*An Amateur Radio publication for the Microwave enthusiast*

# MICROWAVE NEWSLETTER

*Published by the Radio Society of Great Britain and edited by G3PHO and G8AGN.*

*Lambda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE*

## FROM THE EDITOR

## 2002 – JULY / AUGUST

As is the norm at this time of year, this issue covers two months. The next one will appear in mid-September. Please send any items for that issue before the first of September as the editor will be attending the Weinheim convention in Germany at the time he normally puts the Newsletter together.

Before the next issue there will be four microwave contests to tax your equipment and operating skills! On July 28, we have the third 10GHz Cumulative. The 11th August sees the Multiband Microwave Contest, while the 25th August stages the fourth 10GHz Cumulative. On the 8th September, the Millimetre Bands Contest takes place. Please try to be active during most if not all of these events.

**Many thanks to all who have contributed articles and other information to this month's issue.** We are once again running out of material for use in future issues. We welcome all kinds of articles, from highly technical to downright easy beginners' stuff! Short, practical articles are particularly welcome.

## Contents



News, views and articles for this newsletter are always welcome. Please send them to G3PHO (preferably by email) to the address shown below. The closing date is the Friday at the end of the first full week of the month if you want your material to be published in the next issue.

G3PHO: Peter Day 0114 2816701

G3PHO: Email: g3pho@qsl.net
or p.day@virgin.net

G3PHO, Peter Day,
146 Springvale Road,
Sheffield, S6 3NU, UK

**SUBSCRIPTION ENQUIRIES SHOULD BE SENT TO RSGB HEADQUARTERS AT THE ADDRESS SHOWN AT THE TOP OF THIS PAGE AND NOT TO THE EDITOR ..**

# The "Wants and Gots" page

Advertise your equipment here for free!

Email or write to the Newsletter Editor before the end of the first week of the month if you want your ad in that issue.

## INFORMATION WANTED

I have come into possession of a Hewlett Packard C34-431c Power Meter c/w 10GHz transition and Thermistor mount 478A 200ohm neg, with 20dB coaxial attenuator. The meter is also marked Meter Absorption CT 495. Unfortunately, the 6 way Plessey plug has come adrift from the Thermistor cable and I wondered if any readers might have a circuit diagram/ operating manual that I might borrow in order to get it wired, set up and working. Naturally, I will be more than glad to pay any expenses involved.

**Mike Street,**
**G3JKX**
**mstreet@g3jkx.freeserve.co.uk**

**Information** required for PA stage picked up at the Newbury Rally.

This has a 9 pin D type plug but the information sheet I was given refers to a 15 pin D type.

**Hewlett Packard,**
**SIM95-1098,**
3.6 – 4.2 GHz,
output nom 34.5 dBmW,
1dB compression 46 dBmW

**Tel.** 0118 932 6465
**Or email:** g8kps@lineone.net

**Wanted** Software or any information on how to drive Aurora 63 LED Tri colour Moving Display, to use at rallies. (These are mainly used in call centres). All expenses paid.
**Email:** richard@g7mfo.karoo.co.uk

## FOR SALE

I am selling the equipment listed below on behalf of he wife of a local Sheffield amateur who has recently passed away:

**FT290R + Microwave Modules 30W 144MHz amplifier.** C/W manuals, mic., shoulder case and strap, mag mount whip, battery charger (**but no nicads**), all in excellent condition. No mods.
**Price £170 (would prefer not to split amp from the sale).**

**FT101Z HF transceiver** c/w manual, Yaesu desk mic and headphones. 100W pep o/p all bands. 2 Spare 6146Bs. Analogue dial. No WARC bands. Very good condition. No mods.
**Price £150**

**SSM Europa 28 to 144MHz Transverter** Plugs into FT101Z as above. 50 to 60W o/p on 2 metres ssb/cw. QQV06/40 PA. C/w manual.
**Price £25 (£20 if purchased with FT101Z above!).**

**Carriage extra or buyer inspect & collect from Sheffield, or can collect at next microwave meeting (GCHQ September?)**

**Contact the editor, Peter Day, G3PHO via email, telephone or letter ... Details on front page).**

## Help required

Technical Manual (or schematics) required for Wiltron (Anritsu) 1 to 2GHz sweep generator, model 6610S.

**Ray Gathergood, G4LUA. QTHR**

**Email:** raymond.gathergood@virgin.net

## Wanted

Service/Operators Manual For HP 8341A Synthesized Sweeper
**Richard, G7MFO**
**Tel:** 01482 898559 or
**Email:** richard@g7mfo.karoo.co.uk

## FRIEDRICHSHAFEN 2002

I have been going for the last three years to Friedrichshafen. I still have not managed to get to Dayton yet but hope to get to it next year if I can get the time off. The good thing about the German rally is you can just about get anything you want, from microwave components, which you can get hold of in single quantities in the flea market at very reasonable prices, to all the test equipment you could every dream of owning, at a price! The rally is over two and a half days but this year, with Germany playing in the World Cup on the Sunday, a lot of the traders had left early.

The best part of the rally is the flea market which is in two massive halls. It took me most of the first two days to go around them (I need a new pair of boots after all the walking!). On the flea market and trade stands you could purchase amplifiers from 5 watts on 13cm to 1.5KW on 23cm as well as 10w amplifier for 10GHz. The number of different antenna manufacturers present at the rally was quite amazing. For example, I counted at least six manufacturers of aerials for the 23 & 13cm band. You could even buy the ultimate mast for the home QTH out of stainless steel or aluminium, again at a price. I would recommend anybody to go to the rally, especially staying next to Lake Constance (known as the Bodensee, by the Germans) which is surrounded by mountains and within easy reach of dozens of pretty little resorts, and, with the price of cheap flights from the UK I'm sure you could persuade the family to go as well!

**Richard G7MFO**

## HOW LONG BEFORE 47GHz EME ?

**The following email from Barry, VE4MA, details some remarkable findings from sun noise measurement experiments on 47GHz. Barry is one of a handful of millimetre wave EME operators and has already worked intercontinental DX via the Moon on 24GHz.**

I have been busy performing 47GHz Sun Noise Tests in recent weeks and comparing notes with Al, W5LUA, Gary, AD6FP and Will, W0EOM. There are not many people looking at sun noise or even capable of doing so at this frequency. There is a real shortage of large antennas rated for this frequency.

Measurements were taken using 1, 2, 3, 4, 6, 8 and 10 ft dishes and all receivers are believed to have Noise Figure sof about 4.5 dB. Cold sky to ground measurements are about 1.3 dB using the feedhorns alone

**Here are the Sun Noise results:**

**W5LUA** 15 " Prime Focus 39GHz Dish 1.4dB Sun Noise
**VE4MA** 30 inch Offset Metal 2.4dB
**W5LUA** 24" Prime Focus 39GHz Dish 2.5dB Sun Noise
**VE4MA** 4ft Offset Plastic dish 3.6dB
**W0EOM** 2ft dish 4.1dB
**VE4MA** 6ft Offset Fibreglass dish 5.0dB
**AD6FP** 3ft Precision (95 GHz) dish 5.2dB
**W5LUA** 10ft (24 GHZ EME dish) 5.7dB Sun & 0.4dB Moon Noise
**VE4MA** same 4ft Offset Plastic dish with Aluminium foil now on surface 6.4dB
**VE4MA** 8ft (24GHz EME dish) 6.9dB

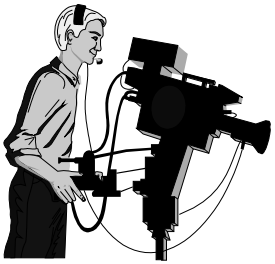
The remarkable thing is the 3.3dB gain improvement in the 4ft offset dish performance with the addition of aluminum foil. The plastic/ fibreglass offset dishes seem to be reasonably accurate but the reflecting material imbedded in the surface is not very effective at this frequency (designed for 14GHz) . The 30 inch metal offset dish does not seem to be efficient, nor are the 39GHz dishes.

The 4ft dish I was using was part of a General Instrument 12GHz receiving system and has eight large 5/16th inch bolt heads sitting on the surface. I will be modifying this for rounded heads.

The foil was attached with wallpaper cement (temporary) and subsequently painted with white latex paint to reduce the heating of the feedhorn!

Best 73

**Barry VE4MA**



# ATV Contests ~ The Way To Do 'Em ?

**TV contests do not run at the same pace as phone or CW contests, and can therefore be more enjoyable. Here are some tips from 22 years of contesting.**

**Microwavers can easily take part. In fact this mode is an excellent way to use your old wideband FM gear!**

## Talkback

During contests, 144.750MHz becomes a calling channel, not a talkback channel, so please QSY as soon as possible. On QSYing, both stations should check out the new frequency by asking 'IS THIS FREQUENCY IN USE PLEASE?', beforehand, to avoid losing the contact and causing QRM to others. FM is the most commonly used mode for talkback but it is often difficult to find a clear channel when on hill tops. Remember the all mode section of the band has many allocated channels: Beacons, Raynet, Packet, RTTY, etc.

Deep QSB causes difficulty on FM, so why not use SSB, which won't block the ATV half as much, and give yourself a chance of maintaining contact with DX! Also, don't forget to listen around 144.170MHz USB, as this frequency is used abroad.

## Where To Beam

With narrow beam aerials aligned on the same mast, the use of headings based on QRA locators is highly desirable, assuming you can calibrate the rotator that well, and you have an RF quiet electronic abacus!

Otherwise beam up on the 2m signal if you are the same polarization. On 70cm best headings are obtained from using a narrow band (SSB) receiver tuned into the carrier, once you can extract frequency from the transmitted station.

For 24cm and higher exchanges, send the 70cm pictures first is an obvious rule but be prepared to deviate the heading slightly, as the paths can bend and reflect differently.

## What To Send

The contest rules require a different four number code per band to be sent in vision. These numbers must not be sequential or repeating. So sending pictures of that nice tidy shack, is NOT required (that's a relief), nor is that colour test card ... only the four number code.

However, one should identify the code as being yours, so also include the callsign. The numbers should be designed to fill most of the screen (allowing room for callsign). They need to be thick; this is especially true for all the vertical portions of the digits, as this is the first detail to be lost.

## Viewing

Contest pictures are best viewed on a small screen 5" from a long way away 5' in subdued lighting. This is because one's brain can do a lot of 'state-of-the-art' picture processing and act as a frame store under these conditions.

## Reports

Only the check sum (the code numbers added together) is permitted to be communicated on the talkback link, the code number itself must not be communicated on pain of disqualification! Don't forget to log the code number seen.

A report of:

**P0** means no usable picture was received.
**P1** is a picture just interpretable.
**P2-P4** increase in viewability, until:
**P5** no apparent noise.

Under contest conditions it is often possible to extract part code numbers from fleeting glimpses, where aircraft QSB just lift the signal long enough to get some of the code. Several QSB peaks may be required for the whole code. Usually a P1 report is given, though P0+ would really be correct. In addition to QRA, check sum and report, the exchange needs a contest serial number per band, as with other contests this is a 3 digit number starting from 001.

### Scoring

The BATC logsheet template should be used; this can be downloaded from the BATC web page and printed out, or used 'live'. Unlike most other radio contests scoring is based on km per direction. Bands higher than 70cm: 1 point per km, 24cm: 2 points per km, and for contacts on higher bands: 5 points per km One-way. Multiply by 2 for a two way contact. BATC contest and the IARU International are scored the same.

### Be Brief

Please remember also that others want to exchange pictures too, so remember to cut transmissions once the code number has been seen or when the other station is not in a position to Rx.

### Logs

Don't forget to send in your logs and cover sheets to the contest manager by the third Monday after the contest (September 21st for the International).

### Information

As stated above, the contest sheets and the latest information can be down loaded from the BATC web site or obtained from myself. **I would like to thank John G8MNY for the above article** and I hope to see you on during the International in September!

**Richard Parkes, G7MFO:** 7 Main Street, Preston, Hull. HU12 8UB. England.
**Telephone:** 01482 898559
**E-mail:** contest@batc.org.uk
**Web:** www.batc.org.uk

# International ATV Contest 2002
# Saturday September 14th to Sunday September 15th
# 1800 GMT Saturday to 1200 GMT Sunday
# Fast Scan TV all Bands

# G4DDK004 OSCILLATOR UPGRADE

## Notes by Kevin Murphy, ZL1UJG

I did some improvements to the last DDK004 oscillator that I built. Listed below are the modifications and the reasons for them. You will need the original circuit diagram and construction notes for reference:

| MODIFICATION | REASON |
|---|---|
| **1.** Fit a 330nH axial inductor across the crystal (1nF series capacitor Cx must be fitted to prevent DC flowing between TR1 and TR2 emitters) | This gives a stable pulling range due to the xtal capacitance (~7pF) being cancelled |
| **2.** Ground TR3, TR4 and TR5 emitters directly. R11, R15, R19, C12, C17, C22, C24 are not fitted. The holes for TRs 3, 4 and 5 were carefully filed with a small round needle file so that the collector and base leads would fold down in little notches while the emitters were soldered directly to the groundplane. The PCB areas where the emitter Cs and Rs were are covered with copper tape and soldered. | This gives a direct path for the emitters and reduces potential problems with emitter bypassing. |
| **3.** The 1st striplines in TR4 and TR5 collectors are now directly grounded with copper tape. The transistors' outputs are fed via small chip caps (eg 33pF 0805 types). Tr4 has its collector volts fed via a 100nH 1206 size chip inductor. TR5 pcb stripline extended with a small wire. C21, C25 and C29 are not fitted. Where the first tuned striplines in TR4 and TR5 collector circuits are grounded, there are 2 cuts in the 1st striplines. The 1st cut is to isolate the collector from the tuned stripline and the second cut is to isolate the grounded end of the 1st stripline from the power<br>feed circuit. The 2 pcb cuts can be done in one motion with a scalpel and metal ruler. | This increases the Q of the striplines by grounding them directly. |
| **4.** Collector resistors R12, R16 and R20 (associated with TR3, TR4 and TR5) are increased to 150 ohms. The collector's side of each R is fed to the base bias circuits. | This is called a self-regulating, saturated multiplier circuit. (The collector voltage reduces under drive and reduces the base bias). Values other than 150 ohms were not tried. Increased power may be obtained by reducing the resistor values to 120 or even 100 ohms. |
| **5.** A 3 terminal regulator (78LO8) is fitted on the pcb with associated tantalum caps of 10uF on the output and 1uF on the input. Note the 4 holes (each 1mm diam) drilled with clearance pads. (use on outboard 7808 1 amp regulator if a crystal heater is fitted and run it off 8 volts). | This reduces the effects of the operating point of TR3, TR4 and Tr5 changing due to supply variations and reduces chirp and other random variations. |

| | |
|---|---|
| **6.** The small 3 terminal regulator, IC1, already fitted to the pcb for TR1 and TR2 is removed. A new NPN transistor (eg BC547 or 2N2222) is fitted (collector to +8V, base to centre hole and emitter towards the Butler oscillator). A 1K resistor from the 8V to the base of the transistor and a 10uF tantalum from base to ground is used. Note: the middle hole must now have a clearance pad so that the base lead doesn't short out. | This reduces regulator noise feeding into TR1 and TR2 circuitry. |
| **7.** Fit low cost and more common Philips 1.4 – 5pF trimmers for the 1200MHz multiplier section by reversing the middle trimmeter (like an interdigital filter). | Availability and the original trimmers were overcoupled, causing th middle trimmer not to tune. |
| **8.** An extra 2.2pF NPO ceramic capacitor is fitted on TR3's base and the the position of R9 is moved. Two holes need to drilled, with clearance pads. | To improve the multiplier performance (increased collector current) |

**Note:**

Where tantalum capacitors are mentioned in the original DDK004 documentation and in these modifications, it is very important that they are used as they have superior filtering characteristics. Even if you are not doing these modifications to an existing pcb, it is still recommended that an additional 10uF tantalum is fitted close to the output of IC1 to suppress noise.

The level of crystal harmonic products on the output (eg 1200MHz) is better than –45dBc.

The board draws ~60mA.

MRF901 transistors were used for Tr3, 4 and 5 multipliers and +7dBm (5mW) output was obtained.

R8, 18 ohms, was changed to 100 ohms but it is not a necessary modification.

Overall, the modifications are made to improve the keying characteristics, stability and noise characteristics of the DDK005 oscillator/multiplier. I am upgrading four other units to this standard so that their performance is enhanced for transverter and beacon use.

Since the crystal is sensitive to temperature, it is recommended that a crystal heater is fitted. These are obtainable from the RSGB Microwave Components Service (G4KGC, QTHR), Downeast Microwave un the USA or from VK5EME Minikits in Austrakia. Failing that, some sort of thermal jacket from foam or a polystyrene packing bead can be fitted over the crystal.

For even superior stability, an external crystal oscillator such as that available in kit form from John Hazell, G8ACE, may be fitted and fed into the first stage of the Butler Oscillator, after removing the existing crystal and choke. For matching reasons it is recommended that a J310 FET is fitted instead of TR1 and that R2 is changed to 220 ohms. TR2's emitter in this case can have the 22pF NPO capacitor replaced with a 1nF type.

# Kochelsberg 2002

The Kochelsberg microwave event occurs every year at the site of the DK0PX club station **(http://www.qsl.net/dh3iaj/dk0px.html)** which is an old army radar base (I think). It is on top of a hill with no surrounding trees, a rarity in both DL and HB9, and is about 3000ft a.s.l., a great site. They have access to a couple of buildings one of which is kitted out with separate radio rooms for HF and VHF, proper male and female toilets, a dining room, and a proper kitchen. There are no neighbours so TVI is not an issue. There is a large dish on the site, a remnant, I believe, of the previous radar. It is used in contests and on EME from time to time.

The meeting is held as a means for microwave people to get together and to chat, and maybe do some buying and selling. At this sort of event even mention of 23cm is a little passé. People came from far and wide. All of the HB9 microwave operators came (including HB9AMH, HB9CZF, HB9DRD, HB9MIO), probably all of the DL operators from southern Germany, and the furthest of all was Rudi OE5VRL who had a six hour drive. There was a DX dinner the night before nearby for those who wanted it.

We (me and HB9CZF) arrived a little early at 0800 for an 0900 start. We were immediately attacked by the biggest mosquitoes I have ever seen in my life, I think they could carry a small child away ! They were to be a nuisance for the whole day.

Attendees were free to set up stalls to sell their goods, most of the people selling things were individuals selling surplus with varying quality. The only well known stalls were from DL2AM (of PA fame), Eisch Electronics and UKW-Berichte. There were some good things to buy, for example I bought five 150mm leads with SMC connectors, brand new for one Euro. One stall was selling some surplus solid state PAs for 23cm and 6cm, the 23cm ones were capable of 200W, to which one DL said "its only suitable as a driver" and wandered off!

One thing to bear in mind is that this was a German speaking event and, as a German learner, it was fun to practice my newly learned skills. However after about four hours speaking halting German, I switched back to English.

I met a number of people there who are active on microwaves, many of whom are to be found on Converse. People I met include: OE5VRL, DK9MN, DL6NCO, DF6TK, DL3IAS, DK4GD, and DL3NQ. Rudi OE5VRL showed us photographs of his RS Detector and the plots he receives that indicate rain scatter. Altogether about 150 people attended and I noticed that one French station was also in attendance.

At around 1100 we had a storm go over and one of the portable 3cm systems operating there was able to hear a number of beacons via RS, needless to say RS activity was very low at the time. The weather quickly went back to its previous temperature of about 29C, and stayed there for the rest of the day.

In the afternoon the lecture streams started, although I didn't attend any. One was about generating power on 47GHz. At the same time outside, DK4GD showed off his 241 (??) GHz equipment, it had a 10cms dish and waveguide that looked like thick wire. He also had a laser system. Another amateur also set up a laser system about 20ft away and so a laser QSO was demonstrated. I took photographs throughout the day and maybe at some time in the future I will put some up on my web page for people to see, but don't hold your breath.

One thing I must mention was the standard of catering, in a word ‘excellent‘. The main courses were good and cheap and the selection of cakes was astounding. Having got used to Swiss prices, seeing anything edible or drinkable for less than 2 GBP is shocking.

I will certainly be going next year. There is no doubt that Weinheim is the largest of the German events with microwave connections, but this is the most focused and as such is to be preferred in many ways. The only thing that could have made this event better would have been the presence of DB6NT with his modules for sale, and fewer mosquitoes. Next year I will wear some fly repellant spray.

As a postscript, the day after the Kochelsberg meeting I was not well. This was caused by me being stupid and not wearing any sun block. The problem was the back of my neck getting heavily sunburned. So if you do decide to go, be prepared.

**Jonathan HB9DRD/G4KLX**

## OSCAR 7 LIVES ON!

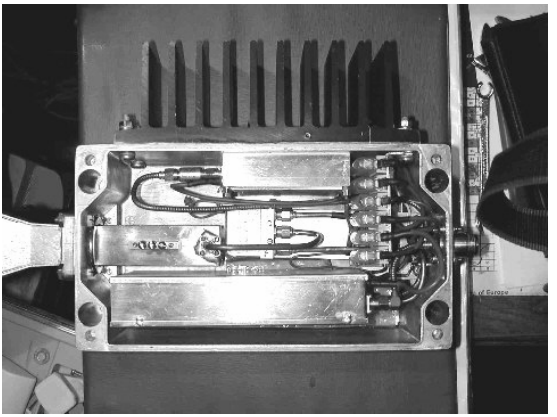
**The following email extract from Don Woodward, KD4APP, reminds us that microwaves are very much a part of amateur satellite technology. AO7 recently burst in life after many years of it being believed to be dead. Like something out of a science fiction movie, the "bird" gave satellite listeners quite a shock, as Don describes ...**

For anyone with a 2.3GHz station, there might be an opportunity to hear the AO-7 satellite's 2.3GHz beacon. The 2 meter beacon of AO-7 was heard on June 21st of this year for the first time since the spacecraft went silent in 1981 - AMSAT believe the batteries went dead/ shorted at that time some 21 years ago. Because it's thought the satellite is operating on the solar panels now and the battery cells are open, the spacecraft turns on in random modes. All of the modes have been used/ heard except the 2304.1MHz beacon, which, under normal operation, must be commanded on and would only stay active 15 minutes. It is possible that the 2.3GHz beacon is operational at random times also, but has not been heard.

See **http://www.amsat.org/amsat/sats/n7hpr/ao7.html** for details of the spacecraft.

**Happy hunting!**
**73 from Don Woodward KD4APP**
**AMSAT 33535**
**kd4app@amsat.org**
**http://kd4app.webhop.org**

# NEW HOME STATION FROM IO70



The neat looking unit above is a 10GHz transverter, recently made by Ralph, G4ALY. Ralph lives in "deepest" Cornwall and, during the 10GHz Cumulatives, can often be heard operating portable from nearby Kit Hill. For much of this year he has been building equipment and installing a strong antenna support system for a home station on VHF and microwaves. His transverter has just been installed at his home station, feeding a 75cm offset fed dish and he already hearing the French beacon in IN88 at fair strength (QRB 232km).

The 3cm transverter includes a DB6NT transverter driving a DL2AM two stage 5 watt PA. These modules easily fit in to a weatherproof diecast box as shown. Some idea of the total size can be gained from the WG16 transition on the left of the photo.

After being plagued by back and shoulder problems which prevented him from even operating some months ago, Ralph has persevered and is now ready to offer IO70 square on a regular basis to both 23cm and 3cm operators. He is well sited to the south but has to get over Dartmoor and other higher ground to the North and North East. Please turn your beams his way! Email him at **Ralph.Bird@btinternet.com**

## ERRATA !

**The email address for the New Zealand Microwave Newsletter ("FUN") as shown in last month's issue was incorrect and should read:**

**rfman@xtra.co.nz**

**Somehow an extra "e" got in the original version!**

## CAN YOU BEAT THIS?

**Roy, G3FYX** is now active on twenty two different amateur bands from 136kHz to 76GHz ... and not a spectrum analyser in sight!

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# MICROWAVE ROUND TABLE MEETING: GCHQ, CHELTENHAM

We have been promised a meeting at GCHQ this year but, as yet, the Newsletter hasn't received any details. Since the next issue of Microwave Newsletter is due out around the same time as the proposed GCHQ meeting (Sunday, 15th September, 2002) it could be that you won't be able to receive booking forms and other details via the Newsletter. We suggest you check G3PHO's website (**www.qsl.net/g3pho**) over the next month or so as details and a downloadable application form will be posted there as soon as they become available. If you are not on the Internet yourself then either arrange with someone who is to get you the information or send the editor a self addressed **stamped** envelope soon after you receive this issue and you will then be forwarded all necessary information as soon as it becomes available.

As most of you already know, attendance at the meeting is by prior application only and numbers are usually limited to 50 people.

By the way, we are hoping to provide a larger than usual quantity of "bring and buy" items this year!

## CAN YOU HELP?

The South Coast Repeater and Beacon Group will be manning a stand at the **Flight Refuelling Hamfest** on Sunday August 11th. The intention is to demonstrate the GB3SC# series beacons and related activities and also to raise funds towards the ongoing site rental, power and associated running costs . Any offers of equipment for sale would be gratefully accepted before or on the day.

Please contact John Fell. GOAPI, **[jfell@crydom.com]** if you can help in any way.

**DON'T FORGET**

**TO GO TO THE**

**TELFORD RALLY**

**SUNDAY, 1st SEPTEMBER 2002**

**Photo left:** A scene from one of the aircraft hangars at the Telford Rally last year. The microwave stand was manned here by David Hall, M0VZT (a.k.a. G8VZT) in the white shirt.

# ACTIVITY NEWS FROM THE WORLD ABOVE 1000MHz

A number of microwave records have been broken recently.....

### The 3.4GHz EME WORLD RECORD

Was extended on June 13 this year by OK1CA (JO70GM) who had a fine contact with Al Ward, W5LUA, operating from EM13QC . The mode used was CW. **Congratulations to all concerned.**

### A new World 10GHz Rainscatter Record

was also set in recent weeks. (Our thanks go to Jonathon, HB9DRD for the following details) ... On the 20th June 2002, DB6NI and DL6NCI (JO50VI) worked IW4CJM/P in JN72MA, **a distance of 961km**. There is some belief that the QSO was a mixture of sea ducting and rain scatter, although QSOs of over 700km were being worked over land at the same time.

DB6NI is DL6NCI's daughter and had been licensed for only three days at this point. What an introduction to amateur radio! The Italian had been active on on 3cm for 3 days when he made the QSO, a few days more than DB6NI. He was also heard in JO71AD by Rico DF2CK .That would have been over 1000km!

## UK ACTIVITY REPORTS ...

**From: John, G3XDY (Suffolk, JO2 square) [g3xdy@btinternet.com]**

A few interesting QSOs this past month ... One highlight was the **PA6FI/MM** expedition to **JO13** on 15th June, which resulted in a new square on 10GHz despite all the difficulties of accurately pointing a dish on a boat! See PA2DWH's website for more details: **http://www.qsl.net/pa2dwh/actual.htm**

Tropo conditions were up across the North Sea on the 18th June with PA3CEG in JO33 59 on all bands. Later that evening F1PYR/P (JN19) was worked on **10GHz rainscatter**.

My activity in the June 10GHz Cumulative was constrained by family activities, so I made just 5 QSOs, the best two being F6DKW and DL3YEE. Tests with stations inland were generally not very successful.

Portable activity on 23cm seemed quite poor in VHF NFD. Conditions within the UK were average, several tests with GM6MGS/P did not result in a QSO. EI7M/P (IO62) was heard weakly whilst working G3LQR but did not come back to a tail end call and a later test set up via 2m drew a blank. However, conditions to the South compensated, with F1ANH (IN88) using his EME dish to good effect on tropo. The highlight was F5KMQ/P in JN15JB who was 59 on 23cm and was also worked on 13cm for a new square, although a test on 3cm did not go. A few PA stations were also worked on 13/9/3cm as their contest is on all bands.

**From: Brian Coleman, G4NNS, (Andover) [BrianColeman@compuserve.com]**

I have been QRT on 10GHz EME due to a thrush nesting in the frame supporting the antenna! “Mum” held on tight when the antenna was turned slightly but panning down to the horizon was out of the question. Four young hatched and flew by Friday 14th June in time for the EME Sked Weekend. I heard I5PPE, and F2TU and worked OK1UWA (O - O report) who was a consistent signal throughout the weekend.

### Claimed Scores from M1CRO/P contest group (May 432+Up weekend) ...

**Submitted by Andrew, G6SPS, [andrew@g6sps.fsnet.co.uk]:**

**432MHz:** 182 QSOs: Best dx OK1KIM (JO60RN) 859km
**1296MHz**: 72 QSOs: Best dx OL2C (JO70SL) 1004km
**2.3GHz**: 28 QSOs: Best dx DL0PVD (JN49BO) 542km
**3.4GHz**: 13 QSOs: Best dx DK2MN (JO32PC) 412km
**5.7GHz:** 14 QSOs: Best dx DK2MN (JO32PC) 412km
**10GHz**: 22 QSOs: Best dx DJ6JJ in (JO31LG) 397km
**24GHz**: 2 QSOs: Best dx PA6C 375km

## Meet the Microwavers …

### John Hazell, G8ACE/P

This photo shows John on Walbury Hill, IO91GI during the April Millimetre Bands Contest. Shown here are his 24 and 47GHz transverters, mounted on sturdy tripods. This gear may be small in terms of wavelength but it still needs strong mechanical support if it is to withstand the windy weather often experienced on UK hilltops.

Many readers will already know John through his articles in the Microwave Newsletter. He is a prolific experimenter and home constructor, particularly in the field of millimetre power amplifiers and high stability local oscillators. Formerly working in television, he is now enjoying the freedom of retirement at his home base of Winchester.

John, along with G3PYB, G8BKE and G3FYX, have created and extended several millimetric records over recent years.

**From: Neil Whiting, G4BRK (Nr Swindon) [neil@thewhitings.freeserve.co.uk]**
I now have the 3cm system with SSPA running about 8W at feed and have had some good rainscatter QSOs over the past month or so. I got the system installed the day after the May cumulative. The new DB6NT transverter seems to work well but I need to fix a frequency stability problem (the LO cycles ~500Hz over 20 seconds).

## BEACON NEWS …

**GB3MHX Upgrade … a note from John, G3XDY**

The 10GHz beacon GB3MHX (Martlesham) will be taken out of service at the end of July so that a 1W PA stage can be fitted. This should increase signal levels by ~10dB and make the beacon more useful as a guide to rainscatter conditions. Thanks go to Bob G4BAH and Sam G4DDK
for making this possible. We expect to bring the beacon back on line during August and will be keen to receive reports.

**From: Bryan Harber, G8DKK, Letchworth [bryan@harber.f9.co.uk]**
I was sad to hear that Tim, G3KEU has passed away. It is one fewer keen operator on the microwave bands.

I have been reasonably active in the RSGB Tuesday activity evenings, mainly the 23cm events. I have only been back on 10GHz since April but have been monitoring for rain scatter and other propagation every morning and most evenings. On the morning of Sunday 2nd June we had some tropo to the North from here and I heard GB3MLE(S) on 10GHz for the first time since late 2000 so pleased to find it is still there. GB3CCX continues to be a consistent signal here on 10GHz especially under rain scatter, and other beacons heard so far are: GB3SWH (all the time), GB3SEE (tropo and RS) and GB3CEM (mainly RS). I have not yet heard the new GB3SCX beacon but do not have much of a take-off that way.

## JUNE 10GHz CUMULATIVE REPORTS ...

### From: Andrew Hutley [andrew@g6sps.fsnet.co.uk]

Sunday did not get off to a good start from JO01IT. An eleventh hour call from our Parish Priest meant that I was called in a week early to provide the musical accompaniment to the weekly service and eventually reached the shack at around 12:15 having assembled the mast and antennas on the Saturday.

I seemed to struggle to hear any stations on 2m and several calls to those heard resulted in no responses, even when calling in CW. Eventually I found G4ZXO/P and completed easily with Peter on SSB, followed by his colleague G4WYJ/P at the same location, on CW.

After a long gap, interspersed with calls on 144.175MHz & 144.390MHz, G3UYM/P was located and much to Harold's surprise we exchanged excellent CW reports of 599 & 589, reverting to SSB after exchanging details..

Another long gap ensued with a GW heard in the meantime but no QSOs resulting until hearing G4BRK. Neil was 52 on 2m but 599 on 3cm with a report of 559 given back to me. I noted the serial number given for the contact as 019 so obviously there was a good deal of activity that I just couldn't hear or make hear me. Maybe being over on the East Coast was, for once, not advantageous. Maybe folks did not know I was there and didn't look eastwards ?

I was looking forward to trying with G3PHO/P and some of the other Northern stations but sadly nothing was heard very far north all day and I eventually had to call a halt at around 1600 GMT.

So, I managed a total of 4 stations - two of which were in the same location – but an interesting and enjoyable afternoon nevertheless.

### From: Peter Day, G3PHO/P (Houndkirk Moor, South Yorkshire, IO93EH)

This was my first trip to Houndkirk Moor, since last year. It is an excellent off-road site in many respects and is only 15 minutes drive from home. Instead of my usual 10 foot mast, I put the 1.2m prime focus dish on an EMI Outside Broadcast tripod since it is easier to erect single handed and is less metalwork to carry around in the van. This was the same arrangement that I used from the Isle of Wight in May. I intend to use it again in the 10GHz only events, reverting to the mast support for the all band contests when the tripod will be used with a 1m offset dish for 5.7GHz and 24GHz.

Conditions on 10GHz were very poor indeed during the morning. This has been noticed before when the weather was windy. Several, normally easy contacts were not made at the first attempt and some thought was given to the gear being faulty. This is a dangerous thought when out portable as the temptation is to go into the transverter with a trimming tool! If you are ever tempted to do this in the field then don't! The temptation was resisted and we plodded on, working only six stations by 1100z. Things started to improve after that and we were up to 20 contacts by 1338z. By the time we pulled the plugs at 1740, we had worked 32 of the 37 stations known to be active that day, a personal best. The stations that were unworkable earlier that morning were now relatively easy copy in the afternoon. What an interesting band is 10GHz!

It was very nice to work F6DKW (JN18CS) at 572km once again. Other welcome contacts included G4ALY/P and G8ACE/P who were operating side by side at Kit Hill, IO70UM, 363km away.

I was delighted to find a number of stations who had not been too active in the past had, once again, made the effort to come on. Nevertheless, I feel the average activity is down over the past two years by around 30%. Where have you all got to?

### From: John, G0API, (Dorset) jfell@crydom.com

I was pleased to finally work G3PHO/P during the June 10GHz event. I missed out on the May session as my 10 year old WDG-based masthead transverter RX decided to go intermittently deaf the day before - the Law of Sod applies yet again! I managed to find at least 4 separate joints on the RX striplines that looked to be totally dry/devoid of solder and should by rights have killed it off but after reflowing it was still deaf! No amount of mechanical pokes could cause the fault to lift . I had the system in bits in the shack for the best part of 2 weeks before finally removing all old solder and reflowing ALL component joints. That seemed to do the trick and touch wood it works better than ever - this was the same system (untouched) that had worked quite a few stations off the Moon in 1994 .....

However during the second Cumulative I managed to get on for a few hours and worked 18 stations from home at IO80XS77. These included F1GHB/p and F6DKW, who was probably the best dx for the day and over a difficult path for me due to local rising ground to the SE.Conditions were very poor over the northerly path from me - lifting marginally after lunch.

After reading G3PHO/P's comments in last month's Newsletter about hearing the GB3SC# beacons weakly from the IoW, I put the location details into the G4JNT Profile program and it showed that there were 2 obstructions on the 82km path to the beacons at IO80UU. One was at 228 metres asl and 2.5km away from Peter at his 177 metre asl site at IO90JO and the other 200 metres asl at 16.5km. Other than those, it's line of sight all the way. This also explains why I used to struggle working G4BCH when he was using that site at Ventnor!

**From: John Hazell, G8ACE/P [hazell@dsl.pipex.com]**

I worked a total of 12 stations in the Cumulative from **Kit Hill, Cornwall, IO70UM.** My thanks go to Ralph, G4ALY, for suggesting it would be ok to join him. My impression was that this site is better than Tintagel (a site I have used before) for the East, despite Dartmoor being in the way but Tintagel is better toward the N/NE. 250mW continues to amaze me where it will get to! The weather was a distinct improvement on that in May. We failed to hear any French stations though I have discovered since they were on 144.250MHz for at least some of the time. 144.390MHz was quiet when we tried.

**From: John Thompson, G3NWU [g3nwu@yahoo.co.uk]**

A short report of activity heard in the June 10GHz contest (all times are BST) and the stations were on 144MHz:

1015 hrd G4BRK on ssb calling cq (S2)
1028 hrd G0API from the south very weak.
1105 hrd on cw G3LRP and G3FYX calling each other.
1109 hrd G3PHO/P calling GM3NCY? on 144.185
1150 hrd G7EYT(?) calling cq
1159 hrd G4NNS Then the band went flat with only heavy local qrn In the afternoon hrd GW8AWM/P on 144.174MHz
1305 G3PHO/P calling ???? And then at 1540 G7EYT/P

I need to build up a really good 144.2Mhz cavity filter to remove all the pmr rubbish/whistles/arcing relays, etc. I have 12 Cellnet masts within 3 miles radius of home. How I wish I could get back on local moors again!!

## WHERE WERE THE WIDEBANDERS?

In spite of the promises made, the number of wideband FM only operators who appeared in the June 10GHz cumulative was minimal, to say the least! The only report we have of any attempt on the day to use the mode was between GW3ATM/P (IO81LS) and G8BKE/P (IO80RQ). The Kent lads never appeared, as did the promised half dozen from South Yorkshire. G3PHO/P took his old wb gear out to IO93EH but there was no one to work!

So, we now have the July 10GHz contest for the widebanders to show that they are really interested in being active and trying to join in with the rest of the 3cm "gang". They won't be able to complain that no one takes an interest in them if they fail to turn out this time! It's a pity the support was so low as we firmly believe that wb FM is an ideal entry route into 10GHz for beginners.

Well that's it for this issue. Please keep the reports coming in and please keep coming on the air.

**Monday night is Microwave Activity Night** so call CQ for microwaves on 144.175MHz then, and at other times. You could surprise yourself!

**Remember – A thousand receivers make no noise!**

# ACTIVITY TABLES

The following pages show the **All Time Squares/DX Ladder** and the **2002 League Table**. Entries for the latter so far this year have been very few! Please send in your scores for the League Table so that it becomes a more faithful representation of the activity that has taken place this year! Date required for both tables are as follows:

### ALL TIME SQUARES/DX LADDER:

Number of locator squares, countries and best DX worked per band. These must be from one location only. However, you can send in separate entries for different locations you have used. This applies especially to portable microwave stations. The scores are for all time operations.

### LEAGUE TABLE 2002:

Number of different callsigns worked this year, per band, together with best DX fo far, per band. The following are examples of 'different' callsigns — G9AAA, GM9AAA, GW9AAA, GI9AAA, GU9AAA, G9AAA/P, GM9AAA/P, F/G9AAA, F/G9AAA/P, and so on.... Two way contacts count as one point while a one way counts as half a point. You supply the basic data as above and our Excel spreadsheet does the rest!

**Up to date versions of these tables can be found on the World Above 1000MHz website: www.qsl.net/g3pho**

# ALL TIME SQUARES/DX LADDER

**Entries ranked on squares. In cases of a tie the countries score determines the final order.**
**Entries must be from defined locations. An asterisk (*) denotes UK record.**

| BAND | CALL | LOC | SQ | COUNTRIES | DX |
|---|---|---|---|---|---|
| 1.3GH | G3XDY | JO02OB | 123 | 23 | 1341 |
| | G4DDK | JO02PA | 73 | 16 | 1005 |
| | G8VOI/P | IO90MX | 66 | 18 | 1134 |
| | G8DKK | IO91VX | 32 | 10 | 797 |
| | G6XDI | IO91SM | 30 | 8 | 945 |
| | F1VBW | JN03SO | 30 | 4 | 825 |
| | G4LDR | IO91EC | 22 | 6 | 593 |
| | G0API | IO80XS | 21 | 8 | 687 |
| | G3FYX | IO81RM | 16 | 8 | 1165 |
| | GM4WLL/ | IO85NR | 9 | 2 | 488 |
| 2.3GH | G3XDY | JO02OB | 43 | 11 | 1179 |
| | G4DDK | JO02PA | 28 | 8 | 1005 |
| | G8VOI/P | IO90MX | 18 | 6 | 770 |
| | F1VBW | JN03SO | 18 | 1 | 825 |
| | G4LDR | IO91EC | 10 | 2 | 444 |
| | G3FYX | IO81RM | 7 | 2 | 521 |
| | G6XDI | IO91SM | 6 | 1 | 183 |
| | G8DKK | IO91VX | 6 | 1 | 174 |
| | G8BKE/P | IO80RQ | 1 | 1 | 114 |
| 3.4GH | G3XDY | JO02OB | 15 | 3 | 506 |
| | G4DDK | JO02PA | 9 | 5 | 754 |
| | G8VOI/P | IO90MX | 8 | 1 | 214 |
| | G3FYX | IO81RM | 4 | 3 | 487 |
| | G3FYX/P | IO91GI | 2 | 1 | 92 |
| | G8BKE/P | IO80RQ | 1 | 1 | 114 |
| 5.7GH | G8VOI/P | IO90MX | 17 | 5 | 730 |
| | F1GHB/P | IN88IN | 12 | 4 | 730 |
| | G4LDR | IO91EC | 11 | 3 | 436 |
| | F1VBW | JN30SO | 7 | 1 | 665 |
| | G3FYX/P | IO91GI | 6 | 2 | 335 |
| | G4DDK | JO02PA | 3 | 3 | 233 |
| | G8BKE/P | IO80RQ | 2 | 2 | 242 |

| BAND | CALL | LOC | SQ | COUNTRIE | DX |
|---|---|---|---|---|---|
| 10GHz | G3WDG | IO92RG | 55 | 16 | 1135 |
| | G4KGC | IO92RG | 52 | 15 | 1135 |
| | G4FCD | IO91KX | 47 | 13 | 1062 |
| | G4DDK | JO02PA | 41 | 14 | 1005 |
| | G4BRK | IO91DP | 41 | 13 | 1115 |
| | F1HDF/P | JN18GF | 35 | 6 | 867 |
| | G3GNR | IO70WT | 34 | 11 | *1275 |
| | G3XDY | JO02OB | 34 | 11 | 1012 |
| | G3FYX/P | IO91GI | 34 | 10 | 787 |
| | G8VOI/P | IO90MX | 33 | 8 | 753 |
| | G8APZ | JO01DO | 30 | 10 | 1026 |
| | G4LDR | IO91EC | 30 | 8 | 1118 |
| | G3JMY | IO81RM | 28 | 8 | 1137 |
| | G4BCH/P | IO90JO | 25 | 7 | 1177 |
| | G3FYX | IO81RM | 24 | 8 | 1137 |
| | G4EAT | JO01HR | 24 | 8 | 721 |
| | G3UYM/P | IO92XA | 22 | 6 | 522 |
| | G3PHO/P | IO93EH | 21 | 5 | 586 |
| | G3JMB/P(i) | IO90TV | 21 | 5 | 368 |
| | G8DKK | IO9VX | 20 | 6 | 578 |
| | G8LSD/P(i) | IO90TV | 20 | 5 | 384 |
| | G0API | IO80XS | 19 | 5 | 489 |
| | F1GHB/P | IN88IN | 19 | 3 | 431 |
| | G8DKK | IO91VX | 18 | 6 | 578 |
| | G4KNZ | IO91PJ | 17 | 6 | 1052 |
| | G8LSD/P(ii) | IO80WP | 16 | 4 | 385 |
| | G3JMB/P(ii) | JO01BB | 16 | 3 | 368 |
| | G8LSD/P(iii) | JO01BB | 16 | 3 | 368 |
| | G4MAP | IO82WJ | 16 | | 309 |
| | G3UKV | IO82RR | 15 | 7 | 494 |
| | G4JNT | IO90IV | 14 | 4 | 339 |
| | G4RFR/P | IO80UU | 14 | | 414 |
| | G3ZME/P | IO82QL | 13 | 4 | 357 |
| | F1VBW | JNO3SO | 13 | 1 | 665 |
| | GW4MAP/P | IO82JG | 11 | | 311 |
| | G0IVA/P | IO83XF | 10 | 3 | 304 |
| | G0API/P | IO80UU | 8 | 2 | 277 |
| | G0JDL | JO02UK | 7 | 3 | 415 |
| | G8BKE/P(ii) | IO80XP | 7 | 2 | 248 |
| | GM4JJJ | IO86GB | 6 | 2 | 323 |
| | G3PHO | IO93GJ | 5 | 3 | 748 |
| | G0WZV/P | JO?? | 5 | 3 | 279 |
| | G8BKE/P(i) | IO80RQ | 4 | 2 | 242 |
| | G3JMB | IO91WA | 4 | 1 | 87 |

| BAND | CALL | LOC | SQ | COUNTRIES | DX |
|---|---|---|---|---|---|
| 24GHz | G4DDK | JO02PA | 7 | 3 | 268 |
| | G3UYM/P | IO92CA | 6 | 2 | 182 |
| | G3WDG | IO92RG | 5 | 2 | *391 |
| | G3FYX/P | IO82JG | 5 | 1 | 141 |
| | F1GHB/P | IN88IN | 4 | 2 | 158 |
| | G3PHO/P | IO93AD | 4 | 2 | 128 |
| | G4KNZ/P | JO02TD | 3 | 2 | 173 |
| | G4FCD | IO91KX | 3 | 1 | 154 |
| | G8VOI/P | IO90MX | 3 | 1 | 88 |
| | G3GNR/P | IO80AQ | 2 | 2 | 154 |
| | G8BKE/P(ii | IO80WX | 2 | 1 | 81 |
| | G8BKE/P(i) | IO80RQ | 1 | 1 | 100 |
| 47GHz | G3FYX/P | IO81XW | 4 | 1 | 136 |
| | G4KNZ/P | IO92CA | 2 | 1 | 117 |
| | G3UYM/P | IO92CA | 2 | 1 | 65 |
| | G8BKE/P | IO90MX | 1 | 1 | 78 |
| | G4DDK/P | JO???? | 1 | 1 | 39 |

**UPDATED TO 10 JULY 2002**

UPDATED:2002-07-17

# Microwave League 2002

| Callsign | 1.3G Wkd | 1.3G Dx | 1.3G Score | 2.3G Wkd | 2.3G Dx | 2.3G Score | 3.4G Wkd | 3.4G Dx | 3.4G Score | 5.7G Wkg | 5.7G Dx | 5.7G Wkd | 10G Wkd | 10G Dx | 10G Score | 24G Wkd | 24G Dx | 24G Score | 47G Wkd | 47G Dx | 47G Score | 76G Wkd | 76G DX | 76G Score | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **G3XDY** | 106 | 788 | 3205 | 41 | 788 | 3115 | 17 | 500 | 1932 | | | | 43 | 500 | 2338 | | | | | | | | | | 10590 |
| **G3PHO(/P)** | 19 | 255 | 185 | | | | | | | 5 | 227 | 1574 | 45 | 572 | 2799 | 11 | 139 | 1359 | | | | | | | 5917 |
| **G4BRK** | 43 | 601 | 991 | 14 | 601 | 811 | 2 | 427 | 194 | 2 | 185 | 513 | 4 | 122 | 53 | 7 | 112 | 696 | | | | | | | 3258 |
| **G8DKK** | 38 | 381 | 555 | 6 | 143 | 82 | | | | | | | 14 | 196 | 298 | | | | | | | | | | 935 |

| BAND | | | | | | |
|---|---|---|---|---|---|---|
| **SCORING CALLSIGNS** | 4 | 3 | 2 | 2 | 4 | 2 |
| **AVERAGE DX** | 506 | 510 | 463 | 206 | 347 | 125 |
| **AVERAGE CALLS** | 51.5 | 20.3 | 9.5 | 3.5 | 26.5 | 9.0 |
| **TOTAL SCORING CALLSIGNS** | 4 | | | | | |

**BAND SCORE CALCULATED =** No. OF STATIONS WORKED / AVERAGE No. OF STATIONS WORKED **X** MAX. PERSONAL DX WORKED / AVERAGE DX FOR THE BAND **X** 1000

**UPDATED 10 JULY 2002**

**See January 1999 Microwave Newsletter for Rules**

**Compiled by G3PHO**