavemeter described above). He may still stock some 80-metre frequencies. The little tranmitter can be easily driven from a VFO and instructions on the adding of a VFO are given with the literature supplied. I guess that with a VFO, this box and a station receiver, would make a more than viable station for the band.

The transmitter is only supplied in a ready-built form that sells at £29.95 (£1 p/p). I think this a little expensive, but there again I think all amateur radio equipment is expensive. But if you have a receiver and want to get onto an amateur band and have some good CW QSOs without spending a great deal more money, this transmitter offers an easy way forward.

SOURCES:
TWO-METRE WAVEMETER KIT: £4.65 (50p postage). *J. Birkett,* 13 The Strait, Lincoln, LN2 1JF. (0522-20767).
80M. 10W CW TRANSMITTER: £29.95 (£1.00 postage). *Chris Moulding Radio Services,* 276 Hulton Lane, Bolton, Lancs. BL3 4LE. (0204-651348).

Single-Valve Transmitters

Rediscovering some Forgotten Knowledge

JOHN ROSCOE, G4QK

THERE is an obvious revival of interest in simple valve transmitters, in particular for low-power applications. It is also apparent that much of the experience gained in 50 years of living with valves has been forgotten. Developments in valve circuitry have now come to a complete stop, so it is an opportune time to look at some simple types of transmitter using one valve. No attempt will be made to consider even two-valve transmitters as there are far too many permutations. For example, there exists — at least on paper — the 4-1000A tetrode, which could be driven by an 807 oscillator to give a handy little output of over 3kW!

When licences were "determined" in 1939 the GPO rounded up a lot of one-valve tranmitters. All of these would have been crystal-controlled, using the tritet circuit (it is difficult now to remember why!) perhaps with a ceramic-based 6L6G valve (7s.6d. from Webbs Radio). Running a somewhat elastic 10 watts on 7 and 14 Mc/s (no MHz then), they gave perfectly acceptable results. Even though crystals could be pulled down about 0.1% in frequency, today's crowded bands really rule them out; and just to make things more difficult, the selectivity of modern receivers demands ever greater stability.

The valve is really most at home as an amplifier, where the gain it can provide still looks impressive. As an oscillator it is not ideal, simply because it is a thermal device: it gets hot and heats up its surroundings. However, given suitable circuit design — which is not always forthcoming these days — its disadvantages can be largely overcome. Consider the structure of the valve: the anode and cathode are relatively robust, but the control grid is a flimsy affair in close proximity to the hot cathode. When the valve warms up, the capacity between grid and cathode inevitably changes. At the same time external components, notably inductances, can also be affected by the heat generated.

Getting down to circuits, three types of single-valve transmitter can be distinguished, using respectively one tuned circuit, two tuned circuits, and a multiple valve. If a tuned circuit is connected to an aerial, the aerial inevitably becomes part of that tuned circuit. With movements of the aerial itself — not to mention next door's washing flapping in the breeze — the stability of a single-circuit transmitter without crystal control is rather limited.

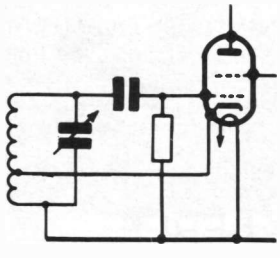


Fig. 1 HARTLEY OSCILLATOR

E 625

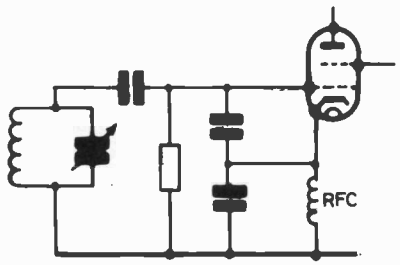


Fig. 2 COLPITTS OSCILLATOR

E 626

Nevertheless, transmitters of this type have been tolerated up to 56 MHz, if not higher. Among applications can be mentioned a modulated oscillator for playing records through a receiver, which had more FM than intended, and a beacon in Essex which was supposed to be just LF of the medium-wave band — and wasn't always. The only reason for using a single-circuit nowadays would be an addiction to triodes.

A transmitter with two tuned circuits offers the immediate advantage of isolating the oscillator from the load. The most common oscillator circuits use a tuned circuit between grid and earth, with the cathode tapped up the circuit either inductively (Hartley, Fig. 1) or capacitatively (Colpitts, Fig. 2) to provide feedback. The Hartley is a most reliable oscillator, and produces impressive results when coupled to a 40-swg inductance wound on a cardboard former sitting across a variable capacitor with a wobbly bearing — which is no reason for treating it in this way. It is a prolific generator of harmonics, particularly with (as it often was) the cathode tapped too far up the coil. On 28 MHz, for example, the first oscillator of the HRO receiver produced enough second harmonic to wipe out TV on Channel 3.

The feedback in the Colpitts oscillator is determined by the ratio of the two capacitors forming the cathode tap, which is often more convenient to adjust than a tapping point on a coil. The real advantage of this circuit, though, is that a large capacity can be put across the input of the valve, effectively swamping variations in the internal capacity. A variation of the Colpitts is the series-tuned circuit (Fig. 3), which permits the use of a larger inductance. This was introduced by Gouriet for the pre-war BBC short-wave transmitters, giving a stability approaching that of a crystal — though using, admittedly, three valves to do so. In spite of the efforts of Clapp to publicise this circuit, it is not much in evidence now.

The name "electron-coupled oscillator" is a little misleading, since the two tuned circuits are inevitably coupled through the grid/anode capacity of the valve. The advantage of keeping this parameter as small as possible can easily be demonstrated. The ordinary run of RF pentodes (EF80, etc.) have a grid/anode capacity of less than 0.007pF, which is very useful, but are restricted by anode voltage and cathode emission to an input of about 3.5W. Among larger types, the 12BY7 runs at 0.055pF and 7.5W, and the 807 at 0.2pF and 75W. Valves designed for audio-frequency applications often have a capacity of 2.0pF and are best

E 627

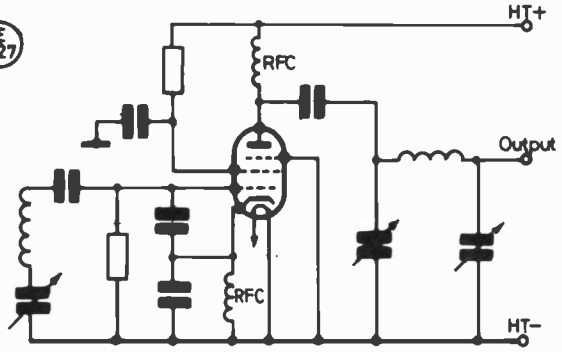


Fig. 3 SERIES TUNED COLPITTS OSC. WITH PI-SECTION ANODE CCT.

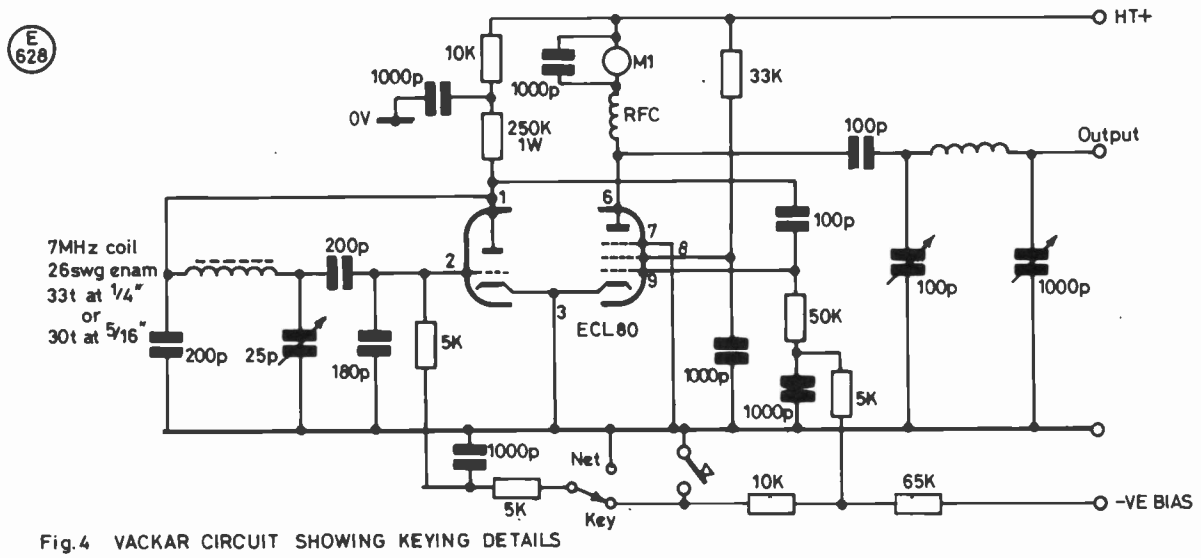


Fig.4 VACKAR CIRCUIT SHOWING KEYING DETAILS

avoided in simple circuits. Even with an 807 it should be perfectly possible to run the two circuits at the same frequency, though tuning the output will inevitably pull the oscillator frequency. There is no point in doing this, though, since ample output can be obtained at the second or third harmonic.

All this adds up to an entirely practical design of transmitter for the lower frequencies and lower powers. (The author took second place in the 1947 RSGB Low Power Contest — a one-week marathon on 3.5 MHz — with 1.4W into an 807: smaller RF valves could not be persuaded to develop sufficient power at the stipulated 120 volts of HT.) The circuit also ran happily up to 35W on 3.5 MHz and produced useful output on the fourth harmonic.

The third type of transmitter, using a multiple valve, opens up greater possibilities. The obvious type of valve to use is the triode-pentode. The ECF80 (and similar ECF82) will only run about 2.5W, whereas the ECL82 will run up to 13.5W and the ECL86 up to 25W. However, the most common triode-pentode is the ECL80, much used in earlier television sets, and this runs up to 8W. The common-cathode configuration of this valve is no disadvantage, as it fits immediately into the Vackar oscillator circuit (Fig. 4): full details and circuit values for this oscillator, kindly provided by Dave Deacon (G3BCM), are set out on page 6.14 of the fourth edition of the RSGB "Radio Communications Handbook". The same oscillator circuit could no doubt be used in a simple valve oscillator between grids 1 and 2, but the coupling capacity to the output would then be between G2 and anode. This figure is rarely published by valve manufacturers, but is very much higher in a pentode (let alone a tetrode!) than the corresponding G1/A capacity. The Vackar circuit again has a large swamping capacity across the input of the oscillator valve, and is stable enough to run at 7 MHz, or even higher, without temperature compensation.

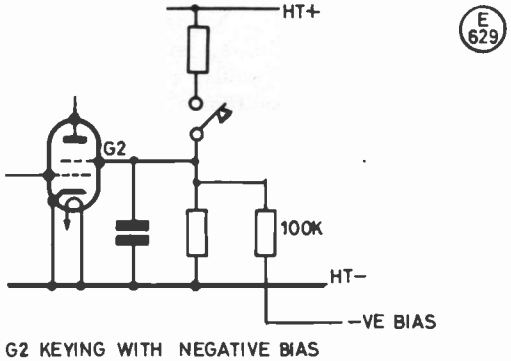


Fig.5 G2 KEYING WITH NEGATIVE BIAS

The tuned circuit of an oscillator should of course be robustly constructed, completely screened, and kept well away from all sources of heat — particularly the valve. It may be easier to achieve this isolation by using a varicap rather than a mechanically variable capacitor for tuning. In the Hartley and Colpitts circuits the heater will be at earth potential (unless fed through RF chokes), whereas the cathode is not. The capacitor formed by these two electrodes will therefore appear across part

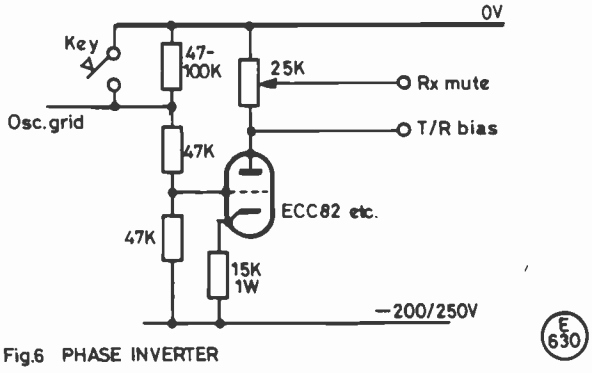


Fig.6 PHASE INVERTER

of the frequency-determining circuit. Apart from the effect of heat on this capacity, the materials used for insulating valve heaters are not chosen for their dielectric properties. Although the importance of using high-quality components in oscillator circuits is often stressed, the author has never seen any comment on this problem. It can be avoided, of course, by using the Vackar circuit. Even in low-power transmitters, a pi-section anode circuit is always preferable to a parallel-tuned circuit with inductive coupling because of its harmonic attenuation.

It is surprising how often tuned circuits are carefully separated and screened, while RF chokes in the cathode and anode circuits are mounted in any convenient position — perhaps even side by side. They can easily take over control of the frequency between them, so if two chokes are considered essential they should always be dissimilar, and therefore with different resonant frequencies. In low-power circuits, cathode and anode chokes can often be replaced by resistors, their size being determined experimentally.

So far no mention has been made of any method of keying the transmitter. The first decision to make is whether the key is required to cut off the valve completely or merely prevent the radiation of a signal. This really depends on the type of T/R switch used. With a relay or manual change-over switch the

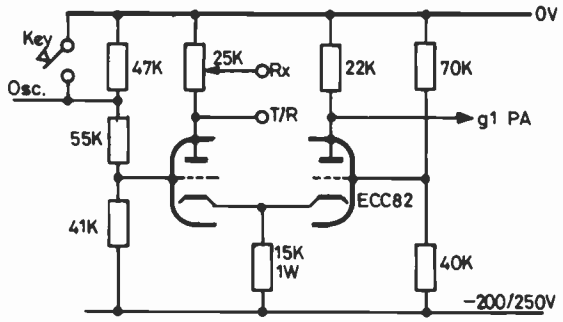


Fig.7 BISTABLE KEYER

prevention of oscillation is usually enough, but with a valve T/R switch any residual current through the PA valve is likely to cause noise in the receiver. The (far too) common method of interrupting the cathode current should be avoided. If the cathode is completely isolated from earth its potential will inevitably creep up towards that of the anode, to the detriment of the heater/cathode insulation. When complete cut-off is not required, a bleed resistor can be put across the key. Most tetrodes will continue to conduct with no volts on the screen, so if the G2 supply is keyed (with the assistance of a relay or a good life-insurance policy) a small negative bias may be required (Fig. 5) to suppress the residual noise from the valve.

The most satisfactory method of keying is undoubtedly by applying a cut-off negative bias to the oscillator control-grid, and shorting this out with the key. The key may also reduce the bias on the PA valve to the working value; and at this point a net switch can be added that energises the oscillator but not the PA stage, as shown in Fig. 4: the exact circuit values will depend on the bias voltage available. A further refinement is to add a phase-inverter valve, which can mute the receiver and actuate a valve T/R switch. The basic circuit is shown in Fig. 6: the valve must have its own heater supply, connected to the cathode or bias line. A simple bistable circuit (Fig. 7) can be used, and in this case the anode load of the second triode can be the grid resistor of the PA valve. This circuit can be set up simply with two 100 K-ohm potentiometers: the figures given were measured values. As shown, these circuits contain no time-delay elements, and would be a little harsh in action. A more sophisticated circuit devised by Peter Martin (G3PDM), and giving perhaps the utimate in break-in switching by this method, is described on page 8.17 of the handbook already quoted.

• • • "Practically Yours" • • •

with GLEN ROSS, G8MWR

IT takes, so I am told, a great man to admit his mistakes. I now put forward my claim and admit to a slight disagreement between the circuit diagram and the parts layout for the 50 MHz convertor which was described in the September 1985 "Practically Yours". My thanks to G4GEV for mentioning the following points.

First, there is no connection shown from the drain of TR1 to the end of L1. This is simply due to the fact that it is a layout, not a wiring diagram, and I do not usually include all the wiring. It so happens that in this instance this was the only wire not shown.

Secondly, the capacitor that is marked as C7 on the layout should be marked as C11. Fitting C7 here would stop the oscillator from working.

Lastly there is the omission of R4 and R9 from the layout. This would not, in fact, alter the performance of the convertor to any great extent. Because all stages operate at differing frequencies the design is inherently stable but the inclusion of the two resistors make sure of this. The problem occurred because the circuit was a revised version of my own convertor but the layout was actually drawn using the original as a model. The revised layout shown here in Fig. 1 will make the changes clear and is the one to use for your own construction.

There was no mention of the precise crystal frequency to use; for a 28 MHz IF this should be 22 MHz. But because the band is only 500 kHz wide the actual frequency used may vary between 22 and 23.5 MHz and the tuning range will still fall between 28 and 30 MHz on the main receiver.

One point that should be brought up is in regard to the layout diagrams. With all the designs that have been published in this series it has been assumed that the builder will normally work

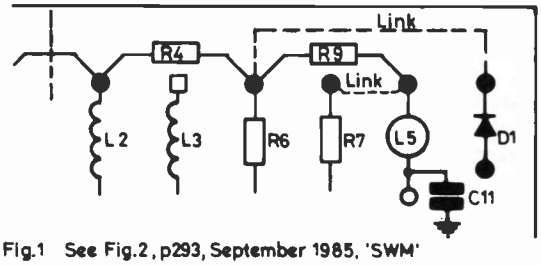


Fig.1 See Fig.2, p293, September 1985, 'SWM'

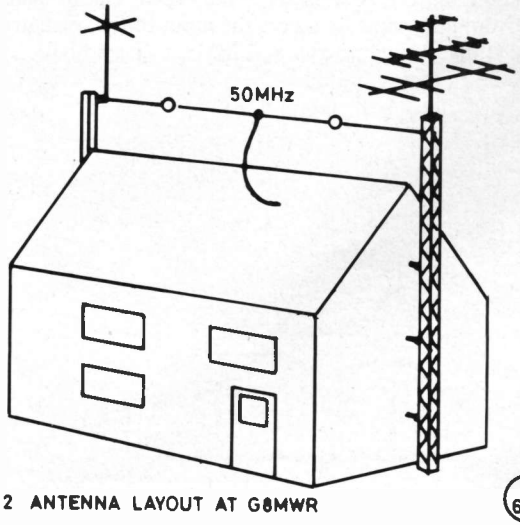


Fig.2 ANTENNA LAYOUT AT G8MWR

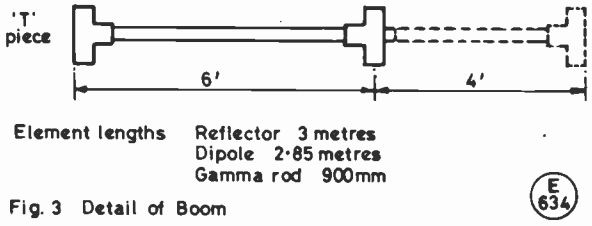


Fig. 3 Detail of Boom

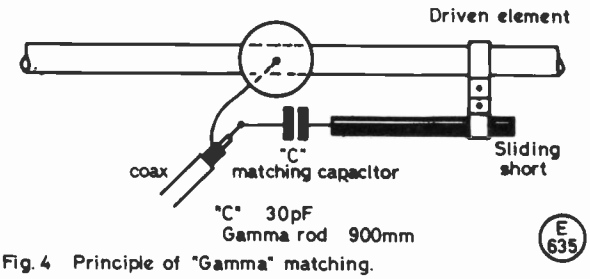


Fig. 4 Principle of "Gamma" matching.

from the circuit diagram during construction. The layout has been included only to give you some guidance to the prototype configuration, and is not the only, or perhaps even the best, layout to follow.

The Aerial

I have had several people ask for advice on a suitable aerial to use with the convertor. As with any aerial system the comment that "if it did not fall down in the winter gales it was not big enough" still applies! 50 MHz beams are strange devices: for the man who is used to a full size twenty-metre beam they are remarkably small but to someone more used to a two-metre array they are an awesome sight. To put that into perspective, a 50 MHz array is three times the length and breadth of the same configuration on two metres. This implies much higher wind loading and a much heftier rotator than you are using on 'two'. It may also generate some interesting comments from your neighbours! One thing that does come to our aid is the fact that a dipole on 50 MHz "captures" a signal three times as strong as a dipole on two metres and is therefore a useful system with which to make a start. My own dipole is suspended about three feet above the ridge of the house and has produced excellent results. If you are using the aerial only for receiving it can be fed with cheap 75-ohm TV co-ax; this is an excellent match to the dipole. The same co-ax could be used on transmit provided that the output stage of the transmitter is retuned to "see" 75 rather than 50-ohms. (Even if it is not retuned the SWR is only 1.5 1o 1).

The Designs

If you still have the copies available please refer to the general design discussions in the September and October 1984 issues of *S.W.M.* as the designs here are based on the criteria discussed then.

The simplest aerial is the dipole and this consists of a length of wire 2.89 metres long fed at the centre with co-ax and supported in the clear.

The beam to be described can be made as a two-element unit with a gain of 6dB or three elements with a gain of 8dB; the two-element will be described. The beam is made in "plumbers delight" fashion using standard water pipes and fittings. The boom is a six-foot length of half-inch (or the nearest metric equivalent) with a "T" piece at each end into which the dipole and reflector elements are fitted. These should be cut slightly oversize originally and then trimmed to the correct length after assembly. A waterproof plastic box (a small sandwich case?) is fitted to the boom and the capacitor and gamma matching rod are mounted as shown in the sketches.

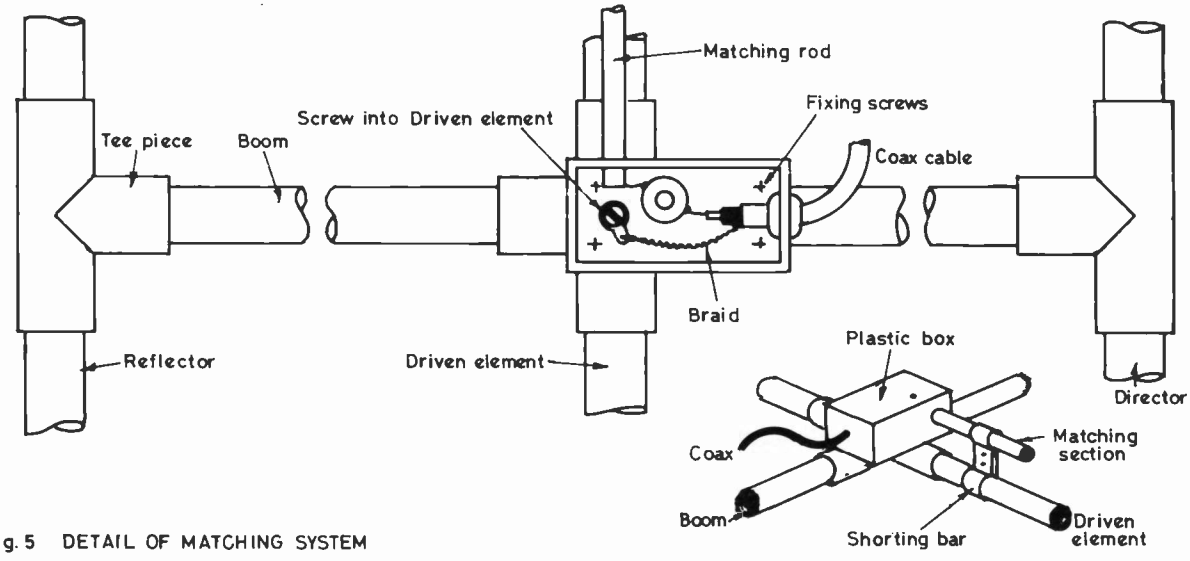


Fig. 5 DETAIL OF MATCHING SYSTEM

Tune-Up

This is done by applying some RF to the array and then adjusting the length of the gamma match rod and the value of the capacitor so as to obtain minimum SWR. Once this is obtained the unused part of the rod may be removed.

If you are going to use the aerial only for receiving the adjustment will be less precise and entails adjusting the variables so as to obtain the best possible signal into the convertor.

That G3VTT D.C. Receiver again . . .

In addition to the corrections given in last month's issue regarding "A Direct-Conversion Receiver for the LF Bands" by Colin Turner, G3VTT, published in the October issue, further corrections are required to Fig. 1 on p.326. These are: add a 10K resistor between the junction of C18/TR2(gate 2) and C15; there should be a 2.2 μF capacitor (C26) between the slider of R11 and the base of TR7; the value of C4 is correctly shown on the diagram as 4700pF.

The author and *S.W.M.* apologise to readers for these errors and omissions — but all should now be well for those building this excellent little receiver.

★ ★ ★ ★ OBLAST CORNER ★ ★ ★ ★

NIGEL CAWTHORNE, G3TXF

THE middle of winter is when the LF bands take over as the major DX bands. Oblast chasers will be searching around 80m. and 160m during the long dark nights.

The June issue of *Radio,* the USSR's monthly electronics magazine, has a "160m achievements table" in which the top entrant, UA3QGO, is shown as having confirmed QSOs with 3,402 different stations (presumably worldwide) and 165 confirmed Top Band oblasts. Several other entrants have comfirmed 160m. oblast scores in the 140's and 150's, which all goes to show that there is plenty of 160m. activity in the USSR.

Another listing in the same issue of *Radio* is given for 160m. 'countries' at the head of which is the well-known Top Band DX-er UT5AB with 133 worked and 113 confirmed. The 'countries' listing used is the USSR R-150-R rather than the ARRL's DXCC. In second and third places in the 160m. countries table are RB7GG and UG6GAW with 90/86 and 113/85 worked/confirmed respectively.

From a similar listing in the July issue, the high scoring 160m. SWL oblast chasers in the USSR are UB5-073-408, UB5-073-307 and UA9-154-1016 with 156/141, 147/131 and 144/124 heard/confirmed oblasts respectively.

SWL Calls

Russian SWL 'callsigns' are in three parts. The first gives the country, the second group of numbers identifies the oblast, and the third number group is presumably a serial number. For example SWL UB5-073-408 is SWL number 408 in oblast 073, which is in the Ukraine (UB5).

Russian SWLs are prolific SWL card senders. Transmitting amateurs that receive numerous Russian SWL cards sometimes keep a record of how many 'SWL oblasts' they have confirmed! Trying to collect rare SWL oblasts is just pot-luck!

Top Band

The June issue of *Radio* also lists the 160m. frequency allocations available in different countries. (The revised USSR allocations which set a lower limit of 1860 kHz for SSB and 1830 kHz for CW were detailed in the June '85 issue of *S.W.M.*). In a footnote to the international 160m. allocations listing, *Radio* says that "Some of our amateurs are tempted to call stations outside the band used in the USSR" and then goes on to warn readers that "it should not be forgotten that going outside an amateur band is one of the most serious violations."

"/R" Explained!

From Dexter, W4KM, who provides an excellent summary translation of the two publications in the USSR that have regular columns on amateur radio (the montly *Radio* and the weekly *Soviet Patriot*), comes the information that the "/R" that was being used by W.W.II veterans earlier this year stands for "rodina" meaning "homeland".

Still on the subject of W.W.II celebrations, the several EN0A-- stations noted during August and September were part of the "Victory 40 — Far East" celebrations.

Contest News

The *CQ* Worldwide 160m. CW Contest is held on the last full weekend in January and runs from 2200z on Friday, January 24 to 1600z on Sunday, January 26, 1986. There is usually plenty of Russian activity during this CW contest and can be a good source of new 160m. oblasts.

By the time this appears, both the major 1985 *CQ* Worldwide Contests will be over. A few hours operating in the CQ-WW-SSB in late September netted some new '1985 oblasts' for the writer, including RA0FA (obl. 153) on Sakhalin Island.

Contest Checking in the USSR

Contest adjudicating is a tedious, time consuming task at the best of times, but it can be made even more so when logs are submitted which do not follow the rules or which are 'non-standard' for one reason or another.

An article by UB5MCI in the June issue of *Radio* throws some light on the task of contest log checking in the USSR. UB5MCI was the principal secretary for a team of adjudicators working on the logs received for one of the USSR's internal CW contests.

The Austrian (OE) QSL bureau has nine sub-bureaux, one for each of Austria's nine counties (OE1 to OE9). Seen here are the individual sorting pidgeon holes used at the Viennese (OE1) sub-bureau which is run by members the local branch of the ÖVSV (Austrian national radio society).

photo: G3TXF

OBLASTS 'WORKED' TABLE

Station	1985	All-Time
G3BDQ	147	—
G4OBK	130	144
G4MQC	122	132
G3TXF	119	172
G2DAN	110	115
G4OII	107	134
G4PWA	100	172
G4UNH	97	121
G4WSX	97	108
G4ZSQ	97	100
G3YRW	—	100
G4XRX	95	125
G3UD	77	92
G8KP	70	167
GW4PXQ	65	94
G0AMH	65	—
G4XTM	63	83
G4TWX	61	109
G3RJB	55	159
G4LZZ	47	70
G4ZFE	47	47
G4EZA	45	117
G3URA	45	76
G4VFG	43	56
G3LQI	39	124
G4VDX	39	56
G4Y1R	26	32
G4GOF	25	115
G4YWG	23	36
G4VXU	23	147
G3DOP	19	—
G3ICG	18	95
G4ARI	2	61

OBLASTS 'HEARD' TABLE

Station	1985	All-Time
BRS1066	145	172
SWL Frank Dunn	135	172
BRS87156	107	107
BRS25429	106	151
SWL Arthur Miller	104	161
BRS87259	98	98
BRS37186	92	112
SWL Philip Davies	91	91
BRS32601	73	148
BRS86766	69	69
BRS28198	64	—
BRS44984	37	90
G14386	—	108

Table 1. "All-time" maximum total is 191 (including 7 'deleted' oblasts), whereas the 1985 'in year' maximum total is 184. As from 1986, the maximum in both tables will be 184. See text regarding 'deleted oblasts'. Send your entries for the last up-date of the '1985 in-year' table to reach G3TXF by first post *3rd January* 1986 for the February issue.

UB5MCI comments particularly on the inaccurate logging. In the article fifteen stations are named as having been disqualified for having over 20% of the contacts "unconfirmed". What exactly is meant by an "unconfirmed" contact is not clear, because UB5MCI goes on to say that most stations had a maximum of 10% "uncomfirmed" contacts.

Two of UB5MCI's gripes will find sympathy with amateurs involved in contest adjudication the world over. One concerns the station that transposes the 'sent' and 'received' reports columns in his log; another is the station that uses non-standard sized paper for contest logs "that doesn't fit into any file."

The Viennese section of the ÖVSV which has some 700 members owns a large three-storey house in Austria's capital city, which has been converted into club meeting rooms, offices, classrooms for amateur radio exam lectures and Morse classes. The building also contains a radio museum, test laboratories, a workshop and the OE1 QSL bureau!

photo: G3TXF

'Deleted' Oblasts

Paul, G4PWA, has raised the question of whether or not 'deleted oblasts' should be included in the "All-Time" table. Paul notes that several oblasts chasers will soon be getting into the higher All-Time scores (and possibly within striking distance of having worked or heard 'the lot'). Paul argues that if the "All-Time" figure includes deleted oblasts, then it will never be possible to go for a 'full-house' which at 191 includes seven deleted oblasts.

All but two (171 and 172) of the seven deleted oblasts date back to the early 60's. Paul proposes that it would be fairier to set the "All-Time" figure on the basis of the 184 'current' oblasts and ignore the 'deleted' ones. This way there is the one common target of "184"!

Unless there are any strong counter arguments, deleted oblasts will be ignored in both the "In-year" and "All-Time" tables as from 1986! The maximum score will then be 184 in both tables.

Reports

First-time SWL entrant Philip Davies has sent a full list of USSR oblasts heard, with a short 'queries' list which includes EK8FOW. According to the writer's interpretation, this 'decodes' into an UF-0 (oblast 015), thus adding another new one to Philip's score.

SWL Luciano, BRS86766, has sent in a photocopy of his first three Russian QSLs, two of which are for QSOs reported in 1985. A SWL QSL turn-around within one year is probably a good average.

Tables and Deadlines

Send your entries for the "All-Time" and "1985 In-Year" oblast heard/worked tables to reach G3TXF at Holt Cottage, Kingston Hill, Kingston-upon-Thames, Surrey KT2 7JH, by **January 3rd** (*i.e.* posted first-class no later than the 2nd, please!) for the February issue. This extended deadline is to enable readers to complete their "1985" figures, ready for the final 1985 table in the February issue.

But don't forget to keep a new set of oblast records from 1st January 1986 for a "1986 In-Year" table. How about using your "1985" score as your oblast target for "1986"!

Many thanks to K1KI (USSR *Tidbits),* IARU/ARRL, and W4KM (translations from *Radio*) for items extracted. Good oblast hunting es DSW!

BOOKS REVIEW

ANTENNAS

WHENEVER a group of radio amateurs meet, one subject which can be guaranteed to produce an interesting discussion is antennas. While many seem content to spend hundreds of pounds on a six-element mulitband *Yagi* and hundreds more on the rotator, tower and control cable, there is much more satisfaction and pride in designing and building something for yourself and experimenting with it. The ultimate satisfaction comes on those occasions when you get a better report with your Delta-loop than the fellow across town with his £400 American tribander on a sixty-foot tower, from a DX station on the other side of the world.

The *ARRL's* latest publication, **Antenna Compendium, Volume I,** will appeal to all experimenters. *The League* receives more antenna manuscripts than it can hope to publish in its journal *QST* so, rather than let this material go unpublished, editors Gerald Hall, K1TD, Paul Rinaldo, W4RI, and Maureen Thompson, KA1DYZ, have compiled this 175-page volume from the work of 31 authors, and very fascinating reading it is.

The first section, *Quad and Loop Antennas,* features seven designs including a full wave loop for four bands, *Quads* for 80m. and 160m., and 10/15/20m. *Quad* which utilizes the elements of a 40m. helically wound *Yagi* beam to support the loops. The next chapter, *Log Periodic Arrays,* is more of an ideas piece than a 'built it' one, although construction details and a parts list for a "second generation spiderweb" antenna covering 14-30 MHz are given. The third part, *Other Beam Antennas,* describes a simple log-yagi for 50 MHz, designing X-beams, an HF phased array using twisted wire directional couplers and, for the fortunate few with plenty of space, a line array of rotary antennas in echelon.

In the fourth part, *Multiband Antennas,* there is G5RV's up-to-date multiband design with diagrams of the current distribution on the eight amateur bands from 3.5 through 30 MHz. In the next part, *Vertical Antennas,* there is a mathematical treatment of a 10/15/20m. parasitic vertical directional array, such a design being suitable for anyone wanting useful gain in one particular direction. The maximum element height is thirteen feet and the spacing just over five feet. There is an interesting article on five-eighths wavelength antenna mystique in which K7DBA dispels some of the myths which have grown up over this configuration. The sixth section, *Antennas of Reduced Size,* features a piece by W6TWW on the optimum design of short, coil-loaded HF mobile whips which includes a fair amount of mathematics and diagrams, and an offering by N3CDR who uses a *Sinclair* ZX-81 computer program to design short, loaded half-wave dipoles.

In the next section entitled *Miscellaneous Antennas* there are descriptions of dielectric ones for 10 GHz and above, a crossed-loop/goniometer DF antenna for 160m. and a curious piece on subsurface antennas by W0YBF. The penultimate part, *Antenna Construction and Installation,* has two contributors, VK2AVA who goes in for really big *Yagis* and log periodics, and N4LY who describes how to raise beam antennas. The last chapter, *General Antenna and Transmission Line Information,* covers five topics:-the performance of horizontal dipoles over lossy ground; antenna polarisation; baluns; available power, SWR and loading; and "Mr Smith's other chart and broadband rigs."

The **Antenna Compendium** is a soft bound book, 275 x 208mm. produced from the author's camera-ready artwork, the type setting being done by an *Apple IIe* computer with an *NEC-3550* letter quality printer. The result is a most interesting volume which complements the other standard work by Les Moxon, G6XN, the definitive "HF Antennas for All Locations". The price is **£8.95** including postage and packing.

COMPUTERS

THE home computer market is currently in a very poor state and, with some major companies in grave financial trouble, there are some excellent bargains being offered as manufacturers and dealers unload their stocks. More and more radio amateurs are acquiring home computers and assorted peripherals such as printers. Computer use ranges from simple listings of callsigns worked, through contest logging and scoring, satellite orbit predictions to packet radio. On its own, any computer is as useless as a car with no driver; all are driven by software, the fancy name for sets of instructions telling the thing what to do.

Amateur Radio Software is a new *RSGB* publication edited by John Morris, GM4ANB, which contains almost one hundred of a wide variety of programs. The *Introduction* reveals the book's two purposes as (i) to present ready-to-run programs for immediate use, and (ii) to be an ideas source book for the radio amateur programmer. Most all the programs are in BASIC, the aim being to make them as portable as possible, but it will be necessary for users to make their own adaptions to suit their particular machines; for example *Sinclair* BASIC is different from *BBC* BASIC, etc. The next chapter is simply entitled *CW* and contains receive and send programs. Machine code is much more suitable, and faster, than BASIC, so the second half of this section is devoted to four such programs; a 6502 CW keyboard, and CW receivers for the 6502, 6800 and Z80 microprocessors.

Chapter 3 is *RTTY and DATA* in which the basic concepts are explained, followed by sections on RTTY, with and without a UART, and on ASCII transmission. There is a program for an FSK tuning aid for the 6502 for which the hardware requirements are a cassette port and a memory mapped display. This chapter ends with brief introductions to AMTOR and Packet Radio. The following section, *Antennas and Propagation,* features five "real" programs; troposcatter path loss, line-of-sight and troposcatter system power budget, HF propagation prediction, linear array analysis and microwave horn design.

Chapter 5, *Distances, Bearings and Locators,* includes programs for calculating bearings between two stations whose latitudes and longitudes are known and their distance apart. VHF contest scores, locator conversions and National Grid data, which latter will only be of interest to U.K. residents. The usual distance program, assuming a spherical Earth is given, plus an optional sub-routine if you want to be really fussy and account for the Earth's oblateness. The next section, *Satellites,* deals with circular near-Earth, elliptical and geo-stationary orbits and the programs will be familiar to *AMSAT-UK* members who have their "Satellite Tracking Software for the Radio Amateur" by John Branegan, GM4IHJ, one of the contributors to this book.

The seventh chapter, *Sun and Moon,* will probably be of limited interest unless you are an amateur astronomer or a VHF operator conducting Moonbounce experiments. The latter will find a good variety of sub-routines and a useful "contact planner" program. Chapter 8 is *Circuit Design Aids* and is just that and not circuit design. There are seven sections ranging from low pass filter design for HF bands transmitters to tracing spurious responses. An odd inclusion in these days of near-universal crystal controlled front ends and tunable IFs, is a program on superhet tracking. The last section, *Miscellany,* features amateur radio lists and a rather useful network analysis calculator.

Next month, GW3SPA completes his "Colt 295" 10-Metre Conversion

There are three appendices under the heading, *Basic Program Adaptions,* and these are BASIC conversion guides for the *BBC, ZX Spectrum,* and *Sinclair QL* machines. A typical example of these adaptions is how to change the MID$, LEFT$, and RIGHT$ string functions to the string slicing used in the *ZX Spectrum; e.g.* MID$ (S$,X) to S$(X TO), etc. These appendices are very useful. This is an excellent book, written in a very chatty style, and illustrated where necessary such as when dealing with satellite orbits. The flow charts are very informative. It does not claim to be, nor is it, a book for beginners since it demands reasonable intelligence from the reader in that he or she must understand the significance of computer languages. In this respect, the appendices are a great help in pointing out the subtle differences in the various functions and commands found in different computers.

Amateur Radio Software is a hardback volume, 252 x 174mm. comprising 328 pages. It is computer type-set, the text being quite easy to read, even though the spaces between words varies considerably so as to provide a justified right hand margin. The main criticism is the very limited type faces available, virtually only upper and lower case. Consequently, section headings are often quite lost in the text. That apart, this is a highly recommendable book which must appeal to all radio amateurs who regularly use a home computer in their stations. The price is **£8.60** including postage and packing.

Both these new books are available from *Short Wave Magazine* Publications Department at 34 High Street, WELWYN, Herts., AL6 9EQ.

N.A.S.F.

EQUIPMENT REVIEW

The 'Kent' Key

IAN KEYSER, G3ROO

HAVING been very active in the Dover area for some time coaching amateurs for the DTI Morse test I am naturally interested in the Morse keys available on the market. The interest has been further increased with the prospect of taking full classes at the local adult education centre.

Until now the only Morse keys that I would recommend are some of the old Admiralty types and the Marconi keys of yesteryear. However I am not the only one with this view and the prices of these keys on the second-hand market have risen to alarming heights.

It is, of course possible to send Morse using just two pieces of wire, or an old hacksaw blade. In fact for inbuilt keys for portable equipment the hacksaw blade is an excellent substitute! For long term home use and for those learning to send good Morse for extended periods we have to look for considerably more in a key. Firstly it, must be comfortable to use and if not fixed to the operating position it must have sufficient weight not to jump about; finally, and most important, the bearing must be free with absolutely no slap or side movement.

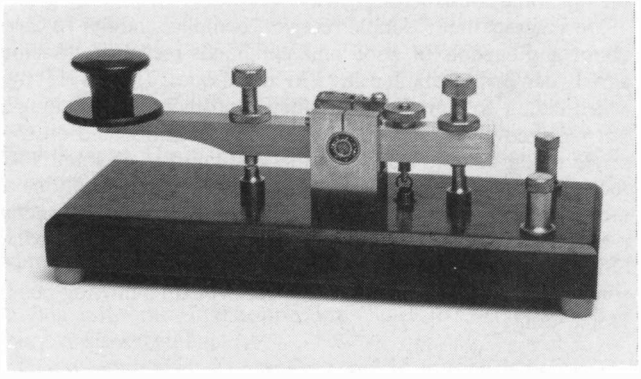
The usual failing with most cheap (and some not so cheap!) keys is in the bearing. One very popular key has a stiff and lumpy bearing: this must be avoided at all costs. Another, although free in the bearing, suffers from bad sideways slap. An important point, especially for the beginner, is to find a key which "talks back" to you. I mean this not only with audible clicks, but also with "feel". This feedback assists in sending good Morse without the use of sidetone.

My quest for a good key at a reasonable cost was ended when one of my ex-students, Stuart G0AXD, noticed an advertisement in a magazine for a key kit. He sent off for the kit and as soon as he received it he came to show me — knowing what my reaction would be!

The 'Kent' Key

This is supplied by the manufacturer, **R. A. Kent,** in the form of two kits. One kit contains the brass key itself, with the arm already mounted in the races and fulcrum; machining and finishing have been carried out to a very high standard giving a satin effect to the brasswork. The key contacts are solid silver and are mounted on adjusting screws which have been cut with a very fine thread. This enables a very accurate setting of the contact spacing to suit the individual. On the spring adjuster there is sufficient length to set the tension from zero to heavy, again with a fine thread for ease of setting.

The second kit is the base assembly and its fittings. This comprises the wooden base which has been routed out to accept the screws and wiring, two metal weights, four plastic feet and screws and a sheet of self-adhesive green baize to cover the underside of the base after wiring to give a really professional appearance. If both kits are purchased it is only necessary to follow the very simple instructions and the key will be ready for use within the half hour. If money is saved by purchasing the key assembly alone it is necessary to cut a suitable base from a piece of hardwood. Using the template supplied the base must be drilled as accurately as possible and then finished prior to mounting the component parts.



The completed *R. A. Kent* key kit.

There are two minor points that I think could be considered to improve a superb product. These are for the terminal pillars to be drilled so that the wires can be passed through the pillar for the screw to trap, rather than the present method of trapping the wire under the head of the screw; also the base, although attractive and reasonably heavy, would be far better if it was fabricated from either slate or marble. These points have been made to **R. A. Kent** and I understand that both are already under investigation.

Finally, the price! Very reasonable at £19.95 for the key kit, and £7.70 for the base kit; postage and packing for the key is £2.00 and £1.00 for the base. They are available from **R. A. Kent (Engineers),** 243 Carr Lane, Tarleton, Preston, Lancs. PR4 6YB (tel: 077473-4998).

"Kitchen Table Technology"

A Series of Occasional Articles to put the 'amateur' back into Amateur Radio

REV. G. C. DOBBS, G3RJV

No. 10 (Part 1): The 'Kowloon' TRF Receiver

Want a receiver that has excellent sensitivity, good selectivity, will easily resolve CW and SSB signals and even AM if required, that is cheap and very simple to build and only uses one tuned circuit? Of course you do. Sit back and read on — we might just have the very thing for you.

I ENJOY receiving letters from readers of *Short Wave Magazine*, although sometimes they do take up time that I might be spending wielding a soldering iron. Some are fascinating, never more so than the one that ended, "P.S. If you're ever passing through Hong Kong, drop in and try one of my receivers yourself". I am still waiting for the opportunity! The letter was from another Anglican clergyman, the Rev. Keith Granger, *ex*-9M2RK and an avid builder of simple receivers. Keith was pleading the case for the TRF receiver having read an item in *Short Wave Magazine* on a direct conversion receiver. Although the TRF receiver is now thought of as being out-dated, Keith suggested that it should be looked at anew as a simple alternative for the home constructor.

He suggests that a simple receiver, compact enough to carry about and capable of good amateur bands reception on short aerials, can easily be built using TRF techniques. There is only one tuned circuit so complicated homewound inductor matching is not required and several bands can be accommodated on that single tuned circuit. Keith has made a number of small TRF receivers and uses them portable from all sorts of locations to monitor the amateur bands. On a recent visit to the U.K., such a receiver with a 10 foot throw out wire received ZL4 on 7 MHz SSB; W stations on 3.5 MHz SSB and KH6 on 14 MHz SSB. Not to mention a PY4 on 21 MHz CW received on a moving bus in Hong Kong!

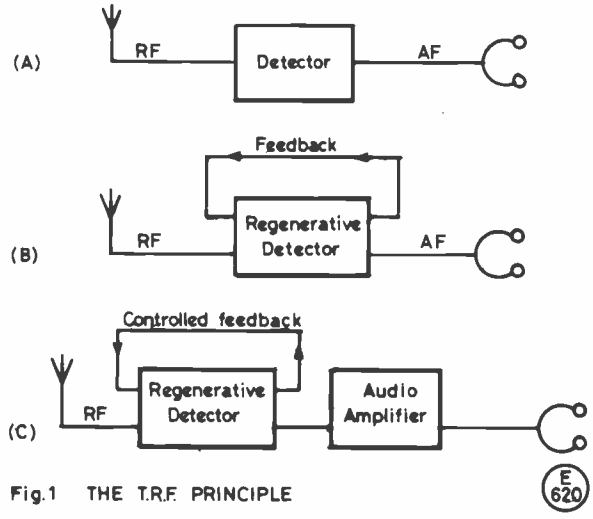
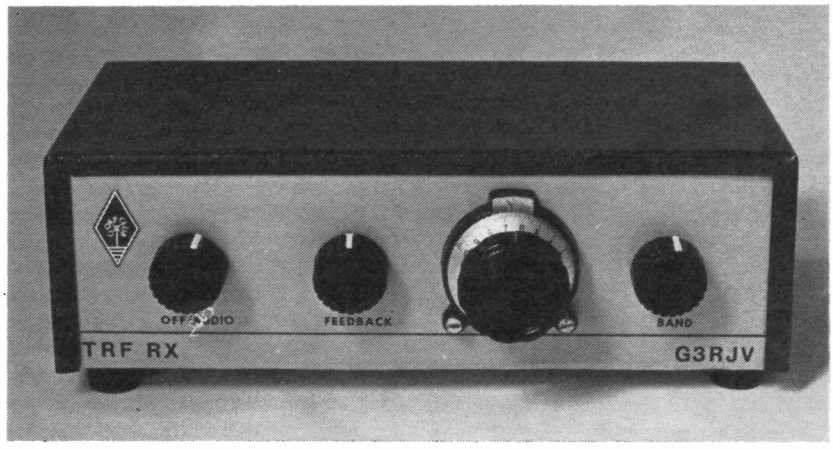


Fig.1 THE T.R.F. PRINCIPLE

Keith rounded off his letter with several circuit sketches of the TRF receivers he has built. Naturally I was interested. I well remember my own experiences with TRF receivers in the 1950s. All valve receivers used with large coils wound onto toilet roll formers. The end of the 1950s was a good sun spot maximum period and the DX (most of it on AM, I remember from that period) received on simple TRF receivers was amazing. So I began to play around with some of the circuit ideas in Keith's sketches.

The TRF

It occurs to me that there may be *Short Wave Magazine* readers who have no experience of the TRF receiver. The principle is very



Front view of the "Kowloon" TRF receiver.

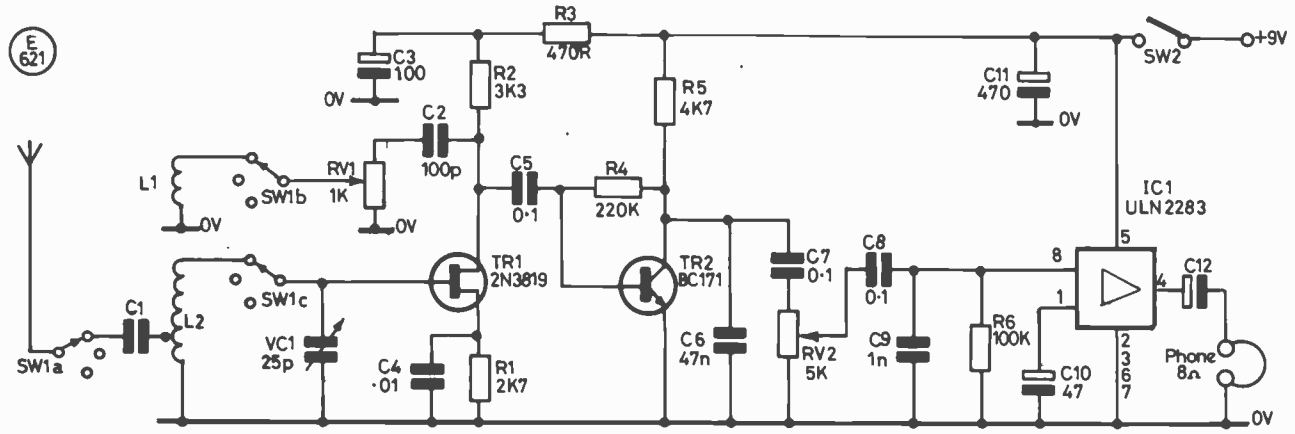
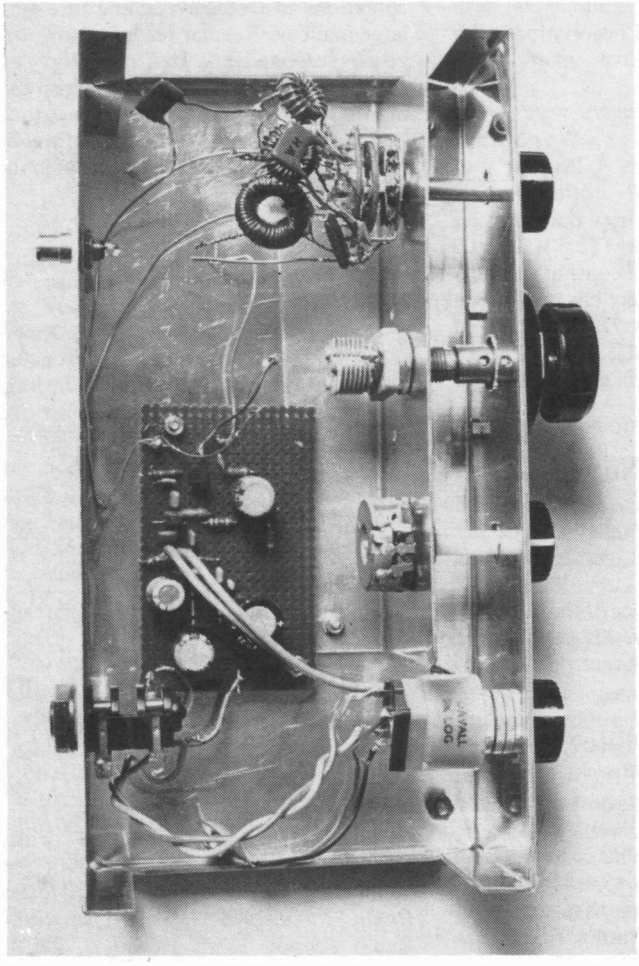


Fig. 2 CIRCUIT DIAGRAM OF THE 'KOWLOON' TRF



"Kowloon" inside view, with all components in place prior to interconnection.

Table of Values
Fig. 2

R1 = 2K7
R2 = 3K3
R3 = 470R
R4 = 220K
R5 = 4K7
R6 = 100K
} ¼W

C1 = *see* text
C2 = 100pF min. cer.
C3, C12 = 100 μF, 25V elec.
C4 = 0.01 μF min.
C5, C7, C8 = 0.1 μF min.
C6 = 47nF min. cer.
C9 = 1nF min. cer.
C10 = 47 μF, 16V elec.
C11 = 470 μF, 16V elec.
RV1 = 1K lin. pot.
RV2 = 5K log. pot.
VC1 = 25pF airspaced variable
TR1 = 2N3819
TR2 = BC171
IC1 = ULN2283 (*Cirkit*, no. 61-02283)
SW1 = 4-pole, 3-way wafer switch
Sw2 = switch on VR2
L1/L2 = *see* text
Slow-motion drive = 6:1 reduction *see* text

Also: Type J8 Equipment Case from *Minffordd Engineering*, Sun Street, Ffestiniog, Gwynedd LL41 4NE (076676-2572); T68-2 and T50-2 cores from *Cirkit Holdings PLC*, Park Lane, Broxbourne, Herts. EN10 7NQ (0992-444111), or *TMP Electronic Supplies*, Unit 27, Pinfold Workshops, Pinfold Lane, Buckley, Clwyd CH7 3PL.

simple, in fact until the superhet reared its ugly head, they were *the* radio receivers. TRF stands for 'tuned radio frequency' and in this type of receiver the only tuned stage or stages are at the radio frequency being received. Fig. 1(a) shows the simplest form of radio receiver. It could be a crystal set . . . did you build one? The RF signal is tuned, detected and converted into an audio signal which can be heard on the headphones. Such simple receivers have poor sensitivity and poor selectivity: you cannot hear much and that "much" is often more than one signal at once.

These disadvantages can be improved by a more sophisticated form of detection called regenerative detection. This is shown in Fig. 1(b). The system feeds some of the signal back into the input of the detector stage. As a portion of the signal is passing through the stage again and being reamplified, the sensitivity is increased. A tuned circuit has resistance which reduces its 'Q', or "goodness" to we simple-minded folk. The fed back signal also has the effect of reducing these resistance losses and hence the receiver is also more selective. A nice little system but it does have disadvantages. The main practical disadvantage is that the signal at the output of the detector stage is out of phase with the input signal and fed directly back would reduce, not enhance the gain. This is easily solved by reversing the phase inductively before it is fed into the input. This is physically simple because the feedback route can be *via* another winding close to the input tuned circuit winding, but wound in the opposite direction to reverse the phase. This is positive feedback.

This solution leads to another problem in that, if too much positive feedback is applied to the input, the receiver will oscillate. Not very useful. Because not only does this make copy of the signals very difficult, it damps the tuned circuit — and what is more the receiver has become a little transmitter. (I am told there were those, who, in the 1920s, used to have amateur radio contacts using the receiver only. By giving it lots of feedback with a key in the power supply they were able to use is as a low power transmitter. Interesting — but not advised!) However, these problems can be overcome by providing a control of the feedback to acceptable levels. Since the amount of feedback required is dependant upon frequency, a front panel variable control is usually employed. The audio level from the regenerative detector is low, except for strong signals, so audio amplification is also required. Fig. 1(c) shows a viable regenerative TRF receiver and is the type of receiver described here.

concluded next month.

VHF BANDS

NORMAN FITCH, G3FPK

SPECTACULAR is the most appropriate adjective to describe the superb tropo-spheric opening for a decade and which lasted from around October 10 to the 30th. Distances worked were often around 2,000 kms., *e.g.* northern England to north Africa. During this period, the weather over western Europe was dominated by a larger anticyclone — 1,040 millibars-plus — which wandered about, thus giving most everybody the chance to work some fine DX. In the December, 1975, VHFB, your scribe was reporting a similar widespread event but that only lasted from Oct. 24 to 29. Obviously, this year's "autumn lift" will go down in the VHF/UHF history books as one of *the* most memorable; but more of it later.

Awards News

Congratulations to Geoff Brown, GJ4ICD, (YJ70a) who is member number two of the 432 MHz QTH Squares Century Club, his certificate being dated Oct. 26. His 100 squares were from 22 countries and those to EA, EI, GD, GM, I, LA, OE, and OK were "firsts" from Jersey. John Quarmby, G3XDY, (AM77g) was awarded his 125 sticker for his 144 MHz QTHCC certificate no. 32 on Oct. 29 and is now at 129 confirmed. One card, from the then DM2BYE, was for a QSO on Oct. 26, 1975: it seems that John did not appreciate that QSOs from Jan. 1, 1975 are valid.

It is always a pleasure to welcome overseas readers to *Magazine* awards and this month it is Witold Wichura, SP9DW, from Tychy in Poland whom we congratulate on his becoming member no. 378 of the 144 MHz VHF Century Club. He was licensed in 1956 and his main interest is CW DX on the VHF/UHF bands. Witold likes contests and has 92 squares and 20 countries on the band, best DX being GM4DSZ on tropo. at 1,582 kms. All his gear is home made, the present Tx being a VXO and QQE06-40 PA. The Rx RF stage is a BF900 and the antenna a 10-ele. long Yagi. He is QRV on 70 cm. and 23 cm. equipment is under construction.

Beacon Note

A new 13cm. beacon is now operating from Kent, It is GB3NWK (JO01B1) and runs 2w output to an Alford slot antenna — about 10w ERP — 30ft. *a.g.l.* The QRG is 2,320.850 MHz. Reception reports on this, and on the 23cm. one on 1,296.810 MHz, should be sent to Alan Bellfield, G4GLN. (*QTHR*).

Repeaters

In an October press release, the *RSGB's Repeater Management Group* advises that the following UHF repeater proposals were to be submitted to the *D.T.I.*;-GB3HL (RB3) West London; GB3BV (RB1) Hemel Hempstead; GB3GH (RB5) Gloucester; GB3DD (RB10) Dundee; GB3WJ (RB5) Scunthorpe; GB3RE (RB11) Chatham and GB3GM (RB12) West Glasgow for RTTY/Data. The RB1, 3 and 5 relays will not be franchised until negotiations with the Scandinavians have taken place regarding co-existence.

Five 24cm. TV repeaters were to be submitted for High Wycombe, Cambridge, Hastings, Glasgow and Durham. GB3UD, the Potteries ATV relay on Mow Cop, is now operating on FM video on channel RMT2 – 1, 1,249.0 MHz input/1,318.5 MHz output, sound 6 MHz higher. This project has been taken over by the *Stoke-on-Trent ARS* and reports should go to G6UKP. The *RMG's* publicity manager is Chris Young, G4CCC.

Contest Notes

A reminder that the 144 MHz Fixed contest is on Dec. 1, 0900-1700. The last two sessions of the 1,296/2,320 MHz *Cumulatives* are on Dec. 3 and 19, 2030-2300, and the last leg of the 432 MHz *Cumulatives* is on Dec. 11, at the same hours. The last *RSGB* event on Dec. 15, 0900-1400.

The Satellites

In last month's VHFB, we suggested that the *Columbia* shuttle mission with the *Spacelab D1* mission would likely be launched on Nov. 27. That was based on information from the *NASA*. However, it seems they got their missions mixed up. In the event, as everyone knows, flight STS-61A lifted off at 1700 GMT on October 30, and it was the *Challenger* anyway. Your scribe must be one of the few who did not hear any transmissions from DP0SL, but from reports received, it seems that there were strong signals from the beacon on all passes, many noting fully-quieting reception using a hand-held transceiver with a short whip antenna. Apparently, due to pressure of work, the three radio amateurs only had time to operate two-way voice mode on two passes.

UoSAT Bulletin no. 150 quotes G3IOR as reporting that Soviet satellite *RS-8* ". . continues in serious difficulty with command stations unable to keep the satellite turned on." Due to their being in an eclipse period, *RS-5* and *RS-7* will only be on very spasmodically in December.

The operating schedule for *O-10* is frequently altered for power budget reasons, so regular users should check the bulletins on the general beacon on 145.810 MHz for the latest details. References to the spacecraft's attitude seem to confuse some folk so an example should clarify matters. If its attitude is stated as "LON 165, LAT -26 deg." this means that, when standing behind *O-10* at *apogee* and looking towards the Earth, its antennas are pointing to the right 15° and upwards towards the northern hemisphere at 26°.

Band Reports

As was expected, the superb tropo. conditions in October resulted in a very large mailbag. Regular readers know that your scribe likes to mention all contributors individually but to do so this month would require far more space than that available. So the usual format will be varied to accommodate all the news in the five pages.

The Microwaves

The 13cm. All-time Table has a few more participants now and there are several reports on activity. Denis Jones, G3UVR, (MSY) has one watt from an *LMW* transverter kit to a *JVL* loop antenna but was just too late to catch the lift. John Quarmby, G3XDY, (SFK) found propagation rather disappointing with a 30-40 dB difference in signal strength than on 70cm. for the same ERP; signals were there, but often only for short periods. On Oct. 13 and 16, he found six new counties including GW8TFI/P (GWT). SM6HYG (FS) was new on the 24th, SM6ESG worked on the 25th and DK5AI (FL) on the 27th was another new square.

John Tye, G4BYV, (NOR) is up to 15 squares on 9cm. and 42 on 13cm. He has worked DF7VX (EL24c) on 9, 13 and 23cm. at 542 kms, and DK5AI at 665 kms. on 13 and 23cm, all in the Sept. 11/12 lift. He sent an historic photograph of the members of the *RAF Swanton Morley Radio School,* 1946-51, when it was No. 4 Radio School. Keith Hewitt, G6DER, (YSS) worked DL2KAL (DK), DJ6JJ (DL) and PE1GHG and ON6OO in CL on Oct. 13; DK5AI on the 23rd and SM6HYG, SM6ESG (FS) and DK1VC and DF1EQ in DL on the 24th.

"VHF Bands" deadlines for the next three months:—

January issue — December 4th
February issue — January 8th
March issue — February 5th

Please be sure to note these dates

Pete Hizzey, G6YLO (KNT) is QRV on 13cm. and enters the table, but he gave no details of recent stations contacted. Geoff Toulahan, G8AAP, is now QRV on 13 and 23cm. from a new QTH in AN61g and was hoping to take part in the *Cumulatives,* portable. Anyone wanting AN on either band can write to him at 21 Thornton Crescent, off Boston Road, Horncastle, Lincs.

Gordon Emmerson, G8PNN, (NLD) sent a photocopy of his extensive log for October, showing five Dutch stations and an ON on the 1st. He was on in the *Cumulatives* on the 16th and on the 27th got DK5AI. Jonathan Eastment, GW4LXO, (GNS) added GW8TFI/P (YL) for a new country on the 16th.

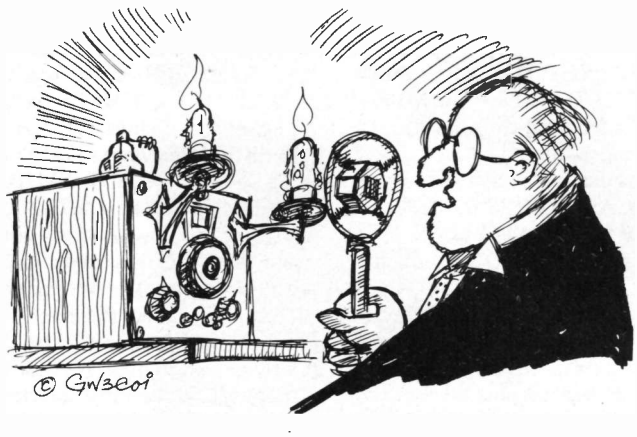
Now for 23cm. on which band, G3UVR added a further 20 squares in the Oct. 12-27 period, comprising six new countries, EI, HB, OE, OZ, SM and Y. In the contest on Oct. 6, G3XDY worked HB9CVC/P (DH), and on the 10th and 13th, John contacted many Fs, plus G3VVB (CNL) for a new square. The 16th brought GM, GI and HB9 QSOs and OE2KMM (GH) on the 17th. A nice assortment of OZs and SMs featured in the log on the 20th and 24-26 period, while the 27th brought Y23BD (GM) and OK1KHI/P (HK). He rounded off with DL7APV (GM) on the 28th and OE2CAL (GH) on the 30th.

THIRTEEN CENTIMETRES
ALL-TIME TABLE

Station	Counties	Countries	Squares	Total
G3JXN	22	8	30	60
G8PNN	15	6	23	44
G3XDY	12	6	17	35
G6DER	12	7	15	34
G6YLO	6	1	3	10

Paul Whatton, G4DCV, (KNT) now has a 7289 PA going but only after the lift. With his 2w. he worked 14 new squares between the 10th and 16th, all but two on SSB. Longest DX were HB9AMH/P (DH), F6ECI (AF), DK0NA (FK) and GM6MGS/A (YR). For Terry Hackwill, G4MUT, (BRK) this was the first real opening since he came on the band, so he was glad to get HM9AMH/P on the 10th, albeit after four attempts. Tony Collett, G4NBS, (CBE) has written for this first time since he moved from Slough. On 23cm. he has four 23-ele. Yagis fed with 10w through 30ft. of UR67 coax. A preamp and valve amplifier are on the stocks.

John Lemay, G4ZTR, (ESX) lists F6DKW (BI) and HB9AMH/P on the 10th, D and Fs on the 13th and GM6MGS/A on the 16th. On the 24th, he worked SM7CFE (HQ), SM6HYG and OZ1HRA (EQ). He remarks that on several evenings, nothing unusual was heard even though the weather map had hardly changed from the previous evening when lots of DX was about. On Oct. 12, G6DER heard his first French station and worked into AF, AI, CF, ZE, ZF,ZG and ZH. The 17th brought OE2KMM, the 23rd DK5AI and DC8QB (EO) with a bonanza on the 24th; DG2LO (EN) running 150mw. LA8AK (DS), OZ1HRA, OZ1ABE, SM7DEZ and SM7EYW in GP, OZ1FEF (GQ) and SK5EW (HT) whom he worked on CW.



". . . we're looking forward to a grand old-fashioned Christmas as usual . . ."

Philip Ruder, G6MGL, (LDN) echoes G3XDY's comment that, although conditions were superb on 70cm. they never quite made it on 23cm. in eastern England. Even so, he worked most of the DX others did, including F6ETI (YH) and F6CIS (ZE) on the 13th, GI4OPH (XO) on the 16th, but lists his best DX as OE2KMM, OE2CAL, SM6GWA and SM6HYG. Graham Ratcliffe, G6WZO, (MSY) is away at university now but, having discovered the good conditions when he telephoned home, nipped back to work PA3DZL (CL) and PE1CQQ (DM01e) at 613 km.

G8PNN added three new squares on 23cm. Many of the stations Gordon Contacted on 13cm. already reported, were first worked on 23cm. including ON6OO, the first Belgian this year. Some choice QSOs from his log include DK2NH (FN) on Oct. 1, F1BUU (ZE) on the 12th, and DK5AI on the 27th. He had 23 QSOs in the Oct. 16 leg of the *Cumulatives* on 23/13cm.

From Jersey, Geoff Brown, GJ4ICD, is now up to 59 squares on 23cm. and that was only up to Oct. 14. It all began on the 10th, when he worked EA1BLA (VD) for the first GJ/EA QSO on the band. Another first was Y23BD (GM) at over 1,000 kms. In a three-day period, ten countries were worked. Among the 16 new squares, DK0NA (FK), G3HHD (ZO), DK2NH (FN) and DK5AI (FL) are probably the best. Alex Scott, GM8BDX, (BDS) now has a pair of 23-ele. *Yagis* outside at 20ft. fed with 10w of RF. A 100w amp. is on the stocks.

Roy Webb, GW3CBY, (GNW) concentrated on 23cm. in the opening and on the 13th, worked Fs in AF, AG, BI, ZE, ZF, ZG and ZH; a GU station and HB9AMH/P. GW4LXO aslo worked the HB on the 13th, plus DK5AI, EA1BLA for a new country at last, DC8UG (DK), DF7VX (EL) and some Fs. On the 27th, Jonathan found DF5LQ (EO) and DC9XO (EM). Kelvin Weaver, GW4TTU, (GWT) lists five Fs and HB9AMH/P on the 13th, LA6HL (CS) on the 24th and DF5LQ, PE1GHG (CL) and PA0RDY (CM) on the 27th. In all, he made 39 QSOs over 500 kms.

Seventy Centimetres

There is such a huge volume of correspondence relating to 70cm. and 2m. that it is impractical to list who worked what in the usual way. Instead, a chronological report would seem to be the most appropriate way to go, mentioning any particularly unusual or outstanding individual achievements.

Starting with the contest on Oct. 5/6, from reports from Bob Nixon, G1KDF, (LNH), G3XDY, G4DCV, Keith Killigrew, G6DZH, (HWR) and G6YLO, it seems that conditions were reasonable with F, PA and HB9 QSOs made. G6YLO includes LX0RA, LX1JL/P, LX1TX/P and LX1TG/P in CJ, and a couple of Ds in EJ. In the Oct. 8 leg of the *Cumulatives,* conditions were flat, G1KDF making 24 QSOs, the only other reader mentioning this being Ela Martyr, G6HKM, (ESX).

On the 10th, GJ4ICD worked EA1BLA (VD) and new reader Keith Boleat, GJ6TMM, worked EA1OD (XD) using a *Yaesu* FT-790R at one watt to a 24-ele. *Parabeam,* 220ft. *a.s.l.* Others worked were HB9s AMH/P and ACA (DG) and Fs in AF, BH, CF, CH and DI and DC6MQ/P (EI) by Paul Brockett, G1LSB (KNT), G3XDY, G6MGL and John Pilags, G8HHI, (HPH).

Next the period Oct. 11-13 when the band was open all the way from northern Spain, round to the east in Austria. Spanish stations worked include EA1s

BLA, CYE, ED, NU, OD and TA in VD and XD, and EA2s AWD and LP in ZD, also EB1MS/P (XC). The Swiss stations were HB9s AMH/P, AEN/P and MIN/P (DH), while Fs from all over the country appeared in readers' lists.

G6DER was the only reader to mention working OE2CAL on the 13th, while only G6DZH noted EI9EH (WN) on the 11th. Things were much more DX-productive from Jersey in this period. GJ4ICD reports beacon HB9F at S9-plus all day on the 11th, but little activity. But Geoff did contact OE3OBC (II) followed by HB9s later on. HB9F was S9-plus all the next day, too. In this period, he worked 19 countries including I, LX, OZ, SM and Y. GJ6TMM got Y36ZK/P, Y37Q and Y23KK/P (FK) and Y25GI/P (FL) on the 12th.

On the 13th, G4NBS had 37 QSOs with stations in nine countries and 23 new squares. G6HKM reckons the 13th was the best day and she spent 14 hours in the shack which resulted in 22 continental squares. Other readers reporting on this period were G1KDF, G1LSB, G3XDY, G4DCV, Graham Taylor, G4JZF/P (ZM31a), G4MUT, Martyn Jones, G4TIF, (WKS), Jerry Russell, G4SEU, (WKS), new contributor John Palfrey, G4XEN, (NHM), G4ZTR, G6MGL, G6YLO, G8HHI, G8PNN, Tony Frost, G8UDV, (CNL), GW3CBY, GW4LXO, GW4TTU and Reg Woolley, GW8VHI, (GNW) who was now joined the RAF so will only be QRV at odd weekends and leave periods. Lastly, Colin Morris, ex-G6ZPN, (WMD) who has passed his morse test and is now G0CUZ, and who reckons the Class B morse variation enabled him to build up enough confidence for the test.

During the period Oct. 14-16, a few readers worked EB1MS/P again, but much activity was to France with more German stations being contacted in the D and E rows of squares. A couple of contributors listed OZ5BZ (EP) and OZ9FW (GP) in this period. The 15/16th saw a lot of Irish activity adn G6HKM worked GI4NRE (WO) in the rare county of Fermanagh on the 15th. Although the Angus beacon on 70cm. was well up on the 16th, Ela only worked two GMs even though GM4NHI (YR69e) was S9-plus all evening. Other readers whose letters covered this period were G1KDF, G1LSB, G4DCV, G4NBS, G4TIF, G6DZH, G6MGL, G6YLO, G8HHI, GJ6TMM, GW3CBY, GW4LXO, GW4TTU and GW8VHI.

Some choice DX was worked on the 17th, but very few readers got at it. G1LSB notes DC6HQ/P (EI) and OK2BWY/P (HK), the latter also worked by G8HHI. From the Ipswich area, G3XDY got to DC7QH and Y24BO in GM, SP6GWB/6 (IK) for a new square and country, OK1KRA (HK), OK2KZR/P (IJ) and OE2KMM. G6DER mentions stations in EJ, FJ, GH and HK squares as being worked from near Barnsley. G6MGL's haul from east London was DC6HQ/P, SP9FG (JJ), OE2KMM and OK2BWY/P.

There was a short respite from all this DX till the 20th, when G3XDY had success with SM7LXV and SM7BAE (GP), SM6CMU (FR), OZ7LX (FP) and SM7NNJ (IQ), a new square. The following day, John caught GM0BPO and GM0BPY (YP). The next main period was the 24-26th when the band was full of Scandinavian stations. The 24th was a *Cumulative* evening for good measure. Undoubtedly the most interesting station was OH0NC (KU) especially since the Aaland Islands count separately from Finland for WAE/DXCC purposes. Sam was worked by G6MGL and G4JZF/P at least.

G4JZF/P worked into 15 squares in the D, E, F and G lines in the *Cumulatives* from ZM31a and Graham comments that the DX seemed to come in spasms with the OH0 coming, ". . out of the blue after working several Gs and calling CQ." The GB2WQ expedition (WQ30g) was widely worked in this period. G1KDF, G1LSB, G3XDY, G4TIF, G4XEN, G6HKM, Richard Mason, G6KHS, (NOR), G8HHI and GW4TTU reported on this activity.

On the 27/28th, the band was open to several countries including D, OK, OZ, SM and Y and on the 27th, G3XDY found EI9Q (WM) as well among his collection of OK, Y, D, SM and LA stations. This opening extended from about HK square in the east, round to HR in the northeast and was reported by G1LSB, G4RGK, G4TIF, G4XEN, G6DZH, G6HKS, G6MGL, G6WZO, G8HHI, Julie Yates, G8MKD, (WMD), G8PNN, GW4LXO and GW4TTU. The two Welsh stations fared as well as those on the east coast, it appears. The last DX reported was on the 30th when G3XDY worked OE2CAL (GH) and OK1s VAM/P and AQT/P in HK, the OE also being worked by G6MGL and G8HHI.

Finally, a welcome note from Claus Neie, DL7QY, (FJ61e) who reports working many Gs in the Oct. 12-15 period, best DX being GW8ELR (XL), G0AYM (XK) and GW8KJW (XM) who provided Claus with his 200th square, no less. DL7QY is the editor of *Dubus Informationen,* of course.

Two Metres

The pattern of the extended opening on 2m. followed the same pattern as that on 70cm. As observed at G3FPK, there were periods when much of the action was going right over the heads of London stations. EIs were exchanging S9-plus reports with OEs, for example, who were very weak in London. The lift started on Oct. 10. G3XDY worked I2FAK (EF) and HB9RCJ (DH); G4DCV got I2ZQN, I2FAK and I2XDI all in EF and HB9s IN and DBM in EH, plus DK2LR (FH). Peter Atkins, G4DOL, (DOR) heard the FX4VHF beacon (AF69c) and worked HB9RCJ. GJ6TMM worked Fs in AF, AG and ZE, and EA1OD (XD) and EA1KC (XC). GW8VHI got EA1BLA and Reg also worked this station on the 11th.

On the 11th, G4DCV to HB9BZA (DG), G6DZH to EI4FO (WM), GJ4ICD to OE5s UKL and GDL (GI) and GJ6TMM to HB9s RSQ (EH) and SNR (DG) plus Fs in AF, BF, BG, CF, CG, DF and ZE. In the 12/13th period, there was again much activity to central and southern France. In Spain, EA1DAV (WD) was a popular fellow, others being EA1s ABN (XD), TA (VD) and DDU, EB1MS/P (XC) and EA2ZE (ZD). Some OEs were worked including 2EJN, 5MKM and 5XDL in HI, 9BBH (EH) and 9BBX (GH).

There was a German contest on the 13th so more than the usual number of Ys were contacted in the FK, FL and FM squares, and Ds in FI and FJ. A few worked OK1OA and OK2BWY/P (HK) and OK1FAV (GK). LX2GB (G4FDX) was in some lists. From Jersey on the 13th, GJ6TMM worked a number of OZs in EQ, DH0HAR (FN) and PA2GFL/MM in BN.

Although there was a good selection of continental DX about in the period Oct. 14-16, it was notable for the large number of EI and GI stations on. The EIs included 3CNB, 5FK and 9GA in VL, 3FX/P, 7FS and 9FE in VM, 4AQB and 5AOB in VN, 8EF in VO, 2EZ/P, 6EV and 7BTB in WN and 9FH in WP. This period was a bit of a bonanza for country hunters as reflected in the Annual Table scores. On the 17th, G4DCV found some nice stuff from Kent, best DX being 1,221 kms. to OK2BFH/P (JJ) and five others in HJ and HK. Paul got SP6ASD (HL) on CW too. Only Mark Page, G1EGC, (BKS) noted any DX for

ANNUAL CW LADDER

Station	4m.	2m.	70cm	μWave	Points
G4TWD	—	620	—	—	620
G3GHY	—	576	11	—	587
G4WHZ	—	330	28	—	358
G4UKM	6	295	24	—	325
GW4TTU	—	—	262	56	318
G4WGY	—	275	15	—	290
G4YIR	—	257	—	—	257
G4SFY	—	244	—	—	244
G4NZU	7	162	2	—	171
G4ZTR	—	139	—	23	162
G4ZVS	—	152	—	—	152
GW4VVX	—	143	—	—	143
G4VXE	—	127	7	—	134
G4CMZ	39	92	—	—	131
G0CUZ	—	117	12	—	129
G4ARI	7	118	—	—	125
G4EZA	—	75	—	—	75
G4OUT	—	74	—	—	74
G2DHV	21	45	1	3	70
G6VMQ	—	66	—	—	66
GW4HBK	58	—	—	—	58
GM4CXP	3	38	1	—	42
GM4WLL	8	22	—	—	30
G4LVE	—	23	—	—	23
G0CAS	—	22	—	—	22
G4PSS	—	10	1	—	11
G0BPS	—	11	—	—	11

No. of different stations worked since Jan. 1.

the 19th, contacting SMs in GP, GR and HR, all new squares.

Two readers did well on the 20th. G4DCV worked SMs in GQ and HS, a couple of OZs in FQ and GP, UQ2GCI (KQ) on SSB, SP2DXL and SP2FAV in JO, SP4DCS/4 (KN) and UA2WJ (KO) which is a separate country, all on CW. G4XEN called "CQ" on CW in the afternoon and was answered by UP2BEA (LQ) at 1604, the QRB being 1,586 kms. At 1846, John got SP2DXL and SP4DCS/4, for his first tropo. QSOs to Poland. IQ square was worked by some in the guise of SM7NUN.

The period Oct. 24-26 saw extensive coverage of Scandinavia with all the OZ squares activated. In addition to the more "usual" Swedish squares, SM0HAX and SM5CFS in JT were worked, and G4XEN found SM1NVW/1 in the rare JQ square in Gotland. SM1NFH (JR) in the other half of Gotland was worked by others. GB2WQ was a popular target for many and another rare one was GM4SUF/P (XS80d) on the 26th.

On the 27th, the opening favoured the more easterly stations with several OK portables in HK worked. G3PBV worked SP1DPA (HN) as did G4DCV. He had an almighty chirp on his signal. G4DCV also got SP2YJR (KM), SP1AAY (IO), SP2DXL (JO), and SP5DDC (KM), all on CW. Ray Baker, G4SFY, (NOR) also worked several Poles: SP1II (IO), SP1DPA, SP6ASD (HL) and a couple in JL, SP3s MFI and JBI, while G4XEN managed SP1DPA, SP5BDC and 5GTI in KM and SP2JYR (JM). Some LAs in CS were worked, too, as were many DLs and some Ys in FN, GM and HN, and a few OZs.

The last day for most people of this magnificent opening was the 28th when some OK portables were still workable from London. However, it lingered on better in East Anglia since G3XDY got five more SPs in HL, IL, JL and KM. Thanks to all the many readers who sent in reports and it is hoped that this method of writing up this event will have given a reasonable history of it.

On the MS mode, G4SFY completed on CW with YU7MS (KF) on Oct. 19 at 2000-2100, 10b, 6p. Ian Parker, G4YUZ, (HFD) completed his Saturday skeds with I3LGP on Oct. 12, 19 and 26. On the 20th, he was successful on CW with OE3OKS (IH) but did not complete with OH6AI (LX) — a bit optimistic *via* sporadic meteors, he reckons.

Four Metres

Terry Hackwill, G4MUT, (BRK) says that the 4m contest on Oct. 27 was well supported with a few new calls to be heard but one or two dreadful signals, too. He wonders if there is any support for an All-time Table of counties, countries and squares, like the new 13cm. one? Roger Greengrass, G4NRG, (ESX) has 100w on the band and a 3-ele. *Yagi.* Anyone wishing to try MS can contact him *QTHR* or by "twisted pair" on 0277 810831.

G4SEU lists GU2HML (GUR) new all-time on Oct. 13. Jerry also worked G4RDT (IOW) on FM on the 14th. During the *JOTA*, he put on GB4FHC and made 19 QSOs before the PA died. He has reserved the call GB4MTR for use from Jan. 1 for the use of 13 stations from hopefully 13 different counties to promote activity. Anyone interested in using this call for a 28-day period is invited to contact him, or G4VOZ or G4WND; they are all *QTHR.*

G4TIF added eight more counties and one 1985 country in October. These included EI2CA (Wicklow), GU2HML (GUR) and Martyn was on in the Fixed contest on the 27th. New for G4YUZ were G4KMG (AVN) on the 13th, G3TWG (BKS) and G3VIP (HBS) on the 14th and G4RDT (IOW) on the 27th. Ian also worked EI2CA (WM) for a new country on the 13th. G4ZTR was out portable on the *JOTA* weekend and had a random MS QSO with EI2CA/P (VP) completed in 40 mins. John recommends 4m. as a good band on which to learn MS techniques. He operated -/P in Wiltshire in the contest and made over 50 QSOs, best DX being GM4WLL/A at 510 kms. He wrote, "Also had a 'QRZ?' on CW from 5B4CY — now that *would* have been DX! Presume MS?" Sounds a bit far-fetched to your humble scribe.

John Jennings, G4VOZ, (LEC) comments on the almost nightly activity in October by EI2CA. He worked G4RDT on FM, too and the IOW station only runs

ANNUAL VHF/UHF TABLE

January to December 1985

Station	FOUR METRES Counties	FOUR METRES Countries	TWO METRES Counties	TWO METRES Countries	70 CENTIMETRES Counties	70 CENTIMETRES Countries	23 CENTIMETRES Counties	23 CENTIMETRES Countries	TOTAL Points
GW4TTU	—	—	95	34	69	17	39	11	265
G6DER	—	—	70	25	65	20	46	16	242
G4TIF	49	5	80	20	61	17	—	—	232
G4SEU	63	7	70	15	45	14	—	—	214
G1KDF	—	—	93	21	79	16	—	—	209
G4NBS	*28*	*2*	65	12	50	16	33	4	180
G4MUT	41	4	59	20	33	11	*16*	*4*	168
G6MGL	—	—	50	17	43	16	28	14	168
G6HKM	—	—	65	20	55	19	—	—	159
G0CUZ	—	—	81	21	48	8	—	—	158
G4YCD	—	—	77	22	43	8	—	—	150
G6WZO	—	—	50	8	50	14	21	5	148
G6AJE	—	—	61	12	50	9	—	—	132
G1EHJ	—	—	58	14	43	12	—	—	127
G1EZF	—	—	64	19	38	6	—	—	127
GW3CBY	34	5	46	8	24	8	*9*	*5*	125
G4VXE	—	—	65	15	38	5	—	—	123
G3BW	34	5	36	22	—	—	13	5	115
G6XVV	—	—	64	12	31	4	—	—	111
G4WXX	—	—	90	21	—	—	—	—	111
G4HGT	2	1	63	20	18	2	—	—	106
G6ECM	—	—	77	23	—	—	—	—	100
G3FPK	—	—	80	20	—	—	—	—	100
G6XLL	—	—	61	13	21	4	—	—	99
GI1ZO	—	—	79	19	—	—	—	—	98
G6YIN	—	—	54	9	25	5	—	—	93
GW6OFI	—	—	65	19	—	—	1	1	86
GI1NK	—	—	32	9	37	8	—	—	86
G8RWG	—	—	50	10	23	3	—	—	86
G1EGC	—	—	64	19	—	—	—	—	83
G8PNN	—	—	—	—	26	12	32	10	80
G1DWQ	—	—	58	20	—	—	—	—	78
G8XTJ	—	—	59	17	—	—	—	—	76
G4YIR	—	—	57	17	—	—	—	—	74
G4VKE	—	—	64	10	—	—	—	—	74
G6XSU	—	—	35	9	21	7	—	—	72
G6OKU	—	—	40	8	21	3	—	—	72
G4ARI	16	1	47	7	—	—	—	—	71
G6XRK	—	—	53	17	—	—	—	—	70
G2DHV	10	1	47	7	1	1	—	—	67
G0CAS	—	—	54	13	—	—	—	—	67
GW6VZW	—	—	51	13	—	—	—	—	64
G1HGD	—	—	51	10	—	—	—	—	61
GW1JCB	—	—	53	8	—	—	—	—	61
G1JOU	—	—	50	10	—	—	—	—	60
GM4CXP	5	2	34	10	6	2	—	—	59
GM0BPY	—	—	31	10	9	9	—	—	59
G1LAS	—	—	49	10	—	—	—	—	59
GW4VVX	—	—	46	12	—	—	—	—	58
G4CMZ	26	3	23	4	—	—	—	—	56
G4WHZ	—	—	38	7	4	1	—	—	50
GW4HBK	45	5	—	—	—	—	—	—	50
G4WJR	—	—	39	7	—	—	—	—	46
G4WND	25	2	—	—	14	4	—	—	45
G4EZA	—	—	36	6	—	—	—	—	42
G0BPS	—	—	30	7	—	—	—	—	37
G6CSY	—	—	11	5	5	1	13	1	36
GM4WLL	9	2	13	5	—	—	—	—	29
G6SIS	—	—	19	5	1	1	—	—	26

Three bands only count for points. Non-scoring figures in italics.

15w to a dipole. He now has a transverter and SSB with a 3-ele. *Yagi* promised. Others mentioned by John are Gareth Albrighton, G4ZUR, (WKS) on SSB worked on Oct. 6 with 300mw, GU2HML, G4MES (HFD), G2YS (HFD) and G4ENB (BFD) all on SSB. He worked G3YEU (YSN) on the 19th, and G4ANT (NOR) the same day. *JOTA* stations QRV were GB4FHC in Nuneaton, GB2HSG in Upminster and GB4SGB in Bromley. From Gwent, Dave Lewis, GW4HBK, worked GU2HML and G3PGN (ESX) on the 13th, G5DQA (KNT) on the 14th and G4ANT on the 21st.

Six Metres

Still no news about the release of the band generally. The *RSGB* is continuing to negotiate the best possible conditions for us with the *DTI,* is all that can be stated at present. Little news from readers. G4NBS has a 4-ele. beam aloft but has to BCI-proof the neighbours. G4NRG has a 5-ele. *Tonna Yagi* and has receive capability on the band. On Nov. 2 at 11.30, Roger heard ZB2VHF at good strength. At the time, 28 MHz was open to Spain and there was commercial-sounding Spanish on FM on both 4m. and 6m. He is willing to try some 6/4m. crossband MS or tropo. tests if anyone is interested. GM8BDX is also listening on 6m. using a *Yaesu* FT-726R and preamp. with a dipole or long wire antenna. Alex has heard G6NB, G3OHH and GM3ZBE.

Cross-band Operation

Recently the *DTI* issued a press release to "clarify" the matter of cross-band and duplex operation. In most radio amateurs' licences, there is no reference to duplex operation, i.e. two stations operating on different frequencies, perhaps on different bands, with their transmitters on all the time. In particular, is it legal for a Class B licensee to communicate with a Class A operator on say 2m. to 160m? Unfortunately, the afore-mentioned press release still did not answer this question in the obvious "yes" or "no" manner. On checking with the *RSGB,* which broadcast the statement over GB2RS, it *is* legal for such crossband operation now. The other ambiguity was the sentence, "Each station must be identified but the identification of the second station should not be re-transmitted by the first." Some took this to mean you should not mention the callsign of the station you are working, which would be nonsense. What it really means is that, if your microphone is picking up the other station's voice from your loudspeaker, you must ensure that his callsign is not re-broadcast.

VHF Convention

Geoff Stone, G3FZL, has advised that the 1986 *RSGB National VHF Convention* will again be held at Sandown Park Racecourse, the date being Sunday, March 16. This is a departure from the usual Saturday slot. However, as most all mobile rallies are on Sundays, and attract large crowds, a Sunday Convention should be more popular.

Overseas Note

Ken Osborne, G4IGO, has heard from Johannes Baardsen, LA6HL, that TF3LJ is active from Iceland and that a 2m. beacon is likely soon, possibly on 144.937 MHz in QX square.

CW Matters

From GW4TTU. "In reply to Sue Frost, G3WGY's comment in the November issue, I find that if the 70cm. band is open it can be really fruitful to use CW and hence, whenever I am on 70cm. or 23cm., I spend 90% of my time on the key." He went on to say that there are often surprises when calling "CQ" on an apparently dead band.

Your scribe is very disappointed by the increasing number of poor quality CW signals appearing on 2m. The usual trouble is very bad key clicks and these are for two reasons. First, certain transceivers are badly designed and generate clicks; without owner modification, the problem cannot be cured. This should not be, for surely it is not beyond the capability of designers to produce a decent signal? The old *Liner 2* was disgusting, the early *Trio* TR-9000 transceiver had to be heard to be believed, the *Yaesu* FT-221/225 series of otherwise excellent transceivers all produce hard keying and the *FT-290* is much the same.

Some owners have successfully modified some of these sets and from time-to-time, notes appear in club newsletters, etc. If any reader has effected a cure please let us know; we will be delighted to publish any "mods" for the benefit of us all.

Second, there seems to be a trend to use so-called linear, solid-state amplifiers on CW with the amplifier in the RF-sensed switching mode. *This is very bad practice* for, not only does it give the relays a very hard time, it generates a nasty click on every single make and/or break. So if you operate like this, please stop it and hard switch the thing *via* the PTT socket so that the amplifier is on while the gear is in the transmit mode. After all, very few VHF/UHF operators seem to work true break-in.

Locators again

The Maidenhead system has a few more fans, it seems. New contributor Jim Smith, G1DWQ, (DOR) prefers it, ". . . despite being 'brought up' with the old one, therefore I can use either." Mike Newell, G1HGD, (WKS) reckons he never could get on with the old system; "I knew where ZM and YM were, after that I was lost." He continued, "Now, if you say 'BK' I haven't a clue where you are talking about, tell me JO10 and I know exactly where it is."

Dave Sellars, G3PBV, (DVN) reckons Maidenhead is catching on for *E-M-E* and the satellites and was used on those trans-atlantic 6m. QSOs, but he found a 50/50 split in the recent October openings. G4NBS admits to getting used to Maidenhead and feels its merits outweigh the problems of changing. He mentions similar arguments when we changed from NGR to QRA Locator as it was first called.

G4XEN prefers Maidenhead and took the trouble to learn the new squares. John, ". . . supports the view from the *Midlands VHF Convention* that it is stupid to give both locators and to ditch the new system before it has been given a chance." Claus Neie, DL7QY, went to the *VHF/UHF Convention* in Weinheim in October and collected a large number of signatures of well-known European operators who oppose the *IARU* decision to scrap E-QTHL. This list will appear in *DUBUS* issue 3/85. Clause received a further 52 letters anti-Maidenhead and only four in favour. In the U.K., of those who have commented, it is about six-to-one against Maidenhead.

John Tye, G4BYV, makes the very valid point that Maidenhead has been virtually completely ignored by the microwave fraternity. He writes, "To change the QRAs on microwaves is like asking HF bands operators to use a new Morse code." Your scribe has a list of amateurs who comprised *IARU* Committee B which foisted Maidenhead upon us. Of its 21 members, only G3WSN and SP5JC appear in *DUBUS's* "Top Lists" and it should be appreciated that the participants are the *real,* dedicated backbone of Europe's VHF/UHF operators. Can the same be said of C31OB, HA5WH, ON4VY and TF3KB? Surely, unless such worthy folk are regular operators, they simply cannot be in touch with day-to-day opinions, so should not presume to tell us what to do?

Frivolity

To conclude, some gems overheard recently. From Graham Daubney, G8MBI, who heard:— "I just tapped my barometer and it dropped down 20 dB." Another chap said he was running 170 watts which he explained was 10w from his transceiver plus another 160w from his amplifier. And a real classic heard by G4MUT, "I still haven't got your callsign but don't worry. I'll get it from your QSL card when I receive it!" As Terry commented, "Who needs radio when you can get it through the post?"

Deadlines

The deadlines are in the box so don't miss them. As always, everything to:— "VHF Bands", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6 9EQ. *73 es Happy Christmas de G3FPK.*

An American Experience Part 4

Three Weeks to Remember

CHRISTOPHER PAGE, G4BUE,
***and* COLIN TURNER, G3VTT**

The American Radio Relay League

IT was a coincidence that while we were talking to Pete, W1RM, about our visit to the American Relay League the following morning, he mentioned that his QTH used to belong to Bob and Ellen White, W1CW and W1YL. At the time they lived there, Bob was employed by the ARRL in charge of the DXCC awards programme, a position he held for many years. Bob and Ellen now reside in Florida.

The ARRL is the U.S.A. equivalent of the Radio Society of Great Britain. It was founded in 1914 from an idea of Hiram Percy Maxim earlier that year. Maxim wished to send an amateur radiogram from his home in Hartford, Connecticut to another station in Springfield, Massachusetts. His own transmitter did not have sufficient range to reach Springfield, and so he conceived the idea of having it relayed by intermediate station at Windsor Locks, Connecticut. There was nothing particularly unusual about this feat, even in the early part of 1914, as ships had been using the relay principle to get messages from mid-ocean to shore with the assistance of other ships for some time.

The idea itself, therefore, had no particular significance. The application of the idea, however, had all the significance in the world. Maxim had for many months thought of starting a national radio organisation. He had not carried it further than the notional state because he could think of no prime moving force, no basic principle around which to build the structure: if an amateur organisation were ever to progress beyond the paper stage it must offer something more than one's name amongst the membership. In short, unless he could find something definite for such an organisation to do, he could not justify its existence.

The morning after the Hartford to Springfield relay, while thoughts were harking back to the previous evening's success, the old ideas about the national organisation wandered through his mind, something clicked, and the problem was solved! For here, without doubt, was the idea around which the organisation could be successfully and strongly built. The missing block in the puzzle had been found and fitted. The organisation would be a relay organisation. It would have as its object the developing of relay routes over all the country among all the amateurs, so that by this means an amateur in one part of the country could send a message hundreds of miles to an amateur in another part; perhaps even send a message from one coast to another!

Within a week, a name had suggested itself suitable for this new organisation, and a month later it was decided to start the ball rolling. In May 1914 Maxim, together with another Hartford amateur Mr. C. D. Tuska, sat down and wrote to every one of the amateurs listed at that time in the government call book, announcing the formation of the American Radio Relay League, (ARRL). The letter outlined the League's purposes, and solicited for membership; there were no subscriptions, as membership was free upon application.

The response was immediate and very enthusiastic, with applications being returned in every postal delivery. In the early summer of 1914 the first publication was issued by the League, a little blue-bound call book listing the names, addresses, calls, power, range, receiving speed and operating hours of over 300 amateurs; it sold for 50 cents.

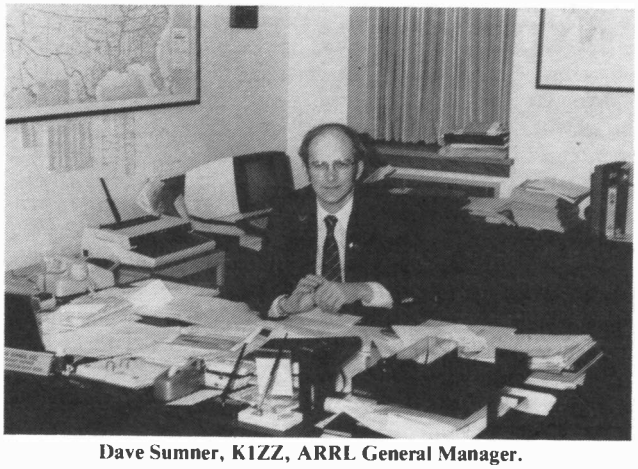
Membership increased rapidly and in January 1915, the League was incorporated under the laws of the State of Connecticut as a non-commercial organisation with no capital stock. A second call book was issued in March 1915 and this time listed details of over 600 members.

In the meantime attempts were being made to build up the relay routes for which the organisation had been formed, and some success was being achieved. During the late summer of 1915 a serious difficulty loomed and demanded attention. It was proving a real task to acquaint the membership with the plans and schedules by means of letters only. Increasingly it became evident that a bulletin of some kind was necessary. The League, however, had no funds; membership was still free and the call books were sold at cost. The answer came in 1915 when each member of the League received in the post a sixteen page magazine called *QST*.

This first edition of *QST* announced that it was being published privately by Maxim and Tuska, and was therefore the official publication of the League. Membership of the League continued to be free, but any member who wanted *QST* could obtain it by sending a $1 for a year's subscription. Response was again immediate and *QST* has been published on a regular basis ever since.

Having now a journal in which to illustrate the activities of the membership, amateur radio really began to take off in the United States. A member, discovering some new improvement for his apparatus would write an article about it, and within a month or two every other amateur was benefiting from it. Manufacturers, having been invited to advertise, found a new and responsive field

The ARRL Hq building in Newington, Connecticut.



Dave Sumner, K1ZZ, ARRL General Manager.

for their products, and some of them began to manufacture equipment specifically aimed at the new amateur radio market.

Bearing in mind the emphasis of the newly formed organisation was the relaying of messages, on 22nd February, 1916, occurred the first attempt at a nation wide test. 9XE of Davenport, Iowa inaugerated the first Washington's Birthday Relay, with a message from Colonel Nicholson, of the Rock Island Arsenal, addressed to the Governors of every State in the Union. The Pacific Coast got the message fifty minutes after it had been started at 9XE; the Atlantic Coast, sixty minutes after; New Orleans had it in twenty minutes and Canada also had it in twenty minutes.

The success of this test, though far from one hundred per cent, created the greatest enthusiasm, and led to a prediction in *QST* that a transcontinental message would eventually be sent with only two intermediate relays!

On January 27th, 1917, it happened. Three messages were started at 6EA on the Pacific Coast, and passing quick jumps through 9ZF, 9ABD and 2AGJ, ended up at Maxim's station, 1ZM. This accomplishment was almost immediately overshadowed by an even greater one a few days later on February 6th. On this day a message was started on the East Coast, relayed to the West Coast, and an answer returned in the record time of one hour and twenty minutes!

Until this time Maxim and Tuska had been acting as self appointed President and Secretary of the League respectively. By 1917 the League had grown to such an extent that a more business like organisation was regarded as a necessity. On 28th February, 1917, a group of amateurs met for two days at the suggestion of Maxim. During this time they wrote and adopted the constitution that outlined the policies of the League, laid down the procedure for the election of officers, divided the country into six Divisions, and had elected by vote twelve Directors and four Officers.

The Officers elected were Maxim as President, A. A. Herbert as Vice-President and General Manager, Tuska as Secretary, and C. R. Runyon as Treasurer. Shortly after this it was announced that membership had increased to 4000 and then soon after came a report that a West Coast station had reported hearing an East Coast station direct!

Probably the most famous, and certainly most productive relay was put out soon after the United States declared war on Germany in April 1917. Although the Government had placed a ban on the operation of all amateur apparatus, a representative of the Navy Department, Lt. McCandless, met Maxim and Herbert in New York. He requested the aid of ARRL relayers to act as radio instructors and operators for the duration of the war. The need, it was explained, was desperate and the conversation is reported as going as follows:—

"How many do you want?", asked Maxim.

"Five hundred!", replied McCandless.

"How soon do you want them?"

"Immediately!"

"Can you put that in terms of days?"

"Yes — we want them within ten days!"

A last broadcast went out over the League's relay routes, and within ten days the Navy had its five hundred operators!

The war ended on 11th November, 1918, and eleven days later the old Board of Directors of the ARRL met in New York to re-organise the League. After successfully getting the transmitting ban lifted in October 1919, the number of Americans turning to amateur radio exceeded all expectations. Things then moved very quickly indeed, a message was relayed from Hartford to Los Angeles and back again in six and a half minutes, 6ZK in California was heard in New York City, 9ZN in Chicago was heard in Panama, and then 2RK in New York was reported by a ship's operator at Gibraltar. Relay routes grew overnight and traffic became heavier and heavier.

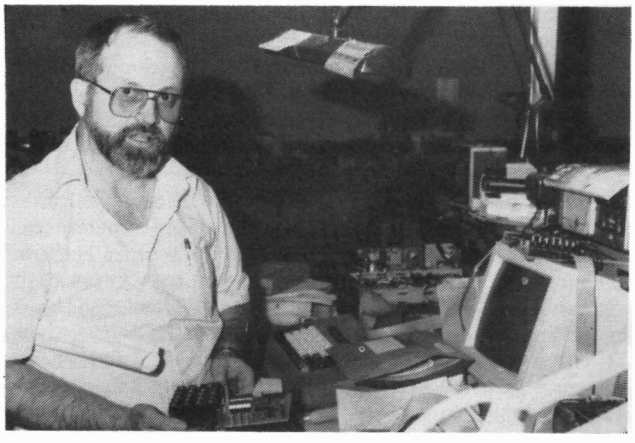
Then, as valves slowly began to become available to the amateur, spark transmissions were even more slowly replaced by continuous wave transmissions (CW). At first CW was an off-shoot of radio amateurs' war experience: while serving in the Army or Navy they had seen five watt valves covering very respectable distances. It was initially confined to a small group, due to valves not being commercially available. Only a favoured few were in a position to acquire government war time valves, with the acquiring being done by devious methods!

It was soon discovered that CW travelled long distances with low power, was sharp, cut through the static, and did not create the vicious local interference that spark did. These advantages could not be overlooked, and when 'tubes' became commercially available early in 1921, the League started a campaign for the adoption of CW for amateur use. The rank and file members refused to be altogether convinced that CW was superior, and waited for proof. That proof was not long coming. In December 1921, thirty American amateurs transmitting on 200 metres were heard in Europe, and two thirds of them were using CW. That convinced the ardent spark users, and CW quickly became the accepted mode.

The accomplishments of the next decade are very well known and have been written about many times. The League continued to be in the forefront of these accomplishments, reporting them regularly in *QST* and encouraging even greater achievements by sponsoring tests and activity periods.

Today there are 120,000 members of the League located in Canada and the United States, and a further 11,000 foreign members. The League has a full time professional staff of 125 in Newington, and is a non-profit making, educational and scientific organisation, dedicated to the promotion and protection of the privileges that amateurs enjoy.

In addition to the full time staff at Newington, there is the Field Organisation, headed by Section Managers, who are unpaid volunteers and elected by the membership. The Field Organisation provides opportunities for members to promote



Chuck Hutchinson, K8CH *QST* Technical Editor.

amateur radio in areas such as public service, regulatory matters, local clubs, public information, and technical experimentation.

The League's publications are very well known with titles such as "The Antenna Handbook" and "Solid State Design for the Radio Amateur" becoming world famous. Like the RSGB, the ARRL operates a QSL bureau and supports amateur radio through representation before government agencies, and additionally gives administrative support to the Field Organisation.

Recent cut backs in the United States federal budget have led to amateurs taking over the responsibility for administering the amateur radio examinations. The ARRL Volunteer Examiner Programme was initiated to play a crucial role in co-ordinating the scheduling, printing and administration of the exams.

Other services administered by the ARRL include low cost insurance against equipment theft or other losses, assistance in resolving interference and problems in obtaining planning permission for antennas (or zoning laws as the Americans refer to them). Notice the similarity to the services provided by the RSGB, which just goes to show that amateurs problems are basically the same everywhere!

The present day Headquarters building of the ARRL is situated in Main Street, Newington, Connecticut, which is only a few miles from the QTH of W1RM where we were staying.

Pete's wife Bobbie, WB1ADL, dropped us off at the Headquarters building on her way to work. We had arranged to meet Dave Sumner, K1ZZ, the General Manager there, having met him at the F.O.C. Dinner at Danbury the previous week-end. ARRL Headquarters is situated in a smart residential area of Newington and the building, on two floors, is very modern and well designed. The old original building is situated about two hundred yards away and now houses the famous Headquarters station, W1AW, named after Hiram Percy Maxim.

On entering the main Headquarters building you are confronted with a fine reception area which contains a very interesting collection of amateur radio equipment from the early days of our hobby. Some of the original keys used by famous early American amateurs are on display, which was of particular interest to us.

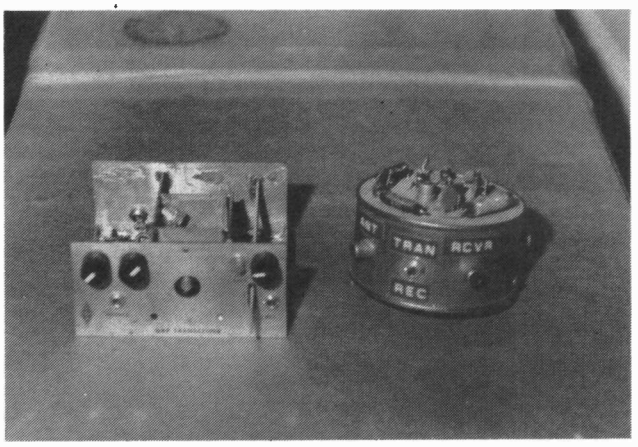
After visiting a few of the administrative offices we arrived at the DXCC Desk with Don Search, W3AZD in charge. Those of you who have applied for DXCC will have had your cards checked by either Don or one of his staff. The DXCC is probably the most famous and sought-after award of all those available, and is usually the first one that the newly licensed amateur starts working towards.

To obtain the DXCC award an amateur must make and confirm two-way contact with 100 countries on the ARRL countries list. Stickers are issued as subsequent countries are worked and confirmed, and the ultimate aim is to try and confirm a QSO with every country on the list. At the moment there are 315 countries, but some amateurs have many more than that credited to them due to countries being deleted from the list as a result of political and boundary changes altering their status. for the really ambitious there is the Five-Band DXCC award, which is awarded to an amateur confirming contact with one hundred countries on each of five bands.

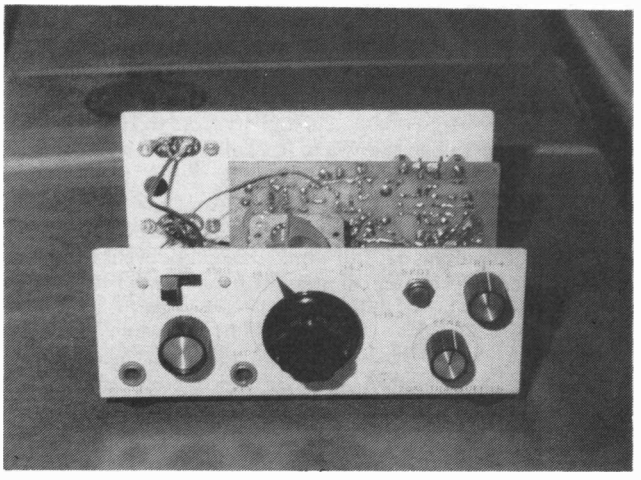
Don had just finished checking the applications and compiling the annual listings for the Honour Roll to be published in *QST*. The Honour Roll is made up of those amateurs having the top ten numerical totals from the current DXCC countries list. Eligibility is determined by subtracting the deleted countries from your overall total to give your current total. The present countries list of 315 means that amateurs with current totals of 306 or higher will be listed in the Honour Roll. Every year the number of Honour Roll applicants becomes larger as more amateurs qualify; the present number on the Honour Roll is over 200.

Don described the procedure in checking and filing the applications. Each individual amateur has his original application, together with subsequent updates, filed in a number of cabinets in the office. As further applications are received for country endorsements the amateurs file is drawn, updated and re-filed. It is a very basic and efficient system, but we were somewhat surprised that the computer age has not reached Don's department, despite being used in most other ARRL departments.

Whilst we were with Don, he was in the process of compiling a list of those ZC4 stations who had operated from inside a British base on Cyprus, thus qualifying for separate country status in line with the recent decision of the ARRL. There are a set of rules which form the criteria to be used in deciding whether a country is a country for the purposes of the DXCC countries list. For



Two exhibits in the ARRL Technical Department: above, the original "Tuna Tin" transmitter; below, Doug DeMaw's, W1FB, 20-metre receiver.



instance one of the rules (Rule 2a) states that "an island not having its own government is considered as a separate entity if it is situated off shore from the governing area and is geographically separated from it by a minimum of 225 statute miles of open water". The effect of this ruling is that the Isle of Wight, being within 225 miles of England counts as part of England, whereas Hawaii, being over 225 miles from the U.S.A. mainland, has separate country status. Hawaii is a State of the U.S.A. and administratively is no different from Florida, Kentucky, California or any of the other 49 States.

Alaska is also a State of the U.S.A. but has acquired separate country status under Rule 3. This rule states that "where a country has a common government, but is geographically separated by land which is foreign to that country, if there is a

The famous W1AW station is situated in the original ARRL Hq building.

complete separation by a minimum of 75 miles of foreign land, the country is considered as two separate entities''. The 75 statute miles of land is a requirement which is applicable to land areas only. In the case of Alaska it is separated from the remainder of the U.S.A. by Canada.

Unfortunately the criteria throws up anomalies from time to time which cause a great deal of controversy amongst the DX fraternity. On the other hand many DX-ers say this is one of the attractions of the award!

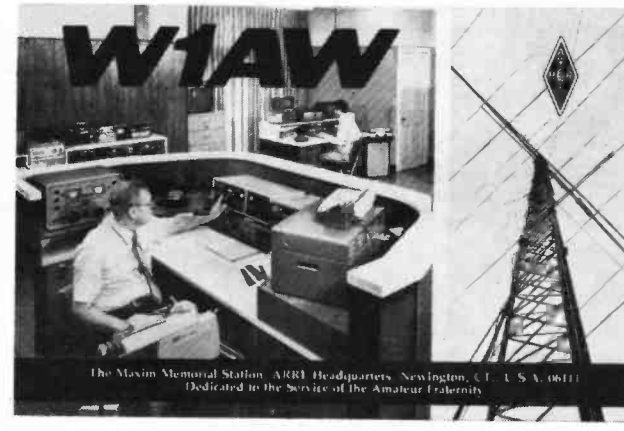
Coming closer to home it would appear that Rockall (57°40N and 13°30W), an uninhabited rocky islet of about 743 square metres in the North Atlantic Ocean, could be classified as a separate country under Rule 2a. Administratively it is part of Scotland, but as it is separated from the mainland of Scotland by more than 225 miles of sea it should, therefore, qualify for separate status. On the other hand is can be argued that as it is within 225 miles of the most western part of Scotland (the Outer Hebrides), it should not count. So you can see that even where the rules appear quite clear, they can be interpreted in different ways.

As far as we are aware no one has ever submitted an application to the ARRL for Rockall to be granted separate country status. In any case the ARRL would not consider an application until there was some positive sign of amateur activity from it. It may be that due to the recent publicity given to Rockall by Tom McClean and his alleged unauthorised broadcasting from there, some enterprising group of amateurs will attempt an official DX-pedition, and successfully apply to the ARRL for a new country to be created. Should this occur it would be a major event within the DX world, as every amateur at present on the Honour Roll would have to contact and confirm a QSO with Rockall to retain his position on the Roll! It is an interesting prospect that in the event of such an operation all the DX-ers in the world would have their beams and quads pointing in the direction of a small chunk of rock rising 8000 feet out of the North Atlantic Ocean, trying to get their call sign picked out from the thousands of others who would also be calling. Such is the magic of DXCC, or as others would argue, the stupidity of it!

We both handed Don some cards to be checked and credited to our own DXCC awards. Chris was especially pleased to hand his cards to Don personally as they qualified him for his 300-country endorsement.

We then moved onto the Contest Department which deals with the planning and adjudication of all the League's contests. Probably the best known of the ARRL contests are the CW and SSB International Contests, held in February and March each year, both of which now have sections for QRP. Dave explained the systems used for checking and cross-checking the logs to pick up ''creative logging'' and ''excessive duping'', two of the problems facing contest adjudicators. He explained that a greater percentage of logs would be checked in future, and this, together with the use of a computer, should result in higher accuracy when the results are published.

We then went into the Technical Department and found it to be a homebrewer's idea of heaven: a large number of work benches

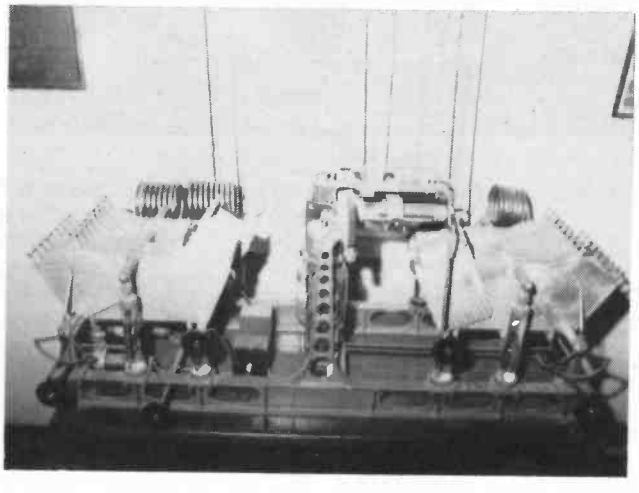


The main operating position at W1AW. The visitor's position is at top right.

together with all necessary tools and test equipment, where all the projects which appear in *QST* are built and tested. We were very impressed with everything we saw here and Chuck Hutchinson, K8CH, the Technical Editor, obviously realised this — especially when we got to where the original ''Tuna Tin'' transmitter and the Doug DeMaw, W1FB, 20-metre receiver were displayed. The equipment reviews which appear in *QST* are carried out on equipment which is actually purchased by one of the Department's staff from normal retail outlets. In this way they feel they are reviewing an off-the-shelf item and can really be free to describe the virtues or otherwise of the equipment, as it has not been donated for testing by the manufacturer. When we were there they had just purchased the new Ten-Tec 425 Titan linear amplifier, which we were later to air-test ourselves at the QTH of K4FW.

Reluctantly we said goodbye to K8CH and his staff, and after visiting the remainder of the administrative offices, including the QSL Bureau, we walked down the road for some lunch.

Dave had arranged for us to visit and operate the famous W1AW station during the afternoon. The station is located in the original ARRL building and has the antennas surrounding it. As you enter the building you cannot help but notice the spark transmitter and the old valve transmitter located just inside the



This 1919 state-of-the-art valve transmitter was used from the original ARRL Hq station. Nice to see a good strong chassis!

foyer. The spark transmitter is called "Bettsy", and is very famous in the U.S.A. as being the original transmitter at the ARRL Headquarters station. It is still in working order but Jeff, WA1MBK, told us that a poor low tension feed connection was causing intermittent output. Colin then proceeded to tighten up the offending nut, thus eliminating the problem (he now claims to have fixed everything from spark transmitters to video recorders!). The old valve transmitter was built around 1919, and is of the then very popular tuned plate and tuned grid configuration (TPTG); it was originally used at the Headquarters station.

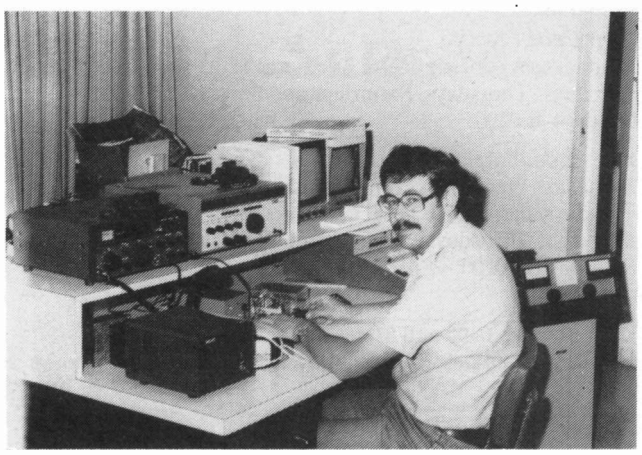
Chuck, W1WPR, and Jeff, WA1MBK, gave us a very good conducted tour of the station, including the basement where all the old log books are filed. Also in the basement are all the QSL cards received by W1AW, filed in call sign order. It was a very quick matter for both of us to locate our respective QSL cards which we had sent to the station for QSOs in the past.

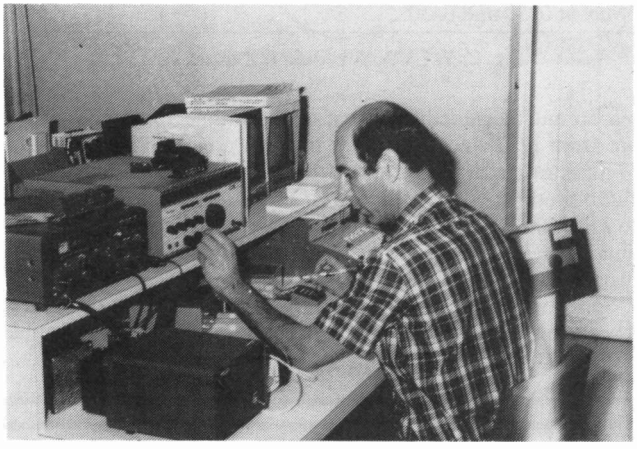
The antennas at W1AW are very impressive. Just outside the building is a 120-foot tower on top of which is a rotatable four-element 14 MHz Yagi. At 90 feet is a two-element 7 MHz Yagi and at 60 feet another four-element 14 MHz Yagi. Both these lower Yagis are fixed at 285 degrees (towards the West Coast) so that when the top 14 MHz Yagi is also in that direction they operate as a four-over-four array. A 60-foot tower supports a five-element Yagi for 21 MHz and another 60-foot tower supports a five-element Yagi for 28 MHz and a six-element Yagi for 6 metres. A third 60-foot tower supports high gain Yagis for 144 and 432 MHz. The three 60-foot towers have been positioned such that dipoles for 7 MHz and 3.5 MHz can be held horizontally between them. An inverted-vee for 1.8 MHz is supported on the 120-foot tower just below the top 14 MHz Yagi, and their pride is a rhombic with 350 feet in each leg firing at 270 degrees.

There are several operating positions in the station as is shown on their QSL card. The visitors' position is that shown in the top right hand corner of their QSL card. Equipment is the Collins KWM-380, and both Chuck and Jeff were very pleased when we said we only wanted to operate CW. It appears that the vast majority of visitors are only interested in operating SSB: shame on them!

As W1AW was due to start transmitting its code proficiency practice transmissions in just over an hour's time, we could only have that time to operate, half an hour each. Fortunately 14 MHz was open to Europe and soon a big pile-up was in existence on 14025. It was certainly very interesting to be on the receiving end of a pile-up for a change. Several QSOs were made with the United Kingdom, including G3LCG, GM3GJB, G4CP and G3OHP.

The main equipment at W1AW is that used for making their code practice and bulletin transmissions. A plan of the equipment





Operating at the W1AW visitor's position: above, Colin Turner, G3VTT, and below, Chris Page, G4BUE.

is shown in Fig. 1 and a very strict operating schedule is followed. Those parts of the schedule of interest to readers in the United Kingdom are set out in Fig. 2.

Transmissions are made on a daily basis, on both CW, SSB and RTTY. The frequencies used for the bulletin transmissions are 1.890, 3.990, 7.290, 14.290, 21.390 and 28.590 MHz for SSB, and 3.625, 7.095, 14.095, 21.095 and 28.095 MHz for RTTY.

Frequencies used for code practice and the CW bulletins are 1.818, 3.580, 7.080, 14.070, 21.080 and 28.080 MHz. Code practice is made at varying speeds between 10 and 35 words per

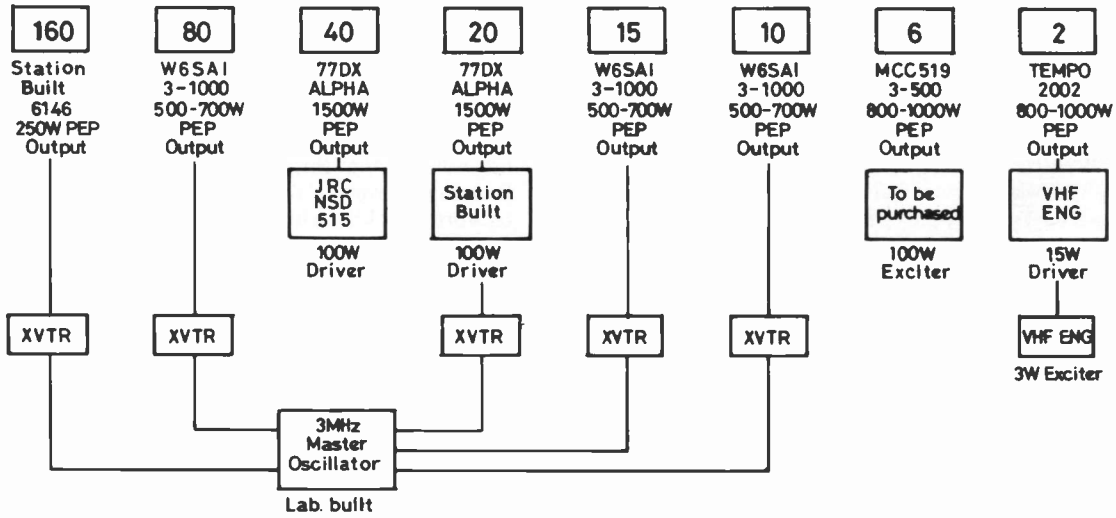


Fig.1 PLAN OF THE EQUIPMENT USED AT W1AW H.Q. STATION OF A.R.R.L. FOR THEIR BULLETIN TRANSMISSIONS

E 637

Slow Code Practice
Mondays, Wednesdays and Fridays at 0200, 1300 and 2300;
Tuesdays, Thursdays, Saturdays and Sundays at 2000;
Sundays at 0200.

Fast Code Practice
Mondays, Wednesdays and Fridays at 2000;
Tuesdays and Thursdays at 0200 and 1300;
Tuesdays, Thursdays, Saturdays and Sundays at 2300;
Saturdays at 0200.

CW Bulletins
Daily at 0000, 0300 and 2100;
Mondays, Tuesdays, Wednesdays, Thursdays and Fridays at 1400.

Teleprinter Bulletins
Daily at 0100, 0400 and 2200;
Mondays, Tuesdays, Wednesdays, Thursdays and Fridays at 1500.

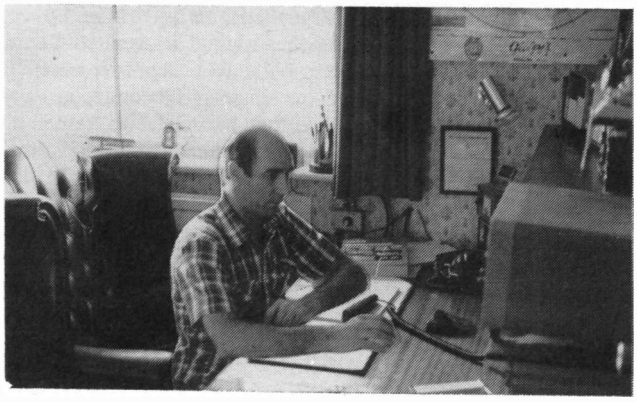
Voice Bulletins
Daily at 0130 and 0430.

Fig. 2. W1AW Schedule (all times GMT).

minute and the bulletins are sent at 18 words per minute. The texts are from *QST* and the source of each practice is given at the beginning of each session and at the beginning of alternate speeds.

On Mondays, Wednesdays and Thursdays from 1300 through to 2100 GMT transmissions are beamed at Europe on the 14, 21 and 28 MHz frequencies; on Fridays a DX bulletin replaces the regular bulletin transmissions.

Sadly our operating period at W1AW went all too quickly, and it was time to say goodbye to Chuck and Jeff. By this time Bobbie had finished work and was able to pick us up on her way home. So ended another day when we had both realised another one of our ambitions — to operate W1AW.



A very rare photograph indeed of Chris Page, G4BUE, caught using a microphone at his home QTH — and believed in this shot to be actually working CB. (We rather like the trendy half-squatting position at the operating table, too! — *Ed.*) *photo: Anon.*

We spent that evening in the shack of W1RM with Pete and Hank, K4FU, who was also staying with Pete and Bobbie for a few days. The highlight of the evening was making the two-way QRP QSO with Bill, N4AR on 80 metres, as described in Part 2. The following morning we made our way to New York, where we collected a hire car and drove south, eventually arriving at the QTH of Vic Dubois, N4TO, in Georgia. There we were to put into practice some of the lessons on tower erection we had learnt from N4AR. That, together with our visit to Ten-Tec in Sevierville, Tennessee, will be described in the concluding Part 5.

CLUBS ROUNDUP

By "Club Secretary"

A SHORT intro this time, just to wish all club members and scribes a very Happy Christmas and a Peaceful and Prosperous New Year. Note that because of the festive season the deadline for the February issue is the earlier-than-usual date of **December 19th.**

The Letters

Acton, Brentford and Chiswick is top of the pile, and the club based on Chiswick Town Hall, High Road, Chiswick. On December 17, a Tuesday, they will have a talk by G1ARQ/A on the 50 MHz band, starting at 7.30 p.m.

Basingstoke have a double bill on December 2 — G1EWO on first-aid and the local crime prevention officer explaining how to avoid having your goods nicked. On December 14 there is a Christmas Social to which all are welcome. Find them at Forest Ring Community Centre, Sycamore Way, Winklebury, on the first Monday of the month.

At **Biggin Hill** the locals foregather at St. Mark's Church Hall, Biggin Hill, on December 17 for a junk sale.

The **Bishops Stortford** group holds main meetings on the third Monday in the month at the British Legion club in Windhill; in addition they have informal sessions at the "Nags Head" on the Dunmow Road each Thursday evening, where they are to be found in the bay window of the saloon bar.

On the first Monday of each month the **Borehamwood** group foregathers at the Organ Hall Community Centre, Bairstow Close, Boreham Wood, Herts. More details from the Hon. Sec. at the address in the Panel — we suspect he might be called Ivor but we can't read his signature!

Now to **Braintree,** and here we note that they are back to their old Hq. at the Community Centre in Victoria Street, where they are to be found on first and third Mondays. The Hq. is right by the bus park at the centre of Braintree, and they have the ground floor room to the right of the entrance.

Now we come to **Bredhurst** members who have their place at Parkwood Community Centre, Parkwood, Rainham, Kent, every Thursday evening at 8.15. December 12 is their Construction Contest.

Bristol RSGB have their Christmas Party on December 16; the list indicates that this is at the Small Lecture Theatre, Queens Building, University Walk, Clifton, Bristol — we think this may be worth checking with the Hon. Sec., *see* Panel.

Looking ahead, February 9th sees perhaps the first Rally of the New Year — the **Bury** Hamfest which will be held at the Club Hq., Mosses Community Centre, Cecil Street, Bury, only moments away from the M66. This address is also the Hq. for the club's weekly meetings, for details of which we refer to the the Hon. Sec. — *see* Panel.

Turning to the **Cambridge Repeater Group** we find they informally get together at a pub called the "Pike and Eel", Chesterton, just down the road from Lowe Electronics' place, every Friday lunchtime.

The **Cheltenham** gang has its Hq. at the Stanton Room, Charlton Kings Library, Cheltenham, where they are to be

located on December 6 for the AGM and on 20th for their "Carachristmas" event, all festivities and fun.

Now to **Cheshunt**; they continue to gather at the Church Room, Church Lane, Wormley, near Cheshunt, every Wednesday evening. Unfortunately this makes one of their dates December 25, so this one is missed!

At **Chester** they have December 10 for a Construction Contest, and on December 17 they have a buffet, tickets from the Hon. Sec. They meet at Chester Rugby Union Club, Hare Lane, Vicars Cross, Chester.

On to **Chichester**; December 3rd's meeting is in the Green Room, as is the social on 19th; and the Green Room is in the Fernleigh Centre, 40 North Street.

Cirencester club has recently been revived, and now meets at the Phoenix Centre, Beeches Road, Cirencester, at 7.30 p.m. on alternate Thursdays, giving December 5 and 19. More details of the programme from the Hon. Sec. — *see* Panel.

"Thursday evenings at the Colchester Institute in Sheepen Road", is the information we have on the **Colchester** gang. Doubtless next month they will have the 1986 programme nailed together and we will then be able to tell you what's on.

December 5 is the date for the **Cornish** Christmas party, at the Church Hall, Treleigh, on the old Redruth by-pass.

The **Crawley** Christmas supper is on December 11 — get the details from the Hon. Sec. at the address in the Panel. The normal Hq. is at Trinity Church Hall, Ifield.

The gang at **Crystal Palace** is nowadays based at All Saints Parish Rooms, at the junction of Beulah Hill and Church Road, Upper Norwood, opposite the IBA mast; December 21 is the Christmas social.

There are three events in December for **Dartford Heath D/F** club; December 3 they are at the "Horse and Groom" for the pre-hunt meeting, and the hunt will be on December 8. Then there is an EGM down for December 17; this is also at the "Horse and Groom" and this is at Leyton Cross, near Dartford Heath.

We now turn to **Denby Dale** where the Hq. is at the Pie Hall in Denby Dale. December 4 and 18 are both down for a noggin-and-natter; there is a Christmas Party, and December 25 they will have G4CDD on the air . . . yes, on Christmas Day!

Back to **Derby**, where the place to look for is the top floor of 119 Green Lane every Wednesday evening. December 4 is a junk sale, and on 11th they have the Constructors' Contest. On December 18 they have a party in the clubroom, and the December 25 meeting is scrubbed.

Dorking has its main meetings at the Star and Garter Hotel, on the second and fourth Tuesday of the month, and the rest at Ashcombe School; both being near to Dorking BR station. December 10 is an informal, details from the Hon. Sec. — *see* Panel.

The **Edgware** crowd is to be found at Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware, on the second and fourth Thursday of each month. In December, 12th is a junk sale and the Boxing Day date is scrubbed.

For all the details on the **Exeter** club and their activities we must refer you to the Hon. Sec. — *see* Panel — as they have just had an AGM and are now doubtless putting their 1986 act together.

Up to **Falkirk** now; they have a visit to the Royal Observatory in Edinburgh slated for December 4, and there are the normal meetings on the first and third Wednesdays at the Grange Centre, Brightons, near Falkirk.

Deadlines for "Clubs" for the next three months—

January issue—November 29th
February issue—**December 19th**
March issue—January 31st
April issue—February 28th

Please be sure to note these dates!

". . . as it is *Christmas OM, wl give u 599 . . ."*

Farnborough nearly missed the bus this time, but in the end the post developed a turn of speed! They are to be found at the Railway Enthusiasts Club, Access Road, off Hawley Lane, Farnborough, on December 11 for their Christmas social. Normal routine is to book the second and fourth Wednesdays.

December 3 is the Construction Contest and December 17 the Hot Pot Supper for **Blackpool**; both events are at the Kite Club, Blackpool Airport. The membership sub. covers both clubs, and so once a member you can go and look at aeroplanes whenever you like!

Now to **Glenrothes** where the Hon. Sec. missed the deadline with a letter bearing a solemn promise never to miss another deadline! However, to be fair, she was in the throes of moving QTH at the time. The club had its annual open night on November 20, at the Crown Hotel; normal meetings are at Provosts Land, Leslie, Fife, every Wednesday and on the third Sunday in each month, always at 7.30 p.m.

The **G-QRP Club** covers the interests of all those who are interested in low-power operating and construction of equipment. Details of membership from the Hon. Sec. — *see* Panel.

On December 12 the **Greater Peterborough** crew have their Christmas party — all details from the Hon. Sec. as it will *not* be at the club Hq. at Southfields Junior School.

Cromwell Social Club, Cromwell Road, Grimsby, is the Hq. of the **Grimsby** group; they are to be found there on every Thursday evening.

If you want to join the **Harlow** club, its Mark Hall Barn venue is about half-way between Kennings Garage and the A1184 roundabout, on the left. They are open every Tuesday evening.

The **Harrow** venue is the Harrow Arts Centre, which is in High Road, Harrow Weald, where they are to be found on Friday nights. What a pity they have a Gremlin member, who is liable to hide in members' cars or equipment! Find them — and the Gremlin, and Uncle Oscar as well — in the Roxeth Room.

The **Hastings** arrangements are like this: third Wednesday (main meeting) at West Hill Community Centre, Croft Road; every Friday informally at West Hill Community Centre, Downey Close, off Harrow Lane, near the D.o.E.

December at **Havering** involves the loss of the meeting which would have occurred on Christmas Day; so we are left with December 4 informal, 11th for 'a topic', and 18th for the Club annual rave-up — and all are at Fairkytes Arts Centre.

For **Hereford** the arrangements are: December 6 a Practical Evening, and December 20 the Annual Quiz, which is a light-hearted affair we understand. Hq. is at the Civil Defence Hq., Goal Street, Hereford, in the room known as County Control.

Names and Addresses of Club Secretaries reporting in this issue:

ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London W3 8LB. *(01-992 3778)*
BASINGSTOKE: D. A. Birleigh, G4W1Z, 14 Winchfield Gardens, Tadley, Basingstoke, Hants. RG26 6TX.
BIGGIN HILL: R. Senft, G0AMP, Mill Hay, Standard Road, Downe, Kent BR6 7HL. *(0689 57848)*.
BISHOPS STORTFORD: S. Mammatt, G6HKK, 11 Twyford Gardens, Bishops Stortford, Herts. CM23 3EH. *(0279 52297)*
BOREHAMWOOD: Hon. Sec. Borehamwood ARS, 140 Aycliffe Road, Borehamwood, Herts.
BRAINTREE: D. Willicombe, 355 Cressing Road, Braintree, Essex CM7 6PE.
BREDHURST: A. S. White, G4EGH, 7 Hanover Drive, Wigmore, Gillingham, Kent. *(Medway (0634) 388760)*
BRISTOL CITY RSGB; C. R. Hollister, G4SQQ, 34 Battersby Way, Henbury, Bristol BS10 7SU. *(0272 508451)*
BURY: B. Tyldesley, G4TBT, 4 Colne Road, Burnley, Lancs. *(Burnley 24254)*.
CAMBRIDGE (Rep. Group): C. Lorek, G4HCL, 11 Bevills Close, Doddington, March, Cambs. PE15 0TT. *(0354 740672)*.
CHELTENHAM. T. Kirby, G4VXE, 29 Tivoli Road, Cheltenham, Glos. GL50 2TD. *(0242 36723)*.
CHESHUNT: R. Frisby, G4OAA, 2 Westfield Road, Hoddesdon, Herts. EN11 8QX.
CHESTER: A. Warne, G4EZO, 113 Queens Road, Vicars Cross, Chester. *(Chester 40055)*
CHICHESTER: C. Bryan, G4EHG, Marmanet, Salthill Road, Fishbourne, Chichester, Sussex PO19 3PZ. *(Chichester 789587)*
CIRENCESTER: M. J. Grierson, G3TSO, 9 Coneygar Road, Quenington, Cirencester, Glos. GL7 5BY. *(Coln St. Aldwyns 532)*
COLCHESTER: F. R. Howe, G3FIJ, 29 Kingswood Road, Colchester. *(0206 70189)*
CORNISH: N. Pascoe, G4USB, Bosuathick Farm, Constantine, Falmouth, Cornwall. *(Falmouth 40367)*
CRAWLEY: D. L. Hill, G4IQM, 14 The Garrones, Worth, Crawley, Sussex RH10 4YT. *(Crawley 882641)*
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London SE23 3BN. *(01-699 6940)*
DARTFORD HEATH D/F: A. Burchmore, G4BWV, 49 School Lane, Horton Kirby, Dartford, Kent DA4 9DQ.
DENBY DALE: G. Edinburgh, G3SDY, 37 Westerley Avenue, Shelley, Huddersfield, HD8 8HP. *(0484 602905)*
DERBY: Mrs. J. Shardlow, G4EYM, 19 Portreath Drive, Darley Abbey, Derby DE3 2BJ. *(0332 556875)*
DORKING: W. Blanchard, G3JKV, The Trundle, Tower Hill, Dorking, Surrey.
EDGWARE: J. Cobley, G4RMD, 4 Briars Close, Hatfield, Herts. *(Hatfield 64342)*
EXETER: R. Tipper, G4KXR, 11 Chancel Court, Chancel Lane, Pinhoe, Exeter. *(Exeter 68065)*
FALKIRK: B. Waddell, GM4XQJ, Carsemount, Polmont Road, Lauriston, Falkirk FK2 9QQ.
FARNBOROUGH: P. Taylor, G4MBZ, 12 Dunbar Road, Paddock Hill, Frimley, Camberley, Surrey GU16 5UZ.
FYLDE: H. Fenton, G8GG, 5 Cromer Road, St. Annes, Lytham St. Annes, Lancs. FY8 3HD.
GLENROTHES: Anne Edmondson, GM4TCW, 94 Prinlaws Road, Leslie, Fife, KY6 3BW. *(Glenrothes (0592) 744449)*
G-QRP: Rev. G. C. Dobbs, G3RJV, St. Aidans Vicarage, 498 Manchester Road, Rochdale, Lancs. OL11 3HE.*(Rochdale 0706 31812)*
GREATER PETERBOROUGH: F. Brisley, G4NRJ, 27 Lady Lodge Drive, Orton Longueville, Peterborough. *(0733 231848)*
GRIMSBY: G. J. Smith, G4EBK, 6 Fenby Close, Gt. Grimsby, South Humberside DN37 9QJ.
HARLOW: Hon. Sec., c/o Mark Hall Barn, First Avenue, Harlow, Essex.
HARROW: D. Atkins, G8XBZ, 25 Maxwell Close, Rickmansworth, Herts. *(0923 779942)*
HASTINGS: D. Shirley, G4NVQ, 93 Alfred Road, Hastings, Sussex. *(Hastings 420608)*
HAVERING: D. St. J. Gray, G1HTQ, 6 Devonshire Road, Hornchurch, Essex RM12 4LQ.
HEREFORD: F. E. G. Cox, G3WRQ, 35 Thompson Place, Hereford. *(Hereford 54064)*
HORNSEA: N. A. Bedford, G4NJP, 39 Hamilton Road, Bridlington, Yorkshire YO15 3HP.
LINCOLN: Mrs. P. Rose, Pinchbeck Farmhouse, Mill Lane, Sturton-by-Stow, Lincoln, LN1 2AS *(Gainsborough 788356)*.
MALTBY: I. Abel, G3ZHI, 52 Hollytree Avenue, Maltby, Rotherham, Yorks. *(Rotherham 814911)*.
MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham B32 1LB.
MORECAMBE BAY: W. E. Delamer, G3PER, 414 Heysham Road, Heysham, Morecambe LA3 2BL. *(Heysham 52659)*.
PLYMOUTH: A. Veale, G4SCA, Valley View, 26 Manor Park Drive, Plympton, Plymouth, Devon PL7 3HT.
PONTEFRACT: C. Mills, G0AAO, 27 Pendennis Avenue, South Elmsall, Nr. Pontefract, W. Yorks.
POOLE: P. Ciotti, G3XBZ, 214 Rossmore Road, Parkstone, Poole, Dorset BH12 2HN. *(0202 730012)*.
QTI-TNA: Hon. Sec., *c/o* QTI-TNA, 2 Cartmel Walk, North Anston, Sheffield, South Yorks. S31 7TU. *(0909 566301)*.
RAIBC: Mrs. C. Clark, G1GQJ, 9 Conigre, Chinner, Oxford, OX9 4JY.
RAOTA: G. R. Jessop, G6JP, 32 North View, Eastcote, Pinner, Middx. HA5 1PE.
REIGATE: T. I. P. Trew, G8JXV, Hoath Meadow, Church Hill, Merstham, Redhill, Surrey.
RUGBY: K. Marriott, G8TWH, 41 Foxons Barn Road, Brownsover, Rugby Warks. CV21 1LA. *(0788 77986)*.
SARUG: P. Newman, G4INP, 3 Red House Lane, Leiston, Suffolk IP16 4JZ.
SKELMERSDALE: G. Crowhurst, G4ZPY, 41 Mill Dam Lane, Burscough, Ormskirk, Lancs. L40 7TG. *(0704 894299)*.
SOUTH BRISTOL: L. Baker, G4RZY, 62 Court Farm Road, Whitchurch, Bristol, BS14 0EG.
SOUTHDOWN: T. Rawlance, G4MVN, 18 Royal Sussex Crescent, Eastbourne.
S.E. KENT YMCA: A. Moore, G3VSU, 42 Nursery Lane, Whitfield, Dover, Kent CT16 3HG. *(0304 822738)*
SOUTH MANCHESTER, D. Holland, G3WFT, 32 Woodville Road, Sale, Greater Manchester. *(061-973 1837)*.
SUTTON & CHEAM: A. Keech, G4BOX, 26 St. Albans Road, Cheam, Surrey.
TELFORD: T. Crosbie, G6PZZ, 41 Culmington, Stirchley, Telford, TF3 1UN. *(Telford 597506)*.
THAMES VALLEY: J. Pegler, G3ENI, Brook House, Forest Close, East Horsley, Leatherhead KT24 5BU.
THREE COUNTIES: R. S. Hodgson, G3TBT, 'Brackendene', Hollywater Road, Passfield, Bordon, Hants. *(042877 368)*
TODMORDEN: Mrs. J. Gamble, G6MDB, 283 Halifax Road, Todmorden, Lancs. OL14 5SQ.
TORBAY: B. Wall, G1EUA, 48 Pennyacre Road, Teignmouth, TQ14 8LB. *(Teignmouth 78554)*
VERULAM: H. Claytonsmith, G4JKS, 115 Marshalswick Lane, St. Albans, Herts. *(St. Albans 59318)*.
WAKEFIELD: W. Parkin, G8PBE, 14 Cleveland Grove, Lupset Park, Wakefield WF2 8LD. *(Wakefield 378727)*.
WELLAND VALLEY: A. Faint, G4TZY, 33 Fairway, Market Harborough, Leics. LE16 9QL. *(0858 62827)*.
WELWYN-HATFIELD: D. Fairbanks G0AII, 2 Sandpit Road, Welwyn Garden City, Herts. AL7 3TN. *(W.G.C. 326138)*.
WHITE ROSE: S. Clack, G4YEK, 40 Woodlands Grove, Harrogate, N. Yorks. HG2 7BQ. *(0423 884481)*.
WOLVERHAMPTON: K. Jenkinson, 10 Avondale Road, Wolverhampton, WV6 0AI. *(0902 24870)*.
YEOVIL: E. H. Godfrey, G3GC, Dorset Reach, 60 Chilton Grove, Yeovil, Somerset BA21 4AW. *(0935 75533)*.
YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

The Mill, Atwick Road, is home to the **Hornsea** group in East Yorkshire, where they are to be found every Wednesday evening.

Turning to **Lincoln** and their activities, we see they have Hq. at the City Engineers Club, Central Depot, Waterside South. December 11 is the Christmas buffet, with CW on December 4 and 18. The December 25 date is not surprisingly missed. More details from the Hon. Sec. at the address in the Panel.

Friday, December 27 is not taken up by **Maltby;** however you can still find them on December 6 for a computer evening, December 13 for a junk sale, and on 20th they have a social. Meetings are, in general, every Friday evening at Church Buildings, Church Lane, Maltby.

The **Midland** Hq. these days is Unit 5, Henstead House, Henstead Street, which is off Bromsgrove Street, Birmingham. It looks as though they are there on Tuesdays, but you should check this with the Hon. Sec. — *see* Panel for his address.

The **Morecambe Bay** area is served by the club of this name based on the canteen, Luneside Engineering Co., Mill Lane, Halton, near Lancaster; they get together every Monday evening, alternating Morse evenings with normal club sessions.

Sherwood Community Association is host to the **Nottingham** club. Meetings are on December 5 for a night-on-the-air, and on 12th they have a talk on the early days of PMR. December 19 is down for the Christmas party, and on December 26th it is inactivity!

Every other Monday evening the **Plymouth** club members head for Plymouth Albion RFC Hq. in Beacon Park, Peverell, Plymouth; December 2 is a talk on PCBs and their testing, and on 16th there is the club quiz and social.

Up in **Pontefract** the locals go every Thursday evening to

Carleton Community Centre, where they have a place on the top floor. More details on what goes on from the Hon. Sec. — *see* Panel.

For details of the **Poole** club we must refer you to the Hon. Sec. — *see* Panel for the needful gen.

The letters **QTI-TNA** mean QTI Talking Newspaper Association; this group records the contents of various magazines of interest to radio amateurs and sends them to blind amateurs world-wide. Obviously they can use some help, and so anyone interested should get in touch with the Hon. Sec. — *see* Panel for the details.

On a similar theme is **RAIBC** which is the club for the blind or disabled radio amateur or SWL; and needing of course the supporters and representatives who make it all happen. Again, details from the Hon. Sec. — *see* Panel.

Next we have the pleasure of mentioning the first *OT News*, put out by **RAOTA** — the old-timers club. If you can demonstrate 25 years of amateur radio activity, then you are a potential member of this one — and now they are talking about a 50-year register. Details from the Acting Hon. Sec., at the address in the Panel.

On the third Tuesday of each month at 8 p.m. the **Reigate** club meets at the Constitutional and Conservative Centre, Warwick Road, Redhill. December 17 is the Construction Contest.

Now to **Rugby**, where the Hq. is the Cricket Pavilion, BTI Radio Station, 'B' Building Entrance, A5 Trunk Road, Hillmorton, Rugby, every Tuesday. December 3 is a talk by Leicestershire Repeater Group, and on 17th they have the Christmas meeting; on December 31 they have an on-the-air session. Details from the Hon. Sec. — *see* Panel.

SARUG is the group for users of Sinclair computers in amateur radio. They put out a very good newsletter and have many useful programs available — well worth the cost of membership. Details from the Hon. Sec. — *see* Panel.

Now to **Skelmersdale** where the locals are to be found at Beacon Park Centre, Dalton Lane, on Thursday evenings as: December 5 a 'Technical Tips' evening, December 12 an activity night on ATV/SS/TV, December 19 a Christmas quiz and social. There is no meeting on December 26.

The **South Bristol** Group's Hq. is at Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol 14. On December 4 there is a lecture and on 11th they have an HF activity night; December 18 is Christmas 'Families Evening' and of course there is no meeting on 25th. We like the title of the meeting on January 1 — 'Hair of the Dog Night'!

At **Southdown** the locals are 'twinned' with Radio Club Normandie and so for the past decade or so the gang have exchanged visits, and the newsletter is full this time of various accounts of the last trip which seems to have been a winner. The main meeting is on the first Monday of each month at the Chaseley Home for Disabled Ex-Servicemen, Southcliff, Eastbourne, and in addition they have Tuesdays and Fridays at the Wealden District Council Offices, Vicarage Fields, Hailsham.

SE Kent YMCA letterhead has a sub-title 'Dover Radio Club' and they have Hq. at Dover YMCA, Godwynehurst, Leyburne Road, Dover; December 4 is a natter night, and on 11th the subject is microwaves. December 18 is a Christmas social event.

Every Friday evening you can find the **South Manchester** crowd at Norris Road Community Centre, Norris Road, Sale — no current programme details are to hand.

The Downs Lawn Tennis Club, Holland Avenue, Cheam, is the home of the **Sutton and Cheam** group; December 2 is a natter evening in the Downs bar, and December 20 a Christmas get-together in the club room.

Now to **Telford** and Dawley Bank Community Centre, Bank Road, Dawley, Telford. December 4 is a natter and committee evening, and 11th a club project night — as indeed is 18th when they hope to complete the job. That leaves the December 20 Christmas social, wining and dining at the Station Inn, Horsehay, Telford.

Thames Valley meet on the first Tuesday of the month at Thames Ditton Library, Watts Road, Thames Ditton. The theme is a talk and discussion on QRP.

Next we have **Three Counties** which has its base at the Railway Hotel; Liphook, Hants. More details from Hon. Sec., *see* Panel.

Up in **Todmorden** December 2 is a 'seasonal social', and December 6 an informal chat night; both are at the Queen Hotel, Todmorden.

Nice to hear from the **Torbay** scribe that even if *he* is out of sync., the club is doing fine! December 21 is the date at the Social Club, Ringslade Road, Highweek, Newton Abbot, for the club party; but for the other meeting we aren't sure whether it is a Thursday or a Friday — so talk to the Hon. Sec. at the address in the Panel to be sure.

Just for this month, **Verulam** change their dates to the *first and third* Tuesdays at the R.A.F. Association Hq., New Kent Road, St. Albans. This is to avoid losing a meeting to the Christmas rush. December 17 is the AGM and will be followed by an informal social evening.

The **Wakefield** members are looking forward to more demonstration station activities as they have replaced the old FT-200 by an FT-101ZD — you can no doubt get a sight of this beast by calling at Ossett Community Centre, Prospect Road, Ossett, on December 10, if you can stop the party for long enough!

The **Welland Valley** club assembles at Welland Park Community Centre, Market Harborough, every Monday; the arrangement they try to stick to is that they have at least one formal meeting, with video, or speaker, or a visit. Details from the Hon. Sec. — *see* Panel.

The Hq. of the **Welwyn/Hatfield** group is not mentioned in the latest letter, so we must refer you to the Hon. Sec. — *see* Panel.

Every Wednesday evening it still is for the **White Rose** club, nowadays based at Moortown RUFC, Moss Valley, King Lane, Leeds LS17 7NT. December 4 is the junk sale, and on 11th they have an AFS briefing. December 18 is a natter night, and they will have the shack open on both Christmas Day and New Year's day. There was also talk of a Christmas dinner-dance, either on December 6 or 13th.

At **Wolverhampton** the locals have a place at the Wolverhampton Electricity Sports and Social Club, St. Marks Road, Chapel Ash. December 3 is a junk sale, and on 10th there is a committee meeting. December 17 is a social evening and there is no activity on Christmas Eve.

Yeovil has a place at the Recreation Centre, Chilton Grove, Yeovil, where they are to be found every Thursday evening; December 12 is a talk on 'Thick Film Hybrid Circuits' accompanied by a video but without maths and given by G3ETA. December 19 is down for G3GC to give a talk on AFS and its history, and operating techniques. December 26 is a natter night.

For the **York** lads, the routine is to head for the United Services Club, 61 Micklegate, York, every Friday evening. We don't have any current programme data as we seem, surprisingly, to have fallen off the mailing list! Details from the Hon. Sec. — *see* Panel.

Wrap-Up

The bottom of another pile. Once again, your information for the February issue should arrive by the early date of **December 19th** (we should already have your January issue input!) and be addressed to "Club Secretary", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. See you next time,meantime don't eat too much!

R.A.E. and CW Courses

Greenhead College, Huddersfield, is to run courses for the R.A.E. and CW Test, commencing January 6th. Further details can be obtained from Kirklees Adult Education Office (Huddersfield 538454) or from course tutor P. Mercer, G6CPM, on Huddersfield 533036.

READERS ADVERTISEMENTS

10p per word, minimum charge £1.50 payable with order. Add 25 per cent for Bold Face (Heavy Type). Please write clearly, using full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box numbers 80p extra. Send copy, with remittance, to the Classified Dept., Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ. Prices include VAT.

Copy must be received by December 13th to be sure of inclusion in the January issue, published on December 31st.

READERS

Wanted: Another WS No. 19 Set, complete installation required. Full details and price please. (Durham) — Box No. 5817, Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

Sale: Trio R-600 receiver, 6 months old, hardly used, £200 or near offer. — Ring Darbyshire, Chorley (02572) 73235.

Offering: Swan 350 with matching PSU/loudspeaker, in practically mint condition, one owner from new, very little used (history available), sensible offers please. Or *exchange/part-exchange* lightweight British motorcycle in good running order (might even consider Honda CD200 if one owner and immaculate). — Ring 07593-408 evenings/weekends.

For Sale: Gemscan 70 computerised digital scanner, 60-512 MHz, plus tape recorder and base antenna, £210. DX-302 digital receiver, 0-30 MHz, with pre-amp., amp., and base antenna, £195. Ten-metre transceiver, repeater, with B.N.O.S. PSU, power antenna and 2m. converter to 10m. Datong, £95. — Ring Bailey, 0722-22646.

Selling: Heathkit HW-100 transceiver, 10-80m., 150 watts SSB/CW, in good working order, needs new PA valves, £80 or near offer. *Wanted:* Circuit diagram or any other information about Heathkit RG-1 general coverage HF receiver. — Botterill, G4EPO, QTHR. Tel: St. Albans (0727) 36201 after 6 p.m.

For Sale: Trio TS-830S, new August 1985, £700 or near offer. Trio R-2000 Rx, new fitted VHF converter 118/174 MHz, £400. — Ring Chalkley, G4BXR, 0908-566266 after 6 p.m.

For Sale: RA-17 receiver, £150 or near offer, plus carriage. *Still wanted:* FT-707 dead, alive or in need of t-l-c. — Ian, G3ROO, QTHR. (Tel: 0304-821588).

Wanted: Murphy Type 618 Tx and PSU; Marconi Elettra Rx; Type 889A or 966A power unit with plugs. — Ring Pete, G4FUY, Reading 733633.

Selling: Yaesu FT-902D 9-band transceiver, all modes, FM, etc., mint, plus S.E.M. Transmatch, two 6146B's, two 12BY7A's, spare unused valves, manuals, £550. Buyer collects or carriage extra. — Ring Rowland, G3TFN, 061-761 2952.

January issue: due to appear on Tuesday, December 31st. Single copies at £1.60 post paid will be sent by first-class mail for orders received by Friday, December 27th, as available. — Circulation Dept., Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

For Sale: Sony ICF-7600D receiver, FM/LW/MW/SW, PLL synthesised, mint condition, £95 negotiable. — Ring Friel, 01-388 2424 (ext. 2080) daytime.

Selling: Collins UHF communications receiver, 200-400 MHz, with manual/circuits, £100. Frequency meter/signal generator, 20-300 MHz, £60. Avo valve voltmeter/electronic test meter, with manual, £60. Carriage extra, s.a.e. with enquiries please. — Hayward, "Sunnyfields", Lighthouse Road, St. Margaret's Bay, Dover, Kent.

Wanted for collection: German military radio equipment of W.W.II vintage (receivers, transmitters, accessories, parts). — Box No. 5818, Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

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Printed by K&SC Printers Ltd., Tunbridge Wells for the Proprietors and Publishers, The Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ. The *Short Wave Magazine* is obtainable through the following: Continental Publishers & Distributors Ltd., William Dawson & Son Ltd.; AUSTRALIA AND NEW ZEALAND — Gordon & Gotch Ltd.; AMERICA — International News Company, 131 Varick Street; NEW YORK. Registered for transmission to Canada by Magazine Post. *December 1985.*