December 1985

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G4 QK looks at Single-Valve Transmitters

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# SHORT WAVE MAGAZINE

(GB3SWM)

ISSN: 0037-4261

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**Editor: PAUL ESSERY, G3KFE/G3SWM**  
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**AUTHOR'S MSS**

Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of A4 sheets. Photographs should be lightly identified in pencil on the back with details on a separate sheet. All drawings and diagrams should also be shown separately, and tables of values prepared in accordance with our normal setting convention — see any issue. Payment is made at a competitive rate for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on publication.

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THE SHORT WAVE MAGAZINE
December, 1985
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
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 particular but in general have shown the classic pattern — conspicuous by their absence, the bands in probably complete on Christmas Day!

My natural pessimism hints the hopes that all this activity will bring us preparations

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

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Comm. and DX News

E. P. Essery, G3KFE

December, 1985
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 DJOP/MM at Port St. Cyprien in the Mediterranean, EA6NB, EA6DZ, HW4SM (a French 'special'), H21HZ (Ahmed, first worked some 35 EA6DZ, HW4SM (a French 'special'), contacts with DJOP/MM at Port St.

THE SHORT WAVE MAGAZINE

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, VK6AGK, 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 N41XIM, KA2YRM, WA2IKR, K7GN and VE1ALZ.

New Bands

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Nice to hear again from DJ6FO (Bad Bodendorf) who just scraped in on the key.

“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

Committee, 160 Contest, 225 Main Street, Newtonville, CT 06111, U.S.A.

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, Contest Calendar of W 1 WY; Frank has been passing these on to us for two decades now, and to Q6QF 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.
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 10016 kHz.

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 DX/NS 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 ZS6G, KL7s, W6s, TG9VT and lots of W/VE. Sadly the BY and the HSO stations were missed. On 7 MHz, Steve made it to 9C on this band; overall the best included VK9NH/Lord Howe Is., VP2EC, CE8ABF, 6Y5RP, AA4VK/J6L, OH1RJ/C56, ZY5EG, ZS6G, K7s, W6s, TG9VT, VKs, VP2MU, YS1RRD, 8P6AG, P48K, P44B, 9Y4VT, HC8X, HP1XXO, VP2VCW, TI2CC, FMC5L, VP2AD and J78A.

Now we have the letter from Dieter, DJ6FO 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, RL8YPL, WB7RFA/V2A, VP2MW, TG9VT and lots of W/VE. Sadly the BY and the H5O stations were missed. On 7 MHz, Steve made it to 9C on this band; overall the best included VK9NH/Lord Howe Is., VP2EC, CE8ABF, 6Y5RP, AA4VK/J6L, OH1RJ/C56, ZY5EG, ZS6G, K7s, W6s, TG9VT, VKs, VP2MU, YS1RRD, 8P6AG, P48K, P44B, 9Y4VT, HC8X, HP1XXO, VP2VCW, TI2CC, FMC5L, VP2AD and J78A.

Now for G4OBK. Phil worked 4U1ITU and UA2FP on 80m, CW plus SSB to CT2CQ, YV5A, HP1IXXO, 9Y4NP, CN2AQ, AP2PQ, H931HICQ, VP2EC, WB7RFA/V2A, PJ2FR, N2AA and LX9BV. Going to Forty, the CW was used for SV1R/P7, UG6GdB, UF7YWG, and ZS1HH; SSB accounted for 4M2NY (a YV), 9Q5MA, CT2CQ, VP2EC, VP2MW, VP2ET, TI2CC, 9Y4VT and VP2AD.

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, JA2EPEW, JA3FYC, JA4GI, JA6JPS, and UA0LT. SSB on Eighty meant AP2SP and VK2AVE, while on Forty CW went to ZL2LI, ZL4AW, ZM2BUI and CO6ER on Phone which was nothing of interest.

Now we must mention G3ZPF (Kingswiford) 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 items of news, the first of which is that Don managed to hook CTC2Q, G4BWP/V9P, H80/DL1F/8, HK7PV, J88BK, N3RD/V9P, NA7E (Arizona), NA5M, VP2MU, VP2VCW, East Coast Ws, W3MA/V9P, W5GX (New Mexico), XE1JJW, 8P9AK, and 9Y4CK. Conditions were a bit unmyty on Twenty, but Don managed to hook CTC2Q, G4BWP/V9P, H80/DL1F/8, HK7PV, J88BK, N3RD/V9P, N8ET/V9P, N6RO, U05QG, V44KL, VK3AH, VO2CP, VP2VCW, VP2/KQ2M, VP9AD, W5XZ, 6Y3M, BR/1 and 9Y4VT, even though Don was limited by the fact that his beam cannot be rotated as the rotator is u/s.

G0BHK found on Phone DL1FZ/SV9, KL7Y, K32O, K2WK, W8TWA, CN8ES, W3JPL, and VP2MW, plus CW with N7DF/T88, W9GW/E9A and W1Z2W, all on 14 MHz. On 21 MHz, it was all CW, including W1CCN, W3VT, VE3NJX, 3XONAB, W9GW/E9A, KAS3DRR/DV2, and OK4CYQ/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.

GW4BWE next; Steve quoted his list severely and only mentions his contacts with TR8JLD, KA8GVS/KH2, KB6DAW/KH9, VK9XZ, 9U5JB, HC8X, JW5E, 8R1Z, AP2ZA, C6AEY, plus some JA5, 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, DK9XK/S9, J28EI, Z21, A92, 7PBCH, 3D6AK, JY, A4, ZF2FI, 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, VP3B, P48, HC8X, FS, 9U5, A71, and 3BS 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/T88, while the same...
mode on 21 MHz gave FM5WD, 6W1AE, N3RD/VP9, 3B8CA, UJ8JA, 9J2BO, 5B4DN, 3D6AK, ZSs, UO5OO, ZB2EO, G6ZY/EA6, CP61B, 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, K6FM/PJ5, VP2MW, JW0A and CT2CQ. On 21 MHz contact was made with CX3AAM, I28EL, W6KG/ZS, ZD7JJM, PZ1DV, PJ7A, VP9AD, VP2CW, P43A, UG7GWL, 6Y3M, HH2WL, 9Y4VU, J87DX, W8HRV/6Y5, W5WMU/C6A, P48K, HB0BHA, CO2BB, HC8X, YB3DAI, JA4BVH/MM, UV9XD, UH8EA, ZC4AK, U9JW1, DK9KX/59, 3D6AK, JY9MG, A4XYX, ZP5CF, 9J2BO, JG1FVZ/5N25, V44KK and some ZSs.

GOBPS 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, VE9FJ, FY5YE, and CO7JC, while a stint on Phone on 21 MHz resulted in contact with VP2VCW, VP9AD, 4X5NM, H31HZ, 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). 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 amateur-science hobbyist. I had any

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.

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 than ever 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 GIFTU RTTY for Spectrum 48k. 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.

GIFTU 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 GIFTU 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 GM4AANB 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. Of all Basic extensions on the Spectrum I have found this the most powerful and easy to use.

That's all for this time. 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, Derbyshire, 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 5½" x 4½"). 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 ¾" and a length of 3½"; 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 ⅛". 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 1¼". 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.

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

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...
The 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 CHRISS 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 me 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 Crystal 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 transmitter 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:
80M. 10W CW TRANSMITTER: £29.95 (£1.00 postage). Chris Moulding Radio Services, 276 Hulton Lane, Bolton, Lancs. BL3 4LE. (0204-651348).

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*SHORT WAVE MAGAZINE LTD., 34 HIGH STREET, WELWYN, HERTS AL6 9EQ*
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 4-1800A 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 transmitters. All of these would have been crystal-controlled, using the triet 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 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.

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 capacitively (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
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 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.

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 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
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 ultimate in break-in switching by this method, is described on page 8.17 of the handbook already quoted.

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**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...
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 coax; this is an excellent match to the dipole. The same coax 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 to 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 coax and supported in the clear.

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 2.2µF 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.
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 confirmed 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 monthly 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 ENOA--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 pigeon holes used at the Viennese (OE1) sub-bureau which is run by members of the local branch of the ÖVSV (Austrian national radio society).
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UBSMCI 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 UBSMC1 goes on to say that most stations had a maximum of 10% "unconfirmed" contacts.

Two of UBSMC1’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 OF1 QSL bureau.

‘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 oblast 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 fairer 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 “All-Time” figure on the basis of the 184 ‘current’ oblasts and “1986" score as your oblast target for “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 UK2FO. 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 multiband 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 W6TW 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 periodicis, and N4LJ 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 Ile 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 adaptations 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; troposscatter path loss, line-of-sight and troposscatter 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 Bragan, GM4HJ, 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, Miscellaneous, 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 Adaptations, 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$, LEFTS, and RIGHTS string functions to the string slicing used in the ZX Spectrum; e.g. MID$(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.

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**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 slam 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 (tel: 077473-4998) 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).
**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!

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
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 it 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.

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

Fig. 2 CIRCUIT DIAGRAM OF THE 'KOWLOON' TRF

Table of Values

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
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<tbody>
<tr>
<td>R1</td>
<td>2K7</td>
</tr>
<tr>
<td>R2</td>
<td>3K3</td>
</tr>
<tr>
<td>R3</td>
<td>470K</td>
</tr>
<tr>
<td>R4</td>
<td>220K</td>
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<td>R5</td>
<td>4K7</td>
</tr>
<tr>
<td>R6</td>
<td>100K</td>
</tr>
<tr>
<td>C1</td>
<td>100pF min. cer.</td>
</tr>
<tr>
<td>C2</td>
<td>100pF min. cer.</td>
</tr>
<tr>
<td>C3</td>
<td>100µF, 25V elec.</td>
</tr>
<tr>
<td>C4</td>
<td>0.01µF min. cer.</td>
</tr>
<tr>
<td>C5, C7, C8</td>
<td>0.1µF min. cer.</td>
</tr>
<tr>
<td>C9</td>
<td>1nF min. cer.</td>
</tr>
<tr>
<td>C10</td>
<td>9V 0.1W elec.</td>
</tr>
<tr>
<td>C11</td>
<td>47µF, 16V elec.</td>
</tr>
<tr>
<td>C12</td>
<td>470µF, 16V elec.</td>
</tr>
<tr>
<td>RV1</td>
<td>1K lin. pot.</td>
</tr>
<tr>
<td>RV2</td>
<td>5K log. pot.</td>
</tr>
<tr>
<td>VCI</td>
<td>25pF airspaced variable</td>
</tr>
<tr>
<td>TRI</td>
<td>2N3819</td>
</tr>
<tr>
<td>TR2</td>
<td>BC171</td>
</tr>
<tr>
<td>ICI</td>
<td>ULN2283</td>
</tr>
<tr>
<td>SW1</td>
<td>4 -pole, 3 -way wafer switch</td>
</tr>
<tr>
<td>SW2</td>
<td>switch on VR2</td>
</tr>
<tr>
<td>LI/L2</td>
<td>slow-motion drive = 6:1 reduction</td>
</tr>
<tr>
<td>L1/L2</td>
<td>see text</td>
</tr>
</tbody>
</table>

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.
from Kent, It is GB3NWK (JO01BI) and equipment is under construction. Yagi. He is QRV on 70 cm. and 23 cm. VXO and QQE06-40 PA. The Rx RF stage countries on the band, best DX being likes contests and has 92 squares and 20 CW DX on the VHF/UHF bands. Witold licensed in 1956 and his main interest is the 144 MHz VHF Century Club. He was late on his becoming member no. 378 of from Tychy in Poland whom we congratu-

... 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 QOE06-40 PA. The Rx RF stage is a BF990 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 (J001BI) 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 DI mission would likely be launched on Nov. 27. That was based on information from the NASC. However, it seems they got their missions mixed up. In an October press release, the RSGB's publicity manager is Chris Young, G4CCC.

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 GW8TF1/P (GW1). 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 DF7YX (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 RAFF Swanton Morley Radio School, 1946-51, when it was No. 4 Radio School. Keith Hewitt, GD6ER, (YSS) worked DL2KAL (DK), DJ6JJ (DL) and PE1GHG and ON600 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:—

<table>
<thead>
<tr>
<th>Month</th>
<th>Issue Date</th>
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<tbody>
<tr>
<td>January</td>
<td>December 4th</td>
</tr>
<tr>
<td>February</td>
<td>January 8th</td>
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<tr>
<td>March</td>
<td>February 5th</td>
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</tbody>
</table>

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 Toulaheo, G8AAP, is now QRV on 13 and 23cm. from a new QTH in AN61 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 HB9CV/C/P (DH), and on the 10th and 13th, John contacted many Fs, plus G3YVB (CNL) for a new square. The 16th brought GM, GI and HB9 QSOs and O2EKM/K (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 (YL) on the 1st. He was on in the October, showing five Dutch stations and sent a photocopy of his extensive log for correspondence relating to 70cm. and 2m.

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), F6CIS (ZE) and FS6C1 (ZE) on the 13th, GI6OPH (XO) on the 16th, but lists his best DX as O2EKM/K, O2ECA/L, 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 ON600, the first Belgian this year. Some choice QSOs from his log include DK2NH (FN) on Oct. 1, FBUUZ (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, G1J4CD, 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, 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, ZG and ZH; a GU station and HB9AMH/P. GW4LXO also 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 DFSQI (EO) and DC9XO (EM). Kelvin Weaver, GW4TTU, (GWT) lists five Fs and HB9AMH/P on the 13th, LA6HL (CS) on the 24th and DFSQI, PE1GHG (CL) and PA0RDM (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, G60ZH, (HWR) and G6YLO, it seems that conditions were reasonable with F, PA and HB9 QSOs made. G6YLO includes LX0RA, LX1JLP, 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, G66KM, (ESX).

On the 10th, G1J4CD worked EA1BLA (VD) and new reader Keith Boleat, G1J6TMM, worked EA1OD (XD) using a Yaeus FT-790R at one watt to a 24-ele. Parabean, 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 (EO) by Paul Brockett, G1LSB (KNT), G3XDY, G66ML and John Pilags, G8HHL, (PHP).

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

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... we're looking forward to a grand old-fashioned Christmas as usual...
BLA, CYE, ED, NU, OD and TA in WD and XD, and EA2s AWD and LP in ZD, also EB1MS/P (XC). The Swiss stations were HB8s 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 G6DZ 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 OE30BC (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 Y36ZX/P, Y37Q and Y23K/K (FK) and Y25GI/P (FL) on the 12th.

On the 13th, G4NBS had 37 QSOs with stations in nine countries and 23 new squares. G6HKK reckons the Class B morse variation leave periods. Lastly, Colin Morris, ex-GNW (GNW) who was now joined the RAF so will only be QRV at odd weekends and evenings. Other readers whose letters appeared in readers' lists were G1KDF, G1LSB, G3XDY, G6YLO, G8HHI, G8PNN, Tony Frost, G4DCV, Graham Taylor, G4JZF/P (GNM) and G4OUI, (NOR), G8HHI and G4TW D (JX).

G4JZF/P worked into 15 squares in the D, E and F gines 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 (WQ90g) was widely worked in this period. G1KDF, GILSB, G3XDY, G4TIF, G4XEN, G6HKKM, Richard Mason, G6KHS, (NOR), G8HHI and G4WTU 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 GILSB, G4RGK, G4TIF, G4XEN, G6DZH, G6HK5, G6MGL, G6WZO, G8HHH, Julie Yates, G8MKD, (WMD), G8PNN, G4W4LXO and G4WTU. 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 AQ5T/P in the HK, the OE also being worked by G6MGL and G8HHH.

Finally, a welcome note from Claus Neie, DL7QY, (FM16e) who reports working many Gs in the Oct. 12-15 period, best DX being GW8ELR (XL), G0AYM (GX) 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 Londog 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. G6TMM worked Fs in AF, AG and ZE, and EA1DQ (XD) and EA1KC (XC). GW8VHI got EA1BLA and Reg also worked this station on the 11th.

On the 11th, G4DCV to HB9BZA (DQ), G6DZ to EI4FO (WM), G4J4ICD to OEs UKL and GDL (GI) and G6TMM to HB9s RSQ (EH) and SNR (DH). Plus Fs in AF, BF, BG, CF, CF, DF, DE 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 (XO), TA (VD) and DDU, EB1MS/P (XC) and EA2ZGE (ZD). Some OEs were working including 2E1N, SMKMK and S5DL in HI, 9BBH (EH) and 9BBX (GH).

There was a German contest on the 11th so more than the usual number of Ys were contacted in the FK, FL and FM squares, and Ds in F1 and FJ. A few worked OK1OA and OK2BWY/P (HK) and OK1FAYV (GK). LX2GB (GFDX) was in some lists. From Jersey on the 13th, GJ6TMM worked a number of OZs in EQ, DH0HRAR (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 3CN8, 5FK and 9GA in VL, 3FX/P, 7FS and 9FE in VM, 4AQB and SAOB in VN, 8EF in VO, 2EZ/P, 6LVE and 7B7IB in WN and 9HF 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 SF6ASD (HJ) on CW too. Only Mark Page, G1ECG, (BKS) noted any DX for
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, UQ2GCJ (KQ) on SSB, SP2DXL and SP2FAV in JO, SP4DCS/4 (KN) and UA2WJ (KO) which is a separate country, all on CW. G4XEN called "QO" on CW in the afternoon and was answered by UP2BEA (LQ) at 1604, the QRQ being 1,586 kmps. 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 IQ 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 some OK portables in HK worked. G3PBV worked SP1PDA (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, G4SFW, (NOR) also worked several Poles: SP1II (IO), SP1PDA, SP6ASD (HL) and a couple in JL, SP3s MFI and JBI, while G4XEN managed SP1PDA, SP5BDC and SGTI in KM and SP2YJR (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 G3XGDY 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, G4SFW completed on CW with YU7MS (KF) on Oct. 19 at 2000-2100, 10b, 6p. Ian Parker, G4UZY, (HFD) completed his Saturday skeds with IØLGP on Oct. 12, 19 and 26. On the 20th, he was successful on CW with O8SOKS (IH) but did not complete with OH6A1 (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 G4QHFC and made 19 QSOs before the PA died. He has reserved the call G4MMT 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 G4UZY were G4KMG (AVN) on the 13th, G3TWG (BKS) and G3V1P (HRS) 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/AP (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 5B4C4Y now that would have been DX! Presume MS" sounds a bit far-fetched to your humble scribble.

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...
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. JOT7 stations QRV were G44FHC in Nuneaton, GB2HSG in Upminster and GB4SGB in Bromley. From Gwent, Dave Lewis, GW44BK, worked GU2HML and G3PGN (ESX) on the 13th, G5DOA (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, and all can be stated at present. Little news from readers. G4NBS has a 4-ele. beam aloft but has to BCI-proof the neighbours. G4NRFg has a 5-ele. Tonna Yagi and has receive capability on the band. On Nov. 2 at 11.30, Roger heard ZB2HF 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. GM6BDX 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, G41GO, has heard from Johannes Baardsen, LA6HL, that TFI3LJ 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, G1DWO, (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, (DNV) reckons Maidenhead is catching on for E-M-E and the satellites and was used on those transatlantic 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, ON9K and TF3KB? Surely, unless such worthy folk are as dedicated and而去 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 Dabbney, 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 notion of forming 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...
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 inaugurated 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 for the organisation, headed by Section Managers, who are unpaid volunteers, and some of them began to manufacture equipment specifically aimed at the new amateur radio market.

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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:—

"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, KSCH 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 for amateurs, 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. The DXCC Desk is staffed by a very busy department, with maximum effort required to keep 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 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 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
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 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 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
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 G3LGC, GM3GJB, G4CP and G3OHP.

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

Operating at the W1AW visitor’s position: above, Colin Turner, G3VTT, and below, Chris Page, G4BUE.
**CLUBS ROUNDPUP**

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, Birstow 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 noggins-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 dinner 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.

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 Fairytynes 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.

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

Deadlines for “Clubs” for the next three months—

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Please be sure to note these dates!
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.

Meeting are, December 13 for a junk sale, and on 20th they have a social.

Turning to Lincoln and their activities, we see they have Hq. at

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 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

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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 worldwide. 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, Himmorton, 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 Chasely 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, Godwynhurst, 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, winning and dining at the Station Inn, Horasehay, 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.

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.

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

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.
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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, G3RO0, QTHR. (Tel: 0304-821588).

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


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