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(GB3SWM)

ISSN: 0037-4261

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Advertising: Charles Forsyth

Published at 34 High Street, Welwyn, Herts. AI 6 9EQ, on the last Friday of the month, dated the month following Telephone 04-3871 5206 & 5207

Annual Subscription:

Home: £9 60, 12 issues, post paid
Overseas: £9 60 (\$17.00 U.S.), post paid surface mail

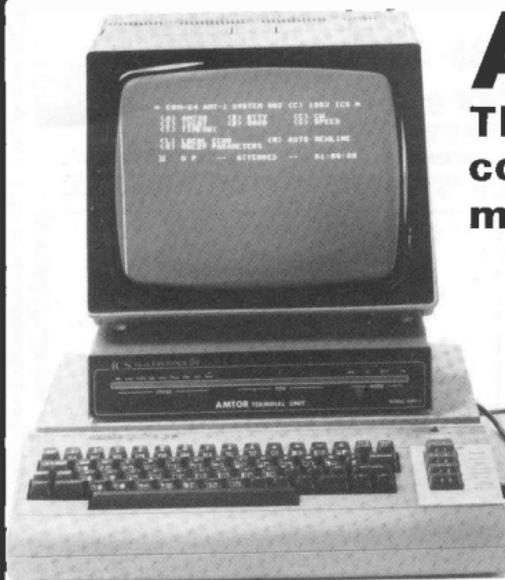
Editorial Address: Short Wave Magazine,
34 High Street, Welwyn, Herts, AI 6 9EQ, England.

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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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AMT-1

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The I.C.S. AMT-1 AMTOR/RTTY/ASCII/CW Terminal Unit is extremely powerful in its own right, but combine it with a Commodore 64 computer and our new split screen program and it forms probably the ultimate amateur radio data communication system.

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EVEN W1AW IS NOW SENDING NEWS BULLETINS ON AN AMT-1!

This is what an independent test laboratory in America said of its AMT-1 performance — "I have a rather expensive commercial SITOR/FEC system, actually two of them (Phillips and RCA) and your AMT-1 tends to maintain as much as 10 per cent less repeat exchanges, which is quite significant. I have compared your system with HAL's new entry, a prototype of some, and with the Microlog software for the 6800, and as far as I am concerned, there is no comparison, as your unit far outperforms them. I use baud optimised terminal units and under adverse conditions with injected noise transients, I have yet to see more than five per cent additional hits with your system compared to the standard I am using. Mind you, this is comparing it with a \$2000 plus terminal unit!"

Copies of the unsolicited letter from which this is extracted are available on request. On normal RTTY, the AMT-1 has been described as being "as good as HAL." G3PLX (who coined the term AMTOR), took three years to write and prove the software in the AMT-1 and to the best of our knowledge, no company has written comparable software which is bug free. For the moment therefore the AMT-1 is the definitive implementation of AMTOR. Others are trying to emulate it, but still have a long way to go!

To make using the AMT-1 even easier, I.C.S. have recently commissioned a really professional software package for the COMMODORE 64. At present this computer is probably the best value for money for use with the AMT-1. Among the features the program offers are: Split Screen with transmit buffer; Message Editing, Multiple Message Storage; CW Ident, RY, CO, QBF; USOS and Automatic Operation. The system can even store and acknowledge messages whilst you are getting on with other things in the shack, with no human intervention! SIMILAR SOFTWARE IS AVAILABLE FOR THE BBC MODEL B MICRO

For £55.00 including VAT, you get a manual, the software in a cartridge, an interface cable with built-in RS232 drivers (for RFI immunity) and labelled keyboard overlays. You can use your computer for other applications simply by unplugging the software cartridge.

The price of the AMT-1 is unchanged at £269.00 inc VAT, and with its built-in tuning and status indicators; four section audio filter/discriminator and crystal controlled tone generator, offer superb value for money. Incidentally, the AMT-1 will work with any computer or terminal which has a 110 or 75 Baud serial RS232 interface.

For those still unfamiliar with AMTOR, it is a unique, error correcting data communications system which gives perfect copy through Noise, QRM and fading. It is on the way to replacing RTTY in Amateur applications, just as it already has done in marine ship-to-shore applications (termed SITOR in this instance.) Once you try it, RTTY will never be the same again!

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AMT-1 Specification Summary

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 AMTOR (FEC mode)
 AMTOR (mode L) — ARQ listen
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YAESU

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FOR THE RADIO AMATEUR AND AMATEUR RADIO



EDITORIAL

"Practically Yours"

A lot of people have come into the ranks of radio amateurs in the last few years who have very little technical background. Many of these new operators are mainly interested in the communication side of the hobby but an increasing number would like to get down to some constructional work. The problem is simply finding a source of information that is written in a simple, straightforward way and can be easily understood.

"Practically Yours" is our answer to your problem. This new, monthly feature starts in the next issue and will cover everything from DC to Microwaves, from earth systems to aeri-als, and will do so in a practical fashion. It will not be a 'blow-by-blow' description of every nut and bolt and it will assume an ability to use basic hand tools and simple test gear. Circuits diagrams and physical layouts will be provided, plus setting-up instructions, if required.

To make the series of even more use to you we will be using readers' requests as the basis of some of the articles; but please do not ask for constructional details of a complete transceiver as we shall leave that to the specialist contributors.

This new series will be written specially for us by Glen Ross, G8MWR. His background in amateur radio starts in 1948 when, amongst other things, he became a member of *S.W.M.*'s 'VHF Listeners' Club'; 36 years later, he is known as an enthusiastic operator on the VHF and Microwave bands and a great believer in the use of the soldering iron. His professional background includes a B.Sc. and over 30 years as a development engineer in the radio communication industry, both here and in the U.S.A.

We feel certain that you will find this new series both interesting and instructive. Please let us have your ideas as to what you would like included; and remember, a little bit of work and it's "Practically Yours"!

This is the first issue of Volume 42 of *Short Wave Magazine* (it's sometimes hard to believe that we've been going so long—which is one significance of the valve on the front cover!) and so, also next month, we shall be announcing the winner of the Volume 41 article competition—and this year it's proving a very difficult choice.

W. J. R. K. F. E.

WORLD-WIDE COMMUNICATION

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

WHAT can we say about January, radio-wise? Not a lot for myself, at least as far as the low bands go, if only for the reason that the gales caused a chafe on the 'continuous halyard' arrangement and so contrived to gently lower the whole shooting-match to the ground. Satisfied, the Clerk of the Weather then called-up the snow to cover everything up and hide the real reason from the casual eye. Hence, I jumped to the conclusion the wire had broken in the gale, and didn't even go to investigate until the snow had melted... the sub-title for this little tale might well be: "Don't do as I do, do as I say"!

The Bands

As ever, the curate's egg — and, incidentally, the original *Punch* cartoon whose caption is so often mis-quoted (as we have just done!) re-appeared in their Christmas number.

At this level of sun-spots normally we would have thought DX on Ten would be pretty well non-existent; but usually a big contest will scare up some contacts, and the FM chaps are still having the odd QSO across the pond on converted CB rigs, though most of the long-distance contacts are north-south. Down through the bands, by 2000 Twenty can usually be reckoned to be deadish, with 7 MHz quite the reverse; Eighty its normal self and Top Band producing various interesting QSOs after dark.

Let's start a little browse round the bands then. . . .

Eighty

G2NJ (Peterborough) reckons that January 13 was the star turn from the DX point of view on the band; Nick was first alerted by hearing Y20M/A working JA1CMN, then VE1ALJ, followed by ten more JAs up to 2207 when Nick had to leave the receiver. On a totally different tack, G2NJ noted that G5YK (Southwold) still uses a 1918 'pump-handle' for his Morse — and it sounded grand. Nick also passes on the news that the TOPS CW Club net on 3592 kHz is being extended (this is the European one); net control between 1930 and 2030 is with G4RAR, and G4GBG takes over the chore between 2030 and 2130 when they close down. The times are 'clock' by the way, and other U.K. stations are welcome to join in.

For G4LDS (Chelmsford) the main eighty-metre activity was by way of discovering a patch of the country from which no signals are heard — while signals nearer at hand and further away are

received OK. Chris says that a station local to him is not having problems in finding signals in the 'dead area' so it would seem reasonable to deduce that it is all a question of the way the inverted-vee radiates better in some directions than others.

Nice to hear again from G2HLU (Earley) who mentions just one notable QSO on Eighty — this was with G4VJQ/A, who had been licensed just six days and was making his first ever CW QSO — which gave Harold nearly as much of a thrill as it was likely G4VJQ/A was getting!

G4SXE (Rolleston) says he has been receiving some good advice from Harold, G3ACR, who suggested coupling into the ATU with a screened coil coupling link; the result of this was a vast improvement, leading to QSOs with DL2ZAE, HA8BJ and UK2BGL for a couple of new countries, the total countries score rising to 18. Another pleasant QSO was with G4ERT in Leicester.

The listings from D. A. Whitaker (Harrigate) are those of a real dyed-in-the-wool DX SWL; David's list is too long for us to reproduce in full, but we notice around tea-time (SSB) ZL1AMN, ZL4BO, JA6XMM, JA6BJT, JR6YAH, JA3HYF; 6W1DY as an appetiser for dinner, HZ1AB and VK3DUP as the main course, plus 4S7, 5B4, 9K2DZ, Asian Russians, 3V8PS, TR0AB and A71AD which circulated with the port. After dinner, we note A92EB, 9Q5JE, YC0VM, YB0WR, and 7P8CM; late-night sessions seemed in the main to produce various inhabitants of North America and the Caribbean.

G3ZPF (Kingswinford) had his professional interest stirred by that photograph of G4BUE's bent tower in the January issue; David had some very interesting comments to make, so much so that we will be passing it on to G4BUE. Coming back to Eighty, David is finding he can still work the Ws and UAs as well as he could from the old place, but a 'VKZP' heard at about 0100 with an S9 signal just *had* to be Fred Phoney again; after all he was launching that signal (were he real) at around noon-time in VK. . . . The onset of the annual AFS romp crept up un-noticed at G3ZPF, so that he was a little surprised to be inundated with hordes of 12 w.p.m. stations calling. He slowed down and gave name and QTH, only to be told, "sorry but a number for the contest please", accompanied by a request to QRS even further! Among that was the Big

Shot, working them at about 200 stations an hour who 'sat on' G3ZPF as though he were not there. Consider this: since he was end-stopping the S-meter at G3ZPF, then G3ZPF must have been a good signal to the Big Shot — so Big Shot clearly hadn't got cloche ears, leaving plain bloody-mindedness (or bad upbringing — Ed.) as the only reason for his behaviour.

Forty

As always a neglected band with lots of DX on it for the faithful; the only snag is that the faithful don't report!

As far as the writer goes, there was the quite serious question of whether or no the entire vertical-plus-feeder would have to be renewed at its rather un-get-at-able location. A quick first try disclosed that the feeder line was 'tired', to put it mildly, and requires early renewal; also that the whole works must be dropped to a position where we can release the SO-239 connector properly, and then carry out a thorough check of all the mechanicals for ageing, fatigue or whatever. Then a retest as required on all bands, SWR graphs prepared for all bands and, if all is satisfactory, back up again; if not . . . we'll have to think of something different! However, since the VKs and JAs still appear with their usual signal strength on occasion, all this climbing and scrambling will have to await the end of the winter for this aged character to go aloft again.

G4HZW (Knuttsford) normally only reports on his activity on Ten; but things have been so slack there that Tony had to do something. That 'something' turned out in the end to be a Best Bent Wire dipole up in the loft — the garden is not very helpful with only twelve feet square. This bent dipole has so far been a pleasant surprise, with lots of inter-G contacts and EI, OY5J and JW6MY all booked in, plus ZL4, VK2, VK5 heard; Tony doubts if he'll be able to work these, but we would say have a go — one is often surprised at what can be hooked, if only you can get the DX out from under the mob you've attracted to the frequency! On a different tack we are very surprised that Tony's first try — a helically wound vertical — didn't do much good as we've always found the vertical to be very rewarding if you give it at least a sporting chance.

Talking of aeriels, it's nice to hear again from G4EZA (Carshalton) after a change of job, two moves of house, and his mother obtaining G6WXX. The big snag is that the Carshalton home has an embargo on aeriels, so Tim now has

individual wire dipoles for the HF bands which are put up around the picture rail when required, and rolled up and put away after operating is over; 80 and 40m. are catered for by a 66-foot wire wound around the roof space and tuned against the central-heating system. Not much good for DX, but it gets out surprisingly well, and that's all that matters.

Another letter from SWL Bob Stone, from Plymouth, about Top Band included a few indications of activity on other bands. Forty yielded the following heard and logged: PJ3QR, YV5JDF, YV5JDP, YV5UDP, H18TMM, YV5AAM, YV5DPO, PY5EG, P29CWS, VU2TFF, VU2BBJ, YV5DPO again, and YV5DBG. All were noted in the midnight to 0430 time slot.

Turning now to G2HKU (Sheppey) we find Ted reporting just one contact, the CW QSO with 3A2LC.

G3BDQ (Hastings) decided to take a peek at some other bands this month; on Forty the CW signals went out to 'Old Faithful' VK3MR, PY1MAG, and PY1JF.

In the letter from D. A. Whitaker (Harrogate) this month we have some indications about Forty; David heard HV3SJ, 5B4JE, VO1CV, VU7WCY, 9V1PV, VU2ZVP, JW1SEA, EL2AO, LU5FAA, YV5JDP, 5N0ASO, 9Q5JE, VP2MF, JA5, 5T5CJ, FM7CL, ZK2RS, FY7AN, D44BC, and OA4WM; the ones before the 4P in the list during the evening, and the rest in the morning.

G2HLU says he has operated all bands, though not so far on Top Band as his solid-state rig is still not built; however, he has built a solid-state QRP rig for Eighty and had a lot of fun from the half-watt, while on Forty there have been the usual European and inter-G contacts both on SSB and the preferred CW mode, but nothing G2HLU would rate as DX.

New Bands

One or two reports this time; G2HKU says he found and hooked HB9ZE on the band one evening — CW of course.

GM4CXP (St. Boswells) is yet another one to be attempting to get aerials back up after the gales (hurricanes?) of the January period. At the time of writing the tuned doublet was back to twenty-feet for the moment, and a quick blast on 10MHz CW in this condition yielded DF2SJ, DL7NS/HB0, and 4X6GP. On a different tack altogether, GM4CXP is all in favour of the 'Maidenhed Squares' idea discussed in the January *Short Wave Magazine*, and would like to see it coming into use on HF as well as on the VHF bands. He wonders how others feel about it — for the writer, anything that shortens the chore of sending "Bishops Stortford" to a novice op. must be great, especially if he comes back for the WAB square and we have to give him that plus the county!

Next we have a long and interesting



"What a marvellous memory you have, old man!"

letter from R. Howes (Weymouth) who obviously has a callsign (hope so, anyway!) but is coyly not telling us what it is! Ron says that from where he sits, he hears lots of Gs, GMs, and one GI; but it is a different matter to work them. Although they are often quite strong, there is very deep, slow fading to be coped with and so the complete QSO is not all that common. However, all that being said, some 43 countries are down as worked, using five watts to a home-brew rig; and VKs appear in the list of gotaways — we doubt if the five-watt limit is what stops one working them, though, even if the 'black box' is there as a temptation to be avoided!

Next we have G4PGW (North Molton) who writes to mention, among other things, a contact with VK3AGW near Melbourne around 1037 on January 23; log-periodic aerial at his end, and Nigel used an eighty-metre dipole fed with tuned feeders through an ATU.

Awards and Contests

A late notice comes in from BYLARA, for their first BYLARA contest; the date is Thursday, March 1, 1900 to 2200 GMT, and Saturday, March 3, 1100-1400z; only one of these periods can be counted. The bands are either VHF or HF, the latter around 3.690 and 7.088 MHz so as to leave room for other, non-contest, users of the bands. Call "CQ BYLARA Contest" — YLs to work YLs and OMs, OMs to work YLs only. Exchange RST, serial number starting from 001; and BYLARA members for 1983/4 to state this for noting in the log. Score 5 points for a member, 3 for a YL non-member, and one point for an OM; no multiplier. Logs, signed by operators and showing claimed scores, to be with GM4COO no later than March 14. Certificates to all, and Special Certificates

to prize winners. Logs to Mrs. Denise Wood, GM4COO, 13 Scotland Drive, Dunfermline, Fife, KY12 7SY.

Not really an award, but something near it, this time; G4HYY wrote in to say that he was thinking of a 'Worked the Jacksons' Award — brother G3ZMX, wife G8WWP, eldest son G8WWP, daughter G6LHY, and of course David himself, G4HYY. Anyone to beat that?

RSGB members should try and come on in support of the Commonwealth Contest from noon zulu to noon zulu March 10-11. CW only and stay in the lower 30 kHz of the band. Details will be in *Radio Communication*.

The G-QRP Club CW activity is over the weekend March 17-18. Times and frequencies are: 3560 kHz, 1200-1300, 1400-1500, 2100-2200; 7030 kHz, 1100-1200, 2000-2100; 10106 kHz, 1300-1400, 2000-2100; 14060 kHz, 0900-1000, 1730-2000, 2200-2300; 21060/28060 kHz, 1000-1100, 1500-1730; all times GMT of course. The SSB frequencies are 3690, 7090, 14285, 21385, and 28885 kHz, and times as for CW. This isn't a contest, but send your logs and comments to Chris Page, G4BUE, "Alamosa", The Paddocks, Upper Beeding, Steyning, West Sussex, BN4 3JW. Incidentally, the frequencies mentioned are all the spots to find the QRP wallahs, and their 'activity time' is, in particular, on Sundays, 1100-1230z, and again 1400-1530z.

Foretell the Future?

Or look into the glass of history, of course!

If you heard or worked CY0SAB, you hooked Sable Island; VE1CBK, Wayne, has on occasion to go there at short notice and for short periods — the last on

January 27/28. QSLs go to VE1AJH. A major expedition to Sable is being bruted, by the group that went to St. Paul in 1983.

DF8MP/XZ has now returned to DL after two years there; we understand he is now trying to obtain clearance for DXCC accreditation.

The Descheo expedition seems to be a busted flush, with the word being that it foundered upon the small matter of getting the landing permission from the U.S. Dept. of the Interior.

The T19 DX-pedition is, at the time of writing, held up for want of a decent weather. At the advertised starting date/time the ship's captain declined to risk the bad weather. At the moment Dame Rumour says something like February 15 as the new start. This all sounds rather like a macho way of saying it's a busted flush. However, N1CWH/T19, a YL scientist, name of Tracy, is on the island for another year, and her QSL route is T12SLC.

KX6DS is mainly on CW, 5 kHz on the LF bands and around 025 kHz on the HF. Request a sked via Box 1179, APO San Francisco, CA 96555, U.S.A., but be aware that KX6DS works 1800-0600z weekends and is not available on Sundays between 2100-0030.

That early-morning net on 7085 kHz with ZL2AAG as MC is quite popular, with check-ins accepted from UK a bit later than the rest of Europe as the band is a bit slower opening here; DXNS gives an interesting list of DX known to have checked-in in the last weeks.

VE7BC and others are setting-off for Beijing on March 18; we understand their time of arrival, and of any operating periods, will be announced later. Tnx DXNS for the foregoing. Turning to TDXB, we find some other items of interest.

Kermadec: Jim Smith says his permission is open-ended, and that is a godsend as he is working very hard on getting the act together — so either March or April looks to be on the cards.

SMOM operations seem to have snagged a rock, and TDXB has it that there won't be any more operation from there until April.

Also noted is that the VUs are still working on the Andamans is, operation and it looks to have a sporting chance of being during March — keep fingers well crossed.

Top Band

A couple of missed targets first. Ron, GW3YDX, you will recall, was after 100 countries confirmed on this band in two years — it took two years and three days

for the final card to arrive. Nevertheless, congratulations, Ron!

Likewise G4AKY. Dave was hoping to make the 100 worked from Harlow before the aerial had to come down and the move to Newport, Essex, took place. It didn't work out, as seven were needed over the final week-end, and despite the contest nothing new was worked, although 9K2BE was supposed to be coming on, and a Trinidadian station was heard but disappeared under a horde of Czech novices. However, as you may imagine, for the final month, Dave was prowling around for new countries with every spare minute and so his tally was much higher than usual. W1-2-3-4-9-0 included W0RF in Colorado; plus an assortment of Europeans, European and Asiatic Russians, 9M2AX, 7X2AL (QSL via I2VGZ), 4Z4DX, 5N1ARY (QSL to 5N8ARY), a couple of TFs, VEs, HH2VP, YV1NX, JX5DW, SPOTBC, UK7PAL, FC8TT and 3V8AS were some of the highlights. Gotaways were YV10B, 9Y4VU, UK0AMM, UA0AAH, 9K2BE who in fact heard Dave at 559; and ZL2BT heard around 0735z on January 17 calling G4AKY, but who faded out as the band closed. Final score 94C all-time, 93 in three years from the Harlow place. Now he starts again from Newport, Essex.

G2HKU listened through the contest and knocked off a few; but Ted, like most of the rest of us deplores the turn to co-channel working instead of the old 'split' style. Of course, it had to happen once many more countries came on, mostly with much smaller allocations than in U.K. As for the enormous signals which Ted reckons are just 'not on' for Top Band, unfortunately they are — we have at last learned that on this band it is what the ground is like that matters. One doubts if you would notice the difference between 10 and 100 watts in QSO, but the 60dB or more difference between indifferent and top-line aereals is a different matter! The old adage that you can't work 'em if you can't hear 'em is still valid, and no-one has yet explained to this writer how a QRO home-station transmitter can improve the operation of the home-station receiver! For example, G4AKY in Harlow could hear and give 599 to things G3KFE couldn't hear at all — coincidence that G3RKJ was another big signal with a simple aerial on the band, and lived only a few yards from the G4AKY place? Or that he has moved and hasn't got anything like the same signal now? Anyway, a listen to one of these hot-shot systems reveals a totally new revelation of Top Band. To come back to Ted's scores, CW worked OK1DXS, LZ1KDP, G6ZY/EA6, F3AT,

PA0KHS, YU3EF, GW3J1, OH1XX, OK1DRU, UK2PCR, EA6ET, LA7JO, GM3PFQ, OZ1LO, OH2VY, YT3T, OK3EA, GU5HFN, SM6HEV, LA2GV, DJ1BZ/A, ZB2EO, EA9EU, LA40, UK2BCC, UK9CAA, DL4MAG, CT2BQ, UK2AAG, U18T, SV1JG, LA55AA, DJ4TV, VE1AXT, YU7JDE, and SM0TW.

D. A. Whitaker (Harrogate) stayed on SSB for his vigils; this mode yielded OY8R, EA9JL, EA9KF, EA9LZ, RA2DFB, SV3SJ, SV8CS, T77V, all between 1700 and 2200, leaving 2300-midnight almost entirely to Russians: R18LBU, UK9CAA, UK6VAF, WJFC, 4Z4DX, R18LBR, UM8NAW, 9H1FN, UL7MAR, VE3CDX broke through around 0100, then at 0300 W9YM was followed by VE3GAS; 0500 started the morning rush with W9POH, and around 0600z there was W1-5, W8, W9, K5NA, W9RE, K0RF (Colorado), WOJ (Iowa), K5UR, N0XA (Kansas), OY8R, KOHA (Nebraska) and ZL2BT.

"CDXN" deadlines for the next three months:

April issue—March 8th
May issue—April 5th
June issue—May 3rd

Please be sure to note these dates

It was an up-and-down month for G3BDQ (Hastings); most will be aware by now that there has been a protest from Bordeaux Radio on 1820 kHz about Top Band amateur signals — not a polite request over the air to QSY but a formal complaint 'through the system'. All we can say about it is that if the Bordeaux aereals pointed the RF to where it ought to be — out to sea — we can't imagine land-borne signals from the U.K. being of any consequence. Anyhow, be that as it may, various stations were inspected, obviously from a list submitted by Bordeaux. On two of the occasions G3BDQ was supposed to be transmitting, his log showed a blank — which doesn't say much for the Bordeaux log-keeping! Anyway, G3BDQ was able to ask some pertinent questions of the inspectors, like "why didn't he shout to us on CW?" and "how are we supposed to get to know which frequencies are sensitive without a crystal ball?" and so on. Clearly not all listen to RSBG newscasts, or for that matter subscribe to *DX News Sheet*.

G3BDQ also enquired about what was happening to the pirates on 6 MHz — without answer. On the positive side, John says he has had genuine QSOs with W RMT, who wants G QSOs — arrange a sked by writing to him at WB0RMT, Rural Rte 2, Conrad, Iowa 50621. On a different tack, G3BDQ notes JA2GQO on January 12, after a 'half-contact' on 9th. He was a good signal all the time, but obviously having problems copying on 1824 kHz; when the QSL card came all was revealed — they still have Loran to contend with at S5-7 up to around 1825 kHz, and peaking to S9 plus topside of 1830 kHz. No wonder he wasn't hearing EU! John says that the JA has also worked GW3YDX, but since the upset with Bordeaux the band has gone very quiet as 1820 kHz was always very much of a key frequency.

We also have an interesting report from Bob Stone, but as space closes down on us and we've still got the HF bands to discuss we'll have to hold it for a month.

Ten

Not a lot! G3NOF (Yeovil) checked the band daily, but only found it open once, when an LU station was raised.

GM4CXP had a Sunday-afternoon session, on January 29, which yielded N7EDK/SN7 and OK2BEW, with a couple of getaways in HH and CE6.

One of the stalwarts on this band is Bill, G2ADZ (Cheshington) who also found it pretty lousy. Between November and December 10, W6QL/HC1, KA4ZYB, VP2EAG, and a string of VKs were booked-in on CW with other stuff heard; then there was nowt till January 6, when LU1BPT/D was worked; since then, only beacons and the odd W when tea is being drunk and a listen is permissible.

G4PGW also monitors the band, and like the others he notes the beacons on an otherwise dead band.

Our ten-meter specialist, G4HZW, (Knutsford) managed QSOs with CX9DXH, 6W1AR, UA9FKU, SP8AWL and a few UA5s, plus the various beacons at times, although the beacons did nothing to produce more activity. So much so that as related elsewhere, Tony put up an indoor dipole and tried a few blasts on the other bands.

G2HLU operated on all the five bands, but on Ten he found, in his own words, "no DX at all!"

G6QQ (Hoveton) checked the band most days but with little success, until one day he was looking for the cause of some SWR problems; after testing, CX4HS called him and an EA8 was worked the same morning, so there was some N-S propagation on that day at least. Apart from that there was nothing until January 31 when several Ws were heard on CW, but David couldn't raise any of them. In total G6QQ managed EA8ASS, RA4LDA, RF6QAI, CT2FR, HG5AAP, CX4HS, RA9SUU, UB5BCX,

RA9CQW, UA9FIU, and UA6AXE on CW, with SSB for EA5YU/EA8, WP4C, ZC4CW, and ZS6DL.

Fifteen

Not much better here — and G3NOF doesn't miss much; he reports W6-7 on the mornings, plus short-path JAs around 1100, along with SPs, VKs and Africans. The East Coast Ws turned up around 1300 but were patchy until 1700, dropping out and then returning around 1800-1900; no Pacific stations were heard. SSB contacts were made with A22ME, A4XYQ, A7LBN, A71BJ, A71BK, C53EK, DF8MP/XZ, DU1NH, FY7CM, HC1SK, JJ1MLQ/MM, K6Y, RA, KY60, K1YSE (Arizona), TA2AT, TL8DX, TR8DR, TR8WCY, TROA/B (Banier Is.), UK8MAA, V3TV, VK1DH, VK1GP, VK1PJ, VK2AJ, VK3DPU, VK3JQ, VK3VYL, VK6AJW, VU7WCY/CV8, VP8LP, W6FLK, W6KG/HCS, YB2OT, YC3CDL, ZD7HH, ZL4AAS, ZS1OR, ZS1SP, ZS4B, ZS6BRZ, ZS6MX, 3X4EX, 5R8AL, 5T5RD, 5V7JJ, 6U0WCY, 6W8CK, 7P8CL, 7X2CE, 810WCY, and 9Q5RN.

G4LDS (Chelmsford) alternated between his own call and GB4HRC, a twenty-year commemorative station for the local Hospital Radio service. During the month Chris discovered that his beam rotator had lost three out of four bolts holding it to the tower — someone forgot the shakeproof washers! The GB4 call managed to get to W5BCU, N41MM, K4JDJ, K8SGI, VE3DJG, KA8JNH, K8KQ, WD9EHE, VK5NXW, WB2AJI, WA1EKV, WD8PFI, KIAYZ, W1HH, K9DMH, K3GEV, N9BCO, N9ADI, W1VEH, K4CRQ, and K4NBN.

G2HLU found, as he put it, "precious little", while G2HKU didn't even give the band a mention!

G6QQ did a little better; his offerings included FG7CM, PY1AT, UK9UAA, NN6R, and K6JCV, plus the usual crop of small fry.

Twenty

Let G2HKU take first wicket; Ted maintained his usual skeeds with ZL, so SSB accounted for ZL3FV, ZL3RS, plus UIAPM, UD6DFV, JA7GBS, ZL1AWN and UK5ZBK. CW did for JA6PA, ZB2EO, and 4X6GP, while the CW from the QRP rig got over to ISYBZ/EA7.

G6QQ next: David managed CW contacts with WA71RD, 3B8CF, VK3AOF, JF1HOH, VE7NI, 4X4HQ, W2NQ/P/W7 and VK1WB.

Twenty was the most useful band, opines G2HLU; Harold offers CW with Ws and VEs, CX7BY, P47E, PJ7A, W6QL/HC1, and SH3WCY, while on SSB a big surprise was a contact with KG6AAY — the first one from KG6 worked since his ZD4AM days back in the 1940s!

Twenty for G4LDS added up to Europeans plus various Ws and VEs, SV0DB, PYs, ZL, PP2JK, several JAs, UIAPM, VK4CO by short path and VK4BHS, all using the GB4HRC call.

G3NOF didn't spend much time on the band, but he noted the usual VK/ZL opening in the mornings, W6-7 around teatime with sometimes KL7 and KH6 mixed in them. VE7 was sometimes audible as late as 1900, and on the evening before he wrote the band stayed open as late as 2000z. SSB contacts were made with HV3SJ, K7DQH, KC7GX, KW7R, NL7V, T32AB at 1700, T77V, VU7WCY/GDG who was S9 at 1615, W7FU, WA7LCP, VE5QM, VE6CU, VE7AKU, VE7BCM, VE7JK, VE7NI, and VE7XM.

D-Day Reunion

The Marconi club are involved in the Portsmouth D-Day Reunion celebrations, in conjunction with their *Mary Rose* Award. The big week-end is June 3-4, and at that time they will have GB1MAR on Southsea Common (during the W.W.II vehicle display) operating VHF; GB2MAR will be on the HF bands, operating from Fort Widley, and there will be an F0 station operating on the beaches at Normandy with a mixed crew of G and F stations. All contacts with these stations are good for five points towards the *Mary Rose* Award. The U.K. stations, and maybe the French one too, will continue for 28 days. In addition to all this, the Marconi club are proposing a new award, to be called the Spectrum Award; the certificate features as background the Marconi yacht *Electra* (which, incidentally was found a few years back rotting in a mud berth, and is due for a full restoration). For all the details on this event and the awards, contact V. G. Scambell, G3FWE, 50 Park Avenue, Widley, Hants.

Fins

For next time the deadline is given, as usual, in the 'box', all your letters being addressed to "CDXN", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. Let's have a big load of mail!

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How to Convert 'Unconvertible' CB Rigs to Work on the Ten-Metre Band

HUGH ALLISON, G3XSE

It all started in a pub. Four amateurs were bewailing the fact that the beloved loom IC1050 CB rig, which is so easy to convert to 10 metres FM, had become as rare on the dealers' shelves as the proverbial hens' teeth. As happens after one has had a sknful, an argument developed — this time as to why the 'dedicated chip' type of CB set cannot be converted. The reason is, of course, that the chip will only work if it has the right frequencies going into it.

On the point of falling over, one of the inebriated present asked the presumably fatuous question, "then why not fool the chip into thinking that it has the right frequency going in?" Well, why not indeed? A few beer mats got drawn on and it became obvious to those still standing upright that if a mixer were introduced between the VCO and the dedicated chip and a signal source injected into this mixer, the frequency of the injected signal has only got to equal the frequency by which you want to depart from the CB frequencies — and you're there. I was working out the differences between frequencies of the CB and amateur bands when suddenly I had one of those once-in-a-lifetime strokes of sheer genius. The funny thing about this idea was that next morning, when sober, it still made sense!

The Mathematics of the Problem

The dedicated chip found in most British CB sets is the LC7137. To minimise the shift of the VCO in the rig it runs at the required frequency minus the IF on receive, and at half the required frequency on transmit. Suppose, for some reason, you wished to transmit on channel 30 of the legal CB system, roughly 27.892 MHz; on transmit the VCO will be running at half this, i.e. 13.946 MHz. Should you wish to receive channel 30 the VCO will run at 27.892 minus the IF frequency of 10.695, i.e. 17.197 MHz.

Let us now consider what would happen if the chip would run on Ten. The action on FM is centred about 29.6 MHz. On transmit it would run at half this, viz. 14.8 MHz, and on receive 29.6 minus 10.695, equals 18.905 MHz.

If we consider the idea of injecting the difference into a separate mixer, to fool the chip, we would need to subtract the frequencies required for 10 metres from those required for CB. Thus on transmit we need 14.8 minus 13.946, equals 0.854 MHz, and on receive we need 18.905 minus 17.197, equals 1.708 MHz.

We now come to my once-in-a-lifetime stroke of sheer genius. Nearly all CB sets have a 10.240 MHz crystal in them. This is because not only can this frequency be digitally divided to give the required channel spacing (10 kHz) but is also used to convert 10.695 MHz IF to the 455 kHz IF. It just suddenly occurred to me that 10.240 divided by 6 is 1.7066, and divide this again by 2 is 0.8533. Almost exactly what we want! Now it so happens that 74LS92 IC's cost about 55 pence and are divide-by-two and divide-by-six all in the same package.

A Few Points About CB Sets

The difference in VCO frequency between transmit and receive, although minimised as outlined above, is still too far to pull by one varicap diode. Careful examination of the circuit will show that a fixed (or even pre-set) capacitor is switched in by a transistor on transmit. Since we will be moving the VCO frequency it will be necessary to locate this capacitor and fit a

variable; I fitted a 10 to 50pF simply because it was to hand. You are also going to have to locate the capacitor connecting the VCO to the synthesizer chip, pin 19 of the LC7137, and remove it. The two lands vacated by the capacitor are those between which you are going to insert your new mixer.

You are also going to have to locate a rail that goes 12 volt positive on transmit, and the 10.240 MHz output from the chip, pin 11 of the LC7137.

A Warning

You really must understand what you are doing. If you don't understand *exactly* what you are doing, don't bother to read on. This article is *not* for beginners — you are entirely on your own and no one is going to help you out if you make a mess of it. No circuit layout is given because the components have to be assembled to fit inside the case of the particular CB set. Some sets contain plenty of fresh air, so modification is easy; some sets are so tiny that you have to shoe-horn in every component. This article is written as a guide for people who are competent enough to be able to adapt components to hand to suit. Also, if you haven't got a 30+ MHz 'scope, a counter and a decent multimeter then forget this modification.

Circuit Description

Many variants on the theme outlined above have been built by the author and incorporated into several types of CB set. The circuit diagram of the most comprehensive arrangement is shown in Fig. 1. Here C1 couples the 10.240 MHz from pin 11 of the LC7137 to input of the 74LS92. R1 acts as a hold down resistor, and its value is a bit of a compromise between excessive loading of the crystal and the correct functioning of the divide IC. Note that, due to the high-ish frequency involved, IC1 must be a Schottky device.

IC1 is a divide-by-six (in on pin 1, out on pin 8), and a divide-by-two (in on 14, out on 12) device, producing 1.7066 MHz and 0.8533 MHz, provided pin 6 is earthed! (Did *that* cause some trouble — but I digress!) IC2 acts as a switch, feeding the mixer with the correct frequency on transmit (0.8533 MHz) or receive (1.7066). Eagle-eyed readers may have noticed that there is a relay in the circuit that would do this job, and it is true. If the available space within the transceiver allows, then a double-pole relay may be used for R1: the second set of contacts have the moving arm taken to C3, the normally closed contacts to pins 8 and 14 of IC1 and the normally open ones to pin 12. Since the only relay I happen to have to hand that will fit in the smallest CB sets is a single throw dual-in-line (DIL) type, I use the circuit shown when space is at a premium.

TR2 acts as a high level mixer. The LC7137 wishes to see a couple of volts in at pin 19, so mixing has to take place at this sort of level. The five volts of injection from our digital divider is presented to the mixer emitter, and the VCO signal comes in at the base. The required output of the mixer is selected by L1/C6 on receive; on transmit the required output is lower in frequency and TC1 is switched in to pad L1/C6. (I am prepared to admit that I spent a day trying to switch in TC1 electronically and would like to hear from any superior megabeings who manage to do this. The problem with electronically switching it in seems to be high RF level across the switch.)

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if I am absolutely honest,



I am not certain whether I own a NRD515 because of its unbelievable performance as a general coverage receiver or just for the sheer pleasure of having and constantly admiring probably the finest piece of equipment available today.

Perhaps it comes down to the same thing, certainly the other NRD owners I have spoken to have all expressed the same feelings, that the NRD515 is a receiver in a class of its own.

As a person not owning the receiver, you may ask what sets this particular one above all the others. This is difficult to define—the feel of the equipment when wandering over the crowded band. Its signal handling capability and selectivity can only really be appreciated by use. Technically, the equipment is above reproach JRC's manufacture and production control methods as applied to other items in the range are equally applied to their amateur products. The other items referred to, only a small part of the vast range, are marine radio equipment, Mansat mobile terminal, Omega navigators, Doppler sonar, echo sounder/fish finders, communication satellite earth stations and a complete range of avionic beacons, radar and associated products. Indeed, a wider range application of electronic and radio technology for land, sea and air.

You may be forgiven for associating such advanced technology with complexity of operation, a piece of equipment that needs an operator with an electronics degree. However, this assumption is incorrect. The NRD515 is easy to use with the minimum of controls to ensure the operator really enjoys his listening time. Digital readouts, MHz mode and filter bandwidth controls, together with a VFO knob that will tune the band continuously without the need for any other control, from 100KHz to 30MHz or vice versa. To assist with the above conditions the NRD515 has pass band tuning and the medium wave band has a 600KHz to 1.6MHz has a preselector control to assist.

To give you a further example, the NCM515 remote control allows frequencies to be quickly keyed in at two rates of frequency stepping in the ability to add to or subtract from the optional 600Hz CW filter. NRD515 owners would say, 'a joy'.

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Basics for the SWL and R.A.E. Candidate, Part 14

SUGAR-COATED THEORY

AT the point where we left off last time round, we had shown you some block diagrams of the direct-conversion (homodyne) type of receiver, and the superhet. It is now time for us to look at circuits for such an easily-built model — see Fig. 1.

Here we show a simple receiver built around the use of a couple of diodes as the product detector. At 7 MHz this has no great snag, save that the use of the diodes, adequately driven (which means some twenty milliwatts of RF), entails the problem of *harmonic mixing* — which implies that signals at 14 and 21 MHz will be received. To some degree this would be ameliorated by the use of rather more elaborate front-end selectivity, and if one could get hold of some hot-carrier diodes the problem would be eased even more. However, we built it as it stands, fed it through an ATU to give it a bit more selectivity, and did quite well. From the input, we start with a high-pass filter section, of two inductors and three capacitors to the left of T1; these are to remove the high-power medium-wave broadcast stations (needed here, but they may not be essential in other areas). T1 is a broad-band transformer, the black dots being an indication of the 'start' ends of each winding; it could be wound up on an Amidon T50-2 core. The right-hand winding provides a suitable inductive-balanced injection from the local oscillator, so each diode gets its fair share of the LO drive. The remainder is just a fat lump of audio gain — about 90dB of gain in fact.

This receiver will look at 0.1µV, though 1µV is clearly audible despite the fact that the diodes have a conversion loss of several dB. If the 'gain block' to the right of the diodes is built up on a separate bit of *Veroboard* it will provide the basis for several interesting direct-conversion receiver designs. One of the things one can do is to replace the diodes as a detector by an IC detector using a Motorola MCI496; this will probably result in too much gain, which can be throttled back by use of a gain control.

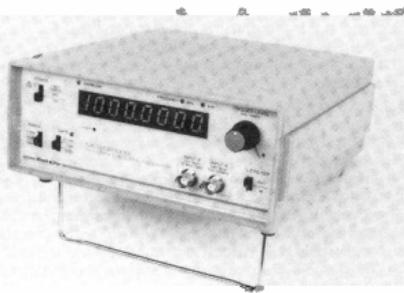
The local oscillator circuit is shown separately in Fig. 2. Again it makes no concessions to complexity, and indeed it could do with a buffer stage and a stabilised power supply — but it happened to be around and was pressed into service. Essentially, it is a very simple Colpitts oscillator. An oscillator, basically, is an amplifier with some form of positive feedback; in this case, by way of the lead from the emitter of the transistor and the junction of the two 680pF capacitors. If you build the circuits of Fig. 1 and Fig. 2 for fun, you will probably initially find the amplifier oscillates and the oscillator refuses to — this, of course, proves the point that we made earlier on about components which appear in the circuit but not the diagram — the inductance of leads, and the stray wiring capacitors and so forth. However, persist with it, and when you've tamed both of them, you'll probably have learnt an awful lot about layout!

Fig. 1 and Fig. 2 are both taken from the invaluable ARRL publication *Solid State Design for the Radio Amateur* — a book which should be on the shelf of anyone who aspires to experiment with home-brew or QRP.

We turn now to Fig. 3, a basic superhet suitable for the radio amateur (once again a straight 'lift' from *Solid State Design for the Radio Amateur* where it is attributed to WA7MLH), we can start by noting that the oscillator now boasts both stabilisation of its DC supply volts, by way of a Zener diode, and a buffer stage to isolate it from any impedance changes it might otherwise 'see' from the mixer. The other oscillator is the BFO; this is stabilised as far as its DC volts are concerned, but doesn't run to any buffer stage. Turning now to the input end, signal is put in through the

aerial terminal, and through the block labelled 'half-wave filter' whose function is simply to ensure that the receiver will not suffer too much from spurious responses; it is a low-pass filter with its centre frequency set to the upper end of the 7 MHz band. L1 and L2, in conjunction with C1, provide tuning of the input stage, and lead straight to the mixer, which is a 40763. The IF is taken out of the drain, while the signal goes to gate 1 and the LO to gate 2. The IF amplifier starts with a crystal filter (which could be easily built from surplus rocks) and then goes into another 40763 FET, which does the amplifying. In the case of too much gain, the closing of the switch will effect about 20dB of gain reduction, simply by altering the bias on gate 2 of Q2. A third 40763 does duty as a product detector, and as we have quite a bit of gain before the volume control (AF Gain), we don't need such a potent audio amplifier.

This receiver will be found to be quite capable, on Eighty and Forty, of giving a good account of itself. If it were desired to use it on Twenty the half-wave filter could be omitted — at least until next sunspot peak! — and the coils L1, L2 altered to suit 14MHz, while the local oscillator would need to be persuaded to cover 12.3-12.8 MHz. However, since it already tunes 80 and 40, and easier way of getting on the other bands would be the use of a converter: taking input on 14 MHz and coming out at 7.0-7.5 MHz



The 'Meteor' series of frequency counters is now available fitted with a temperature-compensated crystal oscillator (TCXO) for additional accuracy and temperature stability. Shown here is the Meteor 1000X which measures typically from 2 Hz to 1.2 GHz, with $\leq 50\text{mV}$ sensitivity at 1 GHz, and features a temperature stability of ± 0.5 ppm from -10°C to $+40^\circ\text{C}$, an ageing rate of ≤ 1 ppm per year, and stability of $\leq \pm 0.2$ ppm. The other models in the range, the Meteor 100X (2 Hz to 100 MHz) and the Meteor 600X (2 Hz to 600 MHz), are also available with the same TCXO; the Meteor 600 was reviewed in the November 1983 issue of *Short Wave Magazine*. The Meteor 1000X cost £225 plus VAT and post/packing, and is available from the designer and manufacturer *Block Star Ltd.*, 9A Crown Street, St. Ives, Huntingdon, Cambs. PE17 4EB. Tel: 0480-62440; Telex: 32339.

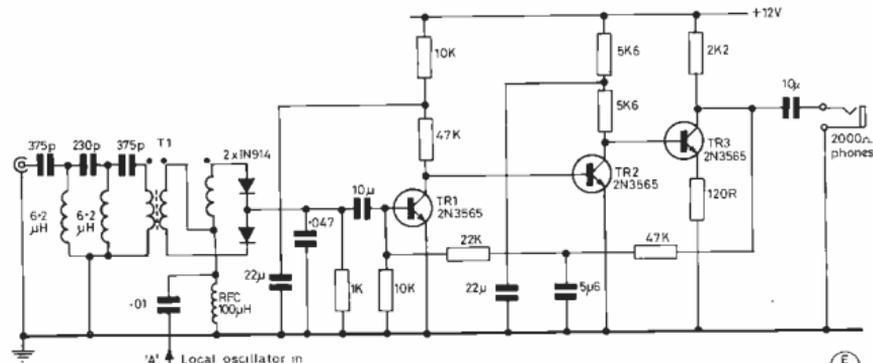


Fig 1 DIRECT CONVERSION RECEIVER FOR 7MHz

or 3.5-4.0 MHz — a little bit like the TV converters which many people built when the first ITA signals came on the air and we only had TVs capable of receiving the low (40-70 MHz) channels, or as is done with transverters to get CW/SSB output on VHF from an existing HF transceiver.

Mixers

Some people will be wondering, as they read the foregoing, just what the heck the real difference is between the 'product detector' and the 'mixer'. In short — nothing! Indeed, the words modulation, mixing, detection, demodulation all mean the same thing and the different appearance of the circuits merely reflects the different frequencies involved. Essentially, we have two frequencies going in (there may be more, but we'll keep it simple for the moment) which meet some degree of non-linearity in the circuit. As a result of this, in addition to the two input frequencies themselves we will have a host of others. If we call the inputs F1 and F2, we will have 2F1, 2F2, 3F1, 3F2, 2F1 + F2, 2F2 + F1, 2F1 - F2, 2F2 - F1, and many more. 2F1 implies the second harmonic of F1, 3F2 the third harmonic of F2 and so forth.

If we consider a superhet receiver having a 7 MHz signal input F1, a local oscillator F2 and an IF of, say 500 kHz, then the local oscillator will be at a frequency of 7.5 MHz, when F2 - F1 is the

IF, and all the other outputs of the mixer are decoupled away to ground. If we consider modulation of an AM carrier, where F1 is the carrier and F2 the modulation frequency, then if F1 is 7 MHz and F2 is 1 kHz, then the output we want is F1 + F2 and F1 - F2 as upper and lower sidebands respectively, and F1 as the carrier; again all other output products are decoupled away. In case some old-timer says this can't be the case with an anode-modulated (or collector-modulated if he's younger!) PA stage, then he can think again; for a nominally steady grid drive, the RF output is varied from zero to peak by the alteration of the HT volts, whence the non-linearity.

Table of Values Fig. 3

R1 = 10K audio-taper carbon control	L2 = 36t 26 AWG enam. wire on Amidon T68-2 toroid core
C1 = 365 pF min variable	L3 = 1.57 μH approx., slug-tuned
C2 = 180 pF mica trimmer	L4 = 7.9 μH slug-tuned coil (Miller 43105-CBJ)
C3 = 100 pF air variable	S1 = SPST toggle
C4 = 15 pF variable	J1 = aerial receptacle to choose wire over L2
L1 = 3 turns 26 AWG enam. wire over L2	J2 = two-circuit phone jack

Note: fixed-value capacitors are disc-ceramic unless otherwise stated; fixed-value resistors are 1/2-watt composition; polarised capacitors are electrolytic

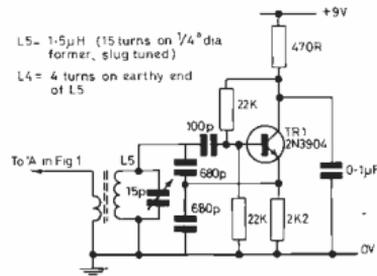


Fig 2 LOCAL OSCILLATOR FOR 6-8MHz

Fig. 2. This simple oscillator will serve to excite the receiver shown in Fig. 1. An improvement would be the addition of a buffer stage between it and point 'A' in Fig. 1, and stabilisation of its 9 volt supply; for explanation, see text.

Turning to detection, the old AM detector stage took the carrier and its two sidebands, and separated them into RF and audio. In numbers we have F1, the carrier, F1 + F2 the upper sideband, F1 - F2 the lower sideband. Outputs are F1 - (F1 + F2), F1 + (F1 - F2), and various others. The two mentioned are both numerically equal to F2, the audio, and so this is used, while the rest are decoupled away. If we have a CW signal, then since we have only one signal coming in, we must apply a BFO. Using the same notation, F1 is the input signal and F2 the BFO; F1 - F2 or F2 - F1 will yield an audio component which we can take away, while the unwanted stuff goes to earth. A product detector is simply a rather nicer circuit for SSB and CW than a simple diode detector.

It doesn't take a genius to realise that one thing we never get is an aerial input with just the wanted signal on it and nothing else.

• • • SWL • • •

SHORT WAVE LISTENER FEATURE

By Justin Cooper

The Mail

LIKE many, A. F. Roberts (*Küdderminster*) has been profiting from the rash of 'WCY' stations on the air to mark World Communications Year, which have gone a little way to cancel out the downward trend in the sunspot cycle. All we can say to that is that this cycle, considering how far we are from the peak, is either holding up superbly well, or else is going to be a very long one. For those who have never listened through a complete sunspot cycle, the radio scene shows a cycle of changing conditions lasting about eleven years — it may be less or it may be longer — and taking about four years to rise from the bottom to the peak, followed by the slower fall away. The cycle we are in now was a good one at peak back around 1981, and has been very good since then with a prolonged, nearly flat, top; only in the last few months have we seen the cycle resume more normal behaviour on the way down again. But, of course, it is well known that conditions on the lower-frequency bands tend to improve with lower sunspot counts, and so much DX-chasing moves down, and takes place at night rather than in the day. All of which explanation is a bit unnecessary for Tony — as a quick look in the records indicates he was listening at least back in 1975!

The Ladies

Down to two again, now June Charles seems to have dropped out. *Mrs. R. Smith (Nuneaton)* says she didn't get a lot of time for listening over the holiday season, and when she did nothing of any great interest was heard, nor any new prefixes. Sad!

As for *Mrs. T. Parry (Blackpool)* her prize for the construction contest last time, which was a copy of the 1984 *DX Listings* call book, seems to have generated some enthusiasm for more construction — which can't be bad! Tina also notes how poor the bands have been of late, but she still manages to get a few more prefixes on to her total each time.

Our third YL letter is the one in which GM4COO, Denise, announces the BYLARA Contest. Most readers will know that BYLARA is the U.K. YLs club, and so they may be interested in listening in to this short contest — the sessions are only three hours long on March 1 and 3 — and submitting a check log — perhaps if the contest is a success BYLARA will introduce an SWL section next year.

Now to *G. Shipton (Rye)*, who has not been as active as he would have liked, having been away in Devon after an illness; but he is still making the score rise gently month by month. Let's hope all is well now, George.

R. Everitt (Bluntisham) sends in his entry from Gimson Hall, Leicester, where he is studying. During the period the main band in use was 80 metres; from home the T77 San Marino expedition was booked in as also was HC1SU/8 in the Galapagos Is. Nothing was noted from the study QTH due to work commitments. They do have a TS-520 and eighty-metre dipole there, cut for the CW end, which lives atop a sixty-foot mast which in turn is atop a high building, which brought in some nice signals even though it was put up for the Phone Section of the AFS contest weekend.

B. Patchett (Sheffield) is now G4VBP, and is looking out for an HF rig with which to make a start. He already has a smattering of Russian, and wants to know if anyone can lead him to a listing of Russian words and phrases relevant to amateur radio operation. We recall the *Amateur Radio DX Handbook* by W9WNW had a page of very basic Russian words; perhaps there are those who might have some more useful and recent data they could pass on. Either Sheffield 442507 in the evenings, or at work Sheffield 731246 will find him; or by letter to 107 Handsworth Avenue,

Sheffield S9 4BU. Come to think of it, that would be useful information here, too. . . .

Back in the sixties *A. J. Chapman (Newark)* was interested enough to listen to the then-mainly AM Phone on Forty; and after a lapse of years an entry into CB has sparked him off again. The first move was the direct-conversion receiver from *A Guide to Amateur Radio*, which worked very well; then an FRG-7, to which there is an aerial of the trap-dipole breed, again lifted from the *Guide*. This is fed by way of "TV-type co-ax" — all we can say about its suitability is that if it has a reasonable dense copper sheath it should be OK, and before putting it up it is inspected for absence of any pinholes or damage to the plastic outer coating (which applies to any co-ax); and if there are any possible chafe points on the cable run, these should be 'served' to prevent damage. As to whether an ATU is required, it is always useful, if only for the reason that it is bound to do something towards the reduction of strong out-of-band signals which can overload the receiver. Precisely this problem seems to be occurring on Eighty for SWL Chapman now, and all we can suggest is that he tries an attenuator in series with the aerial lead. This sounds daft, admittedly, but the argument is this: the large number of big signals hitting the aerial reach the first mixer with very little attenuation from tuned circuits. Thus the mixer overloads, and when that happens every signal will try to mix with every other one, so the output will contain a vastly increased amount of noise. Now, if we can only reduce the largest incoming signal — the one doing the overloading — below the overload level, the mixer can go back to doing its job properly. If you have a variable attenuator (J.C. has used in emergency a 100-ohm pot, as the nearest value in the junk-box that was non-wirewound) it is quite fascinating to listen to noise and signal going down together until you reach the 'break-point' where the noise suddenly drops to a much lower figure and previously inaudible signals become copiable.

Heavy static and QRM annoy RTTY (an *N. Jennings (Rye)*) as this upsets his RTTY decoder and makes it necessary to see the callsign come up on the display repeatedly before logging it with certainty. CW has an advantage here — though either mode is still viable longer after QRM has 'seen off' even SSB phone!

Next we come to another RTTY buff — and pal of Norman Jennings — in *A. P. Lincoln (Aldershot)*. Pete sent in a colour print of his SWL station, re-vamped since the roof repairs were completed. It certainly looks very nice and comfortable now, and Pete says he has no more worries about draughts or leaking roofs! Both these last two readers have the 1984 DX and U.S. Call Books, and both are ready to help other readers in need of addresses. Norman Jennings is on Rye (0797) 222530 and Peter Lincoln on Aldershot (0252) 317870 — and both, one guesses, would more than welcome a natter about SS/TV or RTTY from other enthusiasts or, indeed, newcomers.

Contest

Doubtless from old contributor Mike Toms, we have a note on the Barking club two-metre contest on March 25 from 1300-1700 GMT. The club stations G3XBF and G8XBF will be on and a contact worth ten points; all other contacts one point. The multiplier is the number of U.K. counties (administrative, not postal) and countries worked. Penalties on unmarked duplicate contacts, double the claimed points for the contact; disqualification for a bad signal or out-of-band-plan operating. The SWL section — and this is the most important to us — will log the station heard, the station being worked, RS(T), serial number and county sent, and score as above. No change of location

during the contest; and no repeater or *Oscar* contacts are allowable. Queries (with an *s.a.e.*) and entries, to BRS 31976, 32 Wellington Road, Rayleigh, Essex SS6 8EZ. Entries are to be postmarked before Sunday, April 15. We seem to recall that in the equivalent contest last time June Charles was in the results, and we hope that someone from our contributors will be in there again this time.

Trouble

R. Wooden (*Staines*) has a fault on his Eddystone 730/4; one of the fuses blew and when it had been replaced a cracked 5Z4 rectifier was noted and replaced. Still a dead set, and Roy has written to Eddystone for some help, though we doubt they'll be able to do much because of the age of the receiver. Is there anyone, J.C. wonders, who could offer any help to get our friend back on the air — a letter in the first place to J.C. and then we'll put you in touch.

Over to H. M. Graham (*Chesham*) and his usual long and informative letter; Maurice listens to all the 'old' bands from Ten right to Top Band. On the latter not much DX has been heard — the bands get so noisy at night, but the mid-day hearings of G stations indicate the receiver and aerial are doing well enough. Eighty yielded W2HCN at S9+20 one night at 23.26z; Forty yielded a UB5 and a RP2WCY station — rather unusual for mid-afternoon — while Twenty was pretty patchy. Fifteen was the preferred band but was often folding by 16.30-1700z — exactly as the book, dropping out at sunset or just after. Oh, and a few interesting European and North American openings, around one a week.

E. B. Ward (*Ruddington*) reckons he made a prize hash of his R.A.E. paper in Part 2 simply through thoughtlessness on his part . . . we say, "Wait and see"! A personal feeling — and we have observed it is true of others, too — is that if you think you've got a 100% perfect result, you've failed (or come near!) and if you have the sort of doubts Barry has, then you may well have been much more successful than you thought. The point, one supposes, is that if the mind is clicking into top gear it is, of necessity, more aware of its own shortcomings, and of course the

ANNUAL HPX LADDER Starting date, January 1, 1983

SWL	PREFIXES		
C. H. Kirk (Leeds)	428	C. Burrells (Stevenage)	295
T. Kirby (Cheltenham)	395	N. Fox (Wakefield)	248
A. Woods (Norwich)	395	J. Singleton (Hull)	234

This is the final listing of the 1983 Table. The new Table starts with next issue, recording Prefixes heard since January 1, 1984, in accordance with HPX Rules (see p. 25 this issue).

anxious corner of the mind usually to take over once you are out of the exam-room will instantly magnify the weakness. The over-confident chap on the other hand, never gets into top gear and therefore fails! On a different tack, Barry has added fifty to his total simply because he has been, as he puts it, "very QRPp, all the 'go' gone, and can't do much except listen — till the shack chair gets too uncomfortable!" Still, Barry manages to deal with the chores like mending the kettle, the hairdryer or his daughter's best ear-rings. Back to HPX — did anyone else hear UB58HKs on Forty — it seems a bit odd to the writer, too!

J. Heath (*St. Ives., Hunts.*) was rather chuffed last time round to find he had logged a Turkish station, in TA1MB — the first ever, and John's listening goes right back to the pre-war days.

HPX LADDER (All Time Post War)

SWL	PREFIXES		
PHONE ONLY			
B. Hughes (Worcester)	2784	J. Heath (St. Ives, Cambs.)	715
Mrs. R. Smith (Nuneaton)	2366	G. A. Carmichael (Lincoln)	666
E. W. Robinson (Bury St. Edmunds)	2233	B. Patchett (Sheffield)	662
H. M. Graham (Chesham)	1670	R. Wooden (Staines)	652
Mrs. T. Parry (Blackpool)	1560	G. Shpton (Rye)	645
G. W. Raven (London SE13)	1491	P. Oliver (Paisley)	644
M. Rodgers (Harwood)	1425	A. J. Hall (Alvaston)	624
N. Askew (Coventry)	1288	T. Morris (Headingley)	611
N. Jennings (Rye)	1282	A. Pilkington (Chesterfield)	589
R. Fox (Northampton)	1230	R. G. Hurst (London SE23)	548
J. Doughty (Bloxwich)	1190	S. J. Bedford (Wakefield)	527
H. Bale (Cardiff)	1186	S. J. Bedford (Wakefield)	522
A. Pyne (Bradford)	1179	E. M. Gaucci (Siema, Malta)	520
D. Shapiro (Manchester)	1178	CW ONLY	
R. Everitt (Bluntingsham)	1143	E. B. Ward (Ruddington)	1787
D. J. S. Williams (Wednesbury)	1051	J. Goodrick (I. O. W.)	1577
Mrs. J. Charles (Colchester)	983	A. F. Roberts (Kidderminster)	1284
S. Burgess (Stockport)	906	R. Fox (Northampton)	433
P. Lincoln (Aldershot)	858	RTTY ONLY	
I. F. Thorpe (Bracknell)	747	N. E. Jennings (Rye)	536
A. Chadwick (Bury)	724	P. Lincoln (Aldershot)	433

Minimum score for an entry, 500 for Phone, 200 for CW or RTTY. Listings to be in accordance with HPX Rules, see p. 25, this issue.

Like so many others, C. Burrell (*Stevenage*) cut his note very close to the deadline, so as to get as much of a score as he could — and thanks to all the commemoratives about, he seems to have done very well. Charlie has now got a copy of Geoff Watts' *Prefix List* — indispensable, we reckon.

D. B. Shapiro (*Manchester*) had a query on HPX interpretation, and sent along a stamp for an urgent reply — which we have done although we don't want to encourage that sort of thing lest we have no time for our own SWL-ing! We have credited David with 1178 in the Ladder as a result.

We had to chuckle at B. F. Hughes (*Harvington*) this time; after a description of his 'Magic Book' which is the heart of the system. Bernard says that if he lost that he might as well shoot himself because he could never recover the information! We know the feeling, but our reaction when we realised this was to find a photocopier and make copies of each page; and then when another page is added, to photo-copy that (or carbon it, depending on circumstance).

A final-for-1983 up-date comes in from J. Bedford (*Wakefield*). Jim reckons that those who, like him, have had it easy in the way of getting the prefixes together in 1984 (thanks to all the 'specials' about) should sympathise with people who started in earlier years; a good point. In practical terms, one would expect to find the 500 in around a month or six weeks if one has a good aerial system; of course the new entrant will take much longer than that, usually, for the simple reason that he is learning the ropes, double and triple-checking that which is instantly clear to the old hand. And of course, he probably hasn't yet got much idea about what times a band will be open or shut, or when to listen for a given part of the world, or whatever. But — Jim enjoyed his listening and that's all that matters!

A first entry for 1983 list comes from A. Woods (*Norwich*) who says he has been listening since April '83 on our bands. And 395 isn't so dusty as a start score, even if Andy does have to repeat the dose to get on the 1984 Table. It's not wasted of course, as there will be many to be carried forward when Andy eventually gets into the All-Time list.

HPX RULES

- (1) The object is to hear and log as many *prefixes* as possible; a prefix can only count once for any list, whatever band it is heard on.
- (2) The /M and /MM suffixes create a new series; thus G3SWM, G3SWM/M and G3SWM/MM all count as prefixes, and where it is known to be legal, /AM also.
- (3) Where a suffix determines a *location* the suffix shall be the deciding factor, thus W1ZZZ/W4 counts as W4. Where the suffix has no number attached, e.g. VE1AED/P/SU, VE3UJ/P/SU, they are arbitrarily counted as SU1 and SU2 respectively, and the same holds good for similar call signs.
- (4) When the prefix is changed both the old and the new may be counted; thus VQ4 and SZ4 both count.
- (5) The object is to hear *prefixes* not countries, thus there is no discrimination between say MP4B and MP4K which count as one prefix.
- (6) Only calls issued for Amateur Radio operation may be included. Undercover and pirate call signs will not be credited, nor any MARS stations be claimed.
- (7) G2, G3, G4, etc., all count separately, as do GW2, GW3, GW4, etc., and in the same way K2, W2, WA2, all count separately even though they may be in the same street.
- (8) Send your HPX list, in alphabetical and numerical order showing the total claimed score. With subsequent lists, it is sufficient to quote the last claimed score, the new list of prefixes, and the new total. Give your name and address on each sheet, and send to "SWL", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts., AL6 9EQ, if possible to arrive before the SWL deadline for that particular month.
- (9) Failure to report for two consecutive listings, i.e. four months, will result in deletion from the Table, although there is no objection to a "Nil" report to hold your place.
- (10) Starting score 200. Phone Table is mixed AM/SSB, with a separate CW Table. No mixed Phone/CW Table, nor will AM-only or SSB-only entries be accepted.
- (11) List will be based on those shown in the current "Radio Amateur Prefix-Country-Zone List", published by Geoff. Watts (see Advertisers' Index in any issue of SHORT WAVE MAGAZINE).

J. Goodrick (Newport, I.o.W.) reckons he doesn't care about the issues which don't carry an SWL column. Thank you for those kind words — not sure whether to keep John's letter from the Poor Old Moaner at all costs, or to put it on his desk with his elvensies! On a different tack, John gave your scribe a good laugh when he was discussing the lids who come on the band and call everyone else lids. Of course it goes without saying that to call someone else, on the air, a lid, implies (a) that one thinks one will be heard, (b) that one has all the facts of the case, and (c) that one knows better than the one being criticised. Three distinctly shaky assumptions! Anyway, the guy who insists on using AM phone in the CW end of the band, or who yaks on the SSB DX segment on Eighty says far more about himself than any comments could.

G. Carmichael (Lincoln) notes that the last new prefix for 1983 was also a new country and probably the best catch of the year — HV3SJ, logged at 2236z on Eighty.

E. M. Gauci (Sliema, Malta) uses an FRG-7700 plus a long-wire aerial, which have netted him a goodly total from his first two lists, taking Eddie straight through the 1983 Ladder and into the

All-Time. And, with it all, Eddie has double-checked for typing errors and sent in a note of those too — something not many do, and which can lose points; and it makes it easier for J.C. as well, for which thanks!

N. Rodgers (Harwood) comes back to the Table with a new list, taking his score up to 1425.

T. Morris (Leeds) has a couple of oddities heard on Ten, by way of FD6HCO and DHOGAS; we suspect they are just phoneys, probably in fact intruders from you-know-where. Has anyone else any other ideas? On a different line altogether, Tom received a very beautiful QSL card and this sparked off his suggestion that we should run a competition for readers, who would submit a QSL card which they see as the prettiest they received in 1983 (or some other specified time). Two major objections arise: firstly, beauty is in the eye of the beholder, and no two people will see exactly alike; and secondly, the value to its owner of the QSL card and the worry of it going astray. However, all that having been said, if you would like such a competition, we'll run it! Just say the word.

P. Oliver (Paisley) got his receiver back from 'the menders' in mid-November and started in on picking up the lost time, but unfortunately band conditions in his view haven't been too hot.

Going back to ONY52 and its Morse practice transmissions, G6FU writes to say that he has an old QSL from which he notes that on January 16, 1933, he worked and did exercises with BA3 — as he says, the authorities have always liked putting their signals on Forty!

A bit more nostalgia: M. R. Warburton (Leicester) was an SWL with a PCR-3 some twenty years ago before getting into other things. Recently, however, he bought his stepson a 9R-59DS; but as a result the bug has bitten him again quite deeply and so Martin has re-entered the Table. The one and only query in the list was, we are sure, a copy-missing of the San Marino prefix, heard on Eighty SSB. The aerial, by the way, is a six-element Band 2 VHF aerial in the loft; it could be that there might be some profit in strapping both legs of the aerial together and to the receiver aerial terminal, and connecting the earth terminal to an earth connection. Worth a try, at least. Anyhow, nice to have such an OT back aboard.

From N. Fox (Wakefield) we have an update for the final 1983 listing — we hope to see a new entry for the 1984 Table next time.

Just to get everything straight, J. F. Thorpe (Bracknell) has sent in a full set of copies of his earlier lists. What a task it must have been, thanks to missing mailings. But all is not completely lost, as it showed up the odd discrepancy, all of which have now been sorted out. Thanks, Ian.

Changes

This column has remained, in essence, the same for many years, and the time has come for us to re-think it for the future. That being so, it would be interesting to have the views of you, the readers and the contributors. Will you all, therefore, in your letters for next time, let us know just what changes you would like to see, and quite as important, just what you would like to see remain unchanged. Then we'll kick your ideas around with our own, and see what comes out of the pot.

Tables

This issue contains the last of the 1983 HPX listings; we already have some 1984 entries, and of course more will be welcome — the first appearance of the 1984 Annual HPX Ladder will be in next time's SWL — appearing in the May issue of *Short Wave Magazine*.

Final

This is where we give you the deadline for next time; it is to arrive, addressed to "SWL", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts., AL6 9EQ, by first post on March 22. And by that time let's hope the weather and the band conditions are a bit livelier!

The "Mini-Monitor" Two-Band Receiver

A COMPACT DESIGN FOR THE 40 AND 20-METRE BANDS

REV. G. C. DOBBS, G3RJV

Of all the world's great mysteries, variable frequency oscillator building must rank quite high. Many are the favoured techniques and invoked circuits. My general conclusion is that the way the VFO is built is more likely to contribute to its effective stability than microns of the circuit. Never mind the quality feel the width — sturdy VFOs are usually good ones. Or as Isaiah says:

"... saying of the soldering, 'It is good':
and they fastened it with nails
so that it cannot be moved."

ISAIAH 41:7 (RSV)

Some time ago I was experimenting with switched-band VFOs really in an attempt to devise a simple multiband transmitter without crystal mixing. I ran out of time in the experiments and several respectable VFO boards now languish in corners of the shack awaiting the day when I take up the cause again. When the *Short Wave Magazine* approached me asking for a constructional article to go into the first issue with the new cover, I wondered what I could produce that might be of interest to the readers. The multiband transmitter circuit has yet to come to fruition but the multiband receiver circuit has yet to be developed. Also recalled was a local amateur once speaking of his need for a compact amateur bands receiver to take about on trips so that he might monitor the HF bands. What emerged from my musing is this compact two-band (40 and 20m) amateur bands receiver. It is simple to build, uses standard inexpensive components and fits into a small, cheap, readily available case. It is only a two-band direct conversion receiver but the circuit gives a respectable performance and one inductor and a miniature toggle switch are enough to give coverage to the popular 40 and 20 metre bands. The receiver drives a small earpiece and has a self-contained battery making it small enough to fit inside a briefcase. . . . think of what radio-amateur businessmen and reps. might save

monitoring 40 and 20 in their hotel bedrooms rather than killing an evening in the hotel bar!

The Circuit

The circuit diagram of the Mini-Monitor is shown in Fig. 1; it's very conventional and simple but it is highly buildable and cheap. TR1 is a Hartley VFO which can be switched to tune the two

Table of Values

Fig. 1

R1, R7 = 100K	C10 = 0.47 μ F 16V tant
R2 = 47R	C13, C14, C18 = 1 μ F 16V tant
R3, R8 = 10K	C16 = 100 μ F 25V elec
R4 = 2K2	C20 = 220 μ F 16V elec
R5, R10 = 470R	CT1 = 3-60 pF semi-airspaced
R6 = 100R	VC1 = 25 pF airspaced variable
R9 = 1K	VC2 = 350 pF policon
R11 = 82R	D1 = 1N914
R12 = 22R	ZD1 = 7.5V zener
R13 = 10R	TR1 = J304 (or 2N3819)
RV1 = 10K log.	TR2 = 40673
C1 = 180 pF poly	TR3 = BC171B
C2 = 470 pF poly	IC1 = LM386N
C3 = 680 pF poly	I1 = 20 turns 30 s.w.g. enam wire
C4, C19 = 0.1 μ F	on 3/16" dia former, with core,
C5 = 100 pF min mica	tapped at 5 turns from bottom
C6, C11 = 47 μ F 25V elec	L2 = 22t as L1, tapped 16t from
C7, C12,	bottom. Link winding 5130s.w.g.
C17 = 10 μ F 16V tant	over bottom of main winding
C8, C9, C15 = 0.01 μ F	S1 = 2-pole changeover toggle
	Battery = PP3

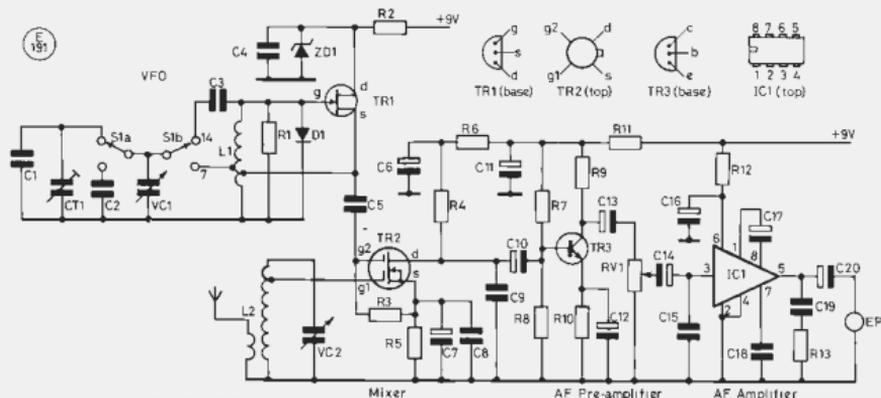


Fig 1 MINI-MONITOR CIRCUIT DIAGRAM

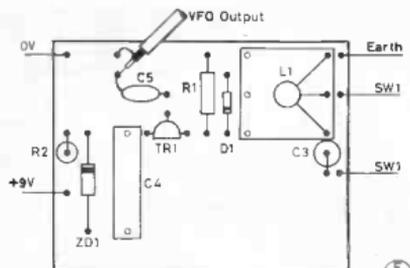


Fig 2 MINI-MONITOR VFO LAYOUT

bands. The Hartley circuit, using inductive feedback via the tapping in L1, is a useful circuit in such applications, being capable of a wide tuning range with one inductor; this FET version is surprisingly stable, even without a buffer stage, in a receiver circuit. The double-pole changeover toggle switch allows a fair degree of bandspread for both bands. This seemingly odd arrangement (note that on 40m, only the tapped section of L1 is tuned) proved to be a practical way of obtaining suitable bandspread on both frequencies. The VFO is voltage stabilised by

A front view of the Mini-Monitor receiver. photo: Jo-Anna



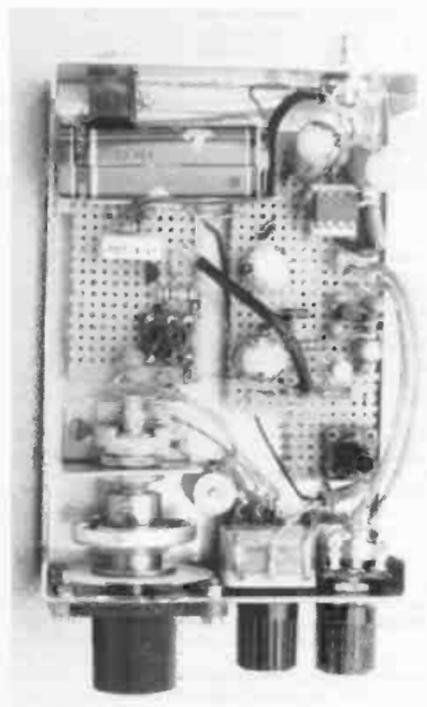
a zener diode (ZD1) and the output is taken from the source of the FET via C5.

TR2 is the good old faithful dual-gate MOSFET mixer. The signal input, tuned by VC2 for either band is fed into gate 1 and the VFO into gate 2. The resultant audio beat note appears at the drain load, R4, is RF decoupled by C9 and fed into the audio preamplifier by C10. The audio amplifier is a now commonly-available integrated circuit, the LM386N; many component traders, including the Tandy chain of stores, stock this IC at reasonable prices. It is a half-watt audio amplifier designed for battery applications as the quiescent current drain is low. It has a nominal gain of x20 but this can be increased with feedback, as in this circuit with C17. The LM386 is much quieter than many ICs, such as the LM380, used in receiver applications. In this simple circuit most of the receiver gain is at audio so a preamplifier stage, TR3, was added after the mixer. The output goes directly to a cheap 8-ohm earpiece but there is adequate audio drive for a loudspeaker if this is required.

Construction

Following the old adage of "build a bit and test a bit", the VFO is best constructed before the main part of the receiver. The VFO was originally built for experimentation and so was constructed using 0.1" matrix Perflboard, that is SRBP board drilled with holes at 0.1" spacing but without the copper tracks of the more common Veroboard. It is available from a variety of sources, including again the Tandy stores, and is useful for trial circuits without the need to etch a board. The components are mounted into the holes and joined up with interconnecting wires on the underside of the board; usually the surplus lead length can be used as the interconnecting wire. Ideally the receiver should be built on etched boards but I also used this technique for the rest of the circuit, and the layout drawings could apply to either method of construction.

The coil, L1, is wound on the familiar 3/16" diameter coil former with an iron dust core. The former is mounted on a base plate which allows supporting wires to be used to secure the windings. This type of former is a common surplus item but can also be bought as the Maplin 722 range of formers, the metric diameter is 4.8mm (ridiculous isn't it!). The bandchange switch is a miniature toggle switch although a small slide switch can be used. I tend to avoid slide switches as they are notorious for bad contacts. The capacitors around the tuned circuit, C1 to C3, should be polystyrene or good quality silver mica types to ensure frequency stability. The main tuning capacitor, VC1, is an airspaced 25pF variable and requires some form of slow-motion drive for a reasonable tuning rate. I used one of the inexpensive in-line epicyclic drives with a home-made card scale mounted behind a viewing hole cut in the front panel. The leads around the tuned circuit L1/VC1 and the switch, S1, should be as short and direct



An inside view of the Mini-Monitor receiver, showing the VFO board behind the slow-motion drive assembly, with the main board behind RV1 and VC2. photo: Jo-Anna

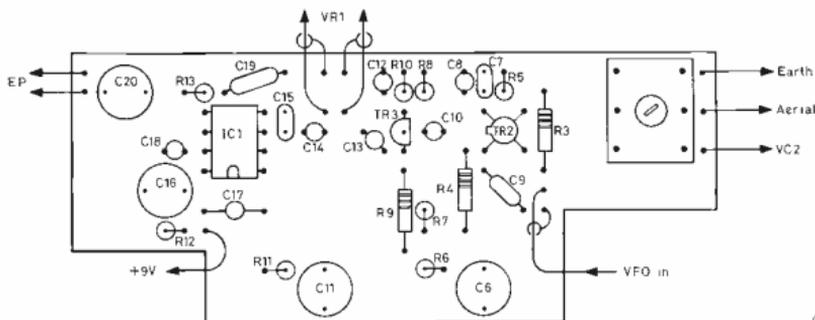


Fig 3 MINI MONITOR MAIN BOARD LAYOUT

as possible.

When the VFO is completed and the wiring checked it may be tested. The well-equipped amateur may check the frequency with a frequency counter but a check on an existing receiver is good enough. The object is to get the two bands onto frequency on the appropriate switch position. Begin with the 7 MHz band and listen for the signal on 7 MHz with VC1 fully meshed, finding the frequency by adjusting the core in L1. Switch over to the 14 MHz position and then adjust the trimmer, CT1, to locate the frequency; CT1 is one of the small semi-air-spaced trimmer capacitors. There should be coverage of the whole of both bands.

The Main Board

Begin the main board, shown in Fig. 3, by building the AF amplifier around IC1. I used an IC holder for the LM386N and small capacitors to allow a compact layout. Wire up the board as far as RV1 and check the wiring. The amplifier can be tested by applying the 9 volt supply; a damp finger placed onto the input on C14 should produce hum in the earpiece or speaker. Repeat the test at the top of RV1 — have your wire it the correct way round? The audio preamplifier can now be built as far as C10. The test can now be repeated including this extra amplification. The mixer stage is added next and it ought to be possible to trace hum through TR2 with a finger on gate 1.

L2 is wound on the same type of former as L1, with an output tapping and the input winding on the bottom end of the main winding. VC2 is a dual-gang polycon tuning capacitor of the type used in cheap AM radios. These are usually about 350pF per gang and just one of the sections is used. I used a surplus polycon from a scrapped radio but they are readily available from many sources, look for ones with enough shaft to mount on the front panel and add a small knob; this is used as a peaking control when changing bands. Adjust the core in L1 to obtain a peak for 7 MHz and 14 MHz at either end of the shaft rotation. Direct-conversion receivers are notorious for breakthrough at the front-end, so VC2 should be close to L2 — and it may even be advisable to use a screen lead between the two. In any case, screened leads should be used between the antenna socket and the input winding of L2 and the source of TR1 and gate 2 of TR2.

Construction

This receiver is not really miniature and is merely a compact receiver using standard components; this results in a very tight layout and construction. The method of building up the finished receiver is shown in the photographs. Naturally the completed project is in the hands of the individual constructor but the prototype used an inexpensive commercial box as a case. This is the A20 aluminium box (4½" x 3" x 1½") sold by *Minford Engineering*. The case is sprayed with three coats of matt black car spray paint and the front panel legends are waterslide transfers. The two miniature toggle switches, S1 and another

switch for 9 volts on-and-off, had to be mounted for ease of operation to fit onto the front panel layout. I also cut a piece of perspex to go over the main tuning control scale window. The power supply is self-contained in the form of a PP3 battery which squeezes into the back of the case.

Fitting all the components into the case is tricky because the two boards only just have enough space between the front panel controls and the battery. The main board has two cutaway sections, one for spacing for the battery and the one near L2 to allow space for the leads connected between L1 and S1. The VFO was not placed in its own box which is my usual practice, but seemed stable enough firmly mounted in the case. The size of knob for the main tuning control is a compromise between a large one for ease of control and the space required above the knob to read the tuning scale.

Using the Mini-Monitor

The use of the receiver depends upon its application. The input to L2 is for a low impedance antenna input; this is ideal in main station applications either from a suitable antenna, such as a dipole, or via an antenna tuning unit. Problems can arise in temporary locations with throw-out bits of wire. The receiver is quite sensitive even with a makeshift antenna but correct matching is a great help. With bits of wire, it could be possible to alter the input on L2 to feed into a higher impedance by using the top of L2. The antenna can be connected to this point via a capacitor, try values from 100 to 500pF. A better idea is to experiment with a simple miniature ATU built from a small inductor and a polycon variable capacitor. The values will depend upon the length of wire being used but try a basic L-Match circuit with a tapped coil of about 30 turns on a scrap ferrite rod.

In spite of its simplicity the receiver is capable of useful results monitoring the two bands. It does suffer from breakthrough when 40m. is invaded at night but so do many other receivers. Adding a simple attenuator, a 1K linear carbon potentiometer with the track across the input to L2 and the wiper to the antenna, can help.

Components Sources: Most of the components are available from the usual component retailers.

The case: A20 Aluminium Box from *Minford Engineering*, Sun Street, Pfestiniog, Gwynedd, LL41 4NE. (Send an s.a.e. for price list).

Waterslide transfers: An A4 sheet of amateur radio legends is available from John Kaime, 74 Camden Mews, London, NW1 9BX, for £1.25.

LM386N and **Perfbroad** are available from *Tandy* stores.

J304 FET is currently available cheaply from *J. Birkett* of Lincoln. (A 2N3819 FET may be used but has differing pin-out).

VHF BANDS

NORMAN FITCH, G3FPK

AFTER the fine tropospheric openings in December, reported last month, January was largely a case of, "After the Lord Mayor's show comes the dust cart". The severe gales everywhere, and the heavy snow in many parts, in the British Isles, took their toll of antennas and, in some cases, masts and towers. This further decreased activity, which no doubt accounts for the lower than usual number of entries in the 1984 Annual Table.

Awards News

The 144 MHz VHF Century Club has one new member this month, Byron Fletcher, G6HCV, from Codsall in Staffordshire. A short wave listener from 1962, he was first licensed in April, 1982. His station consists of a *Trio* TR-9000 and 100w *Microwave Modules* amplifier, the antenna being a 6-ele. *Quad*. The site, at 425ft. a.s.l. is in YM30f locator. Byron's membership certificate, issued on Jan. 12, is no. 363.

Kevin Piper, G8TGM, (ZK17f), member no. 28 of the 144 MHz QTH Squares Century Club, has submitted more QSLs and has gained his "125" sticker, dated Feb. 4. He now has 129 confirmed, the latest confirmations being for a mixture of *Es*, *Ar*, *MS* and *tropo*. QSOs, all SSB mode. The *Es* ones include EA7BVD (XX), YU1OHV (KD), YU5CXY (KC) and 9H1FBS (HV). It would be appreciated if QTHCC members would note the certificate number when submitting more QSLs for stickers, as the records are kept in number order and not by call signs.

VHF Convention

The *RSGB's National VHF Convention* takes place on March 24 at the Sandown Park Racecourse, Esher, Surrey. The start time is 1030 for the comprehensive trade show which closes at 1800. This has been well supported this year with some new exhibitors. The equipment testing facility, which proved popular last year, is again being provided and will be operated by Don Hamilton, G8DON. *RSGB* President Bob Barrett, GW8HEZ, will address the Convention at 1345, followed by the presentation of numerous trophies.

From 1415, there will be the usual three hours of lectures in three streams. *Stream*

A starts with G4SWX on "GaAs fetts for all", followed by G3LTF on "EME operation", and ending with the "VHF Contests Committee forum". *Stream B* commences with G3AAJ on the "Oscar 10 experience", followed by G2FKZ on "Solar Cycle 21 — facts and fancies", ending with G3WSN and G5KWW on "The 50 MHz story". *Stream C* is the microwave one which starts with G3BNL on the "Phase locking of Gunn diodes", followed by G8AGN on "Microwave propagation whatever the weather", ending with G4FRE on "The middle bands — or what can be done on 2.3, 3.4 and 5.7 GHz".

The cost is £1.00, with a 50p entry for under 18s, while under 14s get in free. Tickets at the door or from *RSGB* HQ, Mr. B. Rider. There will be a 50 MHz group meeting at 1130 organised by G4JCC. There will not be an evening buffet supper this year.

Beacon News

Your scribe has received a corrected beacon list from Claus Neie, DL7QY, the publisher of *DUBUS* magazine, in which the World, or Maidenhead, locator codes have been corrected. Incidentally, issue 4/83 was the last one to be printed in Berlin and from 1/84, it will be printed by DL7QY in Bavaria.

Satellite News

UOSAT-B has been completed and was due to be taken to the U.S.A. on Feb. 9. Five of the *University of Surrey* team were scheduled to accompany the bird. Dr. Martin Sweeting, G3YJO, the project director, is very pleased with the effort and the CCD "camera" worked fine when they tried it out. At the time of editing, the launch date was still March 1, between 1759 and 1809 GMT from Vandenberg in California. See pp. 618 and 619 in the February issue for more details.

It seems that satellite users prefer to hide their light under the proverbial bushel, since very few reports are ever received from readers who communicate through *O-10* and the *RS* orbiters. One who regularly does, however, is Adrian Chamberlain, G4ROA, (Coventry) who was on during the low elevation pass on Jan. 4 and who was rewarded by a QSO with KH6IBA on the Hawaiian Island of Maui. SSB mode was used. The passes on Jan. 5 and 6 resulted in the sked with W2GAX in New Jersey and some Californian stations. The next lowish passes were over Jan. 23 to 25 with good QSOs with west coast and mid-west stations. Adrian reports "a nice long chat" with KB7RV in Carson City, Nevada.

It seems a lot of west coast stations get up early to work through *O-10*, some even eating their breakfast at the time. Adrian has now installed a *muTek* masthead

Gasfet preamplifier on the 2m. beam and this has made an unbelievable improvement to the clarity and strength of the signals. If everyone used a good receiving system, the transmitter powers would likely drop.

Dr. Owen Garriott, W5LFL, has now played through his *Columbia* tapes and only five British "contacts" were confirmed. These were with G4UYL, G6DEF, G6EGY, GM8NXC and GW60JK. Considering the thousands who must have called W5LFL from these islands, to have identified a mere five suggests to your scribe that FM mode was the worst choice for the experiment. Nevertheless, the mission provided wide, and generally satisfactory, *media* coverage, exposing amateur radio to the great British public for several days. Hopefully next time, SSB mode will be used, the *Shuttle* operator adopting the successful technique used by HF/LF band DX-Peditionaries, "listening at least 5kHz up ...". As the general standard of operating on 144 MHz deteriorates, perhaps 432 MHz would be a more suitable band.

The British Meteor Society

Paul Whatton, G4DCV, is a member of the *British Meteor Society*. They are interested in collecting information from radio amateurs about their MS activities on the bands. Any reader willing to cooperate, including listeners, of course, should write to:— Mr. R. Mackenzie, FRAS, FBIS, 26 Adrian Street, Dover, Kent. Reporting forms are available and the Society publishes *The Radiant Catalogue* for £1.50, post free. That sounds like it should be of good use to MS addicts.

Continuing the MS topic, BBC Television's popular science programme *Tomorrow's World*, transmitted on Feb. 2, included the description of a radio data link using meteor trail reflexions. The average viewer would have assumed that this was a new invention, as no mention was made that VHF amateur radio operators have been using this technique for several decades. It would be interesting to ascertain if the developers of this system were inspired by the work done by MS operators. Maybe one of our readers may know?

Contest News

Mar. 3/4 sees the 144/432 MHz and SWL Contest from 1400-1400 GMT. This is a two section affair; Fixed and All-other, with those operating -/A considered as All-other entries. Radial ring scoring with RST, serial no. and QTH locator to be given. Two more legs of the 70 MHz *Cumulative* occur in March on the 11th and 25th, the former from 1000-1200 GMT, the latter from 0900-1100 GMT.

The Barking Radio and Electronics

TR9130 TWO METRE ALL MODE TRANSCEIVER

This rig is proof, if one needed it, that TRIO do not bring out new models just for the sake of it. The TR9130 is remembered as a classic rig and today people are still asking for second hand ones, even they are a rarity on our S/W shelf. The TR9130 incorporates the improvements that all amateurs asked for, green display, reverse repeater, tune whilst transmitting, higher power, more memories and of course memory scan. TRIO's answer, the TR9130.

TR9130 £442.52 inc vat.

**TS780 DUAL BAND BASE STATION TRANSCEIVER**

The TS780 is the perfect base station VHF/UHF transceiver for the enthusiastic operator. The rig has all the necessary control functions essential for operating on both today's busy two metre band and the wide spaces of seventy centimetres. Full repeater facilities plus reverse repeater are included and the transceiver has the usual memory channels (10), two VFO's, up/down frequency shift microphone, IF shift, two priority channels, memory and band scan, etc. A superb rig, I have one myself, ring for a full enthal!

TS780 £795.00 inc vat.

**TR7930 TWO METRE FM MOBILE TRANSCEIVER**

Those who have used or owned a Trio TR7900 will know what I mean when I say that Trio, with the introduction of the TR7930 have improved on the unimprovable. The Trio TR7930 improves on the TR7900 by giving a green floodlight liquid crystal display, extra memory channels, both timed and carrier scan hold, selectable priority frequency and correct mode selection (simplex or repeater). The most significant change is the liquid crystal display, but closely following this must be the ability to omit specific memory channels when scanning and the programmable scan between user designated frequencies.

TR7930 £312.11 inc vat.

**R2000 GENERAL COVERAGE RECEIVER**

The amateur bands are only a very small part of the radio spectrum, many other transmissions are available for the short wave listener. Broadcast stations provide an alternative source of current information both political and regarding the life style of the country. Fitted with the eternal VHF converter the R2000 covers continuously frequencies from 118 to 174 MHz giving access to amateur two metre transmissions (am, fm, sabb and cw) plus a lot more. Having 10 memories, memory scan and programmable scan the R2000 provides in one rig the perfect receiver.

R2000 £421.36 inc vat.

**TS930S HF TRANSCEIVER WITH GENERAL COVERAGE RECEIVE FACILITIES**

Much has been said about the TS930S transceiver and it now has a place high in the affections of those amateurs fortunate enough to own one, indeed it has become the "flagship" of the TRIO range. Providing full amateur bands plus a general coverage receiver (150KHz to 22MHz), the TS930S has every conceivable operating feature for today's crowded frequencies.

TS930S £1150.00 inc vat.

**TR2500/TR3500 HANDHELD TRANSCEIVERS**

Two first class hand held transceivers, one for two metres and the other for seventy centimetres. Ten memory channels, band and memory scan, repeater shift, reverse repeater and a low power position make the rigs extremely useful for the radio amateur who wishes to keep in touch with his local scene. A comprehensive range of accessories, base station charger, speaker microphone, mobile mount, etc. can be added to enhance operation, accessories used with one rig being compatible with the other.

TR2500 £237.82 inc vat.

TR3500 £256.45 inc vat.

**TS530SP HF AMATEUR BAND TRANSCEIVER**

A logical progression from the reliable TS500 series the TS530SP was the most popular HF rig in the range. I use the term "was" because TRIO decided to cease production and supplies were no more, however the demand from radio amateurs worldwide for the transceiver have continued and TRIO have reintroduced the rig. A standard HF valve transceiver without the frills but providing today's amateur with all necessary facilities for reliable world wide communication, the TRIO TS530SP. Now fitted with notch filter.

TS530SP £638.00 inc vat.

**TW4000A DUAL BAND FM TRANSCEIVER**

I have been waiting for this rig for the last three years, now it is here and I am using one, words fail me. Send for details.

TW4000A £469.00 inc vat.



just a part of the range

Securicor carriage on the above items £6.00

LOWE ELECTRONICS

Chesterfield Road, Matlock, Derbyshire. DE4 5LE.
Telephone 0629 2817, 2430, 4057, 4995. Telex 377482.



Society's 144 MHz event is on Mar. 25 from 1300-1700 GMT. All modes with contest exchanges as RS(T), serial no. and administrative county. Scoring is one point per contact, but G3XBF and G8XBF are worth 10 pts. Foreign countries, like ON, PA, etc., score as extra countries, the final score being points times total of countries and countries. There are three sections:— full legal limit, low power defined as 10w output on AM, FM and CW or 40w PEP on SSB, and SWL. Entries, postmarked Apr. 15 or before, to BR5 31976, 32 Wellington Road, Rayleigh, Essex SS6 8EZ.

The 432 MHz CW event is on Apr. 8 1300-1700 GMT and is a single section contest with radial ring scoring. In past years, the third Saturday in March was the date for the 432 MHz AGCW-DL Contest. Your scribe cannot find the usual sheet from DK3UZ and has probably mislaid it. The times would be 1900-2300 GMT on Mar. 17 and the scoring rules were detailed on p. 186 in the June, 1983 issue.

Auroral Matters

In past issues, reference has been made to the Auroral Section of the British Astronomical Association, which publishes an occasional newsletter. No. 4 has arrived at your scribe's desk and the section on radio auroras states that only GM41PK and G6GGE provide the BAA with data. One sentence seemed rather unfair. "Regrettably hams prefer to spend their time talking to each other rather than passing on information to other scientific disciplines." All radio auroral reports go to Charlie Newton, G2FKZ, on behalf of IARU Region 1, and probably form the basis of CCIR papers. However, if other readers would like to correspond with the BAA direct, they can write to:— Mr. R. J. Livesey, 46 Padminry Crescent, Newton Mearns, Glasgow G77 5AQ.

DX-Peditions

From Dave Johnson, G4DHF, information about a summer DX-Pedition to the rare XS square in north Scotland. The South Lincolnshire Five Bells Contest Group plan to be QRV from July 25 to Aug. 4 inclusive. The members are G4DHF, G4ODA, G8JNV and G8NWM, plus various members of the families. Dave sorted out the proposed site, XS800 during a previous trip. It is a mountain called Ben Horn, the summit of which is 1,706ft. a.s.l. No schedules will be taken before they get to the site, when MS skeds will be arranged on a day-to-day basis via the 20m. VHF net during the day, and on 80m. at night. 2m. and 70cm. operation is planned with QRO gear and good antenna arrays. More information nearer the time.

Graeme Caselton, G6CSY, wrote:— "Plans for 1984 include an expedition to the Lizard Point (XJ square) in Cornwall,

ANNUAL VHF/UHF TABLE

January to December 1984

Station	FOUR METRES		TWO METRES		70 CENTIMETRES		23 CENTIMETRES		TOTAL POINTS
	Counties	Countries	Counties	Countries	Counties	Countries	Counties	Countries	
G4ARI	11	1	45	6	—	—	—	—	63
G3PFF	—	—	49	7	—	—	—	—	56
G4TF	—	—	29	2	19	2	—	—	52
G4ROA	—	—	17	1	13	2	—	—	37
G4NRG	10	1	3	1	10	2	—	—	27
G4MUT	9	1	4	1	2	1	—	—	18
GM4CXF	—	—	6	2	—	—	—	—	8
GW4HKB	5	2	—	—	—	—	—	—	7
GU4HUY	—	—	1	2	—	—	—	—	3

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

again. QRV 2m., 70cm. and 23cm." Dave Dibley, G4RKG, passes along the news that Pierre Redon, F1ADT, plans to operate -P again from a 1,400m. a.s.l. site in BE square during July, on 2m., 70cm. and 23cm.

Six Metres

Paul Turner, G4JE, completed 90 MS QSOs on 6m. during 1983, so he has certainly done his stint in the experiment so far. He recently completed a back-scatter MS contact with GJ3YHU in about 45 minutes, both stations beaming towards CG square to eliminate any direct tropo. signal reception. Chris Tran, GM3WOJ, has now received permission to operate from his new QTH and Paul has worked him, too, via MS. Dave Lewis, GW4HKB, (Gwent) worked five countries two-way on 6m. last year, and seven cross-band to either 4m. or 10m., including CT, EA, I and SM. He also heard TF.

Eric Jamieson, VK5LP, writes the VHF/UHF column each month in *Amateur Radio*, the journal of the *Wireless Institute of Australia*. He reports a super season on 6m. via Es, by which mode the VKs have made long distance contacts with New Zealand, New Caledonia, Solomon Is., Tonga, Norfolk Is., Papua New Guinea and Macquarie Is. Eric says that during Sunspot Cycle 21, many VKs have had a taste of real DX on 6m. so have upgraded their equipment. Hopefully, when the next sunspot cycle peaks, we will all have the band and be able to work this DX in the Pacific.

Four Metres

The first leg of the 4m. Cumulatives on Jan. 29 enabled four readers to get off the mark in the Annual Table. Terry Hackwill, G4MUT, (Berks.) and Roger Greengrass, G4NRG, (Essex) just sent in their scores without comments, but Tim Raven, G4ARI, (Leics.) listed the English counties worked which were relatively local ones suggesting activity and/or conditions were not all that good.

GW4HKB looks back over 1983 and mentions working six countries on the band. As with his 6m. activity, Dave also indulges in crossband operation in which eight countries were worked to either 6m. or 10m. These included CT, F, OZ and SM

plus an attempt at an HB9. In all, 12 countries were heard or worked.

Two Metres

George Haylock, G2DHY, (Kent) has a lot of difficulty getting out from his "hollow" in Sidcup. However, the December lift increased his countries total to five. He lists having worked ON4AUD, PA0s HIT, PLY, and NIE, PA3s CME and CIC, PB0ADH and a QRP station, PA3COVA. Best DX was DF6LN (FO51). George has a 6-over-6 slot fed Yagi at 20ft. a.g.l. and a new TR-2001M running 10w of CW, so hopes to do better this year.

G4ARI has got off to a fine start with 45 countries and six counties worked up to Feb. 1. Tim was heard brass pounding in the Feb. 5 CW contest so no doubt added a few more. One of the rarer contacts include GM8VBX (Dumf. & Gall.), G6URW (Tyne & Wear), G8TBC (W. Glam.), GD2HDZ and G16ATZ (Co. Down). G4ROA has devoted time to 2m., along with his satellite, UHF and microwave operation. Up to Jan. 30, Adrian had worked 17 G counties from his Coventry QTH.

Pam Rose, G4STO, (Lincs.) is handicapped a little due to fault in the AR40 antenna rotator which suffered in the January gales. The 19-ele. *Cushcraft Yagi* is presently beaming south, so only two countries had been worked up to Jan. 24. As Pam says, with the 2m beam, a 23-ele. Yagi for 70cm. and a 7ft dish for the microwaves, it is probably expiring too much from a small rotator.

Martyn Jones, G4TIF, has been in our Squares Table for quite a while, previously as G8CXQ, and has decided to enter the Annual Table this year. Thanks to the two Swale ARC contests on 2m. and 70cm., he has got off to a respectable start with 29 unspecified counties and a couple of countries on 2m. Graeme Caselton, G6CSY, was out portable for the 2m. Swale event, at Knockholt in Kent (AL51). Weather conditions sounded most inhospitable— three inches of snow, only 3°C temperature, 60ft. visibility with the barometric pressure falling. However, he made 105 contacts in three hours, best DX being G6LYZ (W. Yorks.) and G6OYL (S. Yorks.). Graeme was in the

QTH LOCATOR SQUARES TABLE

Station	23cm.	70cm.	2m	Total
CGN	67	48	164	279
CANQC	57	80	157	294
GATFI	51	109	126	286
G3XDF	48	100	148	297
GBFNN	41	72	115	228
GOCO	40	91	163	294
G8FDU	39	105	88	232
G6KXN	35	37	82	154
G3PRV	33	101	171	305
G8FMK	33	68	79	180
G8EER	32	91	46	170
GBULU	31	85	115	231
GASTO	29	48	113	190
L6AKK	28	100	67	205
GBATK	23	82	129	234
G8KBE	22	96	188	306
G8EFT	22	65	105	192
G8RBT	20	35	182	237
GBHII	20	77	135	232
GBROA	19	55	61	135
G3UVR	17	79	196	292
G4NBS	14	77	94	185
G2HDZ	13	50	91	154
G8KXV	12	76	193	279
GW3CBY	9	30	90	120
GB3YV	9	100	102	209
G8KXN	6	61	132	200
G3BW	6	36	220	262
G3VR	2	24	239	265
G3YU	2	35	146	181
G8DDK	2	13	127	142
G4RSN	2	22	81	105
OG4CD	1	115	280	396
G6CVM	1	29	142	172
GW8LCO	1	58	104	163
G6JNS	1	3	306	310
G6KXN	1	116	343	461
G3HMV	—	91	345	436
G3YUF	—	117	307	424
G3RQZ	—	411	411	822
DKJUZ	—	—	317	317
G4UE	—	—	314	314
G4JLL	—	30	261	291
SP2DX	—	—	280	280
G6ERG	—	16	243	259
G6KXN	—	48	209	257
G4MCLU	—	77	176	253
G4DEZ	—	—	241	241
G4TFE	—	82	157	239
G6KXN	—	28	204	232
G6ACOK	—	—	204	204
G8RZO	—	75	148	223
G4RZP	—	47	147	194
9H4ET	—	11	210	221
G4BWG	—	64	152	216
G4WEAI	—	40	209	209
G4ULX	—	36	172	208
G4OAL	—	31	174	205
G4AWU	—	50	150	200
G3PFR	—	—	197	197
G4KEE	—	—	194	194
G6ACXP	—	27	165	192
G4BEC	—	58	126	186
G4HFO	—	69	112	181
G6CMI	—	—	172	172
G4LDE	—	35	115	150
G4MUT	—	68	100	168
G8LFB	—	—	165	165
G8SRI	—	53	106	159
G4TGM	—	—	158	158
G4RGR	—	48	108	156
G4TJX	—	59	90	149
G8WPL	—	54	93	147
G6HKS	—	—	147	147
G4MHPK	—	—	139	139
G6KXN	—	—	135	135
G4MJC	—	12	120	132
G4FR	—	49	82	131
G4GTFU	—	2	128	130
G4MWD	—	1	120	121
G4DOL	—	—	116	116
G8NLR	—	—	115	115
G4NBO	—	26	87	113
G4GHA	—	2	110	112
G8EET	—	—	105	105
G8FVY	—	—	97	97
G10MOK	—	—	96	96
G8MYP	—	—	94	94
G4WCG	—	—	92	92
G4SBB	—	30	61	91
G6ABB	—	—	80	80
G4CTI	—	—	74	74
G6HRI	—	25	47	72
G8NWF	—	—	67	67
G4PFL	—	13	50	63
G4ZEM	—	—	63	63
G8PYL	—	—	54	54
G4RO	—	—	18	38

Starting date January 1, 1975. No satellite or repeater OSOs.
 *Band of the Month", 23cm.

QRP section, running just 5w to a 9-ele. Yagi. He worked G6XPY (Derbys.) who was also running QRP.

Welcome to new correspondent Bob Hamer, G6NVQ, from Westhoughton in Gtr. Manchester (YN38). He uses a

Standard C-58 transmitter and MM 25w amplifier with an Rx preamp. The antenna is a 6-ele. Quad from *Jumpbeam*, 350ft. a.s.l. On SSB on Dec. 28 Bob worked F6BQX (ZH670) for his best DX to date, then the next day, F1FQM (ZJ), ON4AUD (CK), TO2TY (BK), F1HKU (BK), PEIHHV (CL) and F6AGG (AJ) which last was worked using only one watt. After that, he reports not much of interest, but did contact GM4FZH (YP66C) for his first GM, G6ABB (Essex) and G4PSX (Hants.).

Kevin Pipcr, G8TGM, (W. Sussex) harks back to the *Geminids* and *Quadrantids* meteor showers during which he heard many stations on the SSB random frequency. However, he made no QSOs. In the *Quadrantids*, skeds with OK2SGY and YU3TS (ex-YU3TSB) were incomplete, but one with OK1MAC was completed in 45 mins. for a new locator square HJ, no 163. Kevin thinks random MS operation on SSB, "... is impossible unless your are running 300w plus and two 16-ile. beams, or equivalent". During both showers, DX stations who said "QRZ?" were pounced upon by the QRO stations who then "completed" the contacts. He feels that average stations could well leave random operation alone and concentrate on skeds, when lower power does work.

Don Hughes, G8WPL, (Stockport) did not date his notes but refers back to the *Ar* of Dec. 10 when he worked seven Scottish stations in XP, YR, YS and ZR squares. These were GMs 6KGF, 4NVG, 6KEW, 6WTT, 4ENZ, 1BBL and 6LXN, being the only ones on the band at the time. In a brief note from Jersey, Geoff Brown, G4J4CD, had confirmation from the *RSGB VHF Contests Committee* that he has now won the *Phil Thorogood Trophy* for the September 144 MHz Open Contest five years running. He found December conditions very good on 2m. but is still stuck at 230 squares. During the *Quadrantids*, which he found peaked between 0200 and 0300 on Jan. 4, random SSB operation produced QSOs with 1IANP, EA3ADW, 13HWB, Y21PL, YU1EU and YU1PF. The bursts were strong, but short.

Two letters from Derrick Dance, GM4CXP, (Borders) the first dated Friday the 13th of January. Now he has spent all weekend daylight hours from mid October to late December renovating all his various antennas. Then the violent storms of Jan. 11 and 12 occurred which succeeded in wrecking all his HF, VHF and UHF radiators and supporting masts. Eleven out of thirteen antennas grounded. "Is this a record?" he wryly asks.

In a second letter, dated Jan. 30, wherein Derrick identifies his locator as IO85EN as well as YP37c, he reports having built a 2m, 5-ele. Quad using the "wood and wire" method, to get back on the band. It is loft mounted so he has temporarily

abandoned his wooden, outdoor shack. First impressions are that this antenna is working quite well, although he missed a small *Ar* on Jan. 28. Derrick is one of several readers who have expressed interest in the *Maudenhead Squares* idea, pointing out its compatibility with the existing system, e.g. in his case YP equates to IO85. This means that our QTH Squares Century Club award programme will carry on as it is, since the "squares" are still 2° E/W and 1°N/S in either system. Derrick also welcomes the introduction next month of the CW table for VHF/UHF.

Your scribe is not much of a contest addict but did have a little go in the *Swale ARC* affair on Jan. 22. The conditions were rather flat and the best DX was only about 300 kms. Activity was high and those taking it more seriously made well over 100 contacts. The long *Aurora* on Feb. 4 came after the deadline and seems to have started around 1300 GMT. It was still going at 2000 at G3FPK. The only stations heard and worked from ZL60J (IO91WH) were GMs and SMs with no Russians heard. However, switch on was not till 1810, so perhaps the best was missed. QTC from London was 5-15° and GM3JFG (XR30b) at 1811 was beaming at 45° and GM4ILS (YR24e) at 1822 was aiming at 60°.

Seventy Centimetres

G4ROA's main activity was in the *Swale ARC's* Contest on Jan. 29 during which Adrian gave a few points away. He reports little activity from the north and northeast, or from the southwest. Best DX was G4CQR (E. Sussex) and the consistently strongest signal was GW8TFI/P (Gwent). The band was not in good shape, with lots of deep fading and the pressure only 997 mb. G4TIF is now up to 82 squares on the band, the last addition being OZ2OEE (EP) in the early December tropo. lift. Martyn took part in the *Swale* Contest but did not mention anything specific about it.

G6CSY's letter missed last month's deadline. Graeme mentions a QSO with P14THT (DM) for a new square in the Dec. 29/30 lift using just 5w to a 12XY antenna. G4J4CD is now up to 115 squares on the band, the last additions in December being OZ1AXX (FQ), SM6CMU (FR), OZ1HTB (HP) and F6HEO (BG). Last month, Claus Neie, DL7QY, (FJ61e) mentioned the odd beam azimuth necessary for his QSO with G3WZT on Dec. 29. He has since written to say that G3WZT was beaming towards Berlin (GM) which is much further north than the great circle heading. It would be instructive if mention was made of any future, similar anomalies that cannot be explained by known topographical problems.

Microwaves

Microwave news is rather thin this time; small wonder in view of the dreadful

January conditions. John Tye's, G4BYV, (Norfolk) undated report goes back to Dec. 3 when he worked PE1DPX(DM) on 9cm. at S9. PA2DOL (CL) was also contacted on the same band at the same strength, then worked on 6cm. at S2, a QRB of 254 kms. On Dec. 30, John worked DL9LU at S9 on 9cm. and had a 25 minute QSO with him in DK square. G4BYV now has 11 QTH squares on the band. He is now up to 30 squares on 13cm. the latest being DL5FAU(EK) on Dec. 29.

G4ROA opened his 1984 innings on 23cm. on Jan. 9 when he answered G4HWA's "CQ" call from Hampshire. On the 29th he contacted G3OSS (London) and G8MWR (W. Midlands). Adrian says there is a lot of "new blood" coming onto 23cm. so reckons that the next contest will be really interesting.

George Emmerson, G8PNN, (Northumberland) has spent little time operating and most of his spare time building. The result of this effort is that he now has 60w plus on 23cm. from a 2C39 PA. He has now completed his 13cm. gear but has to check the power output. A 5ft. dish with 13 and 23cm. feeds is now available but he intends to wait till the spring before putting it on the tower. Gordon is now up to 42 points in the All-time 23cm. table with 11 countries and 31 countries. It is planned to publish the All-time Table again next month, so please send in your latest scores.

The Australian VHF/UHF Scene

Eric Jamieson, VK5LP, (PF95KE) says it makes his mouth water reading about the thousands of European operators who are making contacts at any time of the day or night. When anything is done on VHF/UHF in Australia, it is usually significant because of the long distances involved. They enjoy tremendous openings on 2m. in the summer Es season. However, most all the population of this large continent is around the coasts, so they are looking forward to VK8KK's appearance. He is David Minchin, ex-VK5KK, who has recently moved to Alice Springs and who is a very enthusiastic VHF operator. This should make it possible for the elusive Worked All VK Call Areas/States to be more likely to be achieved.

As in Europe, VK operators are now using much better equipment than was the norm a few years ago, and Eric says that 70cm. contacts of 1,600 to 2,000 kms. are "quite common now". From time to time such distances are spanned on 23cm. and even 13cm., which sounds very challenging.

Obviously, the Australian VHF/UHF fraternity have to do it the hard way but, since the continent is much nearer the magnetic Equator than is Europe, the possibilities for trans-equatorial

propagation should be much greater. On the negative side, though, *Auroral* propagation would be something never likely to be experienced.

Thousands More

The Post Office at Chesterfield is now issuing licences at the rate of several hundred per day, which means another upsurge in activity. Most of this will be on 2m., many of the newcomers having no idea about operating procedures and band plans. It seems a great mistake that the basics of how to operate an amateur radio station do not form part of the *Radio Amateurs' Examination* syllabus and test. It is rather like learning to drive a motor vehicle purely from books and swotting up about the *Highway Code*, then being given your licence before you have ever actually driven a car.

Band plans have never formed part of British amateur radio licence conditions, it being left to us to make our own. However, once such plans have been agreed, it seems only logical that they be issued with the licence, as recommendations. Some years ago, your scribe did informally suggest to the *RSGB* that the Society might consider providing such operating notes and sound out the *Home Office* about its issuing them with the licence. It now seems that this may be possible, now that the *Post Office's* issues licences. Very little effort is needed to put an extra small document in the envelope and it ought to prove very helpful to the really new recruits. At least then they could not claim ignorance of such matters.

The other perennial complaint concerns the unsatisfactory quality of many of the signals one hears on all modes, particularly on 2m. This can be due to basic design faults with equipment, failure on the part of the manufacturer to align a set properly or misuse by the operator. When reports are exchanged, they should not be confined to signal strength numbers. Particularly with strong signals, one ought to tune around the edges to listen for nasty clicks on CW, distortion products on SSB and over-deviation of FM signals. Many signals sound good when tuned in "on the nose", but with certain products, on CW they radiate a sort of *D-F-Y Auroral* note, for example.

One has to be careful that one's own receiver is not generating its own distortion. For instance, many sets with noise blankers do generate severe distortion when very strong signals are going through the system. Therefore the noise blanker should be switched out when examining very strong signals.

Many of the bad signals seem to be radiated by operators who are not very competent, technically. To illustrate this, your scribe recently came across a particularly dreadful SSB signal on 2m. The operator was telling his partner that he

was using two "linears" after his QRP transceiver, a 1/10w one, followed by a 10/80w one. From the conversation it was obvious that the chap, though enthusiastic, had little idea of the pitfalls of such a set-up. His friend said the signal "sounded a bit rough" — it was very difficult to read, in fact — so our hero was persuaded to disconnect the 80w amplifier, but the quality was no better. When he took out the 10w device, there was some improvement.

It seemed obvious to your scribe that firstly the transceiver itself was not all that linear since, when tuning away from it, LF, it sounded edgy and spiky. Secondly the first amplifier was being considerably overdriven, thus creating more distortion. Since the fellow did not seem to have any means of monitoring his signal, even by a meter, let alone an oscilloscope, he had no way of knowing what an awful signal he was radiating unless someone told him and tried to suggest what was wrong.

Power matching of transceivers to amplifiers is rarely mentioned. For example, consider a little transceiver with a specified output of 3w PEP on SSB mode, followed by a 3w in/10w out amplifier. The uninitiated would assume that this combination would be ideal. However, what if the transceiver developed 4w and the amplifier only needed 2w drive to attain its 10w, reasonably linear output? The amplifier would try to deliver 20w and in so doing would almost certainly manufacture some nasty distortion products. The solution would be to reduce the output from the transceiver, if possible, or if it was fixed, connect a 3 dB attenuator between it and the amplifier.

It is up to all of us to try to get the best performance from our own gear and to assist newcomers to achieve that result, too, in a friendly and helpful way. Unfortunately, there are a few operators who will not accept any criticisms, and it is all the more sad when they are old-timers who ought to know better and one would expect might want to set a good example to the newcomers. To the Chinese, 1984 is the Year of the Rat, perhaps we should designate it, "Clean up rotten signals year".

Deadlines

That's it for March. Don't forget to put your clocks on to BST on March 25 and, if you are a Class A licensee, have a go in our Cumulative VHF/UHF CW Table. Send in the number of different stations worked on 4m., 2m., 70cm. and microwave bands since Jan. 1, 1984. The next deadline is March 7, and the one after that is April 4. All letters, claims, etc., to: "VHF Bands", SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6 9EQ. 73 de G3FPK.

Traps and Trapped Antennas for the Home Constructor, Part 2

ALL YOU NEED TO KNOW!

A. P. ASHTON, G3XAP

Discrete Traps — Another Approach

IF the reader consults the ARRL *Antenna Book*, (available from *Short Wave Magazine*, Publications Dept.), they will see reference to antenna traps constructed from coil stock — the appropriate length of coil being cut off a 'stock' length. Newcomers may not have come across this material, but old-timers will certainly remember it.

Essentially the material is a length of coiled wire, the turns being held in place by four plastic (perspex) rods which run down the length of the stock — Fig. 1 shows the details. The author attempted to construct material of this type in order to incorporate it into traps, and although some success was achieved, it was found somewhat simpler to use a sheet of flat plastic with holes drilled in it rather than to fit plastic rods to a

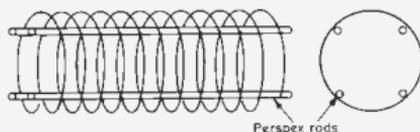


Fig 1 COIL STOCK MANUFACTURED WITH WIRE COILED ONTO PERSPEX RODS

(E 194)

ready-formed coil. He therefore came up with the idea shown in the photograph (Fig. 2) which has proven to be a simple (if time consuming) method of coil construction. One big advantage of this approach is that any coil diameter, turns spacing, wire size, etc., can be accommodated simply by changing the position and/or the diameter of the drilled holes.

Although the unit shown in Fig. 2 is constructed from perspex sheet, this is not a good choice since it does tend to be a little 'lossy' at the higher frequencies; however, the area of contact between the former and the coil is extremely small compared with the contact area of the more conventional coil wound on a grooved former. The coil shown has a considerably higher 'Q' factor than the more usual device and the trap shown is, indeed, a very low loss, high quality device resonant on 10.125 MHz. Winding a coil into a former of this type is very simple if the task is tackled in the correct manner — otherwise it will prove to be practically impossible and downright demoralising! Basically the coil has to be wound first by tightly wrapping the wire around a suitable former — this loose, 'floppy' coil is then 'wound into' the coil former and is quite simple to do provided that one or two small details are understood. Firstly, the coil must be initially formed by winding the wire onto a cylinder that is *smaller in diameter* than the required diameter of the completed unit — this is because the turns of this first coil will spring open when they are released from the former. For the same reason, rather more turns than are required must be wound onto this 'preliminary' coil. The

actual diameter required for this preliminary former must be determined by trial and error since the amount by which the coil expands when released depends on several factors such as the diameter of the wire used and its composition (e.g. hard or soft drawn copper, enamelled or tinned, etc.), how tightly it is wound, and so on. When drilling the two rows of holes in the plastic sheet, remember to stagger them and also to experiment with drill sizes in order that the coil may be easily wound into the former, yet not be too floppy when completed.

After the capacitor has been fastened into place, the trap can be tuned; it will be noted that the inductance of the coil can be adjusted by tightening-up or loosening the turns in the former, which allows a large range of adjustment to be covered. Final 'fine-tune' can be achieved by bending the outermost turns of the coil inwards or outwards in order to produce small changes in the inductance. The coil can be rigidly fixed to the former by either cementing each turn in place, or by melting the former with a small soldering iron which causes the plastic to grip the wire tightly when it sets. Either method will produce a good rigid product, although it must be realised that the coil is rather more vulnerable than the conventional type and some care must be exercised in its usage. This type of trap is not really suited to encapsulation, and varnishing is probably the most realistic method of waterproofing with a device of this type.

Coaxial Trap Construction

As explained in *Part 1* of this series, the coaxial trap used a coil exactly like that used in a discrete component trap, but instead of using a discrete capacitor it utilises the capacitance that exists between two lengths of concentric (or coaxial) tubing. In order to determine the dimensions required to resonate a coaxial trap at a specified frequency, it is necessary to be able to calculate coil inductances and also the capacitance between two concentric tubes.

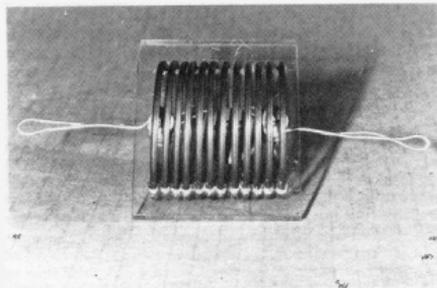


Fig. 2. A discrete component trap — an alternative approach. Note that the coil former consists of a drilled perspex sheet.

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POLYMER	TYPICAL K
ABS	2.7 4.7
ACETAL	3.7 3.9
ACRYLIC	2.2 3.2
NYLON 66	3.5 7.0
PETP	3.2 3.4
POLYPROPYLENE	2.0 2.2
POLYETHYLENE	2.2 2.4
PTFE	2.1 2.2
PVC	2.9 3.1

Fig 3 DIELECTRIC CONSTANTS (K) OF SOME COMMON PLASTICS

Taking inductance first, a reasonably accurate formula is:—

$$\text{Inductance } (\mu\text{H}) = \frac{(N \times r)^2}{9r + 10L}$$

where N = no. of turns

r = coil radius (inches)

L = coil length (inches)

Therefore, if we require an inductance of, say, 3 μH , and we have a coil former of $\frac{3}{4}$ inches diameter, threaded at 12 turns per inch, we could calculate the number of turns as:—

$$3 = \frac{(N \times 0.375)^2}{3.375 + (10 \times \frac{N}{12})}$$

Solving the resultant quadratic equation gives a value of N = 21 turns. Those readers who find that their mathematics is not up to the solving of quadratic equations will find that a trial and error method, fitting different numbers of turns into the above formula, will give the same answer. For example, making an initial 'guesstimate' of 25 turns gives

$$L = \frac{(25 \times 0.375)^2}{3.375 + (10 \times \frac{25}{12})} = \frac{87.89}{3.375 + 20.83} = 3.6 \mu\text{H}$$

Obviously fewer turns are required, so our next trial could be with 23 or 21 turns, continuing until substitution into the formula gives the required answer of 3 μH .

As a memory-jogger for those of us whose algebra was forgotten several years ago, the formula required for solving equations of the form $ax^2 + bx + c = 0$ is

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Calculation of capacitance is based on the formula:—

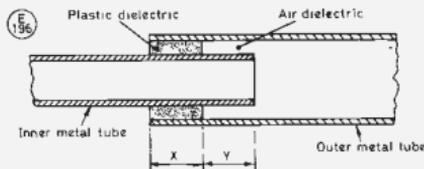
$$C(\text{pF}) = \frac{0.2235 \times K \times A}{d}$$

where K = dielectric constant

A = area of the smallest plate (sq. inches)

d = distance between the plates (inches)

With a coaxial capacitor, the plates are the two concentric tubes, and the area of the outer surface of the smaller tube is used in the



X Area of capacitor with plastic dielectric

Y Area of capacitor with air dielectric

Fig 4 A COAXIAL CAPACITOR (Note that there are two capacitors present)

formula. The dielectric constant of air may be taken to be 1, but the K of plastics varies considerably, so when these are used as dielectrics, the precise type of polymer used must be known — Fig. 3 gives details of the more common types. To take an example, let us assume that we have used polyethylene (polythene), which has a K of 2.3, that the outer diameter of the smallest tube is 0.75 inches and the inside diameter of the larger tube is 1.00 inches, and that the tubes are telescoped such that the overlap is 1.5 inches. Hence:—

$$C(\text{pF}) = \frac{0.2235 \times 2.3 \times 3.53}{0.25} = 7.3 \text{ pF.}$$

However, from Fig. 4 it can be seen that in addition to the capacitance of 7.3pF just calculated, there is an additional capacitance between the two tubes with an air dielectric, and that this additional capacitance can be increased or decreased by sliding the smaller metal tube further into or further out of the large tube — the plastic section remaining in place, flush with the end of the large tube. Let us now assume that we can adjust the overlap from nil to 2.00 inches and we will see that we can 'tune' the capacitor from a minimum value of 0pF to a maximum of:—

$$C(\text{pF}) = \frac{0.2235 \times 1 \times 4.71}{0.25} = 4.2 \text{ pF.}$$

Since this air-spaced capacitor is in parallel with the polythene dielectric capacitance of 7.3pF, their individual values are additive, and the complete device is therefore adjustable from 7.3 to 11.5pF. If we further assume that this capacitor is incorporated

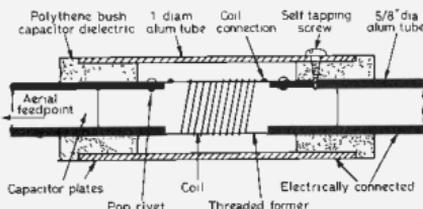


Fig 5 G3VMC'S METHOD OF CONSTRUCTION OF COAXIAL TRAPS

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into a trap with the 3 μH inductance discussed earlier, we can calculate the resonant frequencies of the trap with the above maximum and minimum values of capacitance — these work out to 27.1 MHz and 34.0 MHz. It can be seen, therefore, that such a trap could be adjusted to resonate anywhere within the amateur band 28.0 to 29.7 MHz.

Although a little mathematics is required, it is hoped that the reader will now be able to calculate the dimensions required, and hence design traps for any desired frequency; however, he will also be aware of the fact that some degree of precision engineering will be required in order to fabricate such a trap — reference to Fig. 4 shows that the plastic dielectric material needs to be turned on a lathe in order to obtain a snug fit between the two metal tubes of the trap. It will also be realised that a suitable coil former will not be available off-the-shelf and that this will also need to be produced on a lathe which has a suitable gearbox in order that the former can be threaded to accommodate the turns of the coil and hold them steady. The author is indebted to T. L. Sadler, G3VMC, who wrote an excellent article on the subject¹ and it is

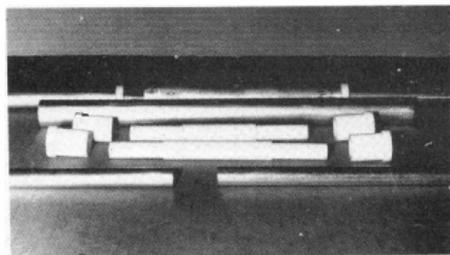


Fig. 6. The component parts of a coaxial trap (to G3VMC's design), plus a completed trap.

recommended that anyone contemplating trap construction should study the article very fully. (All coaxial traps manufactured by G3XAP to G3VMC's design have been found to perform superbly.) Fig. 5 is reproduced from G3VMC's article and shows the construction method used, whilst Fig. 6 shows details of the coil former and bushes used in the design — precise diameters of these components will be determined by the outside diameter of the smaller metal tube and the inside diameter of the larger tube used in the trap. Also seen in the photograph are a semi-completed and a completed trap, which give a good idea of how the component parts fit together to form the complete trap.

The choice of plastic used for the capacitor dielectric needs to be made with some care since some plastics absorb moisture, which has the effect of altering the dielectric constant to a considerable degree. For example, Nylon 66 will absorb up to 1.5% (ASTM test D570) which renders it unsuitable for this application; PVC absorbs about 0.5% which is just about acceptable, while polyethylene and p.t.f.e. absorb practically nil which makes them superb materials for the job. However, PVC has the unfortunate property of becoming very brittle at temperatures near to or below freezing, and continual cooling to these levels (as would be experienced during an English winter) leads to a gradual deterioration of the structure of the polymer with a consequent change of dielectric constant. Neither polyethylene nor p.t.f.e. suffer from this weakness, but p.t.f.e. has the distinct disadvantage of being extremely expensive. The trap components seen in Fig. 6 were fabricated from this material and the material cost alone (excluding the cost of the lathe work) was £4 per trap! This would appear to make polyethylene a good choice and was the material used by G3VMC in his article. The only other point to realise with the G3VMC-type trap is that the large and small tubes are electrically connected together at one end of the trap only — perusal of the original article will make this point clear, although the detail can be seen in Fig. 5.

Trap Tuning

Whichever type of trap is constructed, it will be necessary to tune it in order to bring its resonant frequency (i.e. its frequency of maximum attenuation) to the required point. It is important to understand the distinction between tuning the traps and tuning

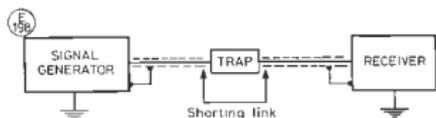


Fig 7 TEST SET-UP FOR RESONATING A PARALLEL RESONANT TRAP

the antenna after the traps have been incorporated into it — once the traps have been resonated they are not altered again, and antenna tuning is carried out solely by alteration of the physical dimensions of the antenna.

The author has seen articles in which it is suggested that if the precise details of the article are followed, the trap will be near enough to the required frequency to necessitate no tuning, and although not wishing to be critical of other author's work, he would make the point that if a trap constructor wishes to be assured that his trap is going to work effectively, he has no option other than to tune it to the required frequency. Other articles have suggested that the resonant frequency can be checked by use of a grid dip oscillator and here the author has found that this method does work but is neither as accurate or as simple as the method to be described which makes use of the station receiver plus a signal generator or, if this latter device is not available, the 'net' signal from a transmitter or even a signal 'off-the-air' may be used.

The equipment is set up as in Fig. 7 and the frequency of the generator and the receiver is adjusted until the generator's output is heard in the receiver at the required frequency of the trap (the shorting link should be connected across the trap at this stage and can consist of a short length of wire with crocodile clips fitted to each end). The output of the generator should be decreased in order to give a reading of S9 on the receiver's 'S' meter — a higher output can lead to swamping of the system with RF which will give rise to confusing results. Without altering the frequency of either

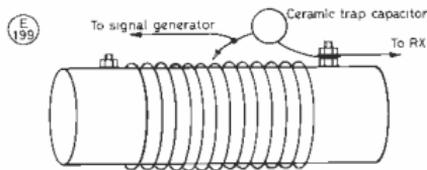


Fig 8 LAYOUT FOR THE INITIAL ROUGH TUNE OF A TRAP

equipment, the shorting link is removed and a marked drop in 'S' meter readings should be noted — the readings before and after removing the short being recorded.

The next step is to repeat the check on other frequencies and to compare the results obtained — in this way it will be determined whether the resonant frequency of the trap is too high or too low (or correct, although Murphy's Law does not allow for this eventuality). For example, let us assume that we are resonating a trap on 28.4 MHz and that the 'S' meter readings on 28.0, 28.4 and 28.8 MHz were S2, S3 and S4 respectively, with a reading of S9 in all three cases with the trap shorted out. In this case it is clear that the resonant frequency is LF of the required frequency and either the effective inductance or capacitance of the trap must be reduced in order to increase the resonant point. (Note that, as mentioned in Part 1, with discrete component traps the inductance is normally altered, while with coaxial traps it is normally the capacitance that is adjusted.) After adjustment of the trap, the measurement process is repeated, further changes being made as necessary until the trap resonates at the required frequency.

With a discrete trap that uses a coil wound with, for example, tinned copper wire as opposed to insulated wire such as enamelled, it is possible to set the signal generator and receiver to the required frequency and short-out the coil progressively with the capacitor to be used in the trap — at the same time watching the receiver's 'S' meter in order to determine the precise tapping point that gives the best null on the 'S' meter. It has been found that very rapid, fairly precise, measurements can be made in this way, although slight adjustments will probably need to be made

FREQUENCY MHz	COMPLETE ENCAPSULATION	VARNISH COATED
7	+100 - 200 kHz	+50 - 100kHz
14	+150 - 300 kHz	+100 - 200kHz
28	+200 - 400 kHz	+150 - 300kHz

Fig 9 TYPICAL FREQUENCY CHANGES NOTED AFTER WATERPROOFING DISCRETE COMPONENT TRAPS

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after fixing the capacitor into a permanent position on the trap due to the effect that stray capacitance can have on the tuning process. Fig. 8 shows the layout for this method of 'initial' tuning. The only other point to note during the trap tuning process is that the trap should be kept clear from metallic objects wherever possible as these can have the effect of detuning the trap; hence the device should be laid on a wooden bench or table — all test equipment, station transmitter, receiver, etc., being moved at least 10 coil diameters away from the trap. (Note that if metal objects are stored in drawers of a desk on which the trap is laid, these are not so obviously close — this applies also to conduit in walls which can influence traps laid close to the wall during tuning.)

Many articles quote actual attenuation figures achieved with traps, but it is suggested that it is beyond the scope of the average amateur to make such measurements. It is possible to calibrate a receiver's 'S' meter fairly accurately in terms of "dB down" compared with an S9 signal and it would appear that all that is required is to set the generator to give an S9 signal with the trap shorted-out, remove the short and re-read the 'S' meter in terms of the newly calibrated "dB attenuation". The snag is that the load presented to the signal generator by a parallel resonant trap is enormously different to that presented by a shorted-out trap, and it is therefore unlikely that the generator's output level will be the same under both conditions. Certainly the generator used at G3XAP is very sensitive to the impedance to which its output is presented and its output meter changes value as a trap is switched in and out of circuit. It should also be realised that the 'input impedance' of the trap will be different in a test set up to that which exists when the device is used as part of an antenna system

— (this will also invalidate any attempt to quantify our test results. However, having said this, it is possible to get a rough assessment of the sort of attenuation achieved, but more important, it is possible to make comparisons of different traps and by this means to experiment with different coil diameters, turns per inch, etc., in order to achieve the best performance possible.

It was mentioned in Part 1 that the completed trap is not necessarily in a form which enables it to be simply placed into an antenna and used — it may require some form of waterproofing. A good coaxial trap will be impervious to moisture and should require no further treatment, although a coating of varnish over its exterior surface will not alter its electrical properties. With a discrete component trap, however, the picture is entirely different and some form of protection against the elements is mandatory — methods were discussed in Part 1 where we also said that treatment will alter the coil's inductance and hence alter the trap's resonant frequency. The actual frequency change depends on several factors and it is not possible to quote accurate figures, but as a rough guide it may be safely assumed that the resonant frequency will be higher after treatment — typical changes are listed in Fig. 9.

Because of the uncertainty of this change, the author always makes a prototype trap prior to making a matched pair if any change in construction method or waterproofing agent is made. Anyone constructing their first pair of traps would be wise to follow this same approach since it allows him to see any difficulties that may arise and make any mistakes on a trap that is not to be used — the matched pair can then be confidently built with, hopefully, no snags at all. Note that the capacitor used in the prototype trap should be of the same type and nominal value as the matched pair but need not be accurately matched to their actual value.

In Part 3 of this series we will consider some trapped antenna types and discuss the tuning of these devices.

to be continued

Reference:

¹"The Trap Antenna", by T. L. Sadler, G3VMC, *Short Wave Magazine*, August 1979.

"I WAS ONLY SLIGHTLY SCATHED"

OLD FANGLER DESCRIBES HIS ESCAPE FROM THE 'BIG SMOKE'

JACK HUM, G5UM

"RATHER a close-run thing, seventeen in favour and seventeen against, with four abstentions" mused Mister Chairperson as he and The Man At The Club left the swing doors of the meeting room behind them and made for the titillation of the tea-cups.

"Oh no, I thought it a very fair result" replied TMC.

At that moment a burly figure bounced past them, clearly intent to be the first in the queue for tea. "Dam' good meeting" he roared: "I really loved it".

"Good old Ethelbald . . . but look . . . he's not wearing his usual football jersey. Haven't seen him in that pullover before."

"No, TMC, you wouldn't've . . . but to me up at the front of the meeting he was very visible . . . and he's got his callign knitted on the front of it" said Mister Chairperson.

By now thirty-nine members — those thirty-four who had voted, plus the four who hadn't, plus Mister Chairperson who couldn't and didn't — were gathered around the fine set of teacups ("None of yer thick old mugs any more" as Ethelbald would have said) which the club had bought out of its funds. Up piped Virginibus:

"Nothing like a soothing cup of tea after a hectic meeting . . . and you really need it when there's been so much talk as there was tonight. The Americans don't know what they're missing sticking to coffee. They shouldn't have thrown all that lovely tea into Boston Harbour in 1776".

Putting on his heaviest frown, which admittedly carried little *avoir-dupis* from an inherently genial ham-man, Mister Chairperson turned slowly and deliberately to Virginibus and said as sepulchrally as he could: "If you make that crack about Boston Harbour once more this session I'll have you keelhaulked from the yardarm . . . no, on second thoughts I'll yank you to that Yagi outside".

"Sorry, skipper, I'll try to remember" came back Virginibus the irrepressible.

No "Compromise"

As the three-dozen plus tipped back their rippie their murmurs of assent confirmed that all present agreed that it *had* been a good debate. The subject was the one agreed upon a few weeks earlier on the 70cm FM net: "That this House is of opinion that the HF bands are played out". The exact division of votes suggested to them all that as with so many other aspects of amateur radio, compromise had prevailed. Indeed, in winding up the debate Mister Chairperson had made this very point, carefully moulding his valediction to say "give and take" instead of "compromise" (the undertones of that word did not please him).

The evening was yet young. Always at club meetings the aftermath was as interesting as the main crop, the tea-cupping *causerie* as engaging as the formal lecture that had preceded it.

"Tell us, Old Fangler, how did you get on when you visited the Big Smoke last week? No, no, we don't want to know about all that dining and wining at The Gargantuan . . . tell us how you got on on Two" came the call from somewhere in the midst of the tea-bibbing throng.

Old Fangler looked slightly embarrassed: "I really don't think I've got much to tell you about who and what I worked from the car while I was away . . . plenty of simplex contacts and I may add plenty of through-repeater ones that almost frightened the life out of me".

"Repeaters!" Virginibus almost spat the word out: "They don't do anybody any good, they don't give you real QSOs, and I think they ought to be abolished".

Mister Chairperson looked at him disapprovingly for the second time that evening: "I don't want to sound avuncular, Virginibus, but didn't I hear you talking through our local seventy cents repeater last week? And I must say, laudie, that one of your little failings when you speak is undue impulsiveness".

"I like that phrase . . . sounds like the definition of a waveform generator about to break down" came the deep voice of Highly Technical Gent from behind Chairperson's tea-lifting elbow. Rarely did HTG venture a comment. He faithfully attended every club meeting to the incredulity of the members, for it was well known that he as a professional radar man had forgotten almost everything the rest of them ever knew. Yet he seemed to have a perpetual thirst for knowledge, never asked questions that might embarrass less experienced lecturers out front, but just sat there smoking his saxophone-shaped pipe, a privilege he alone was allowed to exercise: smoking at club meetings was regarded as almost as antisocial as the use of omni-antennas on Two.

"A nice *bon mot*, that, impulse failures" smiled Mister Chairperson to those around them lest some might not have grasped the purport of HTG's electronic pun.

"Come on, Old Fangler" roared the S9 voice of Ethelbald: "We're still all waiting to hear how you got on in the Big Smoke". "All right, I'll try to tell you" came Old Fangler diffidently: "But what I'm going to say might have influenced tonight's vote if you had heard it *before* the debate rather than now, after it. 'Cos it doesn't put VHF at all into a good light".

All fell silent. The buzz of personal QSOs dropped to S-zero. The teacups were placed silently on the bar. Somebody turned off the hissing urn (it always reminded TMC of the first 70cm. converter he ever built, he was wont to say).

Old Fangler said he would grid his loins even though this was a term incapable of precise definition. But he did take a deep breath before he launched into a description of his visit to a large conurbation where a lot of metre-wave repeaters had their being,

where, in his words, the language was indescribable, things were said that were a disgrace to the callings that uttered them, nobody apparently ever attempted to . . . check you on the input" to decide if a direct contact were possible so that the repeater could be freed for others to use, where child noises and baby music were superimposed on through-repeater conversations — and much else.

"As for the technical merit of the stuff I heard, one chap I was listening to said a halo antenna gave you circular polarization!"

After ten minutes of this, Old Fangler took another deep breath and reached for his third cup of tea.

As if stunned almost into silence, Virginibus observed quietly: "I did say the things ought to be abolished, didn't I?"

"Rubbish!" roared Ethelbald: "That would be giving in to intimidation".

"Well said, Ethelbald . . . though I've never heard you use such a long word as intimidation before . . . but you're right, all the same" observed The Man At The Club.

Old Fangler reminded the throng that he was only describing what he had heard when he visited the conurbation, but he went on to add: "When I was young nobody, but nobody, would ever scribe on walls but they do today. And some of the stuff you hear through repeaters is in the same category. It's electronic graffiti. Ah well, I got away safely . . . I was only slightly soiled, praise be".

"These CB-ers"

From the back of the crowd in the tea-bar came a gruff comment: "It must be all these CB-ers coming into our hobby."

Rarely did Old Fangler allow himself to become incensed about anything, however dire the provocation. But this time for once he obeyed his instinct. Very slowly he said:

"I don't know who made that remark . . . I didn't recognise the voice as being one of our Friday night 70 centimetre netters. So come forward and say that again — and identify yourself".

The silence that ensued reminded everyone of the rare occasion on the 70cm. net when Next-Man-In forgot his turn. No one spoke.

"So you won't talk, huh?" said Virginibus, recalling a phrase he had heard on the telly during one of those predictable Western movies.

Whoever had made the remark about CB-ers wouldn't talk. Old Fangler did:

"Let's be quite clear that CB-ers have done a lot of good to our hobby. They come to it with experience of how to use a microphone. And you've got at least a dozen of them around you now, chaps, all of them as good as the next club member even if they've not been in amateur radio quite so long. They've sloughed off those CB habits like 'the personal' or saying 'You are Radio Five' when they mean 'Readability Five'. And there are going to be many thousands more of them coming in to amateur radio over the next few years. We want 'em with us. They'll help keep this club alive".

Old Fangler had clearly scored a goal, and the sound that arose from the crowd around him reminded him of that collective ". . . RAY!" which emerges from the TV box when a soccer star hits one into the net.

Said Highly Technical Gent: "With due respect, Mister Chairperson, I think the time base is nearing the end of its travel. Hadn't we better all go home?"

"But we haven't heard Old Fangler finish his piece about repeaters!" complained The Man At The Club.

Old Fangler said he couldn't finish his piece about repeaters that night, but might if asked to dissertate further as a later evening.

Punctuating the chorus of assent, he allowed himself a final-final: "Go away with this thought in your heads, chaps: repeaters like motor cars or atomic fission are marvellous. They're here. You can't disinvent them. It's the way they're used that counts. May we leave it at that for the time being? GN OMs all." And he disappeared into the darkness of the night.

MEMORY LANE

SOME PERSONAL REMINISCENCES OF THE FORTIES AND FIFTIES

N. A. S. FITCH, G3FPK

Early Awakenings

My first awareness of "the wireless" occurred in the 1930s while I was still in short trousers. Every family had someone who "knew all about wireless", and in ours it was Uncle Will. Designs for wireless sets were abundant in the hobby magazines of the period, so my father, assisted by Uncle Will, bought the plans for and built the famous Scott-Taggart ST-400. This was a beautiful set built on a stout, stained and polished, plywood baseboard. It had an ebonite front panel, the main features of which were the two slow-motion tuning condensers. It had a hinged plywood lid which you raised to get at the works. The wiring was all varnished, cotton-covered 16 gauge copper neatly laid out just like a circuit diagram — all runs at right angles and no point-to-point wiring. Components labelled "Grid Leak" were clipped into things similar to 1/4-inch fuse holders and almost all the resistors were at least two inches long.

The large moving iron loudspeaker was housed below the main set behind a fancy piece of 'speaker cloth and an intricate fretwork cut-out fashioned by father. The valve filaments were powered from an accumulator which had to be recharged once a week at a local wireless shop called Trumbles. In the district however, other entrepreneurs had set up their own accumulator charging businesses in garden sheds in competition. HT voltage was eventually supplied from a battery eliminator which had tappings for screen grids and grid bias voltages. This set gave reliable service into the early part of World War II but was eventually ruined when I had the bright idea to feed the filaments *via* the mains. I had a large Meccano collection including an electric motor and a mains transformer to work it; I figured it would be all right to supply the filaments with a few volts of AC to do away with the messy old accumulator. Unfortunately, they did not appreciate the assault of some six volts of AC!

I can well recall my father and Uncle Will, fiddling about with the ST-400. Such expressions as, "Will's got a foreigner", and "Somebody's oscillating", come to mind. Stations such as Athlone and Huizen were sought after, requiring adroit use of the 'reaction' control. Because the console cabinet took up too much floor space, the poor thing was sort of beheaded, the lower half being discarded leaving about a one foot high top bit with the works; a separate moving coil speaker in a smaller cabinet was then used. When we moved in 1969, the remnants of the old ST-400 were thrown out but some valves were kept as museum pieces along with those fine slow motion tuning condensers.

Early Hi-Fi

During the war, I discovered I liked classical music. We did have a very ancient, home-made gramophone with clockwork motor and horn-type sound box made out of cleverly curved plywood, complete with doors at the end which were used to control the volume. My friends all had electric gramophones so I decided to build an amplifier. Minuscule wages precluded buying any commercial record playing gear, so everything had to be home-made, even the pick-up at one stage. I was told that a valve called a PX4 was the thing for real AF quality so I built an amplifier using one. These were in short supply and, since they could be used for transmitting purposes, we had to apply to buy them with a special form saying what they were to be used for; I

guess this was my first practical bit of dabbling in what we now call electronics. I used Sowerby's charts to design a suitable mains transformer on the core of a defunct component. However, when I switched it on, it began to smoke and pong so I gave up.

Wartime Bargains

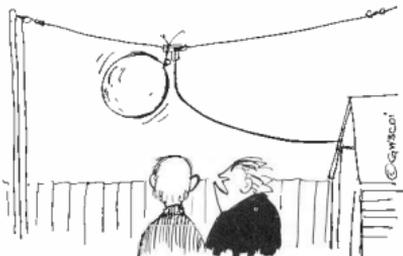
We lived in north-east London then, and on Saturday mornings there was a ramshackle market which Uncle Will referred to as "The Waste", in the Kingsland Road in the Shoreditch area of the city. Some of the stalls were devoted to electrical and wireless paraphernalia with everything from dubious universal mains radios to the sort of ancient components used in the ST-400. Most of these bits cost only a few old pennies, with valves like MH41 triodes and EM80 tuning indicators going for a shilling to half-a-crown. There were some smashing bargains though, like a three-gang tuning condenser complete with dial and backlash free geared tuning mechanism, and three waveband coil sets with band change switch for the equivalent of 15p. Such bargains were usually the result of a small firm clearing out a line of components for cancelled projects due to their having landed a lucrative military order.

The Lease-Lend Era

March 11, 1945 was a significant date in that U.S. President Franklin D. Roosevelt signed the *Lease-Lend Act*. One result of this was that large amounts of radio valves in near little boxes, bearing "JAN" legends, began to turn up on the shelves of radio dealers. Strange little objects like 6V6s in metal envelopes appeared. Not long afterwards, a local department store was selling some very handsome three wave-band radio sets with the unheard-of name Rutland. They featured a push-pull 6V6 output stage and ten inch loudspeaker. The cabinet was veneered and looked very posh, even though the main wood was glued-up offcuts; a typical example of the wartime, make-do-and-mend approach. It was very strong and survived unscathed, apart from a few flying glass scratches, when blast from a V1 "Doodlebug" severely damaged the house in June 1944.

Amateur Radio Discovered

It was when tuning around the short wave band on the Rutland that I happened upon amateur radio operation from the South American continent. One call I well remember is LU6AJ. Towards the end of the war, I stopped buying the *Meccano Magazine* and instead took *Wireless World*, while Uncle Will brought round the odd copy of *Practical Wireless*. I became a keen short wave listener during 1946 when I was working in the Victoria district of London. I discovered the *Short Wave Listener*



"No, no, no — I said a BALUN!"

on the station bookstall and saw the office was just down the road in Victoria Street. Older readers will remember it was a twin publication of *Short Wave Magazine*.

By now I had decided I wanted to be a proper radio amateur so I bought the RSGB's "The Amateur Radio Handbook" and the companion "Radio Handbook Supplement", priced at 3s. 6d. and 2s. 6d. respectively. I still have these gems which are in very good condition, even though the wartime paper is getting a bit pink around the edges. The first edition of the Handbook came out in the winter of 1938 with a printing of 8,000 copies in two printings. The second edition appeared in July 1940 and there were twelve printings. In all, 189,500 copies were sold and 105,000 copies of the Supplement in its five printings. It was indeed a fortuitous stroke of luck for the RSGB that there was no other textbook which covered practical short wave techniques so usefully.

The Spoils of War

The decade or so after hostilities ceased was a glorious period for anyone interested in radio. Vast quantities of military surplus was released and shops flooding the stuff popped up all over the realm, principally in the West-end of London, at first. Shops like Radio Clearance and Proops Bros. (The Walk Around Shop) in the Tottenham Court Road; the Radio and Electrical Mart in the Portobello Road; Henry's in the Harrow Road, and Charles Britain Radio in St. Martin's Lane come to mind. Elsewhere there were such as H.P. Radio Services in Liverpool; H. Whitaker (G3SJ) in Burnley; Chas. H. Young (G2AK) in Sheffield, and Clydesdale Supply Co. in Glasgow.

This surplus was mostly acquired at Government auctions and the lots could be curiously grouped. This explains why there were sometimes goods on sale in the radio shops which were not much to do with radio at all, like mess tins, articles of clothing, etc. The dealers who bought all this stuff were aware of the value of items like BC-348 receivers and T-1154 transmitters, but they had less, or no, idea of the potential value of some of the peripheral gear. Consequently, ex-services types who had worked with it often picked up some marvellous bargains. To illustrate this, a friend of mine saw a hefty Variac in a shop window with a £5 price tag on it. He asked the assistant if he was prepared to haggle, saying he only really wanted the "nice wheel thing on top!" The chap then said, "O.K. mate. A quid all right?"

That incident took place in Lisle Street, near Leicester Square, a rather curious area. On Saturday afternoons, I often cycled there with school friends from the past to browse around the various radio shops. The street was peopled by such as us looking for radio bargains while in dingy shop doorways other blokes were striking rather different bargains with the local harlots!

The various radio magazines of the period devoted a deal of space to the short wave listeners and featured numerous articles on making preselectors, crystal calibrators and all kinds of accessories for the budding radio amateur. Consequently, the Saturday bicycle trips resulted in the acquisition of many cheap components. These included one-milliamp meters for five shillings, EF54 and 6AC7 valves for about the same sum, small trimmer capacitors, large transmitting ones, transformers and oil-filled chokes, all first-class products made to stringent military specifications. The larger items, such as specialised VHF receivers with dozens of EF50s and strange tuning mechanisms, were humped back home on public transport, to be dismantled for components. I remember a friend and me buying a large "R-something-or-other" for a fiver and which kept us in components for these magazine projects for years.

One of the more outstanding items of the era was the American BC-453 receiver, later christened, "The Q-Fiver". It tuned from 190 to 550 kHz, I think, and had an 85 kHz IF. The IF transformers were interesting as the coupling between the primary and secondary coils could be varied. This was achieved mechanically by pulling a projecting plunger up and down. A BC-453 tacked on to the 455-465 kHz IF strip of a modest receiver turned it into a marvellously selective double superhet. Other



Following the recent receivership of Scopex Instruments Ltd. a new company, Scopex Electronics Ltd., has been formed. Here, Mrs. Elsie Roberts hands over the first of the new company's Scopex 14D15 double-beam oscilloscope to General Manager Mr. A. R. Morrison, to whom she is Production Director. Mr. Morrison was Manufacturing Director of the old firm of Scopex Instruments Ltd. Scopex Electronics Ltd. are at 63-65 High Street, Skipton, North Yorkshire. (Tel: 0756-69511).

super bargains were the Wilcox-Gay driver units for the transmitting fraternity, various models of the AR88, BC-342 and BC-348 receivers, prop pitch and cowl gill motors for use as antenna rotators, and the superb BC-221 frequency meter with its book of calibration figures. Many used BC-221s as VFOs for their rigs.

The Good Old Days?

These were indeed halcyon days and, looking back, I reckon that the young amateur radio enthusiast in the immediate post-war years got a much better appreciation of the hobby than do his or her contemporaries in the 1980s. The majority had to study hard for their licences — the R.A.E. was a proper written examination then — and had usually spent several years as short wave listeners. Consequently, by the time they got their licences, they had a very good background of operating procedures. The Morse test was part of the examination and, once you had your ticket, there was the mandatory first year on CW at twenty-five wats input.

Until the British made commercial amateur radio equipment appeared from companies like *KW Electronics*, most gear was either home-made or personally modified surplus. It was basically much simpler, being AM and CW, so we knew how to service it. By contrast today, few seem either able or willing to attempt any repairs or electrical maintenance on their complex "black boxes", for fear of doing irreparable damage to micro-processor or synthesiser circuits. This has led to the allegation that the great majority of today's radio amateurs are mere appliance operators who simply buy transceivers and accessories, including antennas, plug them all together and switch on, with little idea of procedures at all. Fortunately it does seem that an increasing number of amateurs are becoming keen on using more basic and simple equipment as evidenced by the popularity of the QRP movement and the "Kitchen Table Technology" articles by G3RJV in *Short Wave Magazine*. So, maybe there is hope yet!

What happened to all my 1940s and 1950s junk, did you ask? Well, I still have cupboards full of it, including hundreds of valves like SP41s, EF50s, 7Q7s, 1625s, etc. It is most unlikely that any of it will ever be used; it is a manifestation of the squirrel-like mentality of most of us, I suppose.

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CLUBS ROUNDUP

By "Club Secretary"

THIS month, beginning a new volume of the *Magazine*, seems as good a time as any to ask all club secretaries to check the Panel to see their details are correctly recorded; or, if you don't report your club's activities, do at least send us a note of the useful — if you don't want it published, say so, but at least be sure we have enough on file to be able to pass on to you any newcomers who may be looking for your club.

The Pile, A - Z

Abergavenny & Nevill Hall foregather in the room above Male Ward 2, Pen-y-Fal Hospital, Abergavenny every Thursday evening. They also are a local R.A.E. centre and run a class at Nevill Hall Hospital, in the Seminar Room.

Acton, Brentford & Chiswick will be listening to G3XPC talking of more experiences in DX countries, on March 20 at Chiswick Town Hall; this is the talk that was postponed from October last year.

At Axe Vale the headquarters are at the "Cavalier Inn", West Street, Axminster, just west of the parish church on the A35; it is there on March 2 that they will have a talk by G3RSJ on static protection for ICs.

Bangor have the first Friday in the month at the Sands Hotel, Bangor; the March meeting will be on the subject of radio-controlled models. All being well, the speaker will be local expert Des. O'Neill, but if he is unable to make it, his place will be taken by G16IHM who is said to be also a local expert!

Alternate Wednesdays is the form at **Bath**, the venue being the "Englishcombe Inn", Englishcombe, on alternate Wednesdays from January 11. They make a point of stressing the welcome to newcomers and visitors. On a different tack, the new PRO wants to know about how to present us the information — just follow the instructions! Seriously, be sure you have the name and address details right for the Panel, the details of the Hq address, and a note of the dates; and recall that, for instance, you are writing in January for the March issue. Deadline date is to arrive on publication date of the previous month's issue; this year this means January 27, publication date of the February issue. If you miss the deadline, the letter is kept and as much of it as possible used the following month.

Belfast College of Technology has its club room in the lecture theatre, Room B10, Millfield Complex, and is open to the public. March 28 sees G18RKC telling the secrets of how to get on RTTY with the ZX81 computer.

March 20 is the time to check performance of your rig, with test gear to be brought to the meeting; this is at St. Mark's Church Hall, starting at 8.30 p.m. for **Biggin Hill**.

At **Bishops Stortford** the formal meeting is on the third Monday of the month at the British Legion club, Windhill; there is also an informal, held on the first Thursday of each month, at the "Nag's Head", on the A120 road heading east out of town.

Further along that same A120 and we find **Braintree**, where the locals have a place at the Community Centre, in Victoria Street, next to the bus station, in the centre of the town, the booking being for the first and third Monday; March 5 is a talk on propagation and on 19th G4PQY talks about D/F hunting.

South now, to **Brighton**, where the Hq is now the Seven Furlongs Bar of Brighton Racecourse, at the northerly end of the Grandstand complex. Contact the Hon. Sec. for more details.

Bromsgrove A.R.C. foregather every second Friday of the month at Avoncroft Arts Centre; more details from the Hon. Sec.

— see Panel for his details.

Bromsgrove A.R.S. is a newer group, who seem to be rather keen on special-event stations; they have the second Tuesday in each month at Rigby Lane School, Rigby Lane, Bromsgrove. Details, again, from the Hon. Sec. — see Panel.

At **Bury** the members will be treated on March 13 to a talk on the "Fabrication of Integrated Circuits", by G4EXK; however, you can find the gang on any Tuesday evening at Mosses Community Centre, Cecil Street, Bury.

At **Cheltenham** the group is to be found at the Stanton Room, Charlton Kings Library, Cheltenham; for the other details we must refer you to the Hon. Sec. — see Panel for his details.

The **Cheshunt** club seems to be a thriving concern, and can be found at Church Room, Church Lane, Wormley, near Cheshunt. March 7 is a junk sale, and on March 21 they have the GB3P1 Repeater Group lads coming along to do their talk. On the intermediate Wednesdays, they have natter sessions, so "any Wednesday evening" sums it up.

The first Tuesday and the third Thursday are the dates for the **Chichester** gang. The Hq address is at the Fernleigh Centre, 40 North Street, Chichester, and on March 16 they will be in the Long Room, for a talk by John Outram on signal processing of microwave radar systems. The informal evening on March 15 is in the Green Room and, looking ahead, it is back to the Long Room for the AGM on April 3.

Deadlines for "Clubs" for the next three months—

April issue—February 24th

May issue—March 30th

June issue—April 27th

July issue—May 25th

Please be sure to note these dates!

Colchester Institute, Sheepen Road, is the venue for **Colchester** club activities; March 8 is a film evening, and on 22nd they have a talk "Marconi — the Man and his Work, Part 2". J. Stanley Wood will be the speaker.

The **Cornish** club are, for the moment, foregoing each month at the Church Hall, Treleigh, on the old Redruth by-pass. This gives March 1, for G4PEM to give a talk on commercial international communications and, looking on a month, there is the AGM. If you have not been to a club meeting before, we suggest you check with the Hon. Sec. — see Panel — in case they have been able to return to their old venue.

Now **Crawley**; here we must refer you to the Hon. Sec. at the address given in the Panel, as the details on the March meetings are not to hand. However, we can say that the venue is Trinity United Reformed Church Hall, Ifield, Crawley.

Crystal Palace report with regret, the death of their member, G3IIR. Eric Yeomanson, who apart from his activity in the national sense with RSGB — he was President in 1965 — and BARTG, was a committee member of the club from its outset. Such a stalwart will be very much missed. To turn to the club itself, they have March 17 for a talk on RSGB services to the radio amateur by John Nelson, G4FRX, at All Saints Parish Room, Upper Norwood, SE19. This is at the junction of Beulah Hill and Church Road, opposite the IBA mast.

We now turn to **Dartford Heath D/F**; the main interest here, of course, is D/F hunting, but they also have informal gatherings. For details, we refer you to the Hon. Sec. — see Panel for the details.

The **Derby** crowd have a new-look committee — for about the first time since the war, they have a committee not including G2CVV, who this year has decided to stand down as Treasurer. Find the club at 119 Green Lane, Derby, on any Wednesday evening; March 7 is a junk sale, and 14th a natter night. March 21

is the AGM, and on 28th they have a talk on Royal Navy communications by Lt. Alderson of the local RN Careers Office.

Derwentside continue in the R.A.F.A. Hq, Sherburn Terrace, Consett, every Monday at 7.30 p.m. More details from the Hon. Sec. — see Panel.

Droitwich are entertaining G3RJV for a talk on QRP (what else?) on March 26 at the Scout Hq in the town. In more general terms, they have the second and fourth Mondays as a regular booking there.

At Dudley the booking is for the second and fourth Tuesdays; the venue is the Central Library. March 13 is down for the re-scheduled talk on BBC Outside Broadcasting by Joe Jacobs, and on March 28 G3ZPF will give his chat "DX-ing from an Impossible QTH".

March 1 is the date when the **East Kent** club will be hearing from G3ROO, his topic being QRP working. This one, we assume, is at Cabin Centre, Kings Road, Herne Bay, where the club have the first and third Thursdays. Looking forward to August next, they have a mobile rally in the pipeline — more details will be released later.

It's the second and fourth Thursdays for **Edgware**, at 145 Orange Hill Road, Burnt Oak, Edgware. Incidentally, we note from the Edgware newsletter that they export Hon. Secs.: G3GC is the incumbent at Yeovil — which we knew about — and G3VV is in office at Axe Vale — which we didn't! However, we still hope someone down there will tell us, sometime!

Exeter's meeting on March 12 will be a talk "Static and Chips" by G3RSJ. As usual, this will be at the Community Centre, St. David's Hill, Exeter.

Turning to **Fylde** we find they've settled in their place at the Kite Club, Blackpool Airport; March 6 is a talk on the changes electronics have made to air-traffic control, to be given by J. Jefferson, Senior Air Traffic Controller, Blackpool Airport. March 20 is down for a talk by G3AEJ on the construction of Top Band D/F gear, with G8GG also in the act.

March 18 is the date given for the monthly meeting of the **Glenrothes** club, at Provosts Land, Leslie, Fife, Scotland. We understand they also meet informally every Wednesday evening.

The **G-QRP Club** come next, and this must be the one for those interested either in QRP operating or the home-brew of amateur radio gear. All the details from the Hon. Sec. — see Panel.

Greater Peterborough will be at Southfields Junior School, Stanground, Peterborough, on March 22 for a talk on submarine radio by G4SQB.

The **Great Yarmouth** club seems to have benefited from the change of venue; they now have their Hq at the STC Sports and Social club in Beevor Road, South Denes. For March the dates are 1st, 15th, and 29th — in other words alternate Thursdays. At the time of their letter the committee were still sorting through the programme so no doubt a call to the Hon. Sec. will tell you what's what — he is in the appropriate slot in the Panel.

At Harrow the local Arts Centre in High Road, Harrow Weald, is the place, the meetings being either in the Roxeth or Belmont Rooms, every Friday. In general the arrangements are to alternate with informal and formal meetings, the latter with talks, films and so forth; they also play D/F and other activities.

Quite a complicated set-up at **Hastings**; the main meetings are on the third Wednesday at West Hill Community Centre, with March 21 the AGM. Additional meetings are at Ashdown Farm Community Centre and include the other Wednesdays, mainly on micros, with Tuesdays for Morse, Thursdays for R.A.E., and Fridays for chat nights. More details from the Hon. Sec. — see Panel.

Havering has a new Hon. Sec. — see Panel — and he reports to say the club is still to be found at Fairtykes Arts Centre, Billet Lane, Hornchurch. March 7 and 21 are informal; March 14 is a surplus equipment and junk sale (is there a difference?) and on March 28 Miss Y. Tomlinson will present a slide show on Hot Air Balloons.

Hereford will have a new Hon. Sec. by the time you get to read this. However the March doings are already firm, with G3RJV



The HF operating position of Glenrothes & District Amateur Radio Club, GM4GRC/GM3ULG. The club meets on Wednesdays at 7.30 p.m., and on the third Sunday evening of the month at Provosts Land, Leslie, Fife, and visitors are always welcomed.

doing his QRP talk on 2nd, and the informal on 16th. Both are at the County Control, Civil Defence Hq, Gaol Street, Hereford.

On to **Horndean** where they gather on the first Monday of each month at the Merchiston Hall, London Road, for an evening which starts with the business, goes on to a talk or whatever, and ends for most members in the bar. Membership is limited to seventy because of the size of the Hq, but they still have a few vacancies for anyone interested. On March 5 G4RLE is the speaker and his topic the operation of special-event stations.

The **Hornsea** group are based on The Mill, Atwick Road, Hornsea, N. Humberside, every Wednesday evening. From past form the programme alternates between informals and the more academic events, such as talks, films or whatever. More details from the Hon. Sec. — see Panel.

Ipswich now; they are based on the "Rose and Crown" at the junction of Bramford Road and the A45 Norwich Road, where on March 14 there is a lecture on the Talking Books for the Blind Service; and on March 28 comes the Constructors' Contest.

On the **Isle of Man** you look for the Keppel Hotel at Creg-ny-Baa, on Mondays. Various special activities are in the pipeline, for Jurby Day, and an entry in the CQ WW Contest; and the Annual Dinner is on March 10. All the details from the Hon. Sec. — see Panel.

On March 14 the **Jersey** crowd will be at the Communicare Centre, St. Brelade, for a double bill: first the ARRL "World of Amateur Radio" and then the "Two Pioneers of Radio, G2DX and G6CJ" on Video.

March 14 is down for **Lincoln** to get the talk "Amateur Radio on a Shoestring" by G3RJV, and on 28th an activity night with details to be provided for the AGM. March 7 and 21 are CW/R.A.E. nights, and the venue is the City Engineers' Club, Central Depot, Waterside South, Lincoln.

Now **Midland**, and that means 294A Broad Street, opposite Birmingham Repertory Theatre. The main meeting on March 20 is an equipment demonstration by **Dewsbury Electronics**. We understand they are also there for construction on Mondays, not to mention Morse and natters on Wednesday evenings.

Mid-Sussex have their corporate being at Marle Place, Leylands Road, Burgess Hill — for the details and dates we have to refer you to the Hon. Sec. — see Panel.

It is the second and fourth Tuesday in each month at **Mid-Warwickshire**, and the place to find is 61 Emscote Road, Warwick. We note that on March 13 they have a junk sale.

March 7 and 21 are natter nights at **Nene Valley**; on March 14 they have a copy of the Grafton club video called "The Truth

Names and Addresses of Club Secretaries reporting in this issue:

- ABERGAVENNY: D F Jones, GW3SSV, 80 Craesnon Parc, Abergavenny, Gwent NP2 6PE. (0873 78674)
- ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnedersbury Avenue, Acton, London W3. (01-992 3778)
- AXE VALE: P. J. Peach, G3GOS, The Firs, Goldsmiths Lane, All Saints, Armistead, Devon. (Avmaster 342459)
- BANGOR: S. Mackay, G4OCC, 11 Dalnolmu Park, Bangor, BT20 4UA (Bangor 50495)
- BATH: C. Ashley, G4UMN, 57 Stonebridge Drive, Frome, Somerset
- BELFAST (College of Technology): J. Barr, G1CET, 121 Kitchener Street, Belfast BT2 6LF.
- BIGGIN HILL: J. Mitchell, G4NSD, Greenway Cottage, Talsfield, Westerham TN16 2BT. (Talsfield 370)
- BISHOPS STORTFORD: B. J. Sait, G4ITL, 135 Kingsland, Harlow, Essex (Harlow 0279) 20478
- BRAINTREE: Mrs. P. Penny, G6TAF, 13 Newham Close, Braintree. (0376 36487)
- BRIGHTON: N. V. Hewitt, G8JFT, 36 Princes Terrace, Kempdown, Brighton, Sussex BN2 5JS
- BROMSGROVE (A.R.C.): J. Calder, G6EAM, 30 Camberley Road, Kingswinford, W. Midlands. (Kingswinford 8586)
- BROMSGROVE (A.R.S.): A. Kelly, G4LVK, 8 Grenadae Crescent, Bromsgrove, Worcs. B60 1DS
- BURY: B. Tydesley, G4TBT, 4 Colne Road, Burnley, Lancs (Burnley 24254)
- CHELLENHAM: Mrs. G. Harnsworth, G6COH, 42 Leckhampton Road, Cheltenham, Glos (Cheltenham 25162)
- CHESSHUNT: R. Fraby, G4OAA, 2 Westfield Road, Hoddesdon, Herts. EN11 8QX
- CHICHESTER: T. M. Allen, G4ETU, 2 Hillside, West Stoke, Chichester, Sussex PO18 9BL (West Ashling 463)
- COLCHESTER: F. R. Howe, G3F11, 29 Kingswood Road, Colchester. (0206 70789)
- CORNISH: J. J. Vinton, G6GKZ, 'Cheriton', Alexandra Road, St. Ives, Cornwall. (Penzance 795860)
- CRAWLEY: D. L. Hill, G4IQM, 14 The Garrons, Worth, Crawley, W. Sussex RH10 4YT. (Crawley 882644)
- CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London SE23 1BR. (01 699 6949)
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- GLENROTHES: A. A. Dobbs, G4MYR, 41 Veronica Crescent, Kirkcaldy, Fife KY11 2LL. (Kirkcaldy 200335)
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- GREAT YARMOUTH: A. Bedford, G3NHU, 49 Blake Road, Gt. Yarmouth, Norfolk NR30 4LT
- HARROW: C. D. Friel, G4AUF, 17 Clitheroe Avenue, Harrow, Middx HA2 9JU. (01-868 5002)
- HASTINGS: G. North, G2LL, 7 Tonwell Avenue, Little Common, Bexhill-on-Sea (Cranes 4845)
- HAVERING: J. Gibbs, G4QUO, 40 Bridge Avenue, Upminster, Essex RM14 2LX (Upminster 26904)
- HEREFORD: S. Jesson, G4CNY, 181 Kings Acre Road, Hereford. (Hereford 273237)
- HORNSEA: P. Phelps, G6IOV, 152 Cherrytree Avenue, Cowplain, Portsmouth, Hants
- HORNSEA: N. A. Bedford, G4NHP, 39 Hamilton Road, Bridlington, Yorkshire YO15 3HP
- IPSWICH: J. Tooull, G41FF, 76 Fiercroft Road, Ipswich, Suffolk IP1 6PX (Ipswich 44047)
- ISLE OF MAN: Mrs. A. Matthewman, G4GWO, 20 Terence Avenue, Douglas, I o M (0624 22295)
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- YEOWIL: E. Godfrey, G3GC, Dorset Reach, 60 Chilton Grove, Yeovil, Somerset BA21 4AW (0953 75533)
- YORK: K. R. Cass, G3WVO, 4 Heworth Village, York
308. D. Davis, G6YQD, 13 Maple Road, Surbiton, Surrey

about Amateur Radio", and on 28th G4FRX visits to talk about RSGB topics.

A change of Hq has taken place at **Norfolk**; they are now gathering each week at Valley Drive Community Centre, Plumstead Road, Norwich, on Wednesdays. This move knocked the old programme for six, but the committee was at the time of writing busily putting the pieces back together.

March 8 sees a visit to YTV studios for **North Wakefield**, but otherwise they can be found on Thursdays at Carr Gate Working Men's Club.

Plymouth get together every Monday evening, but the Hq has been changed to Hyde Park Junior School, Hyde Park Road, Mutley, Plymouth. More details from the Hon. Sec. — see Panel.

There is a new Hon. Sec. to show against **Pontefract**, and another change is that they now have every Thursday evening booked at Carleton Community Centre, Pontefract, plus every Monday evening for Morse tuition. For March, informals are on 8th and 22nd; on March 1 there is the Chairman's Quiz night, on 15th the final setting-up for the Components' Fair, and on 29th a talk on aereals by G3HCW.

If you work for **Post Office/British Telecom** in the Midlands you will be interested to hear that there is a club for you, based on Birmingham HPO in Royal Mail Street. For the latest details, telephone 021-663 3258 or 6945, or drop a line to the address in the Panel. Retired members would be welcome too.

R.A.I.B.C. hardly needs to be discussed in detail; it is the one

for the invalid or blind in the hobby. But supporters and reps. who make it all happen are always needed. Details from the Hon. Sec. — see Panel.

Rhyl have an activity night on March 5, followed on 19th by an equipment demonstration by G3LEQ; both are at 1st Rhyl Scout Hq. If you don't know where that is, neither do we, so contact the Hon. Sec. — see Panel.

At **Salisbury** they have the meetings at Grosvenor House, Churchfields Road, and the programme will include fetes, talks, films, demonstrations, competitions and other items; every Tuesday evening fully occupied! Details from Hon. Sec.

Every Thursday it is for **Salop** unless otherwise stated, it says in the paper; and lo! this month we see March 1 as being for the G6CJ Aerial Circus on film, March 15 for a fox hunt, and on 29th a visit to the NEC Exhibition Centre.

South Bristol are at Whitechurch Folk House, East Dundry Road, Whitechurch, every Wednesday evening. March 7 is a talk on AMTOR/ARQ, March 14 a construction night, on 21st an SWL night, and on 28th it's all computers.

At **South Manchester** the gatherings of the clan are on Fridays at Sale Moor Community Centre, Norris Road, Sale, plus Monday evenings in the club shack. March 2 is down for a talk on the history of the club by Matt Barnsley, a founder member; March 9 is "The Mysteries of FM" by G8TYU, March 16 a two-metre fox hunt, March 23 a junk sale (in a larger hall, so a charge to non-members), and on 30th a talk by Dr. David Yorke.

Stourbridge have moved to Robin Woods Centre, School Street, Stourbridge, and on March 5 have the informal, with the AGM on March 19.

On the first and third Monday, the **Surrey** club will be gathered on the first floor mess deck at *TS Terra Nova*, 34 The Waldrons, South Croydon. For more details contact the Hon. Sec. — see Panel.

Sutton & Cheam have their Constructional Contest at Downs Tennis Club, Holland Avenue, near Belmont Hospital, on March 16.

Over to **Swale** now, and here the sad news is that their Hq at Nina's Restaurant suffered a fire over Christmas, so meetings are transferred to the Ivy Leaf Club, Dover Street, Sittingbourne, every Monday. Over the weekend of March 5-7 they also have GB2SRA operational during Festival Week.

Now **Thanet**, where they have a place in the Grosvenor Club, Grosvenor Place, Margate, on second and fourth Tuesdays. March 13 is a talk on air-traffic control by G6HXR, and on March 27 the details are, at the time of writing, still to be finalised.

Todmorden means the first Monday of the month, at the Queen Hotel, Todmorden, and on March 5 the talk is of satellites and how they stay up there.

March 6 is down for Petra Suckling, G4KGC, to talk about VHF contests to the **Vale of White Horse** crowd; this is at Landsdown Club, Milton Trading Estate, Abingdon, 7.30 for 8 p.m.

For **West Kent**, March 9 is a talk on transport communication systems, and on 23rd they have a talk on air traffic control by Stephen Harris, both at the Adult Education Centre, Monson Road, Tunbridge Wells; and there are informals, too, on March 13 and 27, these being at the Drill Hall in Victoria Road, Tunbridge Wells.

A new Hon. Sec. takes over at **Westmorland**, but we are told that the routine continues as usual to be the second Tuesday in the month at the "Strickland Arms", Sizebergh, near Kendal. In April they have a visit to Heysham Power Station.

Formal meetings of the **Wirral** club are at Irby Cricket Club — on March 14, power supplies by G6ALH, and 28th for a treasure hunt. Informals are on March 7 at "The Albion", New Brighton, and 21st at the Hotel Victoria in Heswall.

The Oddfellows Club in New Street is the place to find **Worcester's** meeting on March 5, for a talk on DX by G4CNY, while on March 19 they are to be found at the "Old Pheasant", also in New Street, for an informal.

Down to **Yeovil**, where the meeting place is at the Recreation Centre, Chilton Grove, Yeovil; March 1 is a 'bring, show, and talk' evening, and on 8th G3MYM will talk about oscillators. G3GC will demonstrate the use of an oscilloscope on 15th, and G3MYM comes back to talk about QRP transmitters. March 29 rounds off with a natter night.

York means the United Services Club, 61 Micklegate, York on any Friday evening; March 9 is down for a computer demo by G4EYF.

The **308 Club** — named after the room where the founders studied for the R.A.E. — is based on the Coach House, behind St. Mark's Church every Tuesday evening; they hasten to add that though it's painted pink it's not a pub but the Church Hall! More details from the Hon. Sec. — see Panel. Where are they? — the venue is in Church Hill Road, Surbiton.

White Rose Rally

The 17th White Rose Amateur Radio Society Rally is to be held at the University of Leeds on **April 1st**. Doors open at 11 a.m., entrance 50p (children and O.A.P.'s free), free parking. There will be the usual wide range of trade stands offering new and used equipment of all kinds, plus talk-in on 2m. and 70cm. Further information from the Rally Manager, Alan Bramley, G4NDU, (QTHR).

Au Revoir

Arrival deadline dates for your letters are in the 'box', and should be addressed to your conductor, **SHORT WAVE MAGAZINE**, 34 High Street, Welwyn, Herts. AL6 9EQ.

Correction and Addendum

In Part II of "Low-Pass Filters for Attenuating RF Amplifier Harmonics" in the January issue, Table A3 on p. 588 should have the column heading "Wire Size (swg)" changed to read "Wire Size (AWG)"; the information in the table is then correct for American readers. For British readers, a corrected Table A3 is given below.

Table A3 (corrected). Maximum Turns for Single-Layer Winding

Toroidal Core		Max No. Close-wound turns on core ¹					
No.	Min ID (inches) (Note 2)	swg enamelled wire size					
		20	22	24	26	28	30
T37	.200	13	17	22	28	35	42
T44	.224	15	20	26	32	39	47
T50	.298	21	27	35	43	53	64
T68	.360	26	34	43	53	65	78
T80	.485	36	47	60	73	89	107
1 (turns/cmch) (see Note 3)		26	33	41.5	50.3	61	72.5

Notes:

1 It is recommended that only 90% of the maximum turns be close-wound on the core. This provides a space of about 30 degrees between the ends of the winding thereby minimising capacity.

2 The minimum inner diameter (Min. ID) is the nominal inner diameter less the tolerance. The ID tolerance for core sizes T37 to T50 is .005 inches; for T68 to T80 it is .010 inches.

3 Values of 't' (turns/inch) are from Table 23.1, p. 23.4 of the *RSGB Radio Communication Handbook*, 5th edition. The reciprocal of this value is used in calculating the maximum number of turns that can be close-wound around the inner circumference of the core.

4 See Table A3, page 588, *Short Wave Magazine*, January 1984.

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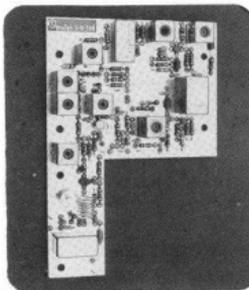
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