Microwave Cumulative Information Sheet 4/80

This is the fourth information sheet which we are producing before each microwave cumulative contest. As we intend to keep producing these on a monthly basis throughout the winter, we will be relying on YOUR support and contributions of equipment details, operating news, comments, technical ideas etc.

Activity in the North-East - G3NWU (Hartlepool) sends details of his equipment and sites, and runs 10mW to a 2' dish, using a 100MHz (75kHz b/w) or 28MHz (5kHz b/w) IF on receive. He is available for tests all day Wednesday and any night except Monday and Saturday, and his phone numbers are 0429-74842 (late evenings) and 0429-62052 (daytime, with ansaphone).

He also asks for a typical receiver sensitivity figure in dBm. This can be calculated from G3WDG's notes on link budgets in the 'microwaves' column, but typical figures would be:

-98dBm (3dB S/N, 200kHz b/w, 10dB nf, FM detector)

-130dBm (3dB S/N, 2.5kHz b/w, 7dB nf, CW detector)

Mixer and detector diode applications notes - G3LQC says Alpha Industries have some very interesting 24 page applications notes giving detailed information on many aspects of mixer and detector diode operation. A copy can be obtained by writing to:

R. Evans,
Alpha Industries,
RMC House,
Station Road,
Witney,
Oxon. OX8 6BP

NGR VS QRA - Several comments have been received on this topic. The most reasonable conclusion seems to be that since NGR's really need to be known before the QSO, to calculate dish heading, there's no reason to make NGR's a necessary part of the microwave exchange. There are also the arguments that the NGR system doesn't cover the continent (though it can be extended by the use of negative co-ordinates), and that having to exchange an 8-character group does make the QSO unnecessarily difficult under marginal conditions.

The recommendation is therefore, that NGR's should be used beforehand to obtain dish headings (and path lengths for scoring purposes), but that the contest QSO exchange should consist of callsigns, report and serial number, QTH locator location and confirmation that the other station has received his information.

For sale / Wanted - This section is fairly self-explanatory. We'll also include any news of sources of microwave hardware.

Wanted - GW8NBK (tel 0222 60694) seeks a dish 2-3' diameter, to complete his 10GHZ system.

Varactor diodes - Mullard BXY27c and BXY28c varactors are available from G.F. Milward Electronic Components Ltd., 369 Alum Rock Road, Birmingham B8 3DR at £1.50 each (+ £1 p&p).

BXY27c will give 5W out at 2GHz for 10W drive at 1GHZ, so is ideal for use as a doubler to 2.3 GHz.

BXY28c will give 3.5W out at 4GHz, so is useful as a tripler to 3.4 GHz.

Alignment of G3JVL Mixers - Several people have reported problems in getting these going, and it does seem to be one of those exercises where you need plenty of patience and faith, and a methodical approach. Most points are covered in G3WDG's article (RadCom, April 1980), but the following notes may prove of assistance:

1. The 'directional coupler' method of aligning the filters (by looking for a dip in reflected power as each cavity is tuned through resonance) is highly recommended. If an isolator or attenuator is available, this can be used immediately in front of the Gunn oscillator to prevent its frequency being pulled by the filter cavities.

2. After this, when aligning the filters in transmission, and looking for diode current in the mixer diode, an AVO can be used to monitor the reverse resistance of the diode. In this way, meter deflection can be obtained with power levels which would be too small to give a reading on a current range.

3. The G8DEK step-recovery multiplier (Microwaves, March 1976) is thoroughly recommended. It is important that the attenuator pad is mounted on the multiplier itself, rather than at the 376.6 MHz exciter end of a piece of cable. It's also more convenient if all the adjustables (i.e. 376.6 MHz matching capacitors, bias resistor, tuning screw and matching screws (if these aren't on the mixer)) are all on the top of the multiplier.

4. Once the 10224MHz LO has been fully optimised (i.e. step-recovery multiplier and LO filter), the multiplier and filter screws should need no further adjustment, and should not be touched (except perhaps the filter cavity screw nearest the mixer).

5. The 10368MHz signal-frequency filter is much broader than the LO filter, and is much easier to align.

6. The adjustment of the mixer matching screws is a compromise between max LO drive and best signal-frequency matching. G3WDG notes that on his rig, at high mixer current (~5mA), both a low receiver noise figure and over a milliwatt of SSB output are obtained - it therefore seems to be worth seeking as much mixer current from the LO as possible.

7. G3YJH suggests a method for aligning rigs where the step-recovery multiplier and mixer have been built from a single piece of waveguide: "By inserting an inch or two of insulating wire, which acts as a small antenna, through the tuning screw holes in turn, the signal can be tuned in on the station wideband rx tuned to 10224MHz. When the tuning screw of the preceding cavity is tuned through resonance, a 'blip' can be heard on the receiver as the signal peaks. By working through the cavities in this fashion several times, it is possible to peak the signal quite easily until sufficient mixer current is observed. The meter can then be used for the final alignment."

Reports from the 3rd Cumulative

1. G3PFR, located Meriton Low, 7km NE Leek. Mike reports dreadful wx, but best contacts were G3ZME at Brown Clee (87km), G3YJH at Titterstone Clee (97km) and G4HUP at Shining Tor (14km) over an obstructed path, with signals audible off the back off dish. Also tried with GW3YGF (Mynydd Maen) but nothing heard. Eventually retired because of waterlogged equipment and operator. G8PNL at the same site also suffered wx damage to his gear.

2. G3YJH, located Titterstone Clee near Ludlow. Dave reports a very successful day's operating, and worked a total of 15 stations (12 two-way and 3 one-way) in 5 QTH squares. Best dx was G4HUP at 104km. Dave also worked G8AFC (Fairsnape Fell) from Long Mynd on 13 July, over a path length of 151.2 km, so can now claim both awards! This QSO took place with torrential rain at Dave's end, and there was rapid fading on the signal.

3. G8ADP, from his home QTH in Upper Wield, 10km S Basingstoke was very pleased to work GW3YGF (Mynydd Maen) on two-way ssb. Anyone who knows Clive's QTH will appreciate what an achievement this is! He has also recently had a one-way QSO on 5.7GHZ with FIBQ. Clive, who was operating from Butser Hill, was running 2W to a 2½' dish, and signals were about 5dBn. FIBQ was running 100 mW, and signals were not audible in the reverse direction.

4. GW3YGF (Mynydd Maen) was very pleased to report a large number of stations active. Julian made 18 QSO's of which 8 were narrowband. 13 of the QSO's only needed low power. Best dx was G3JVL (Hayling Island) at 175 km, though other fb QSO's were made with G8ADP (149 km, see above) and G8DEK (Winchester). These three QSO's were with fixed stations in not particularly good locations, via troposcatter, two-way ssb.

5. G8SHF operated from Charterhouse (ST 498 568) and worked G3IZD in Bath (27 km), G8EQL and G4GUN at Dunkley Beacon (62 km) and GW3YGF at Mynydd Maen (62 km). Cliff also worked G3VPF at Hardy's Monument, Dorset (60 km) from Shepton Mallet. G4GUN was apparently out for the first time!

6. G8RHI and G4CNV, located Walbury Hill, near Newbury, Berks worked G3LQC and G6XM at Broadway (79 km), G3KSU at St. Catherine's Hill, IOW (85 km), G3JVL, G8ADP and G8DEK one-way narrowband. They also worked each other, two-way ssb, when G8RHI stopped on the way back to Oxford.

7. G3PPF and G8NBK also operated from Walbury, and worked G3LQC, G6XM, G3KSU and GW3YGF, and heard GB3IOW. They weren't able to operate later from Cleeve Cloud, as planned, due to vehicle problems. Phil and Jonathan have also been pretty busy apart from the Cumulatives, and report tests from Beesands (Devon) with GU8CIU (unsuccessful, though GB3ALD was heard in the evening), and from Mynydd Eglwysilan (near Pontypridd) with G3MTG, located in the Quantocks, at about 60 km. This test was successful, and G3MTG hopes to be QRV in the next Cumulative. Phil and Jonathan are also planning another trip to Pembroke, to which there is a 150 km superrefraction path from the Mendips. Contact GW8NBK (tel 0222 60694) for further details.

8. G4HUP, at Shining Tor, made a total of 6 QSO's, best dx just over 100 km. Dave reports a one-way narrowband QSO, as well.

9. G3ZIV was on holiday, but took time off to operate from Broadway. Although he was only able to run 50 microwatts (!) he made 4 QSO's with GW3YGF, G3ZME, G3YJH and G8FWA. He unfortunately won't be active for the August event, though hopes to be on for September. Keith asks people to note a change of phone number, to 0757 638503.

10. G3FYX, located near Stroud, Gloucs. Roy had been hoping for contacts into the Midlands, but only managed G3ZME on Clee Hill. He also worked G8EQL and G4GUN, near Minehead, at 114 km.

11. G3RZD and G8GKV. G3RZD sends details of some cross-channel tests. The two Erns worked F0AKD from a site near Newhaven (AK11f) on 2 August to give Don his 5th QTH square from La Pernelle. Path length 162 km. On 9th August, they worked F1BQ at Octeville, from ZK19a, at 135 km.

12. G8AGN, located Meriton Low, reports plenty of activity in the north. Barry made 6 QSO's, with G3PFR, G3ZME, G3MWQ, G8HMV, G8PNL (one way) and best dx G3YJH (93 km), before the gear blew over (a problem that other operators have complained of). Barry also reports that he and G3ZIV are making progress on 24GHz.

Many thanks to everyone who has contributed to this newsletter. Please continue to give us your support, by sending details of operating news from the last Cumulative, equipment details, sites for the next one, technical ideas etc. to:

J. Gannaway G3YGF,
17 Crick Road,
Oxford.

A minimum of 15p is needed to cover the cost of duplicating etc., but donations above this would be gratefully accepted to enable as wide a circulation as possible to be maintained (plus SAE).

The deadline for the next issue is Saturday, 13th September. Apologies for an error in the deadline for this issue, which should have read 16 August, not 16 July. SRI.

73 de G3YGF, G4CNV and G8RHI.

4th Cumulative Activity List

Call	Telephone	Sites and times of Operation	Equipment
G3AMJ	021-354-5783	Titterstone Clee, S0595755, all day	WB
F0AKD		Joburg ZJ22j 15k W Cherbourg AM, then ZJ24a 25k E Cherbourg PM	WB WB & NB
G3JVL	07016-4482	Hayling Is, SZ710992, all day	WB & NB
G3LQC	0993-850576	Broadway, SP115364 (with G6XM), all day	WB
G3PFR	0928-88427	Hope Mnt or Winter Hill or Meriton Low or Mow Cop	WB
GW3PPF	via GW8NBK	Mynydd Maen, ST 260977, all day	WB, NB, 24G
G3RZD	0903-206384	Chanctonbury Ring, TQ134120	WB, 24G
G3FYX	0454-778288	Charterhouse (Mendips), ST 498568	WB, 24G
G3VPF	0305-785057	Woodbury Common, 2 km SE Exter, AM	WB
GM3YGF		Peterhead (NE Scotland) with G8RHl contact via GM3OUR/P, 144.245	WB & NB
G8CDB		Beachy Head (with G8DPB)	WB
G3NWU	0429-62052 (work) 0429-74842 (home)	Sutton Bank (900' asl) N. Yorkshire Moors Trimdon Vill (600' asl) NZ 358342 if weather bad	
GW3ZME	0952-55416	Snowdon, SH611543 noon onwards, (Weather permitting)	WB
G4CNV	0794-513771 0794-515222 ext 370	Hardy's Monument (S. Dorset) SY614876 or Batcombe Down (Central Dorset) ST644048	WB, NB, 24G
G4HUP	0782-642507	Shining Tor, Derbyshire, SJ995740 39953740)	WB, NB tx
G6XM	0793-762540	Broadway, SP115364 (with G3LQC), all day	WB
G8ADP	0420-62316	From home (12 km S Basingstoke) - contact by phone	NB
G8ANZ	045-382-4123	Cleeve Hill, 20997246 until 6pm	WB, NB, 24G
G8EUQ	0582-33876	Probably Dunstable Downs	NB
G8GKV	0903-206384	Chanctonbury Ring, TQ134120	WB
G8SHF	0272-855693	Blorenge, S0269119, or Mynydd Maen ST 260977	WB
GW8NBK	0222-60694	Mynydd Maen, ST260977, all day, (with GW3PPF)	WB
F8WN		AJ51h, near Deauville	WB
F1BQ		Octeville, near Le Havre (with F3LP and F1CVU)	WB (F1BQ has NB)
F6DLA		La Pernelle, near Cherbourg (with F0AKD)	WB
G3KSU		St Catherines Pt., Weather & circumstances permitting	WB
G3LFF	0705-453043	Possibly Portsdown Hill, No talkback - skeds by phone	WB & NB

Abbreviations: WB=Wideband, NB=Narrowband equipment. Please inform us of any corrections to telephone numbers and equipment.