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Volume 44 Number 9

G4ZU describes his high-performance V-5 triband beam

G3ROO builds a modular SSB transceiver

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Advertising: **Charles Forsyth**

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FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT WAVE Magazine

EDITORIAL

Common Licence

The recent move towards a common licence among the CEPT countries is undoubtedly a step in the right direction. What is possibly of even greater interest is that the idea has been picked up in other parts of the world. Perhaps, if the idea catches on world-wide, we may in a few years be able to operate from all sorts of 'faraway places with strange-sounding names' without all the masses of applications and assorted paperwork which at present seem to be involved; one hopes so, as that would be a grand thing to happen as the sunspot cycle starts its upward swing and the bands are open more and more.

Let us hope to see along with this some standardisation in the official attitude, at least in the U.K., towards aerials in the planning-permission context — it seems to us that the present position is quite inane. What is acceptable in one part of the country is quite unacceptable in another, at the whim of individual planning groups and committees and their servants. We need something in the nature of a *national* standard, to which amateurs can aspire without being involved in planning hassles; if we wish to go above that level, then planning permission would be fair enough. At the moment, there are really no guidelines laid down to prevent inconsistencies, and worse, plain bloody-mindedness on the part of individual planners. Such standards could and should be built in to any common licence.

W INICATION

COMMUNICATION and DX NEWS

E. P. Essery, G3KFE

OUR first task this month, sadly, is to record the passing of two people who have adorned the amateur radio scene for a very long time.

George Partridge, G3CED/G3VFA was for many years the proprietor of the successful 'Joystick' line of aerials and accessories and in so doing he gave employment to many people, almost all of whom were disabled to a greater or lesser degree; he went to great lengths to ensure that these people would be able to enjoy the feeling of equality with the rest of us. For himself, George's earlier years were spent in the pre-war Royal Navy, where he gained his basic training and his undoubtedly very fine ability with the techniques of CW operating. As an amateur, G3CED was 'one of the old school' in that his favourite mode was CW, and his power input was only rarely above two watts. Because of his skills as an operator, those two watts and a Joystick produced strings of contacts which seemed quite uncanny — but the writer has had the pleasure of sitting with him and hearing it being done. George will be missed sadly, and not just in the field of amateur radio.

Piet Neve, PA0PN has been mentioned in just about every *CDXN* since the writer began back in 1966 — and for some time before that, in that G2HKU always mentioned his contacts with Piet; for many people overhearing the G2HKU/PA0PN Sunday-morning contacts were the first hint that there was a life beyond the seas on Top Band, as PA0PN's signal was remarkably strong not just on the east coast, but for many miles inland too. G2HKU first came to know PA0PN just before W.W.II. During that war, PA0PN was a radio operator with the Resistance, and was decorated by Queen Wilhelmina for his work, especially for the efforts he and his Resistance comrades gave when the Scottish Lowland Division under Gen. Bedell Smith were endeavouring to liberate the island of Walcheren and thus gain control of the Scheldt. He was also active during the terrible flooding of 1953. Thus it was that PA0PN had a permit to work G2HKU every Sunday morning for tests of the network transmitters on Top Band for many years before the PA amateurs were generally licensed for the band. This remarkable man was still active on both CW and SSB, and a keen constructor, to the end.

The Bands

As always, up and down, but certainly there has been something of interest for those who are prepared to look for their entertainment; and of course on a bad day one cannot expect the DX to be as good as when the band is on form.

What is a Country?

One is prompted to ask this question once again, in terms of the DXCC countries list and the activities of those amateurs who go to great trouble to try and activate rare and new countries for the rest of us.

Firstly we must refer to history and note that there have in the past been expeditions that have come to grief, and expeditions that have either not been where they said they were or have been in the right place but not properly licensed for the 'country' concerned. One recalls the activities of, for instance, ST2UU, or the groups that involved W9WNV — it was, we believe the activities of the latter that resulted in the present-day demand for documentation by the DXCC desk before an operation is considered acceptable as countable.

Now we see a different picture emerging; someone thinks up a new country and gets it accepted in DXCC terms, and then mounts a DX-pedition. Locals, who for one reason or another haven't got the will, the ability or the desire to have put the new one on the air, now act in a negative sort of way and by underhand methods kill the DX-pedition by, for instance, causing withdrawal of the licence, or more physical methods. In other words the small boy saying 'You can't play in my back garden!'

In particular we refer to the Mount Athos situation. SV1PL's letters to *The DX Bulletin* are flatly in contradiction to the details already held by the Editor of that worthy newsletter. SV1PL's letter states that the DL7FT licence did not cover Mount Athos; VP2ML says that *TDXB* has examined the DL7FT licence and other documentation, and that it shows clearly operating permission in the area of Mount Athos, and the 'Diamonitirion' shows quite clearly that operation on the amateur bands is involved. If SV1PL and RAAG care to make their unsupported statements that is up to them; but either DL7FT has genuine documents or a *very* elaborate forgery, and we could hardly expect the DXCC desk to submit every bit of documentation to detailed criminal analysis. What appears to be the case is that RAAG want to do a Mount Athos expedition themselves, and to ensure its rarity they want to squash anyone else. However, when we look for their proposed expedition (last week of September and first week of October) what do we find? A deafening silence.

Now, since the RAAG letter to *TDXB* goes out of its way to throw doubt on every expedition past or present to Mount Athos, then it would seem that the answer is quite clear, albeit a painful one to those who ran the earlier accepted Mount Athos DX-peditions. Firstly, totally expunge Mount Athos from the countries list, past present and future; secondly, refuse any proposals for DX-peditions by any SV licensees for, say, the next ten years. Thirdly, extend the same treatment to any future proposal where similar skulduggery goes on (we could suggest that XF4, Revilla Gigedo, would be a first candidate!)

Top Band

After the summer slack — more the result of noisy conditions than lack of DX — the band has begun to show signs of life again.

G2HKU (Sheppey) mentions contacts with PA0IJM, on SSB, plus CW with T77C, UG6GAW, RL8PYL, F8IH/EA, LA5SAA, and C30AAN. Ted registers a strong grouse about the Belgian station to be heard on 1831 kHz: unmanned, transmitting merely a 'keep-the-channel-open' signal automatically, plus a fine collection of sproggies either side, the ensemble sounding as though it were using spark and keying the AC mains. A delightful example of the wonderful 'benefits' of progress! On a different line, G3RJV was visiting him recently, and he passed on the word that the promised tanker of hot black peas which was sent to Sheppey *via* Welwyn was ambushed by the natives *en route* who threw away the tanker as well — hence Welwyn, Sheppey and Rochdale are all starving for black peas!

The letters from G3BDQ (Hastings) have lots of points of interest. Firstly, John has 102 countries worked, but is scratching about for the QSL cards: but UG6GAW

has now 137 confirmed! Reception is being much aided on Top Band by the use of screened loops; while they don't give as much signal they give a much better S/N ratio when the band is noisy. On the transmitting aerial, the earth mats are being improved, with around 500 square feet around the base of the vertical section, and an increase in the capacitance of the top loading section too, not to mention completely removing all the stranded plastic covered wire throughout the system. To counterbalance this, John says this year is already showing a higher level of activity on the band. CW is the favoured mode, of course, and the contacts included UG6GAW, UL8LWO, RL8PYL, UA9CBO, UA9FM, UA9MS, UA9NN, UA9SHP, UA9SIF, UA9UCO, RV9CBT, UZ9XXM, UX9CWB, UZ9SWY, EK9AD, SV1PL, HG9R twice with his QSL to hand in seven days, and PY1RO twice (who also worked G3RTY and was then called by others who apparently were not getting through to Rolf). For the current month it was all Top Band, and the interesting ones included R18AEV, RA9STL, RW9HZZ, UA9CBO, UA9SHP, UA9SIF, UV9FM, UA0AG, PY1RO, VE1ZZ, VP2VA for a new one, 4X4NJ, HZ1HZ, LX/DF6QC, KA1PE, W2GVX, W2JB, W2PN, W2SM, and W8AH, not to mention a personal QSO with G40BK at Oxford.

Eighty

There's not a lot I can say about the band from my own point of view, insofar as I have difficulty getting out of my own backyard, thanks to the aerial problems. It is of course the haunt of the QRP chaps on CW, and a listen around 3560 is often of interest. G2NJ (Peterborough) reports in particular on the QRP scene, the /MMs and the home-brewers of gear, these coinciding to a degree with his own interests. Nick says that he has noted a marked rise in the number of home-brew stations to be heard on the bands of late, and we agree. There were quite a few of the QRP chaps on the TOPS CW nets and their special call GB6AQ netted them some 194 contacts, mainly on 80 and 40m. QSO's for Nick included G4LYW (Bath) located at Prior Park College and home-brewed, several with G4PTX/M on CW from Burnham-on-Crouch, Burnham-on-Sea and down in the West Country. G4TNI/M was moored up at St. Ives, Hunts, on the river Ouse; his one watt signal was good enough to reach all the members on the TOPS net and to give a 599 to G2NJ.

G3ZPF (Kingswinford) was on a 'high' when he wrote, as he had the 5-band DXCC certificate in his hot sticky hand, although the plaque was still 'in the system' somewhere. Aerials have been revamped a little and the inverted-vee now sports 7 MHz traps, although David still sticks to his straight key and patience; for a change, there is also a vertical bought, unused, at the Telford Rally, to compare against the other aerials. On the QSO front, Eighty produced VE3CRG, VP2VA, and — G2HKU (who remarked that he had every issue of *Short Wave Magazine* except Vol. 1, Number 1. Any offers to bring Ted up to date?).

Forty

This is another band on which reports have always been scarce; but we do know of lots of people who get plenty of DX on the band — we suggest they are keeping quiet so as to keep people steady in the belief there's nothing doing!

G3ZPF switched down to Forty to try out his new traps and was pleased to find that YV1AD, on CW, could set his mind at rest.

G2HKU is always a user of the band; Ted notes QSOs with ZL4AW, GM3ITN/EA1, VK3MR, YV1AD, ZL2AGY, HB9CRV/CT3, ZL3OE, and a ZA2AOP who said his QSL address was OK2AOP. If that was a real ZA, then we will eat the columnal hat! But as always, the motto is "Work them first, Worry later!"

Events

We have already hinted at the Greek Mount Athos expedition proposal, and the withdrawal of the Italian group's licence at the instigation of the Greek national society (RAAG) and SV1PL: we must wrap it up by making clear that of course the SVs didn't appear from the Mount as promised.

The Clipperton DX-pedition did in fact come off, but once again it seems to have emulated the proverbial lead balloon as far as most of us were concerned. The only person we know of who raised them was GW3YDX, but it is believed a few others got over. To be fair to them they ran into some pretty lousy conditions, but they don't seem to have cut a lot of mustard anywhere. Still with this country we hear that the QSLs for the previous operation have been printed and will soon be in the mails — perhaps to hand by the time this is with you.

Turning to the Marion Is., ZS2MI, activity recently we are hearing some nasty things, namely that the recent operation was unlicensed and that cards sent through the ZS QSL Bureau will be going back to the senders.

Those PY0FE QSLs have started on the route back to the thirsty, says PY1BVY. And the bands will soon be well and truly stirred up by those arch DX-peditioners Lloyd and Iris Colvin, who are off around Africa for six months; October 5 was to see them in Mauritius and there is talk of them having a permit for Reunion.

Another six-month DX-pedition is the one involving VE3FXT; during October he was GJ3WNE, GD3WNE and GW3WNE, before heading off to Africa with 7P8BE, 3D6/VE3FXT A25/VE3FXT, ZS3/VE3FXT, ZS6/VE3FXT, H5FXT, V9FXT, and S44FXT. Look for him around 14033, or 14180-185, and be aware that he is yet another actively soliciting donations by way of the dollar-a-QSL caper. The QSL Manager is VE3DPB, Box 137, Lynden, ON, LOR, ITO, Canada.

Once again we have reports of Cayman Is. calls being pirated; so if you snag a ZF2 call beware! On the other hand we hear at least two of the Big Guns will be operating from ZF in the CQ WW Contest.

CDXN" deadlines for the next three months:

December issue — November 5th
January issue — December 3rd
February issue — January 7th

please be sure to note these dates

Common Licence

This scheme seems to be gaining strength. We understand seven countries so far are working the scheme, and others are interested; the only snag has been the Dutch use of NL as a prefix instead of PA, which confuses a lot of people who think they have found a strong Alaskan! We gather that the subject is going to be raised at the Region 2 IARU meeting between now and the time you get to read this. Should it all come to fruition it will save a mighty amount of time and paperwork. Just imagine, you could go anywhere in the world and, with no paperwork, operate using your own call prefixed by that of the country you happened to be in; you could even use the VHF rig at any airport stopover. And an interesting point comes up in the context of getting a licence in the present system, where a country is being a bit 'sticky'. DL2GAC ran into troubles with getting a licence in Tahiti when going through the proper channels; a request to the Tourist Officer for assistance, and thanks to having his licence documents for FK, and the aid of the Tourist Officer, the previous slow-motion was turned into ACTION! Of course there is sense in this — after all tourist organisations want tourists!

New Bands

We have a couple of reports to mention here, one from a newcomer, G0DUS; Mick says that he only managed to get going on the bands on August 28, even though he had had the call for a while. Now there is an eighty-metre dipole, very bent around the plot, and with no traps, tuned up through an ATU and fed by way

of an FT-757. This has netted contacts with LA8SF, DL7CY, DK4YF, VE3DQX, W2GDV, W2AQT, 5B4OG, OK1HBE, OY5NS, EA5CS and VK3MR. Among the gotaways there were lots of Ws and VKs. However, Mick left out of his list all those who were very weak or too fast for him to work, or who disappeared in bursts of QRM, which seems to be plaguing his QTH. We like the G0DUS reason for this burst of activity — when the XYL has to get up and feed the new harmonic, Mick also gets up and *creeps away into the shack!* Not sure we approve of that . . . Anyway, welcome to the piece, and lots more reports please!

Our other reporter is G2HKU who didn't spend too much time on the band, but did make the time to work VK3XB and VK3BXN.

Other news on this area is that the UA stations have been granted use of the 10 MHz band, and we hear that G4OBK among others has been in there working them.

Noted

Extracted from the Exmouth ARC file, we have a letter to say they will be in The Gambia for one week from December 10 with a C56 call; details are not given of the frequencies or modes to be used, but you can ring G4RUT on Exmouth 273157 for more details.

Results are to hand from BARTG's Spring Contest. Of the 75 operators in the single-op section, 9H1EL won and ON4UN was runner-up; G3HJC was fifth and G4SKA sixth. Of the thirteen multi-operator stations a couple of LZs had the two top spots, GU3HFN was third, and G3UUP fourth; BRS 28198 was fifth in the SWL section. We offer our congratulations to all on this result. We also note that for 1987 the contest weekend will be 0200z March 21 to 0200z March 23, 1987, of which not more than 30 hours may be used; and listening time counts as operating time. We suggest that RTTY operators get hold of a copy of the rules and study them before making an entry — and then dive in and show 'em how it's done. The address is: P. Adams, G6LZB, BARTG Contest Manager, 464 Whippendell Road, Watford, Herts. WD1 7PT, England.

Ten Metres

The summer 'lift' in conditions seems to have ended during the period under review. G3NOF (Yeovil) didn't make any contacts on the band at all, but he did spot the odd opening to Europe, and around 1900z on September 23, several LUs and CEs were heard, but they very quickly faded out again.

The report from G4HZW (Knutsford) indicates that he didn't spend a lot of time actually operating, as his 3-element Quad was brought down and returned to its original two-element configuration; and while it was down a new gamma-match was fitted and properly tuned up so that now the VSWR varies between 1.5 on 29.6 MHz, unity at 28.5 MHz, and 2 on 27 MHz, thus removing the need for an ATU. Tony now intends to support the RSGB 28 MHz activity periods, and reports his contacts as having been with DL, SM, T77C, OZ, LA, F6, EA, CT, I, YU, GM4WJA in Elgin for some real short-skip, C30AAN, CE3BFZ and CX7ABS.

Fifteen

Your conductor has been playing around with indoor aerials over the past few weeks, and has to admit that so far on this band he has not had much joy; there seems to be an unwanted resonant length somewhere in the vicinity which is working marvellously as an RF absorber and at the same time detuning the aerial — all the signs of Professor Murphy taking complete charge of things along with a couple of extremely awkward demons!

G3NOF (Yeovil) found the band rather patchy; skip often short and good European signals to be heard. A few VKs and YB/YC signals were heard around 1100-1300z, with southern Africans about between 1500-1700z. South America was noted — but not in quantity — around 2000z, and on just two occasions North America, one opening around 2100z and the other about 1700z. SSB QSOs were made with DF0GVN (Antarctica), DU1KT, DX1MM, TR8LD, HL9CW, VE2PAB/4U, YB0EZF, YB0PR, Z21GN, ZS1AAQ, ZS1DB and ZS6AZJ.

14 MHz

More reports here, of course, and G3NOF takes up the story; Don found that the early-morning long-path openings to VK have begun to open up again around 0730z, together with the odd JA and Pacific station, while the short path to VK has often been open around 1400z. In the afternoons the short path to India, Pakistan, Indonesia and so on has been quite good, and between 1600-1800z there was the odd opening to the States, and on occasion Africa. North and South America were noted in the evenings too after 2100z, but by that time the band was getting unstable. Don made SSB QSOs with A4XYQ, A92C, AP2DM, BY1QH, C30AAN, CO7JC, DV9PI, ED9SJC, FM4DN, FM4EB, FM5BX, HH2JR, HL9HH, HL9YG, IR0ONU, J40MAR (SV9), JA1CIA, JA2FUQ, JA4CYG/MM off 9V, K4YT/DU1, K7UDG, KE7V, KH0AC, KL7KJ, N6JFG, NA7X (Idaho), OE5JTL/YK, OY9JD, RF0FWW, TA1E/2, TI3FPH, TJ1AF, TJ1CH, TZ6MG, UA0FAA (Zone 19), UA0QBB (Zone 19), UF6FFF, UW9CO, UZ0AWB, V44KQ, VE6IH, VE7ATP, VE7FNZ, VE7IG, VE7SV, VK2ALM, VK2DM, VK6HE, VK9NS, VP2EZ, VP2MH, VP2VA, W7KEU (Wyoming) W7PHO, WA6BMG, WB7CHS, YB5NOF, YB6MF, YB6ZES, YU3KI/5N0 ZB2CB, ZC4IT, ZF1LE, ZK2JB, (a fast QSL from this one), 1Z9B, 4U1ITU, 8P6OV, 9L1JW, 9M2CH, 9M2DF, 9M2FZ, 9M2GH, 9M6MA and 9N1MC.

As far as the writer was concerned the success of my efforts in the aerial line, on this band at least, resulted in a flurry of activity, including A4XYQ a moment before G3NOF raised him — the G3NOF signal off the side of his beam was quite clearly audible here — YB, ZL, Ws, and a complete failure with 9N1MC: the 'policeman' didn't give his own call in 30 minutes, couldn't himself get a reaction from 9N1MC and, although I lingered for a while longer, didn't hear him — and doubt very much if anyone else did either! And, of course the odd European went into the log while testing and operating QRP.

G2HKU spreads his activity over most bands, and this time his 14 MHz doings have included K4FU, OY6FRA, UZ9OWE, UA9XR, AM0EEE, W4VQ, K2OZ, C30BBC, VE3BWY (who years ago was the first writer of this piece, post-war), 5Z5EXP, HK1DPO, plus QRP-QRP with I7CCF, while SSB did the necessary with DF6NA/OH0, K3RW/DL, and G4KAM/HB9.

G2HLU (Reading) makes a welcome return, and notes that he took his Micron rig up to Dumfries for his holiday, but the weather was too good to spend time operating, save for the odd moment while waiting for dinner. On the other hand, Harold did put in an appearance at the GB8OO celebrations (800 years since the city received its charter) and duly admired the station and the aerial, which used the top of the steeple of St. Michael's church as its support. Back at home, G2HLU worked J37A, Jim, who said QTHR for QSL — but no-one seems to know what the address really is — anyone out there able to help G2HLU?

Close Down

That's the lot for another month. Because of the mail problems, and the lack of sunspots, support for this column has been a little short of late, so we would *love* to find ourselves drowning in a sea of reports next time! Seriously, lots of newcomers use the reports in *CDXN* as a yardstick against which to measure their own results, and support from all you dab-hands out there is helping them no end.

Deadline for next time is in the 'box' and is for arrival, latest, addressed to your scribe, "CDXN", SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. *'Bye now!*

The G4ZU "V-5" Triband Beam

a lightweight, high performance, economical and unobtrusive antenna

G. A. BIRD, F6IDC/G4ZU

Many readers will probably remember G4ZU, Dick Bird, who way back in the fifties triggered off the triband trend with the G4ZU Minibeam.

Dick is now retired in the South of France and operates under the calls F6IDC and C30LBQ. He still experiments with antennas, has enough space for a proper antenna measuring range, and only last year won an award in the ARRL world-wide contest for the best Six-Band Beam. We are pleased to present his latest effort, which is light, low cost, well suited to home construction, and overcomes many of the problems associated with trap triband beams — Editor

Losses in Trap Beams

TRI-BAND beams these days are very much in fashion. One cannot deny the convenience of being able to switch instantly from band-to-band without playing around with an ATU, switching feeders and decorating the back garden with 3 separate rotary beams sufficiently spaced apart to avoid harmful interaction.

Many leading DX operators are, however, reverting to monoband beams, presumably because they are worried about trap losses and feel that a mono-band beam should give just that "little bit extra".

Surprisingly, one can find very little published literature giving useful information regarding trap losses, de-tuning in wet weather, band-width limitations, etc.

In ref. (1) Moxon, G6XN, suggests that with a trap beam covering only *two bands,* 15 and 20m., the loss of power in the radiator alone at 21 MHz is likely to be around 1.5dB or a quarter of the total gain. If losses in the parasitic element are included, the total losses are likely to exceed 2dB. This is for a *2-ele two-band beam;* with a conventional *3-ele tri-bander* the losses will obviously be even greater and problems with limited bandwidth can be expected. As 12 separate traps are required, the loss in gain could well exceed 3dB (half the transmitter power dissipated in the form of heat in the traps!).

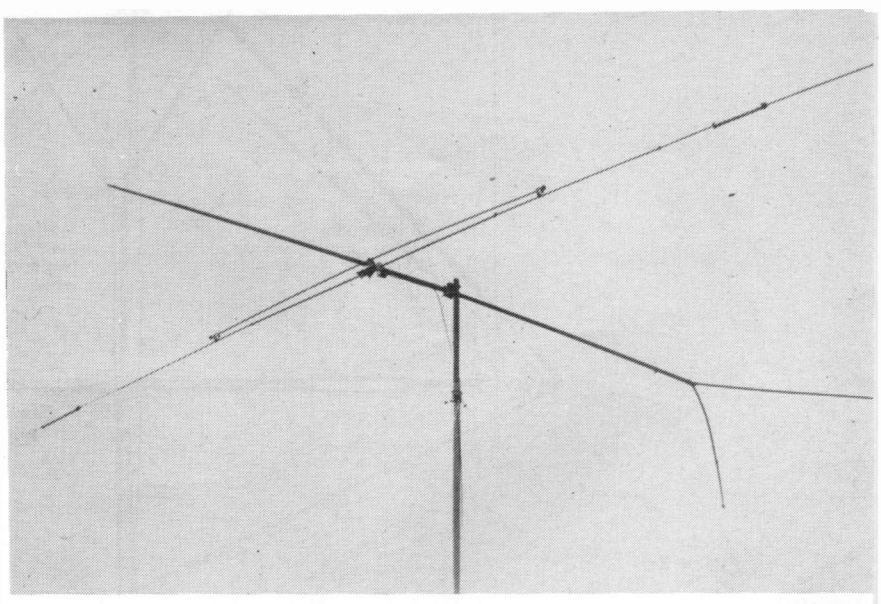
I have great respect for G6XN and would not wish to question the validity of his calculations. However, I must admit that I found these figures somewhat alarming.

Seeing that a carefully tuned 3-ele *monoband* beam is capable of providing not much more than 6½dB gain, one might well ask how is it possible to justify manufacturers' publicity for tri-band beams claiming gains of 8dB or more? *See* Appendix A.

After much deliberation and being fortunate in having an antenna measuring range available, I decided to purchase a typical commercial trap dipole and make a few practical tests, both for my own information and for the benefit of others who might be worried by this problem.

Measurements were made at various heights above ground between 8m. and 15m. The SWR was better than 1.2:1 on both 10 and 15m but considerably higher on 20m. It was found, presumably due to manufacturing tolerances, that the point of resonance on the lowest band was around 13.96 MHz. This was corrected by cutting 5cm. off the tips of the radiator. On each band the trap dipole was replaced by a half-wave dipole in dural tubing, and in no case did the difference exceed ½dB except towards the very top end of the 10m. band. Under conditions of high humidity the SWR with the trap dipole would sometimes rise to 1.5 or 1.6 due mainly to a shift in resonant frequency but this did not seem to materially affect the radiated field.

By degrading the performance of the half-wave reference dipoles with a series resistance at the feed point (something between 8 and 10 ohms was required, according to band) equality of performance was achieved. In other words, for purposes of calculation, trap losses can be simulated by a series resistance of around this value. It was concluded that the trap dipole was a perfectly acceptable, relatively low loss, radiator on all three bands, if one was prepared to accept moderate detuning and rise of SWR under very humid conditions. This does not necessarily imply that it would be equally satisfactory if *three* such elements were combined to form a close spaced tri-band beam. Detuning of



The G4ZU V-5 Lightweight Beam. This shows the skeleton, *i.e.* the boom and trap dipole radiator, the thin wires forming the parasitic elements being virtually invisible. The extra element over the radiator is a dipole for 50 MHz, later added for propagation studies in southern France

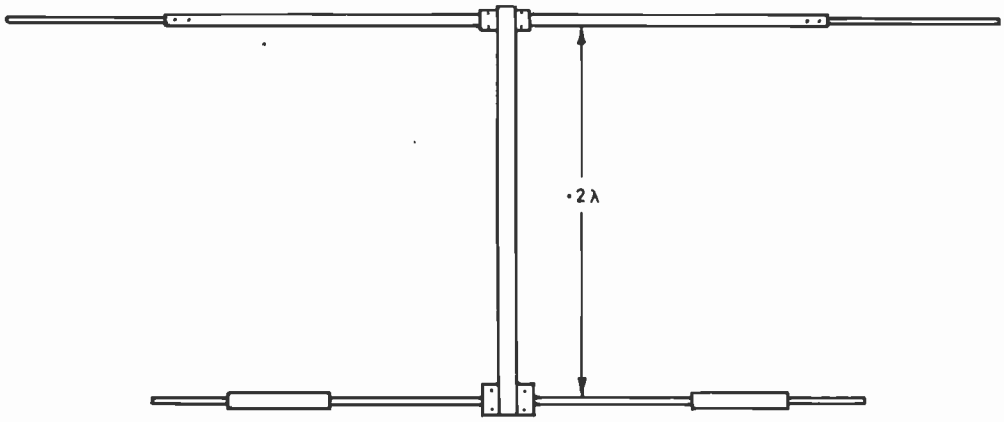


Figure 1

E 802

the *parasitic elements* in wet weather could seriously impair both gain and F/B ratio, and with the radiation resistance falling to some 18-20 ohms with close spacing, the losses in the radiator alone could amount to 30 per cent of the transmitter power (ignoring any additional losses in the parasitic elements!).

By and large, it appears that Moxon was justified in his criticism of close spaced tri-band beams, but it would seem that if a trap dipole were used for the *radiator alone,* with individual *full length* parasitic elements, sufficiently wide spaced to maintain a radiation resistance of 40 to 50 ohms, it should be possible to construct a relatively *low loss* tri-band beam.

Development of the V-5 Principle

To check the validity of such reasoning, an initial trial was made on 20m. using the trap dipole with a full length reflector spaced at 0.2λ (Fig. 1).

Ref. (2) indicates that this spacing gives optimum F/B ratio and more important, the radiation resistance of the radiator remains practically un-affected (reduction from 75 to 72 ohms). On the air tests indicated that this trial antenna was just slightly down on an existing 2-ele *Quad* and with a poorer F/B ratio. Measurements on site indicated 4½ to 5dB gain and only 12dB F/B; fair but not impressive.

The array was rather heavy, required a large turning circle, and looked somewhat out of proportion with the long and massive reflector in 5cm. dural tube.

Being convinced tht a 'V' shaped reflector can provide better gain and F/B ratio (ref. 3), I adopted a form of construction in dural wire as used previously in the antenna which last year won an award in the ARRL Contest for "Best Six Band Beam" (ref. 4).

It will be evident that with this set-up the weight, wind resistance, turning circle (and cost) are materially reduced (Fig. 2).

The gain figured out at 5½dBd (8dBi) with F/B ratio of 16-25dB according to arrival angle, and SWR not exceeding 1.5:1 over the major portion of the 20m. band (1.2:1 at resonance).

Compared with the 2-ele *Quad,* my normal DX antenna, most stations could detect no change when switching quickly from one antenna to the other.

To support the 10.8m. of wire in the reflector, fishing rod blanks were pushed on to each end of the tri-band radiator, these being tensioned forward to a slender boom extension. This forward extension could obviously carry wire *directors* if so desired, but more of this anon. As far as mechanical construction is concerned, only the central two metres of boom is made of dural to support the compression force of the mast head fitting and the clamp supporting the trap radiator. The 'Y' shaped rear extension and the forward looking 'spike' are in tapered fibreglass tubing originally sold for children's fishing rods.

For those who would prefer a simpler, but slightly less elegant structure the arrangement of Fig. 3 might be preferred. Due to a sharper apex to the 'V', the radiation resistance on 20m. will be somewhat lower and it may be necessary to accept an SWR of 1.4 to 1.5:1 at resonance. This is probably no worse than the figures for the average commercial antennas. Many of the published graphs show SWR's rising to 2:1 or even more.

Parasitic reflectors were subsequently added for 15 and 10m. as

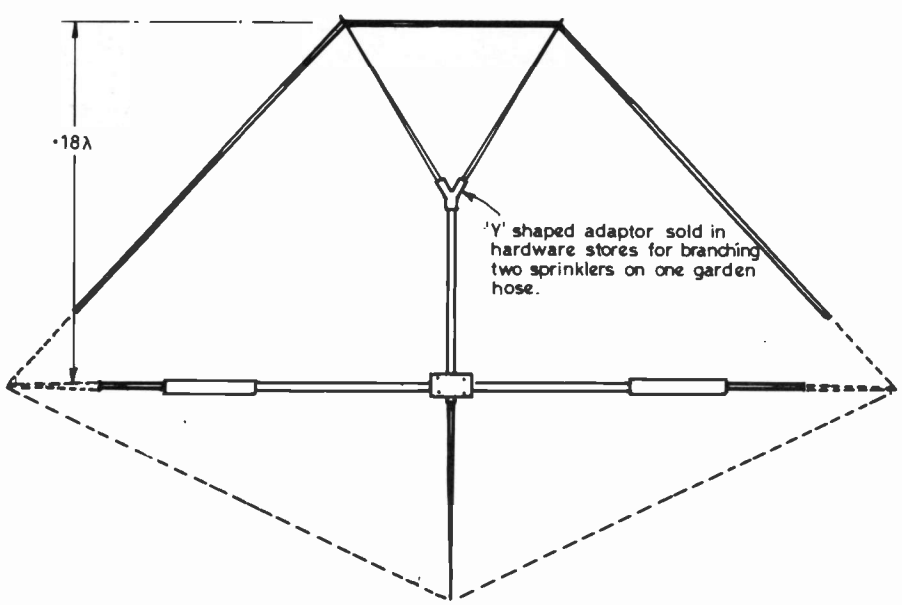


Figure 2

E 803

General view of the F6IDC/ G4ZU QTH in southern France. The V-5 triband beam is just visible over the roof in the middle of the picture.

per Fig. 4. The 15m. reflector was a fraction over 7m. long, and the 10m. reflector was made a bit on the long side at 5.1m. to maximise the gain in the region 28 to 28.6 MHz.

A rather short ten metre *director* was then added out at the front to help maintain performance in the 28.5 to 29 MHz range. This is the only way that one can obtain satisfactory coverage of such a wide spectrum.

At this stage the antenna was taken down and placed on the bathroom scales. It weighed just under *ten pounds!* The construction may appear flimsy, but it is in fact very rigid due to the tensioning effect of the front and rear parasitic assemblies. There is negligible droop on the boom because the weight of the parasitic elements is not more than a few ounces.

While still on the ground, the antenna was given a coat of aluminium paint and a balun was fitted at the feed point because it had been found that indicated SWR varied somewhat with changes in feeder length, indicating a certain amount of RF on the outside of the coax.

Many commercial beams seem to have this idiosyncrasy and manufacturers often recommend the use of fairly critical feeder lengths.

When re-erected, it was found that the balun made little improvement in this respect. It was concluded that *(a)* the more simple types of SWR indicator are sensitive to RF on the outside of the coax, and can give misleading indications with certain feeder lengths; *(b)* the feed point of the beam is an area of strong RF fields and it is not surprising that some of the RF gets on the outside of the coax; *(c)* the feed point of an array is probably not the best point for a balun. The coax leaving the balun is still in a strong RF field and some of this can appear on the outside of the coax.; *(d)* it would appear that for the purist, it might be better to descend the mast with balanced cable, and then at a remote point, with minimum RF field, insert a balun for transformation to coax feed from the transmitter. I am quite open to being "shot down" regarding these somewhat hazy suppositions and no doubt somebody will come up with a better explanation.

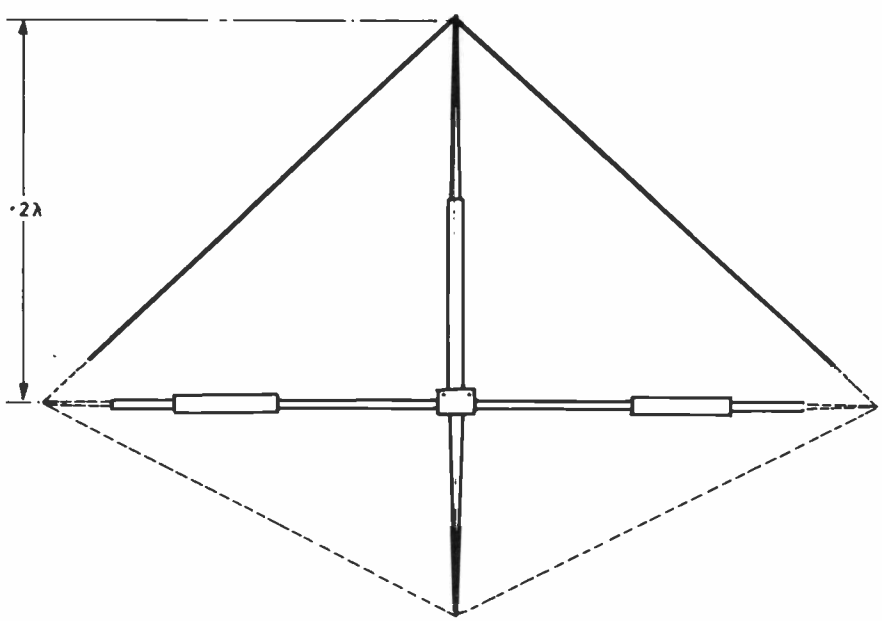


Figure 3

E 804

SWR is generally found to change also with beam heading due to coupling with overhead telephone wires, etc. so there is no point in being too fussy.

Many readers are likely to ask: "Why not add directors for fifteen and twenty metres?" Experiments were made along these lines (and continue), but it was found that to accommodate a wide-spaced 20m. director (in inverse 'V' formation) it was necessary to lengthen the forward boom extension to at least 4 metres. Due to the reduction in radiation resistance the SWR rose to 2:1 at the band edges, and it was not possible to achieve much more than half dB additional gain. Ref. (5) indicates that even with a monoband beam, it is difficult to achieve much more than a true 6dB with three elements (8½dBi if you prefer).

Looking forward to better times on ten and fifteen metres, I later added an extra *dual band* director for 10/15 (using G4ZU minibeam techniques) to provide a total of 4 elements on 10m. and three on 15m. This also required an increase in total boom length to maintain optimum spacing but might be worth considering when we get somewhat closer to sunspot maximum. (*See* ref. 6). As can be seen in the photograph, the antenna is mounted on the side of the house using TV mast sections which rotate inside a length of slightly larger diameter fixed tubing, the rotator being located at the lower end. The antenna-plus-mast can be pushed up into vertical position single-handed, and height above ground can be varied at will by adding or removing TV mast sections at the lower end.

Taking advantage of the flexibility of the split dipole feed system (which avoids the bandwidth limitations and losses inherent in 'T' match, gamma match, beta match and similar systems) I recently installed a *six metre* element for monitoring propagation on this band. It seems probable that a 2m. beam could also be mounted on the boom and be coupled to the main feeder.

Tuning and Testing Procedures

It is assumed that anyone wishing to construct this antenna will start off with a commercial tri-band trap dipole, or the radiator section of a discarded tri-band beam. As an alternative, one could purchase just the traps, and fix them on the tips of a 10m. dipole. Home-construction of traps is time consuming and not recommended.

The SWR should first be checked on the trap dipole alone, at a height of at least 8m, using a length of feeder which is a multiple of 7m. If the SWR is less than 1.3:1 at the point of resonance in each band, construction of the beam can proceed.

The parasitic elements can be cut to the lengths indicated and the eam should give acceptable results without special adjustment, because with the wide spacing it is relatively broad band and docile. It is only if one wishes to achieve maximum possible F/B ratio that slight adjustment of element lengths will be called for, and this will necessitate some sort of measuring system for checking the relative levels of radiated field in the forward and rear direction. A suitable test set-up is described in Appendix 'B'.

Because of the light weight and low wind resistance, it should be possible, with obvious advantages, to install the antenna somewhat higher than would be feasible with a more massive array. The beam is relatively inconspicuous, and the wire elements are practically invisible from a short distance away.

Performance on the Air

The F/B ratio, particularly on 10 and 15m, is quite impressive, the antenna seems to hold its own very successfully in DX "pile ups", and CQ calls can often become embarrassing, with so many stations replying all on the same frequency! After several months of use, it leaves nothing to be desired compared with the *Quad* antennas which were previously used at this QTH. It has not yet been used for portable or field day work, but it seems that it could readily be pressed into service for such purposes, because it can be dismantled, stacked on a roof rack, or in the boot of a car, and reassembled on site in less than half an hour.

I am convinced that anyone who decides to construct this antenna will be more than satisfied with the results, and in the event of queries regarding the type of beam in use, may I suggest that it be referred to as the G4ZU 'V-5' if as per Fig. 4 or 'V-6' if supplementary directors are added "out front".

In closing, I would like to thank G3FPK, Norman Fitch, who encouraged and supported me in presenting this information and smoothed the way for getting it published in *S. W. M.*

References:

In the text, references are quoted from the following publications which should be readily available to U.K. readers:

(a) "HF Antennas for all Locations" by L. A. Moxon, G6XN *(ref. 1,* page 109; *ref. 5,* page 79).

(b) ARRL "Antenna Book", 14th ed. *(ref. 2,* chap. 6 page 17).

(c) CQ Magazine, Aug. 1983, page 28 *(ref. 3,* K4JZB quotes reports of 3 to 5dB extra gain with 'V' shaped elements; a 2-ele 'V' beam was found to outperform a 3-ele full size monobander!).

(d) QST, Feb. 1985 page 45 *(ref. 4).*

(e) CQ Magazine, Nov. 1959 *(ref. 6,* the coaxial fed minibeam).

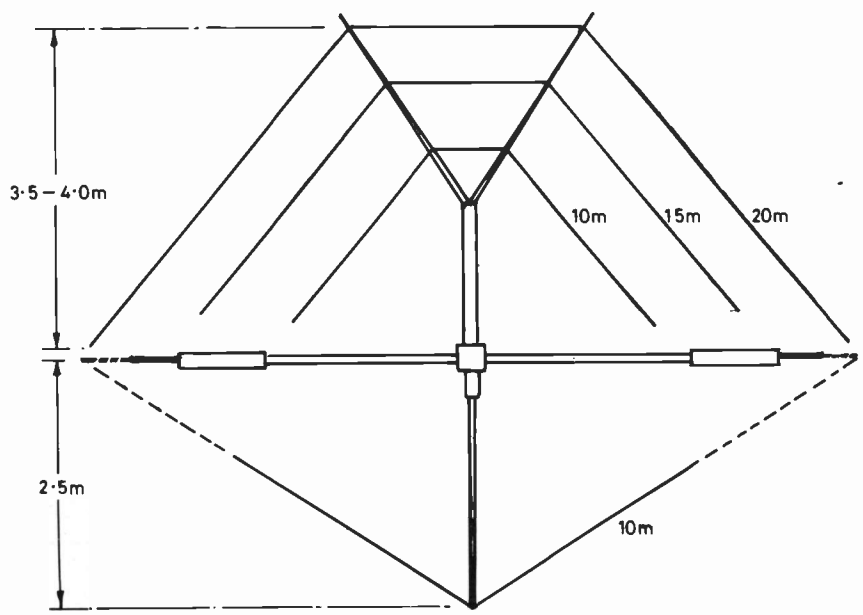


Figure 4

E 805

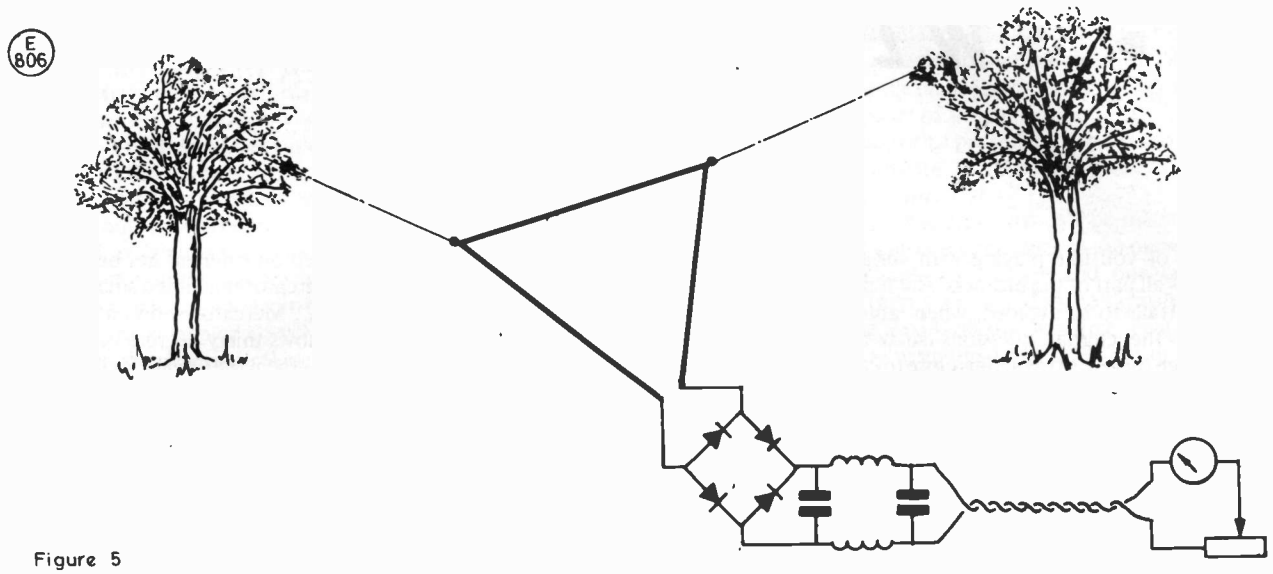


Figure 5

APPENDIX A

Antennas for TV reception must account at least 90% of the annual production for Yagi type arrays.

In commercial laboratories, comparisons between different models are normally made on a basis of *directivity gain*. This is calculated from the angular distance between the 3dB points in the E and H planes, to give the directivity gain relative to an isotropic radiator (ISO).

It is obvious that the narrower the lobe in the E and H planes, the higher the ISO gain figure, *if there are no losses.*

Losses normally occur due to minor lobes in the radiation pattern, resistive losses in the matching system (and additional feeder loss if the SWR is excessive). Such losses are difficult to evaluate and are often disregarded, because for TV *reception* the ratio between the wanted and unwanted signal will not be affected.

For a transmitting antenna, to find the *true* gain relative to a half-wave dipole, it is necessary to substract from this ISO gain figure, first of all 2.15dB (the difference between a dipole and point source) and then make a further deduction for losses (if known).

For example, advertised gain 8½dBi (ISO), gain relative to a dipole 6.36dB *less losses.*

All the above examples are *free space gains.* With an antenna located not far from the Earth's surface, the DX signal gain may be much higher, due to ground reflections, and wave angle from the Ionosphere. Anyone who has changed from a dipole to the simplest of beams will confirm that the improvement is out of all proportion to what might be expected from theoretical figures (not forgetting that most S-meter calibrations are closer to 3 or 4dB per division rather than the ideal 6dB!).

APPENDIX B

Because we are concerned with measuring *relative* fields, and not making *absolute* gain measurements, the measuring system can be quite simple, but it is wise to observe certain elementary precautions.

(a) The measuring antenna, which can be a dipole, or perhaps better a *delta* loop, should be at least as high above the ground as the beam being tested.

(b) It is desirable that the two antennas be separated by at least a wave length and preferably considerably more.

(c) The RF at the feed point of the measuring antenna should be converted to DC by means of a bridge of point contact diodes.

(d) The measuring instrument, which can be a 0-100μA meter, can be located either at the feed point and read with binoculars or, alternatively (as per Fig. 5), the current can be fed through any old piece of twin electric light flex lying on the surface of the ground to bring the measuring instrument to a more convenient point. At F6IDC it is now located in the shack so that the F/B and polar diagram can be verified at any time, even in total darkness, or pouring rain, and one can also check the change of signal level when switching a small linear in and out of circuit.

High F/B ratio requires tight, and rather critical coupling between the radiator and parasitic element (in this case the reflector). With a *director,* this tight coupling can be achieved by very close spacing but this leads to loss of gain and a prohibitively low radiation resistance.

With a *wide spaced reflector,* the correct capacity coupling can be achieved by bringing the tips of the reflector (in 'V' formation) to within 60 to 70cm. of the tips of the radiator on 20m, and *pro rata* for 15 and 10m.

This has little effect upon radiation resistance, and it is theoretically possible to achieve *infinite* F/B at certain wave angles. Infinite F/B demands a certain sacrifice of forward gain. It is useful if one suffers cross modulation from a nearby O.M., but in normal circumstances it is nice to be able to hear a *little* of what is happening off the back of the beam, and to tune for maximum gain.

Small adjustments of reflector *length* can be made to shift the point of maximum gain and minimum SWR either towards band centre, or towards the low end if telegraphy is the main interest.

December issue due to appear on Friday, November 28th.

• • • SWL • • •

SHORT WAVE LISTENER FEATURE

By Justin Cooper

MANY of you like playing with aerials, naturally enough — it's all part of the business. But it must be said that there are some pitfalls to be avoided, when 'antenna farming'. Quite apart from the eternal questions such as horizontal-versus-vertical, when there are two aerials close to each other it is essential that the ones not in use are detuned from the frequency at which the one in operation is working. Hence, of course, the oft-repeated one about earthing aerials not in use. However, it isn't always enough to earth them. For instance, an end-fed wire for Top Band against an earth connection, used from a first floor shack. For a start, the earth lead may be resonant on Ten or Fifteen if it goes straight to an outside RF earth point; and it might be resonant on any other band if you are using (quite improperly from any RF or safety point of view) the mains earth. As for the top, that could be resonant also on Eighty and Forty, and the top plus earth lead length on the HF Bands. On the other hand, a dipole can have, beside the resonance one designed it for, another one comprising half the top and one leg of the feeder, while a beam can have various assorted resonances based on half one element, half another one and the length of the boom, and yet another one involving the length of the mast as well; and of course the household mains wiring can be acting as an aerial too. Any one of these can behave as an absorber of RF energy, and so reduce the amount of RF picked up by the 'real' aerial and passed on to the receiver. What to do? Earthing down unwanted aerials is a possibility, and worth a first check. Listen to a signal on the wanted aerial and see if it changes strength when you earth the spare aerial; if it does, then you are certainly seeing some interaction. Then you can try other networks. With aerials fed through feeders, there is sense in detuning the aerial-plus-feeder complete by putting a tuned circuit in place of the ATU, and tuning it until the signal on the wanted aerial seems optimum. Notice, though, that you *may* have invented a *directional* aerial in this manner! Only your ears can answer this question.

Also, of course, it is virtually impossible to have more than one aerial on site without changing the direction favoured by the first comer, at least to some extent. What about the effect of the mains? Obviously, you can't just earth everything — the power company might object! However, there are still a few things you can try. A capacitor between live and neutral, or between each leg and earth can be built into a plug-top — say, 1000 pF ceramic and at least 1000 volt working, preferably more — and then plugged into various power outlets around the place.

The chap with a transmitter sometimes comes up with the reverse problem, although less often of late years as wiring in houses is done more sensibly. This one is that the signal refuses to go out to DX, but very definitely *does* circulate at home; lamps wink as the key goes down or flicker in sympathy with SSB, or maybe a neon can be struck from various unlikely objects. TVI goes without saying. Again, the cures are along the lines indicated, but using possibly more heavily rated components to allow for the presence of the RF on top of the mains voltages.

Finally, in this context, the aerial which fails to do as well as was hoped — one should seriously consider whether the aerial is 'firing' in the right direction, and if not, why not. The right directions are to be decided by reference to the Great Circle Map, *not* the more usual Mercator projection. The point here is that you can't project the surface of the globe on to a flat bit of paper without some sort of distortion. The Great Circle projection gets directions and distances right and to blazes with shape. Mercator is a compromise which distorts everything to some degree but has some advantages for navigational purposes. Thus New Zealand on the Great Circle map centred on England lies between north and east (almost) while on a Mercator map it is a small spot in the south-east. Even to the U.S.A., Mercator shows a bit south of west, while the Great Circle shows thirty degrees or so north of west. Always get your directions from the Great Circle map, never a Mercator one. Also, of course, one must allow for DX heard by the long or short path. Since the long path is favourite for the VK/ZLs in the morning, in terms of a compromise a dipole firing E-W is preferred, while one firing N-S isn't a lot of good save for Africa, South America and maritime mobiles!

Letters

Rather a long introduction this time — but as usual it reflects editorial or your scribe's activities and problems, or one which has appeared in your letters — in this case, all three!

H. M. Graham (Chesham) makes a welcome re-appearance after a visit to hospital for three weeks, for repairs, plus another couple of weeks while the Araldite set firm. Maurice says that his log is blank from July 11 right through to August 31 — the longest such period we recall since the start of the Graham contributions to this piece. Let's hope all is well by the time this comes to be read. As for the DX, the best of the bunch was definitely OK1XC/JT for a new country all-time and 14 MHz, but in addition gave him the last, elusive, Zone 23 for the complete set of forty.

N. A. Fox (Wakefield) adds some more to his total of prefixes, without comment. Looking at it, we have to admit to surprise at the high proportion of long-distance stuff and wonder whether next time round reader Fox will tell us a bit about his set-up and site; it is obviously 'perking' very well indeed.

In the letter from *P. Oliver (Paisley)* we find a hint that 'summer laziness' has contributed to a low score. However, Pete says he will have had a couple of 'all-nighter's' by the time this comes to be read, as well as going to the Convention at Glenrothes and entering the JOTA SWL contest.

Now we come to *L. Marquardt (Hereford)* who has the usual addition to the score, all but two of them filling in gaps in the European lists. It would be interesting to compare the set-up and *operating* times of Luciano and SWL Fox up in Wakefield — we might learn a lot!

Our next letter is a first entry into the 1986 Table from *J. Doughty (Cheslyn Hay);* but we also recognised the signature — welcome back John! In fact, John has been busy with other things, like a young son for example, which take up time. That's one of the joys of a hobby — it can be put down when time presses or interest wanes, and taken up again later. I recall as a youngster my father building a model of the *Santa Maria* galleon using no more than a knife and some glasspaper as tools. That model certainly took more than five years to finish, but it also was put aside for a year at a time when other things took priority.

Another one to return to the fold is *D. Pye (London W2)* who has been out of routine at work, seen a daughter married off, cares for a disabled wife, and taken and passed RAE. Those with long memories will recall a small wager made on the subject of Don's RAE pass, so your J.C. is doubly pleased! Don notes how much was due to the two tutors at Paddington College (who are in action again this session) and wishes his thanks to them to be public.

Interesting Point

M. Ribton (Gillingham) has various comments to offer on his return to HPX in 1984 after a gap of 4½ years, but the prime point

is the one in the postscript! That 'PS' mentions OE6XG/A on Abu Ail, heard working W0FJH at 2008 on May 4, on 21.303 MHz. The old prefix for Djibouti was FL, before it became J2, and the activity on Abu Ail then was of the form FL. . . ./A. Arguing from that, then, one would have expected something like J2. . . ./A. But it could be that OE6XG/A was correct; it could also be that OE6XG was in the right place but wasn't properly licensed by the J2 authorities, in which case he was in effect a pirate. The only answers to this conundrum are (a) to guess, or (b) to wait and see if anyone claims it successfully for DXCC.

Still with the prefixes, it always used to be the case that if one operated somewhere away from home, the new location appeared as a suffix, for example G3SWM/W3. Of late the tendency has been to go to the more logical idea of putting things the other way round, as for example the SV5/DL7FT noted by Angela Sitton in her letter; in this case the suffix has become a prefix, and this pattern is certain to become more common as it will be used in all the EEC countries when the 'common licence' becomes operative. Once this is so, we would hope it will then spread to the rest of the world.

R. Williams (Biggleswade) is still using the R-600 receiver, but now has an AD370 outdoor active aerial in place of the AD270 indoor. Ray points out that we didn't pick a very good date for the SLP (August 31) as he didn't get his copy until September 2! Your J.C. has to admit that in setting the date he though only in terms of it being well ahead of his own deadline; and Old Greybeard in the editorial chair also missed its relevance in terms of the ever-deteriorating postal service. Sorry, everyone! Anyway, Ray did in fact listen on the SLP date, although he says it would have been a more structured activity had he known it was an SLP. He was on 14 MHz at random intervals between 1650z and 2207z and found 5N9GM, 9Y4FS, K4ADN, PT7BZ, PT7DX, PY1HA, TI2CF, TI2LCR, WA4WTG, YV5HNI, and ZS6EH. Otherwise, there were a couple of South Americans over September 5/6 on 21 MHz, Europeans on 28 MHz and on 14 MHz, such DX as HL9OB, T32AN, TJ1AP, TL8DS, UI9AWD, UV1OO, UZ0QXH, VE8RCS, VQ9GB, VY1CO and YB8VM (Ambon I).

The only other input on this was from *N. Henbrey (Northiam)* who just mentions why he missed it and left it for the rest: a pregnant silence! Otherwise, apart from being a little surprised to see his own station in *Short Wave Magazine* Norman confines himself to being sad about the death of ISWL — naturally he is sadder than most, having been a member since 1964, and latterly Contest Manager. It is indeed a shame; but perhaps it could be a blessing in disguise if a new SWL grouping were to arise in strength, with keen new blood. We shall just have to wait and see. There are certainly foci in existence for such; for example, this column and GW4OXB's International Listeners Association, and even maybe Bob Treacher's piece in the RSGB's *RadCom*.

Another one who has been shown to the world was *B. F. Hughes (Harvington)* whose shack photograph appeared last time. If anyone else is thinking of sending in a snap for the column, it should be nice and sharp, black-and-white and the size somewhere between Enprint and 4" X 5" for preference. The notes about the photograph must go on a different piece of paper which should have your name and address on; and your name and address should be pencilled lightly on the back of the print. 'Lightly' implies that the point shouldn't make a mark on the useful side of the photograph!

Mrs R. Smith (Nuneaton) has nothing to say this time save to include the list; we wonder whether she has yet got the aerial problems sorted out.

Congratulations to *R. Fox (Northampton)* who has a nice shiny new callsign to play with — but the workload has been so heavy there hasn't been a lot of time for listening. Perhaps Roy will be putting a report in to G3KFE's bit in future?

Where can he get 14 MHz traps, asks *W. J. Prior (Lochcarron)*. . . . why not *make* them? Take a piece of 1.25" o.d. PVC pipe and make it 3.2 inches long for one trap. Use RG58/U cable; this gives 28.5 pF per foot, while the UR43 British cable at 29pF/ft makes it a good alternative. The arrangement of the coaxial cable is that one takes 41.45 inches of the coaxial cable, from the reel, and then makes a 3-inch 'tail' at each end. To make the 'tail' after cutting the cable to length, first use a sharp knife to cut the PVC sheath three inches back from the end, taking care to avoid cutting the strands of the cable outer layer. Now bend the stripped end over, and with a pin separate the strands on the outer side until you can, with care, fish the inner through the gap in the outer. *Ditto repeato* t'other end.

If you want to visualise how this can be made into a trap, imagine the inner of one end connected to the outer of the other end; the remaining ends, one inner and one outer, will be connected to the two aerial wires, and the cable instead of being a straight piece will be a coil. Notice how this means you have a short-circuit to DC between inner and outer of our bit of coaxial cable. This is correct, and important to this design.

Take your piece of PVC pipe and drill a 5mm hole near one end. Push the prepared end of coaxial cable into the hole so the coax PVC sheath enters the hole by no more than ¼ inch, and then coil the coaxial cable tightly round the former for six turns, and then carefully mark the spot. Unwind the coax, and drill another 5mm hole at the marked spot. Now the tricky bit. We want the two ends to look the same, but once this end is inside the former we have a problem to remove the surplus PVC outer. The only way is to offer it up and mark the place, withdraw and cut the surplus PVC

HPX RULES

(1) The object it 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 callsigns.

(4) When the prefix is changed both the old and the new may be counted; thus VQ4 and 5Z4 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 callsigns 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 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).

HPX LADDER
(All Time Post War)

SWL	PREFIXES
PHONE ONLY	
B. Hughes (Harvington)	3187
E. M. Gauci (Sliema, Malta)	2954
Mrs. R. Smith (Nuneaton)	2597
E. W. Robinson (Felixstowe)	2478
H. M. Graham (Chesham)	1867
M. Ribton (Gillingham)	1718
M. Rodgers (Harwood)	1681
P. Oliver (Paisley)	1628
N. Henbrey (Northiam)	1485
F. Dunn (Chester)	1436
N. E. Jennings (Rye)	1416
N. Askew (Coventry)	1367
R. Fox (Northampton)	1305
P. Davies (Market Drayton)	1233
G. Shipton (Rye)	1091
J. Routledge (Hartlepool)	1011
B. Patchett (Sheffield)	900
R. Wooden (Staines)	814
J. J. Sales (Lancaster)	805
G. Caselton (Orpington)	698
S. Field (Barningham)	649
A. Vest (Durham)	605
Mrs. A. Sitton (Stevenage)	601
N. Fox (Wakefield)	590
S. Wilson (St. Andrews)	555
R. G. Williams (Borehamwood)	516
J. Singleton (Withernsea)	506
CW ONLY	
F. Dunn (Chester)	1923
J. Goodrick (I.o.W.)	1763
A. Vest (Durham)	858
J. J. Sales (Lancaster)	382
RTTY ONLY	
N. E. Jennings (Rye)	683
P. Lincoln (Aldershot)	530
W. J. Prior (Lochcarron)	423
J. Routledge (Hartlepool)	354
N. Henbrey (Northiam)	328

Starting score 500 for Phone, 200 for CW or RTTY. Entries in accordance with HPX Rules - *see* p. 339 this issue.

sheath off, then re-fit. Some pummelling of the coaxial cable may be needed to get it to 'sit' nicely on the former.

Now we must strip two inches of the insulation off the inner at the start end leaving one inch insulated; and similarly at the other end. However the massage may have slightly altered the length of inner sticking out at the second end, so we settle for leaving an inch of insulation on the inner at this end. Take the inner at one end and twist it to the outer of the other end, to give the circuit we have already visualised; the connection should be as short as possible inside the former, and after soldering the surplus can be cut off. Drill a smaller hole at each end of the former, and twist the inner of the coaxial through the hole and round the edge at one end, and similarly with the sheath at the other end. The two holes should be in line so the trap 'sits' nicely once it is in the air. Weatherproof the exposed ends of the coaxial cables with some silicone rubber sealant. Wrap the trap with some surgical or PVC electrical tape to keep the sun out of the PVC cable sheath. Hang it up, and make another the same. Now make your two-band aerial, but remember you will have affected the length on the lower band by the inductance of the trap; probably around three feet shorter each side for a 7/14 MHz aerial.

Alternatively, go and buy some traps — from *KW Electronics* or *G2DYM* as the first places to come to mind.

As usual, *M. Rodgers (Harwood)* simply offers his list update, and again there is an even spread between EU prefixes and DX. Of course when one has a score like Mike's or higher, one will be looking out for *any* new ones wherever they may be, and so those EU prefixes that were beneath notice years ago become important!

M. Newell (Kenilworth) left us when he got G1HGD, but returns to the fold for the moment as he has disposed of his rig including the PSU, so he can't even get on 432 MHz! Thus it comes about that Mike has borrowed an FRG-7 and is scratching about at SWL again. August 4 saw a session on 28 MHz which yielded lots of European signals, 14 prefixes logged and best of all T77C in San Marino. 14 MHz gave ten prefixes logged including OD5RH and a TA2; so for a couple of days listening there were three new countries and a prefix total of 530. Just shows how much more fun it is to be an SWL than to operate!

R. G. Williams (Borehamwood) sends what he reckons to be a short list but 'bits of the best are better than lots of the locals!' The bits of the best have been found by the expedient of keeping the lamp burning well past midnight.

Nice to hear again from *N. Jennings (Rye)* who has, as we know, been under the weather and not able to spend the time he would have liked at the receiver. Let's hope Norman is soon back in action, and that we may hear from others in that delightful spot.

Annual HPX — a table running through the whole year in addition to the existing ones — seems to have caught the imagination of several readers, so from next time we will run it. Essentially it will be like the others, but in this case, since the object is to see how many prefixes an experienced SWL can rake up at the bottom of a sunspot cycle, the score will take into account all modes. A prefix once scored in any mode cannot be claimed again if heard by another mode. First listings, if there are enough claims, next time round. All prefixes to have been heard in 1986 of course.

Which leads us nicely in to the letter from *E. M. Gauci (Sliema, Malta)* which sparked it all off; Eddie has already in this year of 1986 picked up 936 prefixes on SSB, as compared with his All-Time of 2954.

Angela Sitton (Stevenage) was up to 601 when she wrote on September 5 and we were pleased to see she now has some prefixes entered in the log heard direct on CW, which doubtless pleased her CW tutor, G4ISO. On a different tack, Angela mentions the Stevenage club which is putting on GB3SNT on November 19 to celebrate 40 years of the New Town's existence; so your scribe will be on the look-out for them to renew contact with old friends.

F. Dunn (Chester) in his letter says he will support the proposed new Ladder, and mentions that so far this year he has heard 910 prefixes in total, breaking down into 477 heard on CW only, 135 on Phone only, and 298 heard on both modes. This, taken along with Eddie Gauci's figures suggest that a total for the year would be around 1300 prefixes.

Next we have the letter from *E. W. Robinson* of *Felixstowe,* and he was intrigued by the station from Gloucester signing GB9DB commemorating 900 years since Domesday Book. The operator of GB9DB reckoned this was the first and last GB9 prefix to be issued, as the 9s are reserved for commercial stations. However there have in fact been earlier '9' prefixes issued in this country although they go back about thirty years or so; we seem to recall a series of them issued in connection with an expedition, and that one of the operators was G3AAE. And of course the ITA 'pilot' transmitter used for the initial tests of the Band 3 TV stations in the very early days, which was put together by Belling-Lee, had the call G9AED if memory serves aright.

S. Field (Barningham) is the proud owner of G1VTR nowadays, and operational on 432 MHz. Unfortunately, after 1½ pages of the log had been filled, along came a large mains 'spike' and destroyed parts of the rig. This is, and will continue to be, a problem for those who don't have protection circuits to trap

ANNUAL HPX LADDER
Starting date, January 1, 1986

SWL	PREFIXES
L. Marquardt (Hereford)	543
B. Musselwhite (Warminster)	338
J. Doughty (Cheslyn Hay)	240
D. McGlone (Limerick)	208

200 Prefixes to have been heard since January 1, 1986 for an entry to be made, in accordance with HPX Rules, *see* p. 339, this issue. **At score 500, transfer to the All-Time Ladder, will be automatic; for this year only, those who wish may continue in the Annual Table, provided a separate listing is sent in (where applicable) from the All-Time list. Thus the 1987 final listing, to appear in the March 1987 issue, will show who has heard the most Prefixes in 1986. The listing below is, as indicated in the text, all-mode.**

E. M. Gauci (Sliema, Malta)	936
F. Dunn (Chester)	910

such spikes. One recalls some long time ago that the Mullard Labs near Redhill had a set-up to monitor the incidence of such spikes, and they measured many during each week, quite a few being 100% overvoltage or greater. The way to handle such problems is probably to use the *voltage-dependent resistor* between live and neutral, and maybe even between each leg and earth, selecting the VDR type such that it remains a high resistance at normal voltages, and comes into play when a high-voltage spike appears. The operation has to be very fast, though, if one is to trap the spike before damage is done. This problem, we believe, is the reason why the use of battery-chargers is not recommended on cars with alternators unless the battery is first disconnected; J.C. has a very aged charger using selenium diodes, and these big slow devices with their high stray C to earth seem to have been satisfactory without disconnection of the battery from the car, probably because they 'smother' any spikes that are around. However, we don't know of anyone who makes selenium rectifiers these days! Reverting to the question of VDRs and such, they are made, we believe by the American G.E. company, and there are similar but diode-based devices available from IR under the name, we believe, of *Klipvolt*.

White Rose SWL Contest

The covering letter for the announcement on this one is from *D. A. Whitaker (Harrogate)* who bewails the lack of support for SWL contests in this country; as he says, the club sets 'em up and the overseas stations wins 'em! Anyway, David says, he would be pleased to receive some feedback as to just what sort of contest would please the G SWL types.

Turning to the contest, it is to run from noon GMT on January 17 to noon on 18th, 1987; up to 18 hours may be covered by one's log. Two sections, Phone or CW, no mixed-mode entries. Use 1.8, 3.5 and 7 MHz. The practice of logging a string of contacts by one station is deprecated, and so log entries are not to include the same callsign in the 'Station Worked' column more than ten times and such a station callsign can only be claimed once for scoring. Duplicate entries will incur penalties if not shown as such.

The object of the contest is to log as many stations in as many countries as possible; score one point for each station heard from one's own continent and five for each station in a continent other than one's own. For each band total the points so achieved and multiply by total number of countries heard. Final score is the total for the three bands. This raises a question in the writer's mind; we *assume* the country multiplier is the total number of countries heard on that band, not the total number of countries overall, although the wording seems to imply the multiplier is the total of countries on all three bands. Countries are as per ARRL Countries List, but with the call areas of U.S.A., Canada, Australia and New Zealand each counting as a separate country.

No CQ, QRZ or similar calls to count for points, and no /AM or /MM stations to appear in the entries. Log sheets to show the following: Date, Time GMT, Band, Station Heard, Station Being Worked, Report at SWL QTH, with points only being claimed for stations actually heard and callsigns shown in full. If points are claimed for both stations, then the callsign must appear in the Station Heard column. Entries to J. Hart, G3ZGA, White Rose A.R.S. 146 Street Lane, Leeds LS8 2AD, to arrive not later than Monday February 23, 1987. Certificates of Merit will be awarded at the discretion of White Rose A.R.S. and its decision shall be final. Doubtless this address will also serve for you to get a copy of the full rules and to clarify the point already queried above. In conclusion, perhaps we should note that the arrival deadline is quite tight after the contest is over and so you should be careful that a delay in the postal system doesn't disqualify you.

Meantime, for the sake of a bit of practice, how about another SLP? Say, 0900-1300 GMT on November 16, on 14 or 7 MHz. Hear what you can, and include a listing with your letter to this piece next time, together with comments.

Conclusion

All over for another time; let's have your Table entries — all three of them where they are applicable — and your SLP entries and comments (the SLP entry could be a Xerox of your log pages, annotated if necesary) and send them to us to arrive by **November 20th** — that's a bit tight for the SLP we know — and address them to your J.C., 'SWL', SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts. AL6.9EQ. *Cheerio!*

A Vinegary Tale

A Cautionary Note Concerning Some Adhesive/Sealants

ONE of the many laws attributed to the legendary Murphy is that an equipment failure will invariably occur at the beginning of the best VHF lift for years — and this is just what happened to a friend's antenna rotator recently. A check with an ohm meter from the shack indicated that part of the motor winding was open circuit, so a roof-top investigation was undertaken.

The rotator is a hefty *Ham M* type and access to the eight-way terminal block is through a small plate on the bottom mounting assembly. When this was removed a horrible sight was revealed, the screws in the plastic block having been destroyed by severe corrosion caused by a popular adhesive/sealant supposedly designed to protect such things. The product used was an RTV Silicone Rubber mixture made by *Dow Corning* under the brand name *Silastic*. It is listed in the *Farnell Electronics Components* catalogue as type 732 and similar products are carried by other supply houses.

To quote from the *Farnell* catalogue, it is "A ready to use one component, non-slump, paste-like material which cures to a tough rubbery solid when exposed to moisture in the air. Liberates a small amount of acetic acid during curing. General purpose adhesive/sealant for sealing joints, wire entries and connectors, for waterproofing pumps, motors, switches and enclosures, for glass to metal bonds, etc. NOT suitable for porous cement based compositions." No mention of any corrosive properties.

The same sealant was used to "protect" some EHT components in a high power amplifier since it has excellent high voltage insulation properties. The components are in a small diecast box and, when the lid was removed, similar bad corrosion of screws and all component leads was discovered. The tinned copper leads from components were so badly affected that they literally fell apart at the soldered joints when gently moved. The moral is obvious. Under no circumstances should this type of sealant, which liberates acetic acid during curing, be used in contact with wires and screws.

However, there is a non-corrosive sealant produced under the same brand name, type 738. The catalogue states: "Incorporates a none-corrosive cure mechanism which produces no corrosion by-products (*i.e.* does not generate acetic acid in curing), accordingly can be used in corrosion-sensitive electrical and electronic equipment, essential for use with copper. Non-slump paste . . . Suitable for porous and non-porous substrates."

That seems a rather roundabout way of inferring that type 732 is unsuitable for copper. It appears that the 732 product is widely used in the TV repair industry. It would be interesting to learn if it has given any corrosion problems in the repair of EHT circuits.

N.A.S.F.

Practical, Simple Sideband Part 6

in this special series, these two well-known designers and constructors get together to unravel its mysteries

REV. G. C. DOBBS, G3RJV and IAN KEYSER, G3ROO

A Modular SSB Transceiver — by G3ROO

BEFORE we return to the simple sideband PCB we will first look at another way in which the MLX PCB can be used to make a semi-homebrew transceiver.

Some will call this a cheat and not homebrew as it is hooking-up of modules, but I contest that as the actual construction of the unit is 'at home', and, if it was not built using these units, it is inevitable that the boards would eventually be scrapped or canabilised for other projects.

The RF board used in this project is from the FT-707. The reason for this is that there was a large number of these sets imported with an early type of RF board and many of these have been updated by owners, leaving the old boards on the shelf. These second-hand boards are absolutely useless to the owners and I should think that they would snap your wrist off if £30 was offered! Alternatively a new RF board could be purchased from Yeasu but this will cost in excess of £100. This would still make a cheap transceiver, but I would rather go for the old style board and save the money. There is very little wrong with these boards, in fact they are very good indeed and even with their failings can out-perform many rigs around today. If RF boards from other sets are available it is quite possible that they can also be used in the same way to produce a very neat little unit at fairly low cost.

There are four other units required for the transceiver: the VFO, the crystal oscillator PCB, the power amplifier and the output filter unit. Others could be added at a later date such as a width board for use on CW, and a more sophisticated TRX control board and ALC facility. These are not important and can be left out; however the chassis size has been set to allow room for these as future modifications.

This set works! Occasionally I receive a letter complaining that a project of mine could not have been built and cannot work. Rest assured that all my designs for *Short Wave Magazine* have been built at least once during development and made to work as intended. There are two possible causes of failure: the first is the occasional mistake that crops up in articles (a correction is always published later) and the second is constructor error. In most cases it is the constructor not understanding the design of the equipment. If in doubt ask a local constructor and almost certainly he will point you in the right direction. But if that fails, write to the author enclosing a *stamped addressed envelope* and after each question allow space on the page for the answer. The query will be answered as soon as possible, but please be tolerant as I have at least one hour a day replying to letters (and no doubt fellow authors do the same!).

The Design

We are setting out to construct a multiband SSB transceiver with an output in the region of 20 watts using as far as possible ready-constructed PCB's.

The IF strip will consist of the MLX board being driven by the RF board from the FT-707 (or similar set). The VFO is the unit I described in the May 1986 issue of *Short Wave Magazine*. The

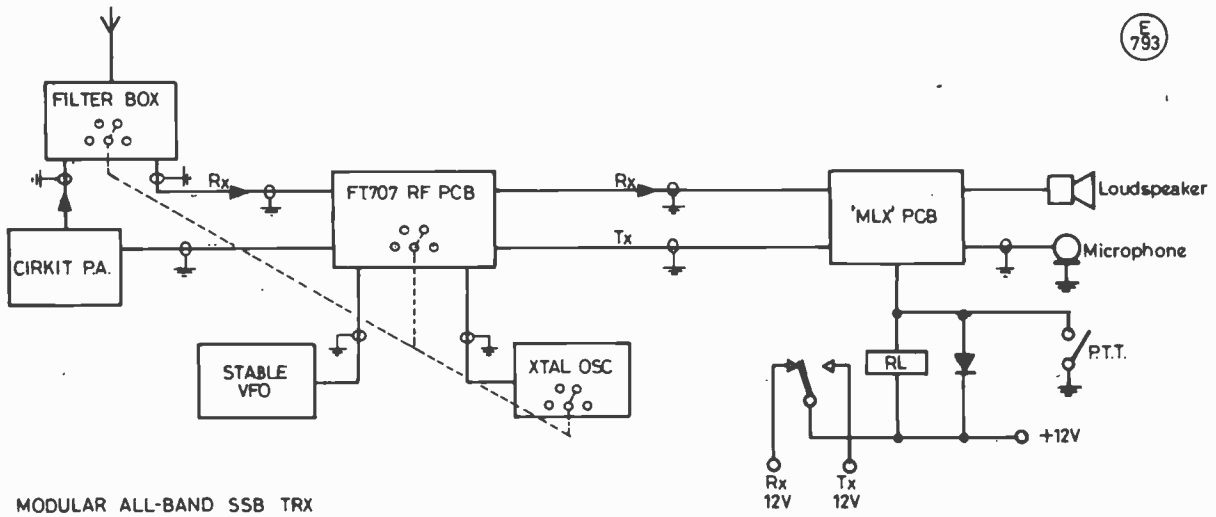
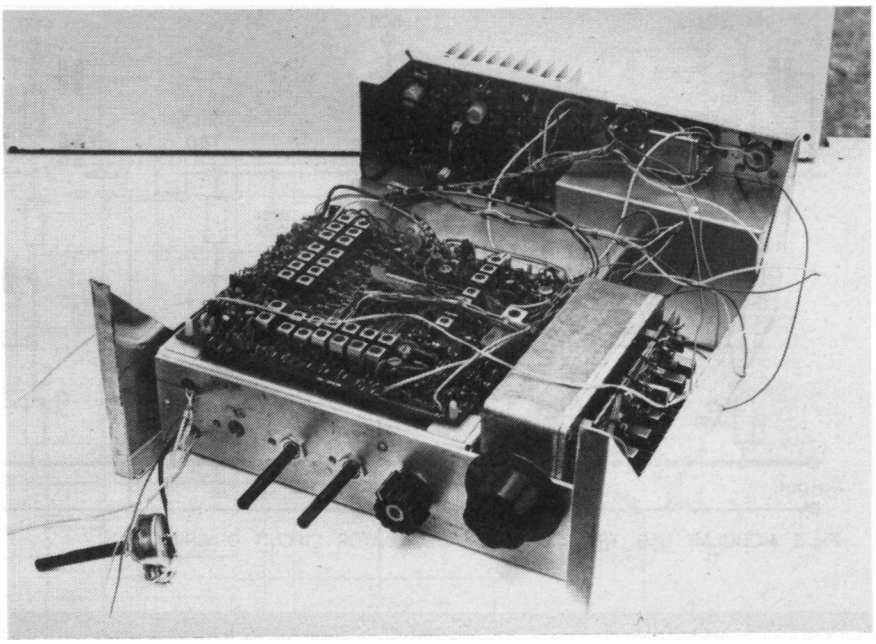


Fig. 1 MODULAR ALL-BAND SSB TRX



The working transceiver. Centre, the FT-707 RF board, with the VFO and xtal oscillator PCB to the right. The LPF box is at the rear right with the aerial relay above it; the *Cirkit* PA is at the rear left of the backdrop.

board that we have to build before we start is an oscillator unit that can provide a signal for each band we intend to cover. This will mix with the VFO to produce the required local oscillator signal for the transceiver mixer; this mixing of the two signals is done on the '707 RF board and the necessary filters are switched with the signal frequency circuits.

The difficulty of trying to make drawings easily comprehensible is made worse when large numbers of interconnections are made. They can be made more readable by treating the wires as cableforms and coding each end clearly. Where more than two wires are together this system will be adopted in this article and to make it even clearer these "cableforms" will be a thicker line on the drawing.

The block diagram of the design is given in Fig. 1 and the overall circuit in Fig. 6.

FT-707 RF Board

A simplified block diagram of this board is given in Fig. 2. I will describe an outline of the action on receive and then on transmit. The diodes on this diagram indicate diode switches which are used extensively on this board allowing very simple band selection.

The signal from the aerial is fed into a tuned circuit selected by diode switches which are activated by the band switch. The filtered signals are amplified by the receiver RF amplifier and then further filtered by a bandpass filter, diode switched for the band in use. The RF signals are then mixed with the local oscillator signal to produce the IF signal. This is fed to a low noise FET amplifier prior to being passed to the SSB filter on the MLX IF PCB. The local oscillator signal is produced by mixing a VFO signal between 5 and 5.5 MHz with a crystal oscillator signal from the crystal oscillator PCB. This produces a signal 9 MHz HF of the aerial signal. These two signals beat together to produce the IF signal.

The local oscillator signal will produce a large mumber of products from the two input signals and the required product is selected by a diode switched bandpass tuned circuit. The principle of crystal mixing to produce the local oscillator signal was covered in Part 2 of "Simple Sideband" and if in doubt refer to that article.

On transmit the post-mixer IF amplifier and the receiver RF amplifier are turned off and the Tx RF amplifier and Tx predriver are turned on. The bandpass tuned circuits are left selected as in the receive mode. The SSB signal from the MLX board is fed *via* a diode switch activated on transmit to the diode ring mixer. This is mixed with the local oscillator signal and the required "in band" signal is selected by the RF tuned circuits. The signal is amplified by the Tx RF amplifier and the predriver to a level sufficient to drive the power amplifier stages.

The Crystal Oscillator PCB

This board has been designed for maximum versatility and consists of 14 oscillator circuits, diode switched onto a common output terminal. The board is so laid out that it can be cut with a hacksaw to produce a smaller board with the required number of circuits. In this transceiver I have left all 14 in use in case I wish to cover another band at a later date. In the interests of page space the circuit in Fig. 3 shows only three of the stages and it can be clearly seen that by applying power to the appropriate terminal the stage will oscillate and all other diodes from other stages will

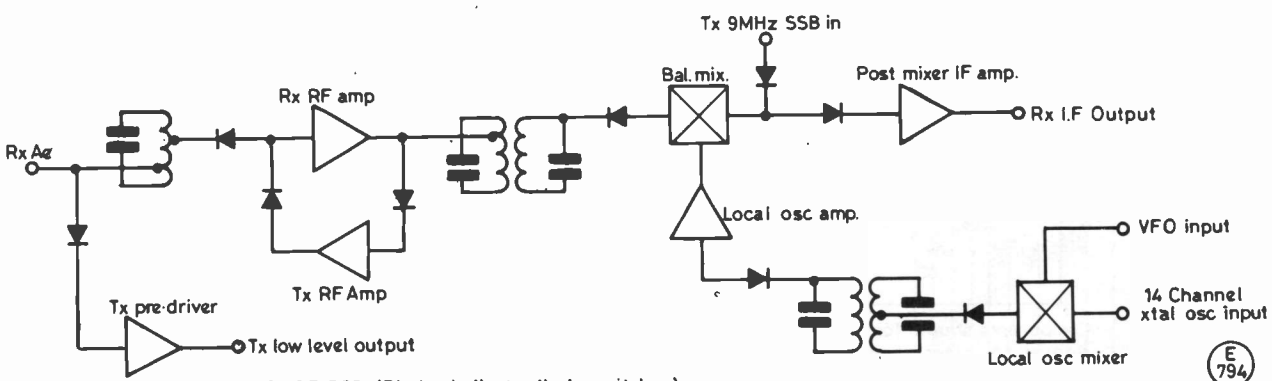


Fig. 2 BLOCK DIAGRAM FT707 RF PCB (Diodes indicate diode switches).

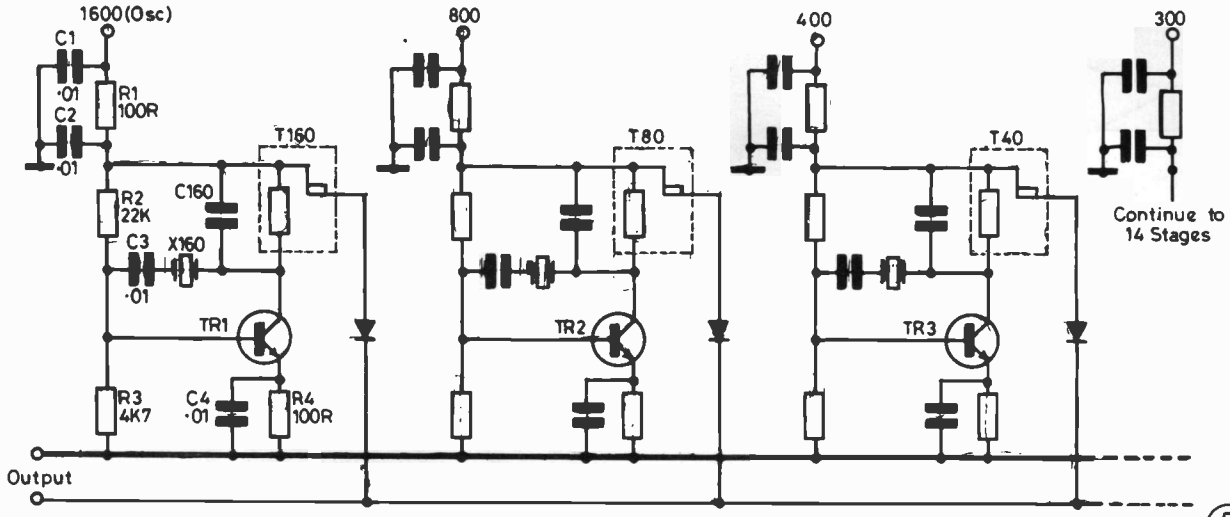


Fig. 3 MODULAR SSB TRX 14 CHANNEL OSCILLATOR CIRCUIT DIAGRAM

E 795

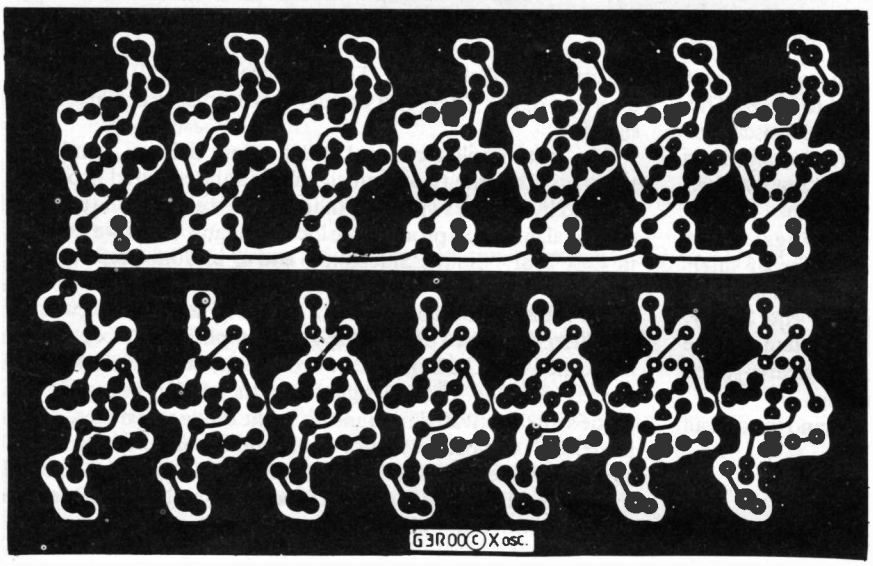
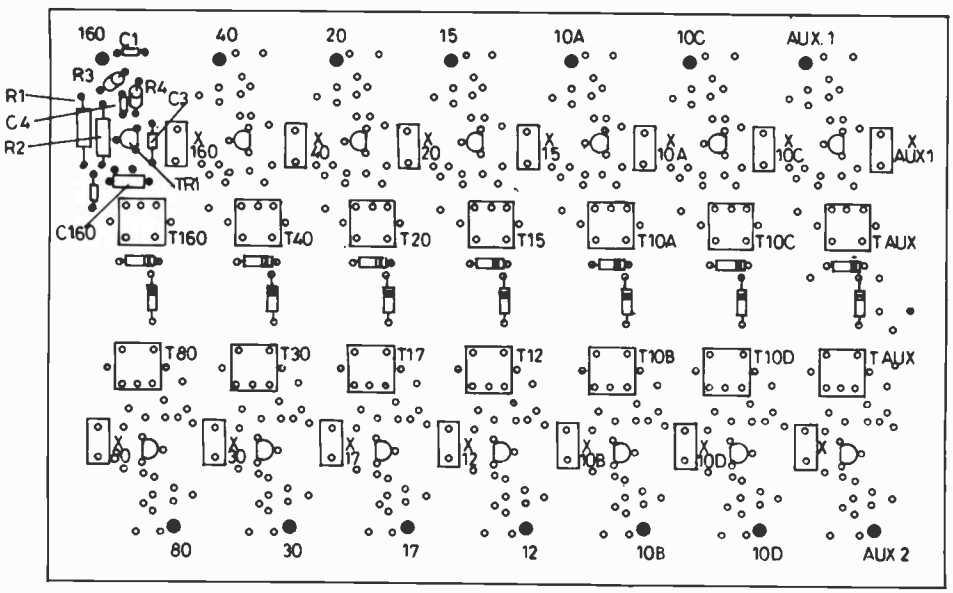


Fig. 4. Oscillator PCB foil



Components shown for 160M only.
Repeat for other channels

Terminal pin

Fig. 5 14 CHANNEL OSCILLATOR PCB LAYOUT

E 796

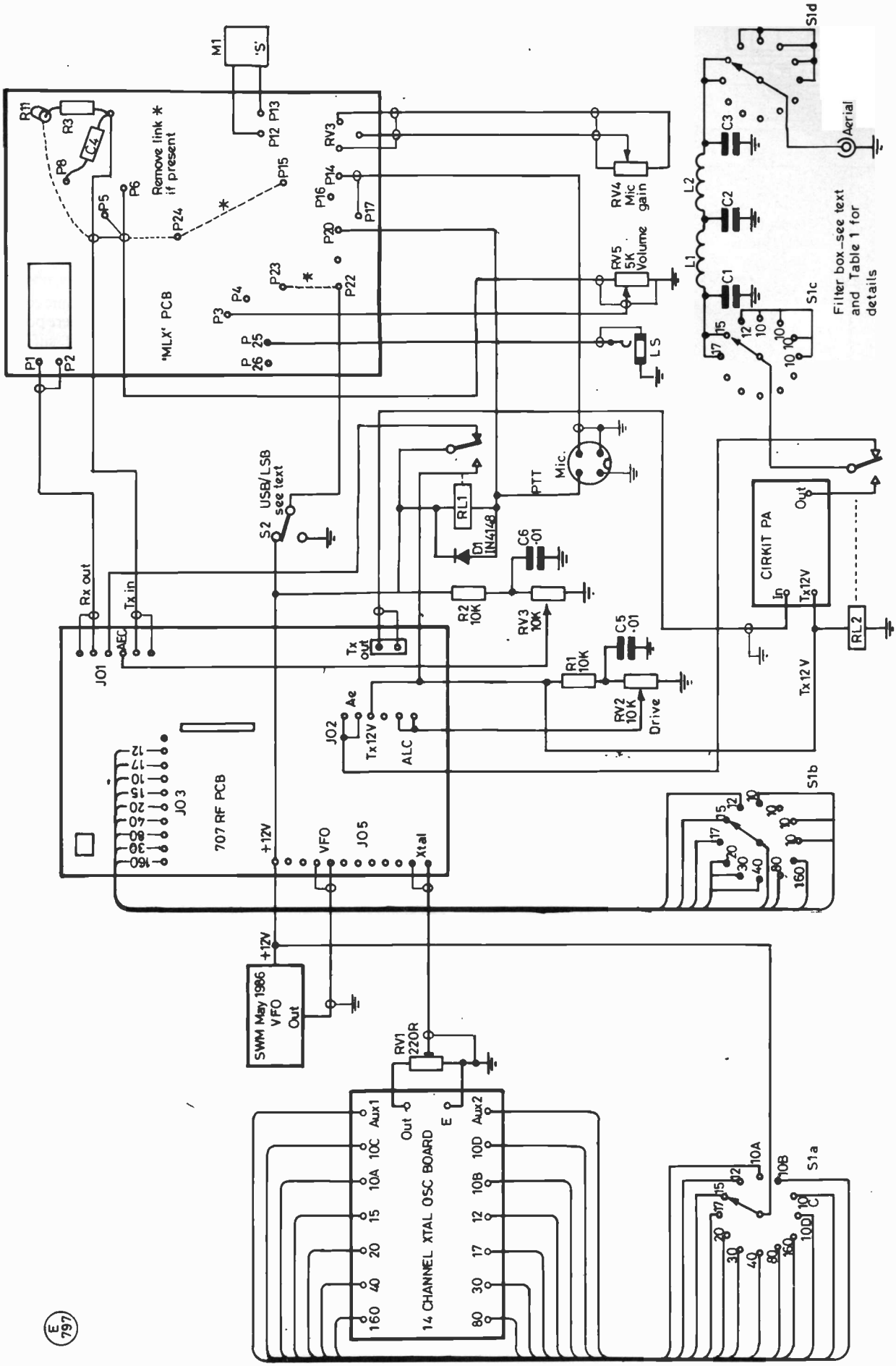


Fig.6 MODULAR ALL-BAND SSB TRX - OVERALL CIRCUIT DIAGRAM

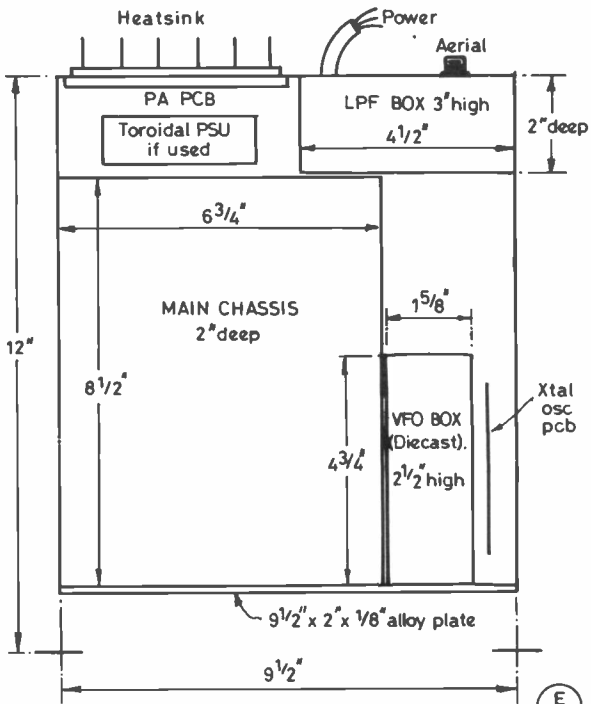


Fig. 7 Main Chassis Layout

be back-biased, effectively isolating those circuits from the common output bus.

The actual oscillator circuit hardly bears mentioning except to say that is is a very common overtone circuit configuration. This will enable crystals to be excited in either their fundamental, third or fifth overtone modes. Very active crystals may permit seventh overtone but reliability of the circuit starting every time is suspect.

Having mentioned crystals we might as well cover that point at this stage. If you wish the dial to indicate the same kilohertz frequency as you switch from band to band it is necessary to use very accurate crystal frequencies. If however you are like me, and prefer to save money, I raid friends' junk boxes for crystals with frequencies as near as possible to that required and allow sufficient overlap in the VFO coverage to permit the required band to be covered.

The MLX PCB

This board has been covered by George, G3RJV, in the last two issues of *S.W.M.*

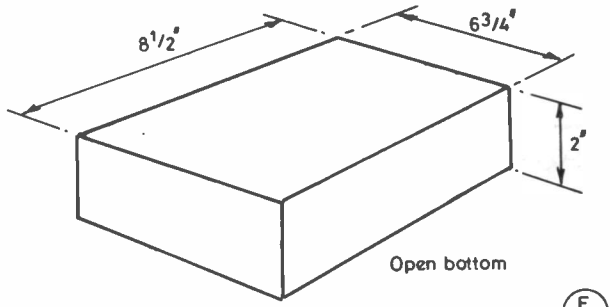


Fig. 8 Main chassis box (16 swg alloy)

The Low Pass Filters

Six low pass filters are used to ensure that the harmonic content of the transmitted signal is kept as low as possible. Where possible the same low pass filter is used for two bands if sufficient attenuation of harmonics can be realised due to the bands being within the same octave. Each filter is selected by two twelve-way switch wafers turned by an extension spindle fixed with a shaft coupler to the rear of the band switch. I would rather use relays to select them but the additional cost is high and this is just as suitable unless computer control of the transciever is required!

The VFO

This was fully covered in the May edition of *S.W.M.* and is ideally suited to this design. The variable output can easily be set for the correct drive level required by any standard board and the stability leaves even me pleasantly surprised very time I build one! This unit was thrown together and the frequency remained within 300 Hz all day during testing. The overnight cool-off produced 1.2 kHz drift which during the course of the next day reduced to 800 Hz giving a 400 Hz shift. I attribute this variation to the

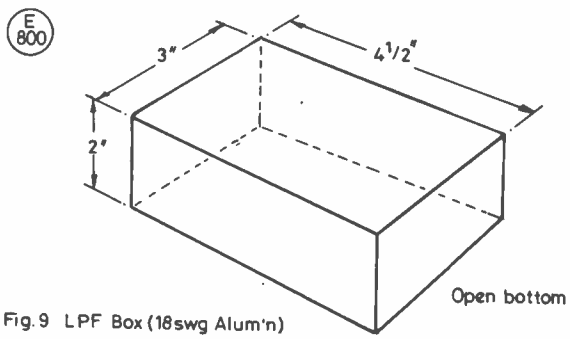
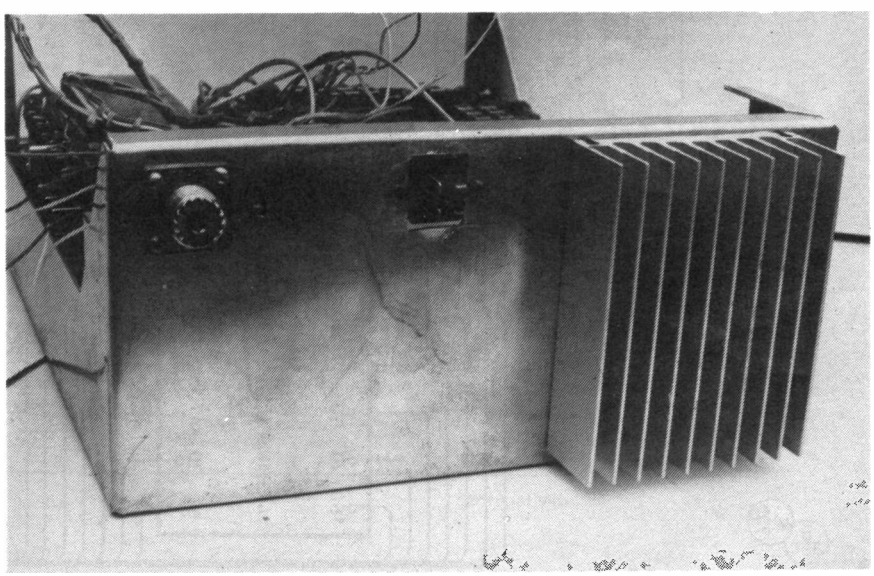


Fig. 9 LPF Box (18swg Alum'n)



The backdrop

Table 1
xtal oscillator PCB components

R1, R4 = 100R	C1 to C4 = 0.01μF
R2 = 22K	TR1 = BC183
R3 = 4K7	T = Toko coil A314 80373

Note: all resistors are ¼-watt, all capacitors are ceramic. Components listed are for one section only: repeat 14 times with the exception of X160, X80 etc., and C160, C80 etc. For these values *see* Table 2.

Table 2
oscillator tuned circuit resonating capacitors

C160 = 180pF	X40 = 21.5 MHz
C80 = 100pF	X30 = 24.5 MHz
C40 = 75pF	X20 = 28.5 MHz
C30 = 56pF	X17 = 32.5 MHz
C20 = 43pF	X15 = 35.5 MHz
C17 = 22pF	X12 = 39.0 MHz
C15 = 15pF	X10a = 42.5 MHz
C12 = 10pF	X10b = 43.0 MHz
C10a, b, c, d = 10pF	X10c = 43.5 MHz
X160 = 16.0 MHz	X10d = 44.0 MHz
X80 = 18.0 MHz	

Table 4
(Fig. 6)

R1, R2 = 10K	RL1, RL2 = 12V 1-pole 2-way relay
R3 = 1K	M1 = 200μA meter, *ex*-CB
RV1 = 220R	Mic, = 4-pin mic. socket, *ex*-CB
RV2, RV3 = 10K 1in. pot.	S1a/D = 4-pole 12-way, long shaft
RV4, RV5 = 5K log. pot.	S2 = 1-pole 1-way switch
C4, C5, C6 = 0.01μF	L/S = ¼-in. jack socket

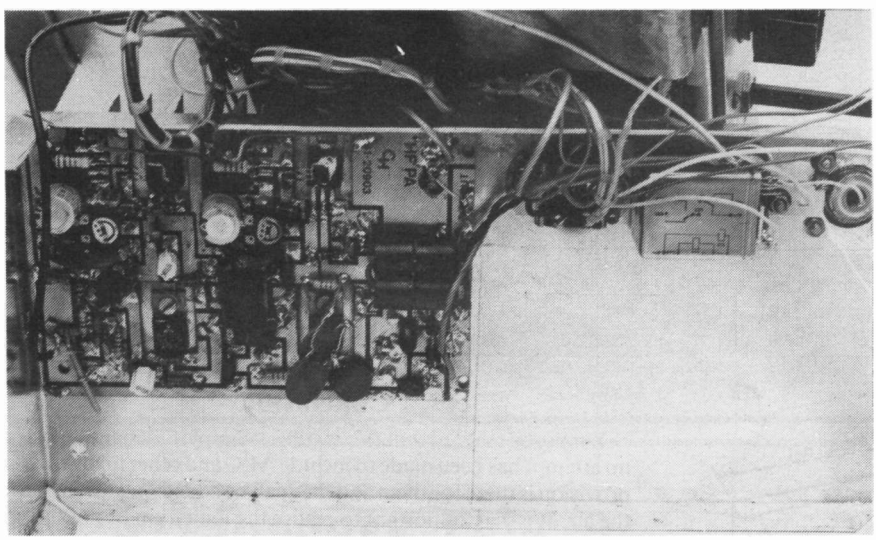
Note: all resistors are ¼-watt

this which might not be immediately apparent: consider trying to trace a fault when one of the diodes in the RF board goes short circuit, or two tracks short together. When tracing with a meter, looking for voltages in the "positive to select" type of design, it will be immediately apparent when there is a voltage present in a circuit that is not in use, whereas in the case of "zero to select" designs there are volts present in both the selected *and* not selected circuits making it more difficult to locate the problem!

The Metalwork

As you can see from the photographs the metalwork leaves lots of free space, for reasons mentioned earlier. It will be seen that the main chassis is the only thing that increases the size of the project. The back-to-front dimension of this box could be decreased by 50mm. (2 inches) and this in turn means the case sides would have to be reduced by the same amount. This would produce a set only 11 inches back-to-front including heatsink and knobs! In fact the whole piece of equipment is very small indeed and compares well with the FT-707 for size.

An excellent source for metalwork at the right price is *H. L. Smith,* 287–289 Edgware Road, London W2. (This firm has been going for years and I well remember as a kid being clipped round the ear at their premises for diving into every little box and



The *Cirkit* PA module

Table 3. LPF components values; all inductors wound on T-50-2 dust core toriods with 24 swg enamelled copper wire.

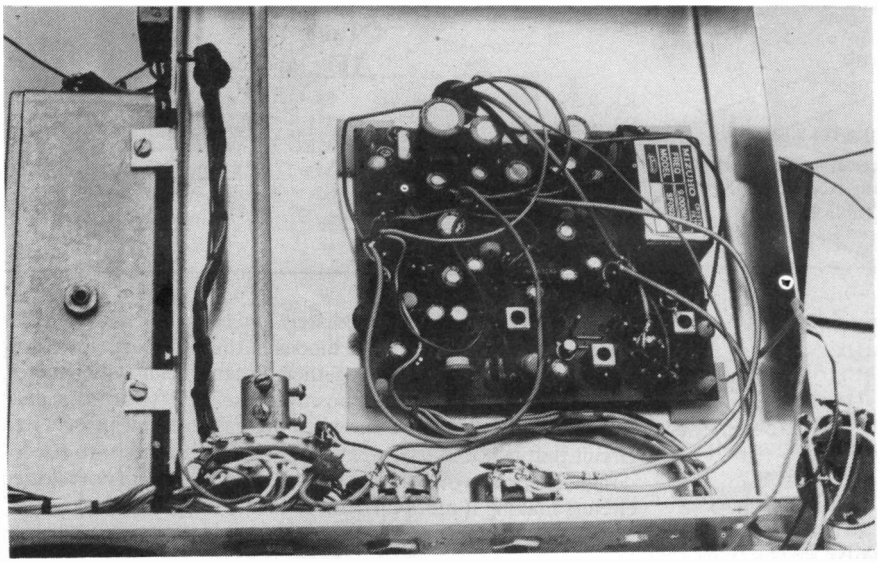
Band	*C1 & C3 (pF)*	*C2 (pF)*	*L1 & L2*	*inductance*
160m.	1200	2700	32 turns	5.4μH
80m.	560	1300	22 turns	2.6μH
40m.	300	680	17 turns	1.4μH
30 & 20m.	160	360	12 turns	0.7μH
17 & 15m.	100	240	10 turns	0.5μH
12 & 10m.	68	150	8 turns	0.3μH

residual heat left in the box after soldering and am sure that the maximum variation normally would be well below 500Hz. This could be improved considerably if care had been taken with temperature compensation but no such efforts were made.

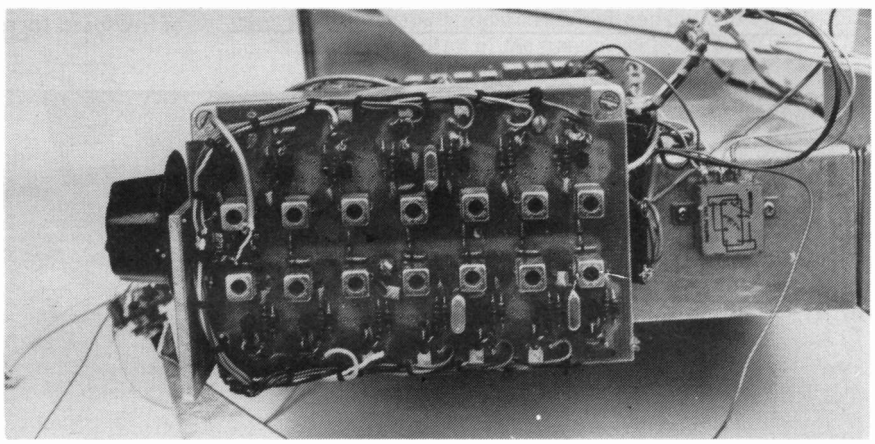
The Band Switch

Two poles are required for this as the oscillator section requires a positive voltage to be applied to each stage and the RF board requires an earth (zero volts) to select the coil circuits required.

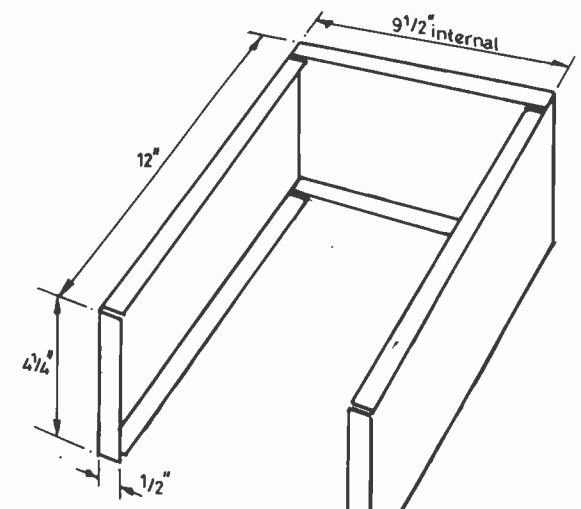
The oscillator board could have been designed to accept zero volts for switching but my preference is always for a voltage to be applied for selecting a circuit. There is a common-sense reason for



The MLX PCB. Note the bandswitch (bottom left) with extension spindle to the LPF box. The VFO box is on the left



The xtal oscillator PCB. The relay (RL1) to the right is the supply changeover



Top and bottom panels to fit in 16 swg.
Front panel 9 5/8" x 4 3/8" x 1/8" thick alloy or mild steel.

Fig.10 Case Sides and Front Panel.

generally making a mess!) They charge a very fair price for a very high standard of workmanship and will make to order in either 16 or 18 swg aluminium. Finding a source of the 1/8 inch alloy for the front panel can be difficult but mild steel can be used with very little extra work.

Conclusion

It must be realised that this is still a "Simple Sideband" rig and no attempt has been made to include ALC and other luxuries. The provision is there for them and they can be added once the set is on the air. It is very important to realise the limitation of not having ALC and care *must* be taken to ensure that the rig is not overdriven. The microphone gain can be used for output level control, or the potentiometer included on the ALC line will control the drive to the PA circuits; as the voltage is reduced from six volts towards zero the output from the RF board reduces. This gives full control of the output on CW if this is included in the rig.

No excuse is made for the photos not showing a fully completed rig as the equipment is working correctly as seen. There is a delay in the final front panel for two reasons, the first being the non-availability of a decent gearbox for the tuning and dial. This is so chronic I am now considering building my own (watch this space!).

The second reason is that the set is not going to stay in this form but be extensively modified; any work done on the front panel would be wasted and so this is being left until the final design is decided upon.

This design up to this point is complete and the front panel layout is left to anyone constructing the transceiver. The other upgrades mentioned for the set (including complete IF and AF boards, leading to RF and local oscillator filter boards) will be constructed and covered in future parts of this series, and can be added at will.

The next project in the series is to describe how receivers such as the FRG-7700 and R-1000 can be modified to act as *transceivers*. with an outboard module. The actual modification will be done on an FRG-7700 but the principle applies equally to other designs.

VHF BANDS

NORMAN FITCH, G3FPK

FEW would have thought that a recent *Sporadic E* opening would be reported in a November issue. The event on Sept. 20 was by far the latest such event of which this reporter is aware. Perhaps some of the real old-timers might recall one? The latest satellite news, packet radio notes and coverage of the good tropo. conditions are also featured.

The Satellites

First, the bad news which is that *Oscar-10* is deemed officially defunct having never recovered from the "stroke" it suffered on May 18. Karl Meinzer, DJ4ZC., and his team have tried valiantly for many weeks to put together a software package that would enable the "bird" to continue with a restricted service, but they have reluctantly given up. The Mode B transponder first came on on Aug. 6, 1983 and up to May 18 this year, *0-10* had provided some very fine service. However, as was mentioned in the Sept. 1983 VHFB, it has proved that the long time the spacecraft has spent in the *Van Allen* radiation belts does seem to have contributed to its earlier-than-hoped-for demise.

Next the good news which is that the *Phase IIIC* satellite should be launched next April or May, according to *AMSAT-UK,* hopefully to be put into a proper orbit at the desired inclination. Incidentally, Ron Broadbent, G3AAJ, the Secretary of *AMSAT-UK,* says he still has PCBs for the *0-10* telemetry decoder in stock. These will be perfect for the new satellite so newcomers might like to get the units built to be ready as soon as the satellite is working.

The new Japanese satellite *FO-12* is working well in Mode JA. However, it was in a eclipse period of about 28% in mid-September so the *JARL Research Laboratory* switched it off on Mondays and Fridays so that the batteries could recharge. This pattern is likely when more than 20% of the orbit is in shadow. The *JARL* has confirmed that Mondays are QRP days and that, as with other satellites, Wednesdays will be reserved for special experiments.

Because of the spinning of *FO-12,* reliable commanding and program loading has been impossible, leading to a postponement of tests on the digital, JD, transponder. It was hoped that PSK telemetry transmission could be carried out by mid-October. *Oscar News* No. 61 included details of James Miller's, G3RUH, *FO-12* modem for use with the JD mode transponder. PCBs should be available now. For details of these PCBs, and all other *AMSAT-UK* supplies and services, send an *s.a.e.* to 94 Herongate Road, London, E12 5EQ.

No reports from readers using *FO-12* have been received and it will be interesting to learn how people are coping with the *Doppler* shift and tracking. Has any reader devised a scheme to use real time computer az-el data to automatically keep their antenna system on target? Finally, still no news about the launch of *RS-9* and *RS-10.*

Award News

Two more readers have joined the 144 MHz QTH Squares Century Club. Member no. 70 is Colin Morris, G0CUZ, from Dudley (YM40f) in the W. Midlands. His certificate was issued on Sept. 15 with "125" sticker and the breakdown was 67 CW and 58 SSB QSOs; 79 on tropo., 36 on MS, six *via Ar* and four *via Es* propagation. Colin was licensed in Sept. 1983 as G6ZPN and one of his first contacts on his starting day was EA1RCR/P (YC). The A licence came in Aug. last year and the present station consists of a *Yaesu* FT-726R and 100w amplifier, with a 14-ele. *Yagi.* The QTH is 190m. *a.s.l.* with a good take-off from the NE, through S to SE, but a blind spot to the N and NE. The main interest is VHF/UHF DX-ing with special interest in the "exotic modes," such as *Es, Ar* and MS.

Member no. 71 is Terry Hackwill, G4MUT, from Woodley (ZL46j) in Berkshire, whose certificate for 107 confirmed was issued on Oct. 10. His analysis is 98 SSB and 9 CW QSOs, 87 on tropo., 9 by MS, seven *via Ar* and four *via Es* propagation. His station comprises an FT-726R also, a *Microwave Modules* 100w amplifier and a 9-ele. *Yagi* from *Tonna* fed with 6m. of *Pope* H-100 cable. He also operates on 6m., 4m., 70cm. and 23cm. and is well up in the tables.

About the tables; from time to time new contributors inquire if the scores are confirmed QSOs. No, as there is no award connected with any of the tables, the figures are counties, or whatever, worked.

Mick Cuckoo, G6ECM, (KNT) was awarded his "175" sticker for certificate no. 27 on Sept. 30. All the new ones were SSB, 12 each on tropo. and *Es,* one *via Ar.* The *Es* ones included OH5LK (NU), UA3LAW (PO) and RA3YCR (RN). For details of Magazine awards send an *s.a.e.* to the Welwyn address.

Repeaters

In a *Press Release* dated Sept. 15, the *RSGB's Repeater Management Group* lists proposed channel changes for six UHF relays, GB3HO, GB3HU, GB3NH, GB3NM, GB3NX and GB3TH, and for seven site changes affecting GB3s HO/KB, KN, LN, WS, DT, VR, VS and PD. A list of Packet Radio repeaters using AX25 level 2 protocol is with the *DTI.* There are 14 from Jersey to N. Yorks. At a meeting on Sept. 13 the *RMG* accepted in principle a 24cm. TV repeater proposal for Emley Moor, a 2m. relay at Aviemore and a 70cm. one to cover the outlying areas of Aberdeen. For further details, contact Chris Young, G4CCC, who is *QTHR.*

Beacon Note

The UHF beacon GB3SUT, is back on the air on 432.890 MHz having been off the air for a couple of years. It was damaged when water ran down the feeder into the Tx causing corrosion. Tom Douglas, G3BA, repaired it some while ago, but re-installation had to wait until the *BBC* had completed a new building at Sutton Coldfield. The old QQV03-20 PA stage has been scrapped and the present power is 4w. A solid state amplifier is contemplated but a new Tx would be better. GB3SUT now has two 8-ele. *Yagis,* QTEs 0° and 135°. Reception reports are *not* required, by the way.

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

December issue — November 5th
January issue — December 3rd
February issue — January 7th

Please be sure to note these dates.

Contests

The October issue of *RadCom* includes the full results of VHF NFD in which the Open section was comfortably won by the *Parallel Lines CG,* and the Restricted section by the *East Kent RS,* also by a convincing margin. In his covering remarks, John Quarmby, G3XDY, reports conditions being ". . generally rated as worse than last year. ." He also mentions a number of bad signal reports which resulted in one disqualification and warnings to several other stations. (N.B. GM3RFQ/P was disqualified under Rule 19 in the 70 MHz Restricted section).

John states that some entrants felt there should be restrictions on the distance travelled to NFD sites and the *VHF Contests Committee* seeks views on this. To further quote, "Another trend that disturbs the Committee is the number of amplifiers that are able to exceed the 400w *p.e.p.* limit by a factor of two or more, and the necessity for extremely large antenna systems to remain competitive. The imposition of anode dissipation limits and restrictions on the antennas used in the

open section will be considered next year in order to reduce the dependence of success on having large financial resources."

It seems to this writer that NFD rules should prohibit the use of PA stages capable of producing a useful power output, taken from the manufacturer's literature, of more than, say, 500w *p.e.p.* This would ensure that the legally licensed power only was delivered to the antenna system, allowing for switching, connector and cable losses. Antenna systems could be restricted to four *Yagis* not exceeding, say, a boom length of five wavelengths, for example. This would encourage groups to maximise the efficiency of their arrays instead of opting for eight commercial beams of mediocre performance. Your constructive views on these somewhat controversial topics are sought.

A reminder that Nov. 1/2 weekend sees the Marconi Memorial CW contest from 1400 for 24 hours. Combined with it on the 2nd, from 0800-1400 is the *RSGB's* CW event. Both are two section affairs, Single-op. and Multi-op. with scoring at one point *per* kilometre. On Nov. 8 and 24, there are the next legs of the 432 MHz *Cumulatives,* from 2030 to 2300 for Fixed and All-other stations. The 1.3/2.3 GHz *Cumulatives* continue on Oct. 31, 16 Nov. and 2 Dec. from 2030 to 2300, another two section "F" and "O" promotion.

In the September *Newsletter* from the *Verulam ARC,* we note that their 144 MHz Club contest is on Nov. 23 from 0900-1300; no details given but their Hon. Sec. is G4OBH on St. Albans 52003. On Dec. 7, 0900-1700, there is the 144 MHz Fixed and Affiliated Societies VHF contest in which members of various *RSGB* affiliated clubs can "pool" their individual efforts in a club entry. This contest is open to individual operators, too on the usual basis. The full rules are on p. 731 of the October *RadCom.*

W.A.B. Corner

The VHF Worked All Britain program seems to have caught on in a big way with numerous nets in the 144.43 MHz region of the SSB part of 2m. From Dec. 1 through Feb. 28, 1987, there will be an opportunity to work for the *WAB Winter Activity Award. The Worked All British Islands Award* has been going since Jan. 1, the initial one being for ten islands, although a few operators have worked over 50. Their September *Newsletter* gives the Awards Manager as Dave Brooks, G4IAR, whose QTH is 28 Avon Vale Road, Loughborough, Leics., LE11 2AA. Further information about *WAB,* and its awards, can be got from Brian Morris, G4KSQ, at 22 Burdell Avenue, Sandhills Estate, Headington, Oxford, OX3 8ED.

Packet Radio

This is another activity now expanding quickly on VHF. In the September VHFB, mention was made of the *Midlands MAXPAK* group. Just received is their Sept. *Newsletter* running to twelve pages, called "Digicom." The Secretary and Publicity Officer of *MAXPAK* is Andy Witts, G1DIL, at 56 Stephenson Drive, Perton, Wolverhampton, WV6 7YB. At Oct. 5, 33 AX-25 stations in the Midlands area were listed and the group made its first public appearance at the Telford Mobile Rally on Aug. 31.

QTH LOCATOR SQUARES TABLE

Station	23cm.	70cm.	2m.	Total
G3POI	—	—	448	448
G3IMV	—	115	395	510
YO2IS	—	37	341	378
G4IJE	—	—	338	338
G4KUX	—	36	306	342
G8GXP	13	133	296	442
G4DHF	—	—	280	280
G4ERG	—	16	278	294
9H1CG	—	—	276	276
G3BW	15	38	269	322
G4DCV	25	71	248	344
GM4IPK	—	—	245	245
G4DEZ	13	4	244	261
GW4LXO	45	100	240	385
GJ4ICD	59	117	239	415
GW4TTU	37	87	238	362
G4NQC	63	99	234	396
G4RGK	34	90	224	348
G4XEN	—	93	224	317
G3FPK	—	—	219	219
I4YNO	—	—	214	214
G3UVR	61	106	213	380
G8XVJ	—	86	213	299
G4SFY	—	—	208	208
G4MCU	25	82	201	308
G3PBV	41	106	200	347
G1EZF	32	86	200	318
G6ECM	—	—	200	200
G4MEJ	—	—	198	198
G4IGO	—	—	198	198
G4OAE	—	46	195	241
G8LFB	—	—	194	194
G6HKS	—	65	186	251
G0CHE	—	—	181	181
G4TIF	—	106	178	284
G3XDY	77	130	177	384
G3COJ	44	102	175	321
G6XVV	7	38	174	219
G3JXN	77	119	172	368
G4YUZ	—	—	168	168
G4MJC	—	23	165	188
G6DER	53	95	164	312
G4XEK	—	—	157	157
G4DOL	—	—	154	154
G6HKM	—	97	152	249
G4YCD	—	35	148	183
G4MUT	23	87	140	250
G1KDF	20	82	137	239
G6DZH	—	82	136	218
G6MGL	48	85	135	268
G8HHI	23	96	135	254
G4NRG	5	47	132	184
GJ6TMM	—	26	127	153
G8TFI	79	141	126	346
G8PNN	53	91	126	270
EI5FK	—	—	126	126
G8ZDS	—	41	123	164
G1EGC	—	—	121	121
G6JNS	5	53	119	177
G4VPM	—	46	117	163
G0CAS	—	—	115	115
G8MKD	—	45	113	158
G6XRK	—	—	112	112
G6XLL	—	36	109	145
GW3CBY	18	46	107	171
G8RWG	—	13	105	118
GW8VHI	—	48	101	149
G4FRX	—	66	99	165
G4TGK	—	—	98	98
G8XTJ	—	—	98	98
G4RSN	2	34	92	128
G6AJE	3	51	90	144
G6YIN	—	58	87	145
G4CQM	—	52	87	139
G4ZTR	35	57	82	174
G1IZO	—	—	82	82
G4NBS	56	91	81	228
G4FRE	56	124	78	258
G1DWQ	—	—	72	72
G6YLO	20	59	67	146
GW6VZW	—	—	63	63
GU4HUY	—	—	54	54
G0FBG/PA	—	17	54	71
G1PDW	—	—	51	51
G1DOX	20	27	49	96
G0FOT	—	54	47	101
G1LSB	—	92	46	138
G8UDV	—	2	42	44
GM8BDX	13	31	41	85
G1CRH	—	—	41	41
G1HGD	—	7	38	45
GM6XPI	—	7	38	45
G6CSY	16	39	34	89
G2DHV	—	3	24	27
G4JZF/P	—	80	—	80

Starting date January 1, 1975. No satellite or repeater QSOs. 'Band of the month', 2m.

Cyprus Project

Readers will know that the U.K. has two Sovereign Base Areas in Cyprus. There is an amateur radio club at the Episcopi one, ZC4EPI, the manager of which is A. L. Poore, ZC4AP. He has written about a proposed project for next year to try to achieve a 2m. contact between ZC4 and G. The QRB from London is about 3,200 kms. and a number of *Es* QSOs of similar DX are listed in the *DUBUS* "VHF Top List."

The suggestion is to try from the last week in May and throughout June, hopefully from a site in the Troodos mountains if permission can be obtained. The letter indicates the club is seeking guidance on this project and will need to install suitable VHF equipment. Your scribe has contacted ZC4AP but other readers may also like to write to him. The address is;- A. L. Poore, ZC4AP, J.S.B., B.F.P.O. 53, London.

DX-Pedition Report

Jonathan Eastment, GW4LXO, (GNS) had sent in a detailed "Expedition Report" covering the *Square Bashers Expedition Group's* Scottish activity in the first half of August. This lists all the MS skeds and random/tail-ending QSOs from YS and ZR squares on 2m., 4m. and 6m. They operated from a cottage in YS54c and by registering their club call at that address were able to operate as GM4NXO on 6m. making 13 MS QSOs. On Aug. 13, from 0500 in a sked with Ken Osborne, G4IGO (SOM) they received a 2½ minutes burst. From the same site, they had a sked with SM2CEW (LZ) a QRB of about 1,600 kms., and copied him very weakly all the time along with the expected strong MS reflexions. Now Jon wonders if this is a new kind of propagation but, in view of the very high *e.r.p.* from the SM2, your scribe would suggest it is troposcatter.

Random CW operation on 144.100 MHz MS was very successful with sometimes as many as five stations replying. This leads to the suggestion that 2½ and not five minutes periods be adopted next year. The Group's QSL address is P.O. Box 136, Cardiff, CF4 6YL and next year they have an idea to go to YG square in France, which is all wet apart from a small area in the NE corner. Our congratulations for another very well organised effort; after all, to put on 6m., 4m., 2m., 70cm., 23cm. and 13cm. plus HF operation equates to a very challenging logistical problem.

Six Metres

Very little news this issue. John Jennings, G4VOX, (LEC) found G4ZFQ (IOW) on Sept. 29 and then they went to 4m. on which signals were stronger. John

Palfrey, G4XEN (NHM) worked LA6QBA/P (JP61) at 1329 on Sept. 14 *via Es* and heard the beacon built by Paul Turner, G4IJE, operating from the LA's summer QTH. John Baker, GW3MHW, (PWS) heard *via* EI6AS that EI4CL in Dublin is now QRV. GD is still a rare one on the band but GD3HQR has a *Yaesu* FT-690 with 3w to an indoor antenna. On Sept. GD3HQR's transceiver was used from GD4GNH with a *Yagi* antenna and QSOs were made with G6XM on CW and with GW3MHW on SSB. John says that the GD4FOC station awaits a beam and will then provide a better chance for IOM 6m. contacts.

Since the *Es* season ended, activity on 6m. has dwindled. To remedy this, and to encourage some activity, the *RSGB's VHF Committee* has proposed that Friday evenings be activity periods. Operators are invited to come on between 7 pm and midnight, local time and call "CQ" on the hour. The first such period was to have been Oct. 24, so hopefully the idea will catch on.

Four Metres

Until Nov. 4, the GB4MTR call will be used from the station of G3VIP (HBS) and from Nov. 5 to Dec. 2 by G4YUZ (HFD). The last use will be by G3RSI (HPH) from Dec. 3 to 30. For Tony Collett, G4NBS, (CBE), the contest on Sept. 21 was very productive with good signals from all directions. GJ3YHU was his first GJ and EI2CA/P (Wexford) and EI5WAR/P (Wicklow) were his first EIs. Three GMs in Strathclyde were contacted, GM3TCU/P on the Isle of Mull being best DX at 601 kms. G0FOK was worked and is ex-G8FMK whom Tony spoke to regularly on higher bands when he used to live in Slough.

Martyn Jones, G4TIF, (WKS) had his first ever MS QSO on Aug. 8 with GB2YS (HLD). New 1986 stations included G4SEU/P (CVE) on Sept. 16 and GJ3YHU in the contest. G4VOZ reports September as a very good month with good conditions for the contest. On Sept. 21, John worked G3BPM/P (SOM), G4FRE/P (CNL), EI2CA/P, GJ3YHU and GW4UAK/P (DFD) on SSB, while CW brought G3JYP (CBA), GM4BVY (IO75) and GM4TCU/P (IO76), in the contest, while outside the contest time he lists G3ZTZ/P (NLD) and GW4ALG (GWT) on CW. A QSO with G4SEU/P on the 16th was made using a dipole antenna so John has now worked all G counties except TWR with a dipole. On the night of Sept. 29, G3RSI (SRY) was very loud on SSB so they worked on FM mode, being joined by G4TGB in Mansfield.

G4VOZ remarks that IOW 4m. operators have been suffering QRM for some time but on the 29th, he managed a QSO with G4ZFQ on CW on 70.4 MHz, which was clear at the IOW end. GW3MHW also reports a lot of activity

ANNUAL VHF/UHF TABLE

January to December 1986

Station	FOUR METRES Counties	FOUR METRES Countries	TWO METRES Counties	TWO METRES Countries	70 CENTIMETRES Counties	70 CENTIMETRES Countries	23 CENTIMETRES Counties	23 CENTIMETRES Countries	TOTAL Points
G1KDF	—	—	94	25	77	16	30	7	249
G4NBS	*43*	*5*	72	22	59	21	47	18	239
G1DOX	—	—	83	11	50	8	30	5	187
G6XVV	—	—	83	17	42	7	20	4	173
G4SEU	56	5	62	13	30	4	—	—	170
G6HKM	—	—	74	26	51	17	—	—	168
G0CUZ	—	—	87	30	37	13	—	—	167
G4TIF	57	6	50	17	25	12	—	—	167
G4YCD	—	—	82	23	39	7	—	—	151
G4MUT	31	3	59	16	32	8	*12*	*5*	149
G1LSB	—	—	56	12	58	20	—	—	146
G6AJE	—	—	49	14	39	11	3	1	117
G4HGT	21	2	68	16	6	2	—	—	115
G6MGL	—	—	27	9	32	8	22	8	106
G3FPK	—	—	80	24	—	—	—	—	104
G6ECM	—	—	79	24	—	—	—	—	103
G1SWH	—	—	86	13	—	—	—	—	99
G6OKU	—	—	61	9	25	2	—	—	97
G1EHJ	—	—	49	6	36	4	—	—	95
G4WXX	—	—	79	14	—	—	—	—	93
G4DEZ	—	—	48	14	5	1	16	6	90
G4VOZ	44	5	—	—	33	5	—	—	87
GW6VZW	—	—	64	19	—	—	—	—	83
G8XTJ	—	—	63	16	—	—	—	—	79
G1PDW	—	—	61	16	—	—	—	—	77
G6XRK	—	—	60	15	—	—	—	—	75
G4YIR	—	—	57	17	—	—	—	—	74
G4TGK	—	—	58	16	—	—	—	—	74
G1CRH	—	—	56	12	—	—	—	—	68
GW4HBK	53	7	—	—	—	—	—	—	60
G8RWG	—	—	45	9	4	1	—	—	59
GU4HUY	—	—	45	11	—	—	—	—	56
GM6XPI	—	—	29	12	5	4	—	—	50
G4EZA	—	—	36	12	—	—	—	—	48
G2DHV	8	2	29	5	2	1	—	—	47
G1HGD	—	—	17	4	13	2	—	—	36
G6CSY	—	—	9	4	13	3	—	—	29

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

and has recently contacted E19Q who has been away from Waterford on a cruise. EIs 2CA, 9BG and 9FK are active. Dave Lewis, GW4HBK, (GWT) lists QSOs with G0DQA (KNT) on Sept. 3, E19Q on the 7th and GJ3YHU on the 20th. Best contest DX was to G3ZTZ/P, an all-time new one, and GM4BVY/P (XP) peaking S7 consistently.

Two Metres

Colin Oakley, G0AEA, (IOS) has now received QSLs from CT3DK and CT3BX worked at 2108 on July 19. He was in QSO with EA8XS, which he does, 'with regularity. . . ', at the time and Salvador told him he was being called by a CT3. G0AEA uses a *Trio* TR-9130, *BNOS* 160w amplifier and 10-over-10 ele. *Yagi* at 25ft. His QTH, 47m. *a.s.l.*, is the highest point on St. Mary's.

Now that bonus *Es* opening on Sept. 20 which must have been a great surprise to everyone. More by luck, G3FPK was QRV since it seemed that tropo. conditions ought to have been good. This appeared to be justified when a station was heard signing off with a YU, who was not all that loud. Then F6FLB was heard on CW calling 'CQ ES,' so the penny dropped. The event probably started around 0720, lasting about two hours and, as it was a Saturday morning, many readers were able to get on.

By far the most numerous stations were the YUs and call areas 1, 2, 3, 7 and 8 were worked. HG1, 2, 3, 7 and 8 stations were on, plus some YOs and the odd OE and OK. The squares worked included HE, HF, HG, IG, IH, JE, JF, JG, JH, JI, KC, KD, KE, KF, KG, so this would indicate about a 300,000 square kilometres region, centred on JF square was workable from G and GW.

Readers who reported on the event were Mike Honeywell, G0ABB (HPH); Colin Morris, G0CUZ, (WMD); Roy Gibbons, G0FOT, ex-G6XSU, (HFD); Bob Nixon, G1KDF (LNH); Ian Rose, G1PDW, (ESX); Peter Atkins, G4DOL, (DOR); Tim Charles, G4EZA (ESX); Ken Osborne, G4IGO, (SOM); Dave Dibley, G4RGK, (BKS); John Wimble, G4TGK, (KNT); Bob Ainge, G4XEK, (SFD); June Charles, G4YIR, (ESX); Mike Johnson, G6AJE, (LEC); Mick Cuckoo, G6ECM, (KNT); Ela Martyr, G6HKM, (ESX); Mike Higgins, G6XRK, (ESX); Julie and Alan Yates, G8MKD/G8RA0, (WMD); Jonathan Eastment, GW4LXO, (GNS) and Paul Baker, GW6VZW, (GWT). So stations from the SW to SE of England, South Wales, through the Midlands, up to the NE participated, suggesting the centre of the reflecting area was over EI square.

The ionospheric records reveal the period between Sept. 15 and 21 to have been very unsettled with considerable geomagnetic activity. It would be

interesting to ascertain meteorological data in the European Alps region for this period to test these wind shear and thunderstorm connexions with *Es* propagation. Maybe a reader might be able to assist? Whatever the cause, this was a very unusual event, since we usually write off *Es* after about the first week in August in average years.

For the record, stations worked included HGs 1W (IH), 3NL (JG), 3FH (IG), 8CE (KG), 8ET and 8VF (JG), and 8UG (JH). OE6WIG (HG), OK3KCM (JI), YO2s FP and IS (KF) and II (KG). YU1s WP (JE), IMN, MI and ZF (KD), AL, DG, LA, MV and TT (KE). YU2s SE (HE), SOM (IG), KDE and OB (JF). YU3s MQ (HE) and OV (HG). YU7s MGJ (JF) and BCX, CDR, EW, FF, FKN, GMN, GMY, MCG and PFR (KF) and 8HYR (KC).

A final interesting point about this *Es* event is that there was *FAI* propagation between SW France and YU as well. F6DRO (AD) was using this mode and confirms there was no *Es* activity for him. YU3GO was heard calling the French station according to G0CUZ.

Now the tropo. scene and, since the beginning of September, there have been periods of very good propagation. In the few days before the Sept. 6/7 contest, conditions were well up to western France and towards central Europe. John Acton, G1DOX, (CBA) got F6GYT/P (ZJ) on the 5th, for a new square. Mick Allmark, G1EZF (YSW) worked OE6/PA3DSS (HH25a) at 1923 on the 5th and at 2040, OK1KEI/P (GK). Later he worked the PAs in OE6 again and they peaked to 45dB-over-9. Other QSOs were OK1KQT/P (GJ) and FC1DUZ/P (YG), also worked by G4XEN and GW6VZW.

During the contest, conditions had declined although some good DX was worked by some contributors. G1KDF sums it up as '. . .a rather bland affair, only Fs, etc.' George Haylock, G2DHV, (KNT) worked into F, ON and PA on CW and SSB and was satisfied with the results from his 25w and 7-ele. *Yagi* at 20ft. from his 150ft. *a.s.l.* QTH. G4NBS (CBE) made 317 QSOs and found conditions to the west good. Tony got EIs 8EF (Donegal), 4AEB (Meath) and 7FJ/P (Wexford). G6HKM (ESX) made 318 contacts, her best DX being DL4NAA/P (EJ). GW6VZW worked eight F squares, FF6KPQ/P in YH being a new one for Paul. Graeme Caselton operated as G6CSY/P and, with 20w of SSB, worked 11 countries from Kent.

On Sept. 14 there was one of those Irish contests we only get to know of afterwards. G1KDF mentions '. . . many exotic EI counties. . . ' listing EI9FV/P and EI5BYB/P (Leix), EI9FE (Tipperary) and EI4GA (Cavan). EI3GG/P (VP) in Donegal, operator GI4OWA, was also contacted on the 14th. Gerry Schoof, G1SWH (LNH) also found 3GG and 9FE plus EI4ALE/P in Galway. It would be appreciated if someone would send a list of the dates of these short contests since many are always seeking the EI counties for the tables.

ANNUAL CW LADDER

Station	4m.	2m.	70cm	μWave	Points
G4AGQ	24	267	12	1	304
G0ABB	—	297	2	—	299
G4YIR	—	275	—	—	275
G4SFY	—	221	—	—	221
G4EIB	—	165	—	—	165
G4ZVS	—	164	—	—	164
G4OUT	—	158	—	—	158
EI5FK	—	116	—	—	116
G4PPV	—	115	—	—	115
G4XUM	—	105	—	—	105
G4VOZ	58	—	26	—	84
G0DJA	—	78	—	—	78
G4EZA	—	71	—	—	71
G4TJE	—	52	—	—	52
GW4HBK	51	—	—	—	51
G0FB-G/PA	—	38	2	—	40
G2DHV	7	30	—	—	37
GU4HUY	—	23	—	—	23
G0FOT	—	11	1	—	12

No. of different stations worked since Jan. 1.

The main DX period started around the 19th/20th and there was still some respectable DX around up to deadline date. Most readers listed much very good quality DX so, to keep within the five pages, reports will be abbreviated, emphasising the best of your DX. First Charles Coughlan, EI5FK, in Cork, and remember he is about 550 kms. further away from the continent than those in the London area. 20th, GM (YO), ON, DB (DK) and FC (CK). 21st, G, GW, ON and PA, HB9COZ/P (DH) who was running 2½w of CW to an HB9CV antenna, and HB9BNI (DH) with 600w and 4 x 16-ele. *Yagis*. 22nd, many Fs from 1100. 24th, OK1KEI/P at 1,681 kms., Charles' best DX of the opening, then many DLs and Y42QK (FK). The lift ended on the 25th.

Next G0CUZ. 21st, F6GAD (AD). 24th, OK2VWB/P (JJ) and others in HJ/HK. 30th, OKs in GK/HK, Ys in GK/GL and OZ4VV (EQ). Oct. 3, OK3KGW/P (JJ) and others in GK/HK again. All this on CW and no SPs heard at all. Now to G0FOT on Sept. 21, F6GAD and F6DRO (AD). Oct. 6, HB9RCJ (DH), first HB on 2m. For Philip Everitt, G1CRH, (CBE) 15 new squares Sept. 20-27 but still looking for counties CVE and TWR.

From G1KDF, Sept. 21 localised open to DK sq. plus a few PAs. 23rd, N/S propagation, FD1FHI (ZH) and GM4UFD (ZR). 24th, OE2CAL and OE2KMM (GH) heard. Bob worked the latter, his first OE, on the 30th. Oct. 3, LX1JA and LX2GB in CJ and DH8NAA (EJ). Next G1PDW on Sept. 30, DL6NAA (FK) and OK1KEI/P. Oct. 3, GI4KIS/P (WO) and LX2GB. Now to G4DOL with F6GAD and F6DRO Sept. 21; DK2EG (FJ) and DL6XZ/P (GI) on the 24th. 29th, GM6LJE (YP). No OKs heard in Weymouth on Oct. 3.

From G4IGO, Sept. 22, EI6EV (WN), GI1RGN (WO), GI1JUS (XO). 21st, DB3VE/P (DJ), EI6BA (VL), HB9RCJ and HB9AEN/P (DG). 24th, DLs in EJ, EK, FJ, FK, GI, OK1KEI/P, OK2KZR/P (IJ) and OE5XDL heard. 25th, DLs in EN, FM and FN. Now G4NBS on Sept. 25, OK1s KFQ/P and TN/P (HK). Oct. 1, HB9AMH/P. 3rd, OK1s VAO/P and VOW/P (GK), DB2RR (FJ). 4th, OK1DFC/P (GK) on CW, DLs in EK/EM and LA1ZE (CS).

Ian Cornes, G4OUT, on CW, Sept. 21 HB9CLN/P, 24th, DL2EBH/P, DL1ZBK and DK3KD, with LX2GB/P on SSB on the 10th. From G4RGK, Sept. 20, DK1KS/P (FH), 24th, OKs in HK, IJ and 2VWB/P (JJ). 30th, OE5KE (HI), OK1FFD/P (GK) and Oct. 3, more OKs in GK, HK, II and JJ, but no SPs heard in Marlow. Next G4TGK on Sept. 20, LX2GB and I2FAK (EF). John called 'CQ' from New Romney at 1740 and HB9SIU replied and for the next three hours, on-and-off, he worked many HB9s in DG and DH. This lift did not reach very far inland, he thinks. For G4TIF on Sept. 24, OK1MDK/P (HJ), 30th, Y25QL/A (GL).

Now to G4XEN. Sept. 19, beacon Y41B audible all day and 3 OZs worked in the evening, plus SP2DXL (JO) on CW at 1936. 24th, 'superb', with 10 OKs including MS operator OZ2KZR/P (IJ) in the morning and OE2CAL in the evening. 30th, OE/OK heard and G4SWX (AM) heard working SP3 and SP6 but nil at John's Wellingborough QTH. Next to Martin Lowe, G4YCD, (AVN) on Sept. 20 with GI1BIW (ARM), then some DLs and F. 21st, GU, EI and FC1BRV/P (BH). 23rd, DL8GAR (EI). 24th, 1623-2108, several DLs, a Y and four OKs, his first, in HK/HJ. 30th, a dozen Oks heard and three worked but the prize catch was LA1EKO (BQ) but very bad manners shown by many callers.

G4YIR added 45 new CW stations in the month but June asks 'Why is my best DX on SSB when I am a keen CW operator?' Sept. 24, OK1KEI/P, 25th DF3XD (FN) on CW. 30th, GI4KIS/P (ATN) and OK1JKT/P both SSB. Now G6AJE. 21st, PDs in CM. 23rd, G1GEY (TWR) and 24th, OK1KEI/P. Next G6ECM on Sept. 21, Fs in AD, AF and CF, seven HB9s in DG/DH, OZ1GTE (FP), SM7s JUQ, LAD and LXV (GP) and Y23SB (FN). 25th, EI8EF, OK1s IBI and KEI/P. Now G6HKM on Sept. 24. Three OKs and OE2CAL. 25th five OKs in HK and IK. 30th, six OKs in GJ/GK plus OE5KE. A 'CQ SP' call was answered by SP3JMZ (IM), then SP7PGO (JL). Oct. 1, SM7JUQ and OZ1IUK (GQ). Oct. 3, more OKs.

Welcome to Ron Reynolds, G6WEM, (ESX) a reader for twenty years writing for the first time. He passed the *RAE* in 1974 and got his licence in 1983. He uses a *Yaesu* FT-290R, 30w *Alinco* amplifier and 5-over-5 slot fed *Yagi* on a 30ft. home

made mast. Sept. 21, HB9SRJ/P (DG). 30th, three OK1 portables and Y23FN. No, Ron, no need for copies of your log, just state the counties, countries and squares worked. Next G6XRK who worked Fs in AD, BD, BE, etc. on Sept. 21, things fading out by 0930. Now Ron Oakley, G8GRT, (CBE) using 25w to an HB9CV in his loft, worked OK1KFQ/P (HK) on Oct. 1.

From G8MKD on Sept. 30, OE5KE. Oct. 3, OK1KEI/P but the EI, GI, GW stations seemed to be having it much better. Oct. 4, DG5NBT/A (FK), OK1s in GK/HK worked with SP1PCE (HN) heard. Now to John Fitzgerald, G8XTJ, (BKS) who found on Sept. 24, DD5TD/A (EJ) and on the 30th OK1ONI/P (GJ) and OK1FFD/P (GK). From Cardiff, GW4LXO on Sept. 30, OK1s JKT/P, KFQ/P and KEI/P. Jonathan remarks that although some very good DX was around, conditions were very patchy with stations fading in and out of range in only a few minutes. He also noted that all the strong DX stations were at high altitudes and those apparently doing best in the U.K. were also the hilltop folk. However, many coastal stations have submitted 'DX-worthy' logs.

GW6VZW lost out in some of the pile-ups but from Sept. 20 to Oct. 2 Paul did work lots of DL, ON and F stations, plus HB9AEN/P with his 10w and 4-ele. *Quad* at 8m. *a.g.l.* He is still looking for skeds with CVE, NLD and TWR stations.

The only reader mentioning MS this time is G0CUZ who comments on the low activity. However, LA1K (FX) on Sept. 11, was new for Colin, as was F/DK6AS in the very rare DC square on the 13th. He also completed with OK2KZR (IJ), I3LGP (GF), I4YNO and HG7B (JH) during the month.

Seventy Centimetres

As there are so many reports, they will have to be abbreviated a little. The conditions followed the same pattern as on VHF and on Sept. 21, G0CUZ worked F1BUU (ZE), other Fs in AF, BF, BH and ZH, plus EI6AS. Oct. 1, HB9MIN/P (DH) and the 4th, OK1KRG/P (GK). G1DOX on Sept. 1, EI6AS (WN) and GW3KJW (XM). Operating -/P from ZM31g, Graham Taylor, G4JZF got HB9 and SP on Sept. 30. New squares were DK7ZB/P (EL), HB9MIN/P (DH), Y22ME (HM), DC8CF (FO), and SP6ASD (HL). Oct. 3, DJ0XR/P (DJ), Y25MN/P (GK) and EI4CL (WN) were new. 4th LX2GB/P and OK1KSF/P (HI) were new countries. Also worked, DL2ML/P (GJ), OK1KHI/P and OK1AYR/P (IK). Equipment used, *Icom* IC-402, *MM* 20w amplifier with Rx preamp. and 19-ele. *MET Yagi*, 6m. *a.g.l.* at 240m. *a.s.l.*.

Next Paul Brockett, G1LSB, (LCN). Sept. 21 Fs in AD to AG, BF, BH, ZG, ZH and ZI plus DK2EG (FJ). The 22nd, EI6AS. 24th, OK1KEI/P, Y23LI/M (FK), LX1JX. 25th F6APE (ZH), DL9HN (FN), ON6OO (CL) and EI8EF (VO). 29th, G4YPC/P (XJ). Sept. 30, DLs in EL/FJ and OE2 (GH). Oct. 1, SM7DKF (GP), HB9MIN/P. 3rd, OK1CA/P (HK), Y25MN/P, three portable SP6s in IK. In the contest on the 4/5th Paul worked DLs, six Ys, Fs and 10 OKs and now has 92 squares on the band.

Now G0FOT, Sept. 21, F1ADT/P (BF) and F1AXP/P (AD) plus 'middle DX' on Oct. 4. G1KDF reports EI7FS (Limerick) Sept. 22, FD1FHI (ZH) next day. 30th, HB9MIN/P and OE2KMM (GH). Oct. 3, many Ds over to FJ. Contest Ds plus OKs in GK but bad *Syledis* QRM. Next G4NBS with a very long list of excellent DX. Tony seems to have worked everything that was on offer, from EI to SP. Sept. 25, best DX to DL7APV in Berlin. The 30th, his first Y and SP QSOs, Y2s 3LI/M, 2EN and 2ME, SP6ASD, also OEs 5XDL and 2KMM. Oct. 1 HB9; 3rd LX and OK. On the 4th, Tony reports the band more like a 20m. contest with LX, DL and OKs plus LA4IW and LA1ZE (CS) at 0030 on the 5th, best DX being OK5UHF (IK) on CW at 1,161 kms.

G4RGK lists Fs in W and S France on Sept. 21, OK on the 24th, Y2 on the 30th and Y and OK on Oct. 4. G4TIF's tally included OE2KMM on the 24th and OK1KIR/P (GK) on Oct. 4, and for G4YCD, FD1FHI/P was new on Sept. 22. G6AJE got down to S France on Sept. 21, over to DL, OE and OK on the 24th and to DL and HB9 on the 28th.

G6HKM found a French contest on Sept. 21 and F1AEN (AG) and F1BUT (AD) were new. 24th, OE2KMM with S9+20 dB reports. 25th, OK1CA/P. 26th, OK2BFH/P, new sq. 30th, Y22ME, new. Oct. 1, HB9MIN/P and EI4CL. Oct. 3, LX1JX and 4th, two OKs. G4XEN also participated in the Sept. 21 'F' contest, 10 QSOs and 8 sq. 24th brought John OK1KEI/P, OE2KMM and DL9PW (FJ). 30th, Y22ME and five OKs but no SPs heard. Now G8MKD on Oct. 4 with DLs in DJ, DK, DL, EK and OK1KIR/P and OK1KHI/P.

Now GW4LXO who also profited from the French contest on Sept. 21 plus three HB9s in DG/DH. 24th, OK1KEI/P, ON4YZ (CK) and DL7QY (FJ). 25th, DK3FB (DL) and PA3CSG (CL). 30th, DLs in EL, EM, FK and FL and Y22ME. Mervyn Rodgers, GM6XPI, (CTR) wrote before it all happened. He operates -/P at 2,000 ft. locally and calls on the band at 2030 local time every Sunday.

The Microwaves

Dave Ackrill, G0DJA, (WMD) had 7 QSOs on 3cm in the last leg of the *Cumulatives* on Sept. 14 but did not get on till 1300. Best DX G1AEF/P and G8SWZ/P at 82kms. Following a microwave workshop at the *Droitwich Radio Club* meeting on Sept. 22, several locals have fully working systems on 3cm. including G4RIO.

Back to 'the lift' with G1DOX on Sept. 7 when John worked G3AUS on 23cm. for YK and Devon. 14th, on 13cm. sq. no. 6 to G3JXN (ZL) at 350 kms. G1EZF finally got G3JXN on 23cm. on Sept. 21 and on the 30th, EI6AS (WM). Oct. 4/5 in the contest, GW4NXO/P and GW4HWA/P (GWT) and G8OHM/P (OFE). Highlight for Brian Bower, G3COJ, (BKS) was OK1CA/P on 23cm. in HK, worked with 2w.

Next G4NBS who did very well on 23cm. Sept. 23 OK1CA/P. 30th, OE2CAL, Y25UN (GK), HB9MIN/P, and DLs in FJ, FK and GM, OK1KEI/P and more DLs in many squares. Oct. 1, HB9AMH/P. 3rd, OK1KIR/P and OK1DKS/P (GK), plus GI4OPH (DWN). Super conditions in the contest on the 4th with many DL, PA and F, plus OKs in HI and HK, the best being SP6s GWN, JLW and PHH, all -/P in IK, with SP6GWB/6 at 1,182 kms. Tony's best DX. Next day conditions were flat.

Now G4RGK with OK1KEI/P and DK0NA (FK) on Sept. 24. Oct. 3/4, OK portables in GK and DLs in DL, EK and EL. On Sept. 21, GW4LXO got FC1HCN (AJ), with HB9AMH/P heard. DB0JO (DL) beacon up to S9 but no activity. 30th, DK0NA heard but only working PAs. Finally to G8GRT and Ron writes he is now QRV on 13cm. since Oct. 4. First QSO DK2HT/P (EK) at 650 kms. and five countries heard. The equipment is a transverter from *Piper Communications*, 500mw to separate *Quad Loop Yagis* for Rx and Tx in the loft with LDF4-50 feeder on Rx. He is also QRV on 23cm. with 10w. His QTH is only 90ft *a.s.l.*, clear to the east but higher ground in other directions.

Dutch News

Godfrey Hands, GOFBG, operates from Vianen in Holland as G0FBG/PA, and in the past as G6WKK/PE and -/PB. He is QRV on 2m. and 70cm. He enters the CW ladder and squares tables and a claim for the counties/countries annual list. However, we can only accept British Isles counties for that, OM, otherwise there would be much confusion if we introduced Dutch provinces, and then, maybe, French departments. etc. Sorry, not practical.

Sign Off

A tight squeeze this time so no room to discuss your Magazine contest ideas. Maybe next month if conditions revert to flat? For now, thank you all for your interesting letters. As usual, all your claims by the date in the box to;-

'VHF Bands,' SHORT WAVE MAGAZINE, 34 High Street, WELWYN, Herts., AL6 9EQ. *73 de G3FPK*

• • • "Practically Yours" • • •

with GLEN ROSS, G8MWR

THIS month we continue with the information on power supply design and come up with a good general purpose supply which incorporates most of the ideas which we have looked at.

Heatsinking

There are ways of working out the amount of heatsinking that you need but to do this means that you need to know the thermal efficiency (usually expressed in the form "deg. C/W") of the heatsink that you intend to use. This is easy to obtain if you are buying the heatsink from a commercial supplier, but you are unlikely to find it available from a scrap electronics dealer at a rally. At the end of the day one usually ends up using the heftiest heatsink that you can conveniently fit and hoping for the best.

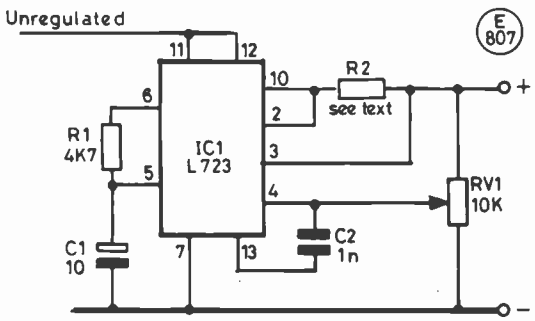


Fig. 1 Basic regulator with current limit

Temperature Rise

Most people seem to worry unduly about the temperature rise on a heatsink and cries of distress go up if it starts to get warm to the touch. In fact the heatsink can get too hot to touch and the transistors that are fixed to it will still operate within the manufacturer's design limit; most of the often used series-pass transistors, such as the 2N3055, are designed to work at junction temperatures of around 200 degrees Centigrade. Let us take an example to see how this works out in practice. The heat generated by the transistor is due to the power that is being dissipated by it:

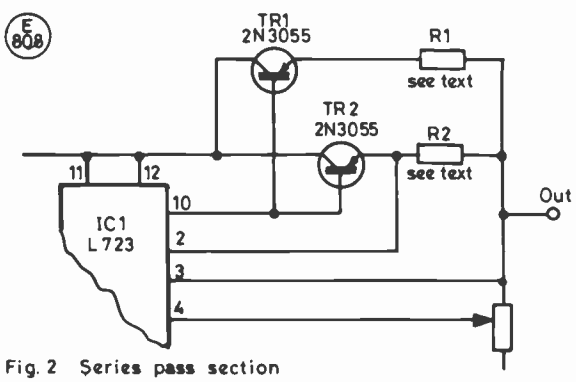


Fig. 2 Series pass section

the product of the voltage across it multiplied by the current flowing through it.

Specifics

Let us suppose an unregulated supply of 22 volts being stabilised to supply 5 amps at 12 volts and using two 2N3055 series-pass transistors. The power lost will be the difference in input and output voltages (10) multiplied by the current (5) giving 50 watts of heat to get rid of. If we use a hefty heatsink with a rating of 1.1°C per watt this will comfortably handle two series-pass transistors in our supply (being, in fact, able to handle around 80 watts of excess heat and in our case we have only 50 watts). The heatsink will rise to a temperature of 50 (watts) times 1.1 or some 55 degrees Centigrade. To put this in the Farenheit scale we are more used to this means a heatsink temperature of about 130 degrees, and and I do not think you would want to keep your hand on that for very long!

Regulation

In the September issue we described a voltage regulator which was based on the ubiquitous 741 integrated circuit as a means of showing the basic operating principles of the circuit. This idea has been taken a step further by the IC makers who have produced

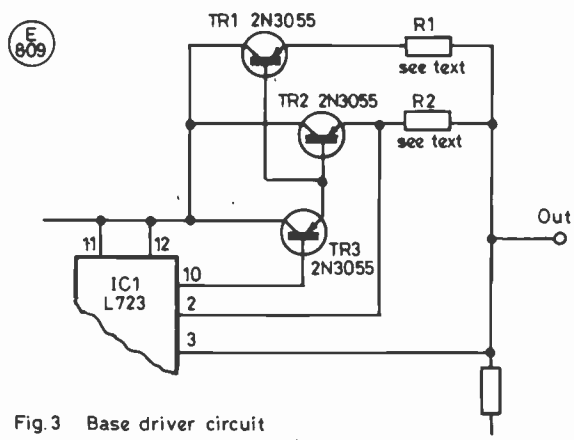


Fig. 3 Base driver circuit

units containing the basic circuit, plus a built-in reference voltage and means of closing down the whole system if the current drawn by the load exceeds a preset amount. All this is furnished in the IC type L723 which is available in several variations from most of the major manufacturers; it is, in fact, an industry standard in the same way as the 741 is . Fig. 1 gives the circuit for using this device and the following notes will explain the various functions of the device.

Current Limit

The unregulated input is taken to pins eleven and twelve and the built-in reference which appears at pin six is connected to one input of the comparator section at pin five. A sample of the

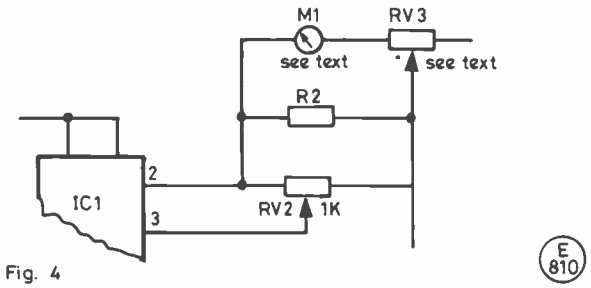


Fig. 4

output voltage is taken from the pre-set VR1 to the other comparator input at pin three; a regulated output is then available at pin ten. The current limit of the IC is only 150 milliamps and so we must use a series-pass transistor circuit to obtain the 5 amps we require. Although not strictly required we will use two 2N3055s with current sharing resistors as shown in Fig. 2. The current limiting input is on pin two which requires an input of 0.65 volts to close down. This voltage is developed across R2, in both Figs. 1 and 2, by the output current. Remember that R1 and R2 are each carrying half the output current (2.5 amps) so to enable limiting at a total of 5 amps R2 would, by Ohm's Law, be 0.26 ohms. The power rating of R1 and R2 would be 1.63 watts and for safety one would use three watt rating at this point.

Variable Parameters

The current limiting can be made variable by using the circuit shown in Fig. 4. If the value of R2 is increased to one ohm then by adjusting the slider position on VR2 the limiting can be set to operate from just over one amp to the maximum of which the supply is capable. If front panel control of voltage and current is required then this preset, and also the voltage sampling one, should be replaced with suitable panel mounted controls.

Current Metering

Fig. 4 shows a way of using a low current meter to measure the high output current of the supply. The meter is actually used as a voltmeter and measures the voltage drop across R2 which is, of course, proportional to the current flowing through it. The preset in series with the meter depends on the full current capability of the meter used and would be 1K ohm for a one milliamp meter, 10K ohm for a 100 microamp movement, and so on. The preset should be set to maximum resistance and a load should be connected to the output of the supply so as to take a known current; the meter is then adjusted to correspond.

Driving

This seems to get us out of the wood but there is still one problem to solve. The gain of the 2N3055 is given as twenty so with a total collector current of 5.0 amps we need a base current of 250 milliamps and this is beyond the capability of the IC to deliver. The answer to this problem is to use another transistor to drive the series-pass system and this is shown in Fig. 3. For convenience and economy another 2N3055 can be used although any small power transistor will do the job.

Complete Unit

A complete power supply can now be put together by using the information given in these articles and by incorporating as many of the ideas as your design requires. A circuit diagram for a 12 volt, 5 amp unit is shown in Fig. 5 with typical circuit values.

Table of Values
Fig. 5.

R1 = 4K7, ½W
R2a, b, etc. = *see* text
R3 = 1K, ½W
R4 = 2K2, ½W
RV1 = 1K preset
RV2 = 10K preset
RV3 = *see* text
C1 = 10,000 μF, 45V elec.
C2 = 10 μF, 25V elec.
C3 = 1nF ceramic
C4 = 220 μF, 25V elec.
C5 = 10nF ceramic (fitted across terminals)
D1 to D4 = *see* text
IC1 = L.723
TR1 = 2N3055
TR2a, b = paralleled 2N3055 (*see* Fig. 2)
M1 = *see* text
F1 = 3 amp fuse
S1 = DPST switch

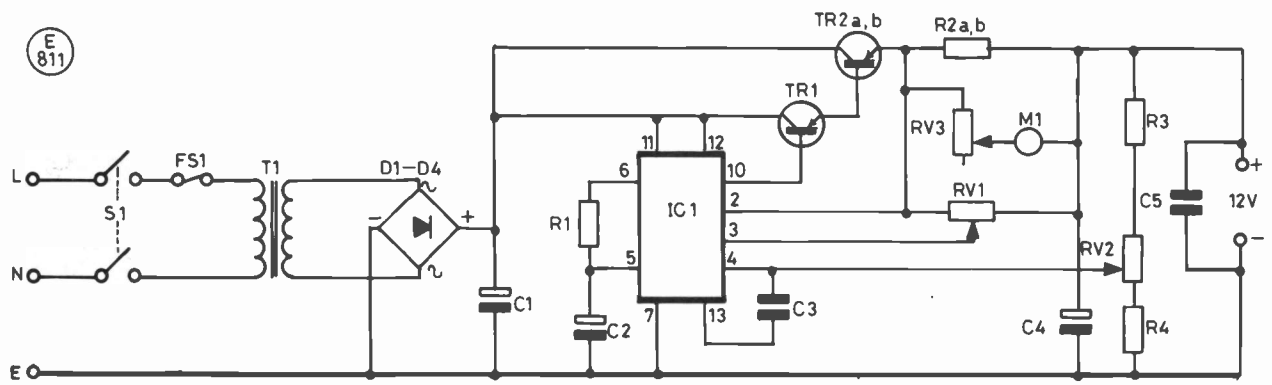


Fig. 5 12V 5A P.S.U.

Higher voltages would require simply increasing the voltage ratings of the transformer, electrolytics, etc., whilst greater current is obtained by fitting more series-pass transistors and a beefier mains transformer. There are still some further refinements that could be fitted including such things as over-voltage protection and a "soft-start" to avoiding blowing mains fuses due to the inrush current on switch on. These can all be fitted as small add-on boards to your original design.

Mechanical

There is not much to say here except to remind you that the PSU should, because of the weight of the completed unit, be built in a good, solid, cabinet. All wiring in the main current carrying path, and to the electrolytics, should be made in wire which is easily capable of carrying the maximum current flow. The mains input should be taken through a double-pole switch and then through suitably rated mains fuses.

CLUBS ROUNDUP

By "Club Secretary"

N.A.R.C. for Starters

THESE letters stand for *Northern Amateur Radio Confederation*. The group exists to promote self-help and co-operation between clubs, for example to organise lists of speakers, inter-club quizzes and other activities, and to circulate lists of stolen equipment — generally to be an interclub liaison and intercommunication network. Interested clubs are asked to write to the Liaison Officer, Peter Kirsop, G4WCE, 5 Planetree Road, Hale, Cheshire WA15 9JJ.

Letters

At **Aberdeen** the meeting on November 7 will be the 40th AGM, and on 14th they have the President's address. November 21 is down for Frank Dinger to enquire "Do you believe your S-Meter?", and on 28th they have a couple of RSGB videos. Venue is at 35 Thistle Lane, Aberdeen, at 7.30 p.m. each Friday.

Thursdays are club nights for **Abergavenny & Nevill** Hall, at Pen-y-Fal Hospital, Abergavenny. Programme details and so on from the Hon. Sec. — *see* Panel.

One club with their eye on the ball is at **Action, Brentford & Chiswick** where the session on November 18 at Chiswick Town Hall, Chiswick High Road, London, will be devoted to "New Problems with TVI". The start time is 7.30 p.m.

The next two meetings of **AMRAC** are on November 7 and December 5, in a room at "The Crown" public house, Bishops Waltham, Hants. More details from the Hon. Sec. — *see* Panel

In a long letter, the Hon. Sec. of **B.A.R.T.G.** tells us of major reshuffles within the group. For those who are interested in RTTY and Data, the club has some back numbers for sale covering the 1985 issues: £1.50 for one or £5 for all four. For the rest, apart from noting that the AGM is on November 1, at 2 p.m. in the Churchill Room, London House, Mecklenburgh Square, off Doughty Street, London, we must refer you to the Hon. Sec. — *see* Panel for his details.

November 3 is constructors' competition night for the members of **Basingstoke**, and on December 1 they have G3VA on "Clandestine Radio". Hq. is at the Forest Ring Community Centre, Sycamore Way, Winklebury, Basingstoke.

Downe Village Hall, Downe, next door to the "George & Dragon" is home to the **Biggin Hill** gang on, it seems, the third Tuesday of each month; but there is also a hint that on the first Tuesday you might also find them in there, informally. However, to be sure, check with the Hon. Sec. — *see* Panel.

On the second Monday of each month the **Borehamwood** club foregathers at the Organ Hall Community Centre, Bairstowe Close, Borehamwood; November's activity is a talk and demonstration of RTTY by G0DDJ.

Turning to **Braintree** we find they have a place at the Community Association Centre, Victoria Street, next to the bus station, where they are to be found on the first and third Monday of each month. November 3 is a surplus sale.

The booking for **Bredhurst** is November 13 and 27; the former is a talk by G0DCA on "A Packaging Problem" and the latter the construction contest. Both are at Parkwood Community Centre, Parkwood Green, Deanwood Drive, Gillingham, Kent.

Stapenhill Institute is the home base of the **Burton-upon-Trent** group, where they are to be found every Wednesday evening, and they also have a Morse class on Mondays. Details from the Hon. Sec. — *see* Panel

The **Bury** newsletter has its own "Letter from America" — not Alistair Cooke, but G3VNQ letting them know what it's like in Chicago. Find the club on Tuesdays at the Mosses Youth and Community Centre, Cecil Street, Bury.

At **Central Lancashire** the Hq. is not mentioned, so once again we must refer you to the Hon. Sec. — *see* Panel for his details.

The junk sale at **Chelmsford** in on November 4, at Marconi College, Arbour Lane, Chelmsford, and on December 2 they have a talk leading them from RDF to radar.

The Stanton Room, Charlton Kings Library, is the home of **Cheltenham;** on November 7 they have a junk sale and 21st is set aside for an 'Any Questions' session. The first December meeeting, on 5th, is the Annual General Meeting.'

The **Chesham** crowd has its Hq. at Bury Farm, Pednor Road, Chesham, where they can be found on any Wednesday evening. The Hq. isn't too easy to find, and so there is a contact for a first visit — Liz on 09278 3911.

The meetings of the **Cheshunt** crowd continue at Church Room, Church Lane, Wormley, near Cheshunt, every Wednesday evening; November 5 and 20 are natter evenings, November 12 a talk by G1MBL and G3WFM on radio control, and on 26th the Annual General Meeting.

Tuesday evenings are the ones for **Chester** at Chester Rugby Union Football Club, Hare Lane, Vicars Cross; get the details from the Hon. Sec. — *see* Panel.

Change

For **Chichester** the big event is the meeting on November 5 — a Wednesday rather than the usual first and third Tuesday routine. November 18 reverts to normal and is a junk sale, and the Hq. is at North Lodge Bar, County Hall, Chichester.

Turning to **Chiltern** we see they have a newsletter which carries some advertising; something that should cut the cost a little. They go to the Sir William Ramsey School, Rose Avenue, Hazlemere, on the second and fourth Wednesday each month.

Deadlines for "Clubs" for the next three months—

December issue—October 30th
January issue—November 27th
February issue—December 29th
March issue—January 29th

Please be sure to note these dates!

On November 13, the **Colchester** crowd have a talk on IARU by Angie, G0CCI, and on November 27 they have a talk by *BNOS Electronics*. Both are at Colchester Institute, Sheepen Road, Colchester, starting at 7.30 p.m.

Now we head for Cornwall, and **Cornish** who have their place at the Church Hall, Treleigh, on the old Redruth bypass; November 6 is a surplus sale, and on December 4 they have a Christmas Party.

Crawley now has its Hq. at the Leisure Centre. However, for the junk sale on November 12 they have taken *TS Cossack,* just north of "The Sun" pub in London Road. On 26 they have G1CKF to talk about magazine production.

The **Crystal Palace** Hq. is opposite the IBA mast, and at the junction of Beulah Hill and Church Lane, which ought to make it easy enough to find. On November 15 G4BUO takes over All Saints Parish Rooms to explain about contesting and the RSGB Contest Committee.

The **Dartford Heath D/F** club has meetings on the Tuesday evening before the Sunday hunt, and so that is the time to catch them: from 9.30 p.m. at the "Horse and Groom", Leyton Cross, and for November the date is November 4, while December 9 covers the following month. More details from the Hon. Sec. — *see* Panel.

Names and Addresses of Club Secretaries reporting in this issue:

ABERDEEN: D. Travis, GM4GXD, Gorsedd, Kirkton, Chapel of Garioch, Inverurie AB5 9HF. *(Pitcaple (04676) 251)*
ABERGAVENNY: J. B. Davies, GW4XQH, 109 Croesonen Parc, Abergavenny, Gwent NP7 6PF.
ACTON, BRENTFORD & CHISWICK: W. G. Dyer, G3GEH, 188 Gunnersbury Avenue, Acton, London W3 8LB. *(01-992 3778)*
AMRAC: P. Bridges, G6DLJ, 9 Hollydene Villas, Southampton Road, Hythe, Hants. SO4 5HU. *(0703 847754)*.
BARTG: P. & J. Beedie, GW6MOJ/GW6MOK, Ffynnonlas, Salem, Llandeilo, Wales SA19 7NP. *(0558 822286)*.
BASINGSTOKE: D. A. Birleigh, G4WIZ, 14 Winchfield Gardens, Tadley, Basingstoke, Hants. RG26 6TX
BIGGIN HILL: R. Senft, G0AMP, Mill Hay, Standard Road, Downe, Kent BR6 7HL. *(0689 57848)*.
BOREHAMWOOD: Ivor Rosenberg, 11 Parkside Drive, Edgware, Middx.
BRAINTREE: D. Brades, 3 Coldnailhurst Avenue, Braintree CM7 7SL. *(0376 44908)*.
BREDHURST: K. Fay, G0AMZ, 37 Sandringham Road, Rainham, Gillingham, Kent ME8 8RP. *(0634 376991)*
BURTON-ON-TRENT: M. Cotton, G4HBY. *(Burton-on-Trent 33958)*.
BURY: M. Sivieri, G4ZTB, 47 Ramsay, Bacup, Lancs.
CENTRAL LANCS: D. W. Fowler, G4YWG, 22 Larchwood Crescent, Leyland PR5 1RJ. *(0772 432275)*
CHELMSFORD: A. C. Mead, G4KQE, 9 Abraham Drive, Silver End, Witham, Braintree, Essex CM8 3SP.
CHELTENHAM: T. Kirby, G4VXE, 29 Tivoli Road, Cheltenham, Glos. GL50 2TD. *(0242 36723)*
CHESHAM: J. Alldridge, G6LKS, 95 Rose Drive, Chesham, Bucks. HP5 1RT.
CHESHUNT: J. & T. A. Watkins, G4VMR/G4VSL, "One Ash," Frogs Hall Lane, Haultwick, Herts. SG11 1JH. *(Dane End 250)*
CHESTER: D. Hewitt, 31 Broadmead, Vicars Cross, Chester.
CHICHESTER: C. Bryan, Marmanet, Salthill Road, Fishbourne, Chichester, Sussex PO19 3PZ. *(Chichester 789587)*
CHILTERN: C. Dunn, G4KVI, 24 Mynchen Road, Beaconsfield, Bucks.
COLCHESTER: F. R. Howe, G3FIJ, 29 Kingswood Road, Colchester. *(0206 851189)*.
CORNISH: N. Pascoe, G4USB, Bosuathick Farm, Constantine, Falmouth, Cornwall. *(Falmouth 40367)*
CRAWLEY: D. L. Hill, G4IQM, 14 The Garrones, Worth, Crawley, West Sussex RH10 4YT. *(Crawley 882641)*
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 11 Liphook Crescent, London SE23 3BN. *(01-699 6940)*
DARTFORD HEATH D/F: A. Burchmore, G4BWV, 49 School Lane, Horton Kirby, Dartford, Kent DA4 9DQ.
DERBY: J. Anthony, G3KQF, 77 Brayfield Road, Littleover, Derby DE3 6GT. *(0332 772361)*
EASTBOURNE: R. Peirce, G1BRC, 69 Bridgmere Road, Eastbourne, BN22 8TF. *(Eastbourne 29913)*
EDGWARE: J. Cobley, G3RMD, 4 Briars Close, Hatfield, Herts. *(Hatfield 64342)*
EXMOUTH: H. Edwards, G4RUT, 5 Laburnum Close, Exmouth, Devon EX8 5PT. *(Exmouth 273157)*
FALKIRK: G. L. Leishman, GM4MCB, Woodside, Redding, Falkirk, Stirlingshire FK2 9UQ. *(0324 715624)*.
FAREHAM: A. S. Chester, G3CCB, Deva Wood, 44 The Ridgeway, Down End, Fareham, Hants. *(0329) 288139)*
FELIXSTOWE: P. J. Whiting, G4YQC, 77 Melford Way, Felixstowe IP11 8UH.
FYLDE: H. Fenton, G8GG, 5 Cromer Road, St. Annes, Lytham St. Annes, Lancs. FY8 3HD. *(Lytham St. Annes 725717)*
G-QRP: Rev. G. C. Dobbs, G3RJV, St. Aidan's Vicarage, 498 Manchester Road, Rochdale, Lancs. OL11 3HE. *(0706 31812)*
HARROW: D. Atkins, G8XBZ, 25 Maxwell Close, Rickmansworth, Herts. *(0923 779942)*
HASTINGS: D. Shirley, G4NVQ, 93 Alfred Road, Hastings, Sussex. *(Hastings 420608)*.
HEREFORD: F. E. Cox, G3WRQ, 35 Thompson Place, Hereford. *(Hereford 54064)*
IPSWICH: J. Tootill, G4IFF, 76 Fircroft Road, Ipswich, Suffolk IP1 6PX. *(0473 44047)*
LOUGH ERNE: W. Ward, GI4NRE, 6 Brackvede Park, Enniskillen, Northern Ireland BT74 7DX. *(0365 24905)*
LOUGHTON: D. Thorpe, G4FKI, 44 Townfield Road, Flitwick, Beds. MK45 1JF.
MAIDSTONE (YMCA): P. Martin, G0BUW, *address wanted. (0622 30544)*
MALTBY: I. Abel, G3ZHI, 52 Hollytree Avenue, Maltby, Rotherham, Yorks. *(Rotherham 814911)*
MAXWELLTOWN: C. D. S. Rodgers, GM4NNC, 5 Elder Avenue, Lincluden, Dumfries DG2 0NL.
MIDLAND: N. Gutteridge, G8BHE, 68 Max Road, Quinton, Birmingham B32 1LB. *(021-422 9787)*
NENE VALLEY: M. R. Byles, G6UWS, 108 Kingsway, Wellingborough, Northants. *(Wellingborough 71189)*.
NORTH CHESHIRE: P. Kirsop, G4WCE, Peel House, 5 Planetree Road, Hale, Cheshire WA15 9JJ. *(061-980 5173)*
NOTTINGHAM: J. Towle, G4PJZ, 63 Digby Avenue, Mapperley, Nottingham NG3 6DS.
PONTEFRACT: C. Mills, G0AAO, 27 Pendennis Avenue, South Elmsall, Nr. Pontefract, West Yorks.
POWYS: M. Smith, GW4DWX, Tonn Marr, Welshpool, Powys. *(Welshpool 2068)*.
RAIBC: Mrs. C. Clark, G1GQJ, 9 Conigre, Chinnor, Oxford OX9 4JY.
RAOTA: G. R. Jessop, G6JP, 32 North View, Eastcote, Pinner, Middlesex. HA5 1PE.
SARUG: P. Newman, G4INP, 3 Red House Lane, Leiston, Suffolk IP16 4JZ.
SOLIHULL: P. Gaskin, G8AYY, 58 Elmcroft Road, South Yardley, Birmingham B26 1PL. *(021-783 2996)*..
SOUTH BRISTOL: L. Baker, G4RZY, 62 Court Farm Road, Whitchurch, Bristol, Avon BS14 0EG.
SOUTHDOWN: R. Evans, G4VOS, Oakside, Waldron, Heathfield, Sussex. *(Heathfield 3168)*.
SOUTHGATE: D. Elson, G4YLL, 200 Churchgate Road, Cheshunt, Herts. EN8 9EL.
SPEN VALLEY: I. F. Jones, G4MLW, 54 Milton Road, Liversedge, Heckmondwike, West Yorks. *(Heckmondwike 409739)*
STEVENAGE: F. E. Wilson, G4ISO, 15 Byrd Walk, Baldock, Herts. SG7 6LN. *(Baldock 892765)*
STOCKPORT: M. Betts, G4FFW, *address wanted. (061-224 7880)*.
STOURBRIDGE: C. S. Williamson, G1IEB, 7 Hanbury Hill, Stourbridge DY8 1BE.
SURREY: J. Simkins, G8IYS, 18 Riding Hill, Sanderstead, Croydon CR2 9LN. *(01-657 0454)*.
SUTTON & CHEAM: G. Plucknett, G4FKA, 32 West Road, Malden Rushett, Chessington.
TELFORD: T. Crosbie, G6PZZ, 41 Culmington, Stirchley, Telford TF3 1UN. *(Telford 597506)*
THAMES VALLEY: J. Pegler, G3ENI, Brook House, Forest Close, East Horsley, Leatherhead KT24 5BU.
TIVERTON (South West): A. Smith, G1OYO, Box 3, Tiverton, Devon, EX16 6RS.
TODMORDEN: Mrs. V. Mitchell, G1GZB, Parrock Farm, Shore Green, Todmorden, W. Yorks. OL14 8SF. *(Todmorden 7572)*
TORBAY: B. Wall, G1EUA, 48 Pennyacre Road, Teignmouth TQ14 8LB. *(Teignmouth 78554)*.
VERULAM: G. Wimpenny, G4OBH, 30 Faircross Way, St. Albans, Herts. *(St. Albans 52003)*
WACRAL: L. Colley, G3AGX, "Micasa", 13 Ferry Road, Wawne, Nr. Hull HU7 5XU.
WAKEFIELD: W. Parkinson, G8PBE, 14 Cleveland Grove, Lupset Park, Wakefield WF2 8LD. *(Wakefield 378727)*.
WARRINGTON: P. Forster, G0CBN, 6 Birchdale Road, Paddington, Warrington, Cheshire WA1 3ER. *(0295 814005)*
WELWYN/HATFIELD: D. Fairbank, G0AII, 2 Sandpit Road, Welwyn Garden City, Herts. AL7 3TN. *(W-G-C 326138)*
WIGAN: J. Cooke, G6TYB, 106 Wirral Drive, Winstanley, Wigan WN3 6LD. *(Wigan 214969)*.
WIMBLEDON: G. E. Cripps, G3DWW, 115 Bushey Road, Raynes Park, London SW20 0JN. *(01-540 2180)*
WOLVERHAMPTON: K. Jenkinson, G1OIA, 10 Avondale Road, Wolverhampton WV6 0AI, West Midlands. *(0902 24870)*
WORCESTER: D. W. Batchelor, G4RBD, 14 Oakleigh Heath, Hallow, Worcester. *(Worcester 641733)*.
WORKSOP: Mrs. C. Gee, G4ZUN, 100 Plantation Hill, Kilton, Worksop, Notts. *(0909 486614)*.
WORTHING: R. Jones, G4SWH, PO Box 599, Worthing, West Sussex. *(Worthing 208752)*
YEOVIL: E. H. Godfrey, G3GC, Dorset Reach, 60 Chilton Grove, Yeovil, Somerset BA21 4AW *(0935 75533)*.
YORK: K. R. Cass, G3WVO, 4 Heworth Village, York.

The **Derby** group gets together every Wednesday evening at 119 Green Lane, Derby, where they have the top floor. Details of the November doings from the Hon. Sec. — *see* Panel.

For more details of the **Eastbourne** club, based on the Archery Youth Centre, Seaside, Eastbourne, on Sunday evenings we have to refer you to the Hon. Sec. — *see* Panel.

Edgware are at Watling Community Centre, 145 Orange Hill Road, Burnt Oak, Edgware, on the second and fourth Thursday of each month; November 13 is G3RDG's talk and on November 27 they have a film show.

The **Exmouth** club sent us details of their expedition to The Gambia in December. From that letter we have taken the Hon. Sec's details, and no doubt he will be pleased to advise on what happens at the meetings, held at the Scout Hut, Marpool Hill, Exmouth.

Our note from **Falkirk** says they are still putting the programme together, so we have to refer you to the Hon. Sec. — *see* Panel — for the details on what happens on the first and third Wednesday at Grange Centre, Brightons, near Falkirk.

Now **Fareham** and that means Portchester Community Centre, even if they don't says so! November 5 is a talk on RFI versus EMC and on 19th they have G3CCB's QRP update. The remaining dates are natter sessions each Wednesday.

The **Felixstowe** crew is based in "The Feathers" pub in Walton

High Street, Felixstowe. On November 1-2 they are at a local Boy Scout Corroboree, and on 3rd they have a social night. November 17 is a visit to the Gaumont Cinema, Ipswich; December 1 is a computer evening.

On to **Fylde** now and for this lucky crowd, the Hq. is at the Kite Club on Blackpool Airport; they pay a combined sub. to enable them all to use the club at any time. November 4 is an equipment sale, and 15th is informal with Morse.

The **G-QRP** Club must be known to almost all our readers; this is the one for the low power and simple home-brew gear enthusiasts. Get all the details from the Hon. Sec. — *see* Panel.

Harrow now, which means Friday evenings at Harrow Arts Centre, High Road, Harrow Weald. The routine is to alternate talks with activity nights, but we do not have the November details.

The main meeting at **Hastings** is at West Hill Community Centre on the third Wednesday; November 19 is down for G8VR to talk about VHF/UHF linears. Every Friday evening they have a chat night, at Ashdown Farm Community Centre, which is also the venue for the committee meetings, the RAE course, the local RAEN group *et al.*

Over at **Hereford** November 7 is junk sale night, at County Control, Civil Defence Hq. Gaol Street, Hereford. The informal meeting is on November 21 at the same venue.

The **Ipswich** gang are to be found at the "Rose and Crown" pub, 77 Norwich Road, where they have a room detached from the bars; second and fourth Wednesdays are the normal nights, but there is usually some activity on the other Wednesdays unless something local clashes. Details from the Hon. Sec. — *see* Panel.

IRTS is the one for anyone wanting to operate in EI; it is also the national society and as such knows most of what goes on in the way of local activities too.

From EI to GI; **Lough Erne** foregathers on the third Wednesday of each month at the Railway Hotel, Enniskillen. Details from the Hon. Sec. — *see* Panel.

Loughton has November 7 for the informal, and on 21st a talk on the history of Laser 558; Loughton Hall, Rectory Lane, Loughton, Essex, is the venue.

November's programme at **Maidstone YMCA** shows natter dates on November 7 and 21. November 14 was still to be finalised when they wrote, and on November 28 they have a session on the use of the club test equipment. The Hq. is the YMCA Sportcentre, Melrose Close, Maidstone.

On to **Maltby**, and November 7 is an activity night; on 14th they will be shown how to build a 100 watt linear. November 21 is a video evening, and on 28th there are three mini-lectures by members. All at Hellaby Community Centre.

For the latest details on the **Maxwelltown** meetings we must refer you to the Hon. Sec.; they meet twice monthy on Wednesdays at the Tam o' Shanter Inn, Queensberry Street, and in addition have a club site near the Solway Firth where they are often to be found at weekends.

Now **Midland**, where on November 18 they have the homebrew contest. Henstead House, Henstead Street, Birmingham, is the place to search for. For the other details, contact the Hon. Sec. — *see* Panel.

Every Wednesday evening the **Nene Valley** group heads for the "Prince of Wales" in Well Street, Finedon, from 8 p.m. Although we don't have the November details, in previous months they seem to have alternated informals and talk nights.

For details of the **North Cheshire** Radio Club covering the Wilmslow area, we must refer you to the Hon. Sec. — *see* Panel for the needed details.

November for **Nottingham** shows three activity nights, on November 6, 20 and 27, while November 13 is down for a talk on cellular radio. Venue is Sherwood Community Centre, Mansfield Road, Nottingham.

Pontefract has moved to the ground floor from the top of Carleton Community Centre, Carleton, Pontefract, for the benefit of older and less active members. On November 6 G1BLT will talk about AMTOR, and on 13th they have a station at South Kirkby Town Council Hq. November 20 is a video on microwaves, and on 27th they have an informal natter session.

For **Powys** you have to find Montgomery, and then look for the road to Chirbury; turn right up a track just before you reach the de-restriction sign and about a mile or so up the track you come to the Lymore Park cricket ground; the club use the pavilion on Thursday evenings.

Now to **RAIBC** for the blind and invalid members of the amateur fraternity; if you know of one such, try and get him to join — and of course you can join yourself as a supporter or representative. Details from the Hon. Sec. at the address shown in the Panel.

RAOTA is for the old-timers; the requirement is to demonstrate interest in the hobby for at least 25 years. Details on membership from the Hon. Sec. — *see* Panel.

Turning to **SARUG** this is the group covering the use of Sinclair computers in amateur radio. Get the details from the Hon. Sec. — *see* Panel.

November 20 at **Solihull** is a surplus sale, at Shirley Centre, Stratford Road, Shirley. The December event, on 18th, is a Christmas social evening at the same venue.

November 5 is club Firework Night for South Bristol, in Rooms 2, 3 and 4 of Whitchurch Folk House, East Dundry Road, Whitchurch, Bristol. We don't have the details for the other Wednesday evenings of November, and we note they may have to shift rooms, so look around!

Southdown has its main meeting at Chaseley Home for Disabled Ex-Servicemen on the first Monday in each month. In addition they have Tuesdays and Fridays at the Wealden District Council Offices, Vicaragae Field, Hailsham, each week.

November 13 at **Southgate** is down for the G6QM Trophy for Construction, plus a slide-show or video. Holy Trinity Church Hall (upper) in Green Lanes is the venue, in Winchmore Hill.

Now we turn to **Spen Valley** where the younger members seem to have mounted a take-over bid and moved the Hq. to Old Bank Working Men's Club, Mirfield. November 6 is the Presidential Lecture, by G3YPC on steam engines, and on November 20 they have an open computer evening. In between, Thursdays are informal at the same venue.

The **Stevenage** meetings nowadays are in Electronics Room No. 1, at SITEC Ltd., Ridgemond Park, Telford Avenue, Stevenage. November 4 is set aside for final details on Stevenage Festival which itself is 11th-26th. November 18 sees the club at the Festival putting on GB4SNT.

November 12 at **Stockport** is for G3LX to give the G3FYE Lecture, and on 19th they have an informal natter in the bar; the Constructional Competition is on 26th, and all these are at — where? You'll have to ask the Hon. Sec. (*see* Panel for the details) but we think it might be at the Magnet Inn.

The Robin Woods Centre, School Street, is host to the **Stourbridge** members on the first and third Monday of each month, and we note November 17 is shown as a surplus sale, the other November date — 3rd — being an informal.

November's talk at **Surrey** might be any one of three possibilities, says the newsletter Editor; the first meeting of the month (first Monday) is the informal, and the other one the third. The venue is *TS Terra Nóva,* 34 The Waldrons, South Croydon, where they have the mess-deck on the first floor.

Turning to **Sutton & Cheam**, we haven't had the programme details beyond October, but we can say they will be at the Downs Tennis Club, Holland Avenue, Cheam, on the third Friday of the month. They also have an informal on the first Monday of each month in the bar at Downs.

The **Telford** group is based at Dawley Bank Community Centre, Bank Road, Dawley, Telford, where they are to be found on Wednesdays. Programme details from the Hon. Sec. at the address in the Panel.

The **Thames Valley** members are booked in to Thames Ditton Library, Watts Road, Thames Ditton, on the first Tuesday of each month; for programme details we must refer you to the Hon. Sec. — *see* Panel.

The Hon. Sec. is the place to which you should direct your enquiries about **Tiverton (South West)**, at the PO Box number indicated in the Secretaries Panel. What a pity they didn't at least indicate where they meet!

Todmorden means the Queen Hotel, Todmorden. November 3 is down for the G6CJ Aerial Circus, and on November 17 they will entertain RSGB's RR2, Peter Stoppard.

Alternation between Thursdays and Fridays is the form for **Torbay** at ECC Social Club, Highweek, Newton Abbot. There is also the monthly business meeting on Saturday, November 29 with a slide/talk show by Mr. Melhuish entitled "Looking at Broadcasting from Plymouth".

For **Verulam** all meetings are now at the R.A.F.A. Hq., New Kent Road, St. Albans; November 11 is an activity evening, and on 25th there is a talk by the County Emergency Planning Officer on what amateurs in Hertfordshire can do in such a situation.

WACRAL caters for those amateurs and SWLs, world-wide, who are practising Christians of any denomination. Details from the Hon. Sec. — *see* Panel.

The Community Centre, Prospect Road, Ossett, is home to the **Wakefield** society, where they are to be found on Tuesday evenings. November 4 is a talk by G4JKH, and G3WWF is to be heard on 11th. November 18 is a film night and on 25th G4JJ talks about amateur satellites.

Now to **Warrington**, at Grappenhall Community Centre, Warrington, where November 4 is down for a talk on fibre optics, and 11th is G4JLG on contest operating. G6AWO talks about the use of op-amps for power regulation on November 18, and on 25th G8HLZ takes up the question of noise blankers.

The **Welwyn-Hatfield** club gathers at the Scout Hq., Knightsfield, Welwyn Garden City, on the first and third Monday of each month; November 3 is down for G3BYG and the QRP CW rig construction, while on 17th they have a construction contest.

Wednesday evenings at 8 p.m. is the routine for the new club at **Wigan**; the Hq. address is St. Jude's Club and visitors are welcome. At the time of their letter they were putting a programme together so doubtless the Hon. Sec. could put you in the picture.

For **Wimbledon** we only have the programme to October-end, but from it we can glean that they get together on first and third Fridays, at St. Andrews Church Hall, Herbert Road, Wimbledon, SW19.

The **Wolverhampton** club has also sent us details to the end of October; we gather that they are to be found on Tuesdays of each week at Wolverhampton Electricity Sports & Social Club, St. Marks Road, Chapel Ash.

If you want to meet the **Worcester** crowd, try the Oddfellows Hall, New Street, Worcester; November 3 for a talk by G4FJN on the Amateur Radio Observation Service, and on November 17 for the AGM.

We hear that the **Worksop** meetings are now at the Woodhouse Inn, Woodend, Rhodesia, Worksop, but that they still gather on Tuesdays.

Lancing Parish Hall, South Street, Lancing, is the venue for the Wednesday meetings each week of the **Worthing** group. They alternate between informals and lecture sessions.

Turning to **Yeovil**, we find that they have G3MYM on Great Circle calculations on November 6, with Part 2 of G3GC's talk on oscilloscopes down for 13th. November 20 is a junk sale, and on 27th they have a natter. December 4 is the tape-and-slide talk on Sunspot Cycle 21 by G2FKZ. All these are at the Recreation Centre, Chilton Grove, Yeovil, where they will be found on Thursdays.

Finally **York**, and this group is visiting the Sam Smith Brewery at Tadcaster in November sometime. Otherwise it is Fridays at the United Services Club, 61 Micklegate, York. We were amused to hear that when York club put on GB2TS at Tollerton Show they were put right next to a steel band, and the latter were using amplifiers in most of the pans! They must have been a bit of QRM!

Finished

That's it for another month; your letters and data, newsletters and chat, should be arranged to arrive by the dates shown in the box, addressed as ever to your Club Secretary, SHORT WAVE MAGAZINE, 34 High Street, Welwyn, Herts. AL6 9EQ. Be seein' ya!

"G9BF Calling"

CONSTANT battle with Editor to get space for my real gen column. Keep telling him ham mags today too full of low voltage QRP gear and that fans really craving for pukka info on decent QRO kit. Foundations of AR built on valves and big Tx's but newcomers now only fed diet of solid state stuff. All vy sad as whole generation knows nothing about valves. This is why G9BF feature so important in weaning 'em offf BLY90s and w.h.y. onto the hard stuff, like 8877s.

Many OMs asking about G9BF 20m. moonbounce project but regret this now set back completely. After mni FB CW QSOs with super PL-172 Tx and rhombic, spectacular failure of big EHT tranny during regular QSO with old chum UV5AC during heavy thunderstorm put the kibosh on it. All going FB when colossal bang from tranny and whole place plunged in darkness, taking out electricity board's main fuses. Shorted turns in primary, so tranny now a write-off and being used as door stop.

Hurried removal of special wiring to shed before calling in EB but when bod came, he was very suspicious. "'Ere mate, how d'you manage to bust our sixty amp fuses, then," he said. Told him, "Act of God, chum. Lightning strike in last night's storm." He remained very sceptical so I plied him with G9BF potent special HB ale and that mellowed him a bit. He mumbled about, "By rights I ought to condemn this lot," but I told him he wouldn't want all the hassle of paperwork, would he? Well he fixed it and got in his van, but by now special brew doing its stuff and he pranged the gate post on the way out and snapped it right off. I trotted up and said, "Dear, dear! This will cost the Board a packet. But tell you what, you forget the wiring and I'll overlook the gatepost, O.K.?" We shook on it and off he trundled.

Before tranny disaster, some OMs heard carping abt big sig fm G9BF. "Ur sigs vy wide dr OM es vy clix . . ." typical of remarks. Never any callsigns, of course. Well, G9BF philosophy, inherited from dear old Dad, has always been to make big noise on band as sure-fire way attract replies to CQs. No point in 100 watt T9 sig nobody wants to hear. This ploy vy beneficial to all as strong evidence that rotten Russian Woodpecker quit 20m. due QRM from G9BF. Old mate UV5AC says this Tx doesn't really exist, of course, and anyway, not necessary as Ronnie Whitehouse and Mike Kremlin and XYLs now great chums es promised neither will lob ICBMs at the other. Suggest that all hogwash. It was big sig from G9BF Tx that gummed up the works so Woodpecker QRM gone from 20m. But now QRO Tx QRT, wanna bet it won't come back?

Without real QRO gear, only way to make mni QSOs with QRP 100 watt rigs is to use rare call. Old pal in LA never did any good with the DX till he changed call to BZ2AA. Now always guaranteed big pile-up after clg CQ, with great queue of VK, W, LU OMs. All reports now, "Ur vfb sigs RST599 dr om Chan es pse pse QSL via buro for next new prefix es country . . ." G9BF hopes attend some rallies es junk sales. Mebbe find another big tranny some time. Should be some around from old Band 1/3 TV TX's? 73 es gd DX, OMs.

("SITUATIONS" AND "TRADE")

30p per word, minimum charge £3.60. No series discount. All charges payable with order. Insertions of radio interest only accepted. Add 50 per cent for Bold Face (Heavy Type). No responsibility accepted for transcription errors. Box Numbers £1.50 extra. Send copy, with remittance, to the Classified Dept., Short Wave Magazine Ltd., 34 High Street, Welwyn, Herts. AL6 9EQ. Prices include VAT

Copy must be received by Friday, November 14th to be sure of inclusion in the December issue.

TRADE

Pye Tx/Rx's, large stock, send s.a.e. for details. — **Cityline Communications Group,** Elystan House, Elystan Place, London SW3 3LA. (Tel: 01-597 9770).

December issue: due to appear on Friday, November 28th. Single copies at £1.70 post paid will be sent by first-class mail for orders received by Wednesday, November 26th, as available.—Circulation Dept., Short Wave Magazine, 34 High Street, Welwyn, Herts. AL6 9EQ.

Amidon toroidal cores, ferrite rings and beads. Send *s.a.e.* for data and prices. Business hours: 10-5 p.m. Tues., Wed., Fri.; 10-4 p.m. Sat. — **SMC (TMP Electronics),** Unit 27, Pinfold Workshops, Pinfold Lane, Buckley, Clwyd CH7 3PL.

Service Manuals: most makes, models, amateur, test, televisions, vintage etc., s.a.e. with enquiries please;—**Mauritron (SW1),** 8 Cherrytree Road, Chinnor, Oxon. OX9 4QY.

Wanted: EE8 American field telephones, any condition, any quantity.— Ring 01-743 0899, 9-5 p.m. Monday-Friday.

FREE READERS' ADS

see Information Panel on page 363

Wanted: For AR88LF: IF transformers numbered 255401-1 and 255401-5 on side of cans. Also valves 6SA7, 6J5, 6SJ7, 6SG7 and 6H6. Details and price please. — Robinson, 165 High Road West, Felixstowe, Suffolk IP11 9BD (Tel: 0394-276087).

For Sale: Yaesu FT-726R complete with 2m., 70cm. and full duplex satellite units, mint condition, boxed, manual, £925. BL-40X 80/40m. trap dipole, £20. — Ring G4IOF, 01-722 7040.

Wanted: Satellit 600 Rx, must be excellent condition and moderately priced. Also exchange 1980 edition "World Radio TV Handbook" for yearly 1960 onwards back issues of *Short Wave Magazine*. — Amoroso, 60 Highfield Road, Salford, Lancs. M6 5LA.

Exchange: Complete 2m. and 70cm. station comprising Yaesu FT-290R and Trio TR-3200 with helicals, nicad packs, chargers, handbooks, 2m. colinear, 70cm. beam and rotator etc. for HF transceiver. — Allcoat, G3PIM, QTHR. (Tel: Nuneaton (0203) 386095).

Wanted: Sony CRF-220 or 230 Rx, must be excellent condition and moderately priced. Also out-of-date issue of "International Listings" *Callbook*. — Ring 061-743 1570.

For Sale: PCR receiver with built-in PSU, good condition, £25. AR88D, RF section only complete, £20. *QST* from Jan. 1970 to Dec. 1985, complete, sensible offers please. All items buyers collect. — Omer, G3DOJ, QTHR. (Tel: 06286-2810)

Wanted: 1980 "International Listings" (DX) *Callbook*. — Ring Keith, G4LXZ, Witchampton 840893 after 6 p.m.

Wanted: Unmodified Heathkit HP-1144 power supply for Heathkit SB-104 transceiver, must be in working order please. — Leaman, 26 Prospect Road, Birchington, Thanet, Kent CT7 9RP. (Tel: 0843-42401).

Selling: Icom IC-751E, with mic., IC-PS20 power supply/speaker, RC-10 frequency controller, FL-70 wide filter and EX-310 voice synthesiser, £1195. Icom IC-2KL 500-watt HF all-band linear with IC-2KLPS power supply, £1200. Icom ICAT-500 HF automatic all-band 500-watt ATU, £375. All boxed and immaculate. — Ring East, G4IOF, 01-722 7040.

Wanted: Portable short-wave receiver, digital operated, with memory back-up, telescopic antenna, coverage 150 kHz to 29.999 MHz, battery/mains, in good working order and moderately priced. Details and price please. — Bartlett, 25 Eagle Close, Enfield, Middx. EN3 4RS. (Tel: 01-443 2673).

For Sale: Yaesu FT-200 HF bands transceiver with FP-200 PSU, one of the last made (1978), in mint condition with manual and original packing, plus 2m. transverter, converter, relay and cables, £250. — Ring Hilleard, G4CQM, 01-928 5879 or 0428-736802.

Selling: TH-3Jr. with new balun, AR-40 rotator and control box, Altron wall-mount slimline mast (wind up to 30-ft.) with reducer tube, no splitting, £250. Buyer collects. — Ring Taylor, G3BHA, Bournemouth 528140.

Sale: Drake TR5 HF transceiver, 160-10m., excellent condition, £400 or best reasonable offer. — Ring Carpenter, G6WAS, 0432-59056.

For Sale: MLX board with extra sideband crystal and full instructions, £30 plus postage. — Ring MacCourt, G4YZX, 0304-375136.

Sale: Yaesu FRG-7700 receiver, without memory, with FRA-7700 active antenna, £250. Heathkit SW-717 Rx, £45. SR-9 2m. Rx, £30. — Wood, Sylvania, Enzie, Buckie, Banffshire AB5 2BN.

Wanted: Instruction manual for Hammarlund HQ-180. Price plus postage please. — Chapman, 97 Valley Drive, Harrogate, North Yorkshire.

For Sale: Solid State Modules 2m. dual-gate Mosfet converter, 4-6 MHz output, requires 12v. DC supply, very good condition, £20 inc. postage. — Ring Gulliver, G8JLV, 0225-708989 after 6 p.m.

Selling: Eddystone 990R receiver, 27-240 MHz, very good condition, £435. FRG-7 with SSB filter, as new, £135. Microwave Modules 1296/28 converter, new, £17 (or swop for 144/28). *Wanted:* Eddystone 1590 receiver. — Ring Howes, Yateley 875242.

Sale: Yaesu FT-209RH 5-watt handheld, with soft case and NC-18C compact charger, £200. Trio TH-21E, smallest handheld, with soft case, spare nicad, DC converter/adaptor, boom mic./headphone, VOX, BNC adaptor, £200. Both boxed, immaculate with manuals. — Ring G4IOF, 01-722 7040.

Wanted: AC/PSU for Marconi Mercury 1017 Rx, also handbook; Codar 250/S AC/PSU. Selling books, s.a.e. for list. 6GE5 valve, £10. — Marris, 35 Kingswood House, Farnham Road, Slough, Berks. SL2 1DA.

For Sale: Hy-Gain V 10m. multimode, USB/LSB/CW/AM/FM, covers 27.6012 to 29.700 MHz, professionally converted cover. Prefer buyer collects. — Ring Ken, 0553-760614.

Selling: Hallicrafters S.108 communications receiver, 500 kHz to 30 MHz, £55. Hallicrafters S.72 portable receiver, 8 valves, mains/battery, £50. Trio JR-599 receiver, boxed, £145. National HRO-M, 9 coils, rack-mount PSU, £75. *Wanted:* Old crystal sets and early wireless receivers. — Taylor, G4ERU, 5 Luther Road, Winton, Bournemouth. (Tel: 0202-510400).

Wanted: Good QQVO6-40A valve. Heathkit 3395 kHz CW filter. Collins CW filter and 3.1 SSB filter for 75S series Rx. *Short Wave Magazine* for March and July 1946 and Jan. 1949, and July and Aug. 1959. RSGB *Bulletin* for June and July 1949 and May 1954. T. & R. *Bulletin* 1930 and earlier. *Sell/Exchange: QST* and *T. & R.* since 30's, *S.W.M.* and *CQ* since 40's. HRO Senior with 13 coils and National power unit. — Baker, Ty-Top, Castle Caereinion, Welshpool, Powys.

For Sale: Hallicrafters S.27 VHF receiver, 27-143 MHz AM/FM, in good physical condition and working order, £35. Unused black crackle aluminium screened cabinet with chassis, suitable for HF linear etc., 19″ wide x 10½″ high x 10″ deep, table top or fit 19″ rack, £9. — Knight, G2FUU, QTHR. (Tel: Nazeing 2274, Essex).

Wanted: Digital general coverage receiver/transceiver, cheap. — Ring Welsh, Maldon (0621) 54547, Essex.

Wanted: Does anyone have either an R.C.A. *AR88* Rx or *CR-100* Rx still working (or with minor faults) to offer, within reasonable distance of Manchester? — Platt, 6 Brabyns Avenue, Romiley, Stockport, Cheshire SK6 4NG. (Tel: 061-430 3127).

Selling: HF station: Yaesu FL-DX400 Tx, 80-10m., CW/SSB/AM, with matching FR-DX400 Rx, 80-10m. plus 2m. FM, CW/SSB/AM, recently re-valved and realigned, with all leads and manuals, £185. — Fay, G0AMZ, QTHR. (Tel: 0634-376991, Kent).

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Wanted: Photograph of pre-war small radio shop and rear workshop (with the stained tea cups!). — Byrne, 52 West Hill Road, Ryde, Isle of Wight PO33 1LN. (Tel: Ryde (0983) 67665).

Wanted: CP-5 antenna; Trio TS-130S; Westminster W15. FM.D, 'E' band or one converted for 4m. *For Sale:* DX-33 Tribander, mint condition, £160. — Rochford, G0DQA, QTHR. (Tel: 01-856 4123).

For Sale: Heathkit 100E Tx, CW/AM, 100-watt, £40. Marconi frequency counter/frequency converter, £20. Or swap, W-H-Y? Both items 'or near offer'. — Ring John, G3DOP, The Lizard (0326) 290711.

Selling: Totsuko TR-2100M 2m. SSB rig with muTek pre-amp., £100. S.E.M. Multifilter, £30. Jaybeam D5/2M, £20. *Wanted:* HF rig FT-107, FT-101ZD or similar. — Ring Tomlinson, G4TGJ, Potters Bar 51449 between 13th Dec. and 10th Jan., or write QTHR.

Sale: Hy-Gain TH-3Jr. 3-ele beam antenna, 10/15/20m., and CD45 rotator with 25m. 8-way control cable, excellent condition, £320. Buyer collects. — Bethell, G4MBP, QTHR. (Tel: Cheltenham (0242) 527651).

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Exchange: Shimizu Denshi 5-band all-mode HF transceiver, fitted FM boards, space for one new band. *Straight swap:* for FT-7 or any *CW only* rig (*e.g.* Ten-Tec Century 21/22, Micron etc.). — Ring Renyard, 0909-566724 to discuss.

Wanted: Old Timer offers good home to Liner-2 SSB transceiver. Details and price including delivery, please. — Bolton, G3FSD, QTHR.

For Sale: Yaesu FT-One, with FM unit and all filters, non-volatile memory disk and palm mics., £650. I.C.S. Morse Baudot ASCII TOR cartridge for Commodore 64, £40. Scarab terminal unit, £30. — Fincher, G6SWO, 27 Albert Street, Tring, Herts. HP23 6AX. (Tel: Tring 6752).

Sell or Exchange: 48K ZX Spectrum, ZX Spectrum Interface I plus ZX Spectrum microdrive, all leads, books, boxes and two games. Plustron TVRC-50 TV/radio/cassette recorder, mains/portable (cost £374 new). Sell for £250, or *exchange* for Belcom LS-102L, SPC-300 or SPC-3000 ATU, Sommerkamp TS-788DX, or very heavy duty PSU (30 - 40 amps.). — Bolton, G4XPP, QTHR.

Selling: Icom IC-751, £850. New UR57, 200m., £50. New UR57, 100m., £30. All carriage extra. — Surman, G3FPD, QTHR. (Tel: 040372-3205).

Wanted: To buy or photocopy, circuits and information on Codar AT-5 Tx and mains PSU, also Codar CR-70A. — Taylor, G4EBT, 26 Mortain Road, Rotherham, South Yorks. (Tel: 0709-370021).

Sale: KW-2000A transceiver in good working order, with handbook, mics., and some spare valves, £170. Insured post £5 extra. — Livermore, Farm Cottages, Market Weston, Diss, Norfolk IP22 2HT.

For Sale: R-532 aircraft band receiver (listed over £200), £125. Trio/Kenwood JR-310 Rx. APR-4Y Rx with S-meter, variable IF attenuator, speaker/phones, pan, video outputs, circuits, £45. Brand new *ex*-NASA satellite receiver in sealed box (cost over £12K), £250 or near offer. All-aluminium 3-4 GHz horn antenna, £7.50 carriage paid. Valves: 2C39A, £10 each; 7609, £4.50. — Wright, 249 Sandy Lane, Hindley, Wigan WN2 4ER. (Tel: Wigan 55948).

Sale: Microwave Modules MMT144/28 MHz linear transverter, as new and boxed (list £125), £75. DRAE VHF wavemeter, used once, boxed (list £27.50), £15. Or both for £85. — Ring Byford, G0DKH, Liskeard (0579) 42384.

Offering: Sharp MZ-711 computer and over a hundred pounds' worth of software including locator program. Best offer secures as space is needed. — Broom, G6BKX, QTHR. (Tel: 021-526 6850).

For Sale: Hammarlund SP-400SX communications receiver with speaker and manual, overhauled, nice condition. Offers? — Ring 01-699 4413 after 6 p.m.

Sale: UR43 coax relays, 12V operation, 450 MHz, £3.50 each. — Barnes, G3AOS, 14 Coalpit Lane, Langley, Macclesfield, Cheshire SK11 0DQ. (Tel: 02605-2287).

For Sale: Yaesu FT-77S transceiver, 10 watts, SSB/CW, with CW filter and mic., £365. FT-290R with muTek front end, nicads and charger, £250. Spectrum 48K with PSU and Interface I, all built into original Fuller FDS keyboard, with Microdrive, Tasword 2 and other software, £75. — Simpson, G3PEK, QTHR. (Tel: 0244-300897).

Technical Books and Manuals

(ENGLISH AND AMERICAN)

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Antenna Handbook (Orr and Cowan)	£7.75
Beam Antenna Handbook	£6.50
Cubical Quad Antennae. 3rd Edition	£6.90
Simple Low Cost Wire Antennas, by Orr	£6.20
Aerial Projects (Penfold)	£2.30
Antenna Book (ARRL) *latest 14th Edition*	£8.00
The (ARRL) Antenna Anthology	£4.50
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HF Antennas for All Locations (RSGB),	£6.65
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25 Simple Amateur Band Aerials (E. M. Noll)	£2.25
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25 Simple Tropical and MW Band Aerials	£2.05
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BOOKS FOR THE BEGINNER

Amateur Radio *(Lutterworth Press)*	£9.60
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Beginners Guide to Amateur Radio (Newnes)	£5.45
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How to Pass the Radio Amateurs' Examination (RSGB)	£3.30

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The Complete DX'er, by W9KNI	£8.25
Weekend Projects for the Radio Amateur (ARRL)	£3.05
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Long Distance Television Reception (TV-DX) for the Enthusiast *(revised edition)*	O/S
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Radio Amateurs DX Guide (14th Edition	£2.45
Power Supply Projects (Penfold)	£2.80

HANDBOOKS AND MANUALS

Radio Communication Handbook, *5th ed.*, Vols. 1 and 2 combined (paperback), RSGB	£14.00
Teleprinter Handbook. New 2nd Ed. (RSGB)	£12.70
TVI Manual *(2nd Edn.)* (RSGB)	£2.20
The ARRL 1986 Handbook for the Radio Amateur, *soft cover*	O/S
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Foundations of Wireless and Electronics, 10th Edition (Scroggie)	£10.05
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