An Amateur Radio publication for the Microwave Enthusiast

# scatterpoint

Formerly the RSGB Microwave Newsletter and now published by the UK Microwave Group

**2004 NOVEMBER/DECEMBER**

Martlesham uWave Round Table Meeting ~ November

Photo by G4ALY

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- Plus repeater and beacon news, want ads and general announcements


## MARTLESHAM 2004 — RECORD ATTENDaNCE!

**Was this the best one yet? See inside for A full report**

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## A BIG "THANK YOU" TO THE FOLLOWING MICROWAVERS WHO HAVE DONATED FUNDS TO THE GROUP OVER RECENT MONTHS…

| | |
|---|---|
| **G4NNS** | **GW3XYW** |
| **G8ROU** | **G8CKN** |
| **G3LTF** | **GI7UGV** |
| **G8UBN** | **G0OLX** |
| **G3JKX** | **G3RUH** |
| **G3RMX** | **G2HIO** |
| **ON1ABU** | **G3RQZ** |

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: Email: microwaves@blueyonder.co.uk

G3PHO: Peter Day ++(0) 114 2816701

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

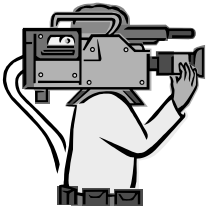
## WELCOME TO THESE NEW MEMBERS OF THE UK MICROWAVE GROUP…

**The following microwavers have joined over the past month**

| | |
|---|---|
| **G6XM** | **Bill** |
| **G1RDX** | **Steve** |
| **G8PNN** | **Gordon** |
| **WA5JAT** | **James** |
| **AA9IL** | **Mike** |
| **GM3JIJ** | **Jon** |
| **W5UWB** | **John** |
| **G3YKI** | **Ken** |
| **WB6RWU** | **Allen** |
| **G0NZO** | **Julian** |
| **G8DQX** | **Robin** |
| **DL6YEE** | **Klaus** |
| **DB6NT** | **Michael** |
| **ON6UG** | **Freddy** |
| **G8ROU** | **Dave** |
| **G3WFK** | **John** |
| **G4DZU** | **Doug** |
| **G7MFO** | **Richard** |
| **M0EDU** | **Mike** |

**David Anderson (Birmingham)**

**SUBSCRIPTION ENQUIRIES SHOULD BE SENT TO THE UKuW GROUP SECRETARY AT THE ADDRESS SHOWN AT THE TOP OF THIS PAGE**



## NEW 13cm ATV REPEATER NOW ON THE AIR ...

**GB3BH**, the new 13cm ATV repeater, was activated on the 5th November 2004.
It is currently just transmitting a test card, we hope to be in full repeater mode by the end of the year.

**Locator**: IO91TP (South of Watford)
**ERP:** 100 W
**Antenna:** Omni, Horizontal
**Antenna Height:** 200 m a.s.l.
**Modulation:** 16 MHz analogue FM
**Times:** 08.00 hrs to 01.00 hrs GMT (18hrs on, 6hrs off)

See our web site **http://www.gb3bh.com** for more info.

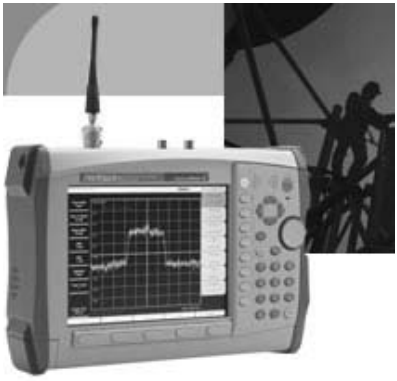
**I would appreciate any reception reports.**
**Regards, Dave, G8ADM**

## Microwave Beacon Applications

**Graham Murchie, G4FSG**, who is our beacon contact man and to whom you should end in beacon applications for onward transmission to RSGB,has recently left BT and has changed his email address to:

**graham.murchie@btinternet.com**

Please use this for future communications or write to him at his Callbook address.



## PLEASE SANTA !

### Could you bring me one of these for Christmas?

Well, we can all live in hope that one day we'll be able to own one of the superb Anritsu hand portable 7GHz spectrum analysers shown above! Compared with your scribe's HP ("Hernia Popper") 141T system, it shows just how far modern test gear has progressed.

## DDS Driver software

I now have a piece of driver software (Windows 98 onwards) for controlling the AD9852 DDS Board over the serial link. I've lost track of who purchased a kit from me in the past (in spite of trying to keep a list), so, if I haven't yet sent you a copy of the program yet and you want one, please contact me direct.

The basic small .EXE file will run if you already have VB or possibly other amateur radio progs on the machine. Otherwise the complete installation is in a 1.7Meg package.

**Andy, G4JNT <actalbot@southsurf.com>**

### FOR SALE WR42 (WG20) Waveguide Brass Flanges 24 GHz

A very large quantity of silver-plated brass flanges in WR42 UG-595/U (WG-20) 18 to 26.5GHz cover flange for the 24GHz band.These are clean, ready to solder brass flanges in excellent condition for your K-band projects. The waveguide fits into this flange and butts up against the inside of the flange so you do not have waveguide exposed at the flange interface. Price is US$6.00 per flange plus shipping. Shipping costs will be dependent on quantity purchased.

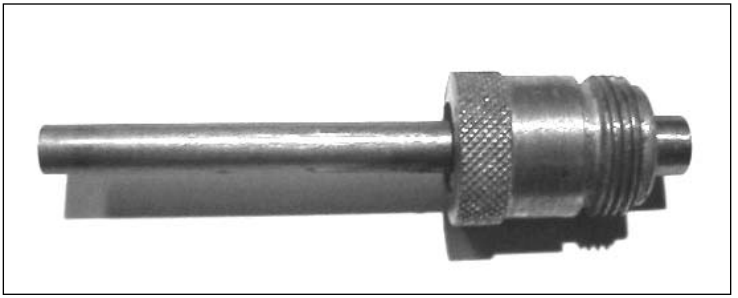
I ship UPS, USPS or Fedex and will ship internationally as well.....**please write**. Shipping costs for up to about 20 flanges to France or UK is $5.00 by Global Priority Mail...up to about 50 flanges for $9.00 GPM (Global priority flat rate envelopes not available for all countries) **please write**.

Check my eBay screen name n6ax to see my feedback (all positive) and order with confidence.

**Please email direct to n6ax@speakeasy.net** ..... **Many Thanks John, N6AX**

# A Circular Waveguide to Type N Adaptor For 47 GHz Power Measurements

K. Banke, N6IZW, San Diego Microwave Group



As I started getting my feet wet with experiments on 47GHz and above, I was looking for a way to roughly measure power. I have an HP436A, Giga-tronics 8540C, and PMI 1018B, all with heads rated to 18GHz . The questions were would any of these heads respond at all to 47GHz, how would I couple 47GHz to the power head and how could I do a rough calibration?

The calibration turned out to be fairly easy as Will Jensby, W0EOM, loaned me a multiplier module for which he had measured the power output. The experiments that myself and Don Nelson, N0UGY, had been performing mostly used 0.188 inch ID hobby tubing as circular waveguide so I needed a transition to the type N connectors on my power meters. The one thing I wanted to avoid was adding any more probes & transitions to increase losses and aggravate the moding situation. I came up with this approach that is very crude but effective.

The basic concept is to have the circular waveguide slip concentrically over the centre pin of the male type N connector, without touching it. I did this by cutting a Type N double Female (bullet) in half and drilling out the center to hold the outside of the .188 ID tubing. The tube is located so that it is concentric with the center pin and set in length to just seat against the rear of the connector on the power meter when tightened by hand.

I have no access for equipment to sweep frequency to see the effects of moding so here are my findings at 47GHz. The Giga-tronics reads 10dB low, the HP head is closer to 20dB low and the PMI doesn't respond at all (>20 dB low). The Giga-tronics responds at 76GHz as well but I currently have no way to check the calibration.

Hopefully this will encourage others to try their power meters at millimeter wave frequencies.

# MARTLESHAM MICROWAVE ROUND TABLE 2004 — the best yet?

That's what many have been saying in their emails and letters! There's no doubt that the two day event was a roaring success and the new format of lectures and activities on both Saturday and Sunday attracted record numbers of attendees on both days. All the talks were well attended and received but it's not the place here to single out anyone talk in particular. The variety of talks (see last month's Scatterpoint for the programme of talks) seemed to offer something for everyone.

The trade tables and Bring and Buy were doing good business from 9.30am on the Saturday! There was a wide range of surplus items available and the general consensus (only one negative report in dozens of favourable ones received!) is that there was a excellent choice of items. It was very pleasing to see our German microwave friends come over, bringing goods for sale. Rainer, DF6NA, had an interesting table of "goodies" and we hope he found his trip worthwhile.

One of the highlights of the weekend was the Prize Draw and Auction. This had been arranged only a week before the event since a surprise (and very generous) donation was received from Paul Drexler, W2PED. He sent the UKuG one of his 3 watt 24GHz power amplifiers to be used as the Group thought fit. We decided to auction it to the highest bidder on Sunday lunchtime and it raised the excellent sum of £170 (Paul sells these at US$425 by the way). The PA was bought by G4BAH who, most generously, immediately announced it was to be given to the Martlesham Radio Society to be added to the 24GHz beacon at Adastral Park! Paul Drexler is delighted that his amplifier is to be used this way, helping many microwavers rather than one only. The amp wasn't the only item for auction as Wood and Douglas donated a brand new Graphic Equaliser/mixer, while Iain, G4EZP donated one of his new transverter control boards he and G4FUF have recently developed and Peter, G3PHO, gave a Wiltron microwave VSWR Bridge.

The Prize Draw was held later that afternoon and consisted of a range of less valuable items than the amplifier(!) but nevertheless generously given by several of the traders and other attendees. Michael, DB6NT supplied bags of useful components for the draw and other donations were gratefully received from DL6NCI, John Denby, G3PHO, G4PBP and G8UBN.

Outside, on both days, Sam Jewell, G4DDK ran the antenna test range and some interesting results were obtained on bands up to 24GHz. A list of results will appear in the next issue of Scatterpoint.

Saturday night was set aside for what is now an annual event ... the Microwave Dinner. Held at the Courtyard Marriott Hotel, not far from Adastral Park, and the overnight accommodation for most of us, it was a nice meal and was rounded off by an interesting and humorous after dinner speech by our "honorary Brit" Kent Britain, WA5VJB. Apparently some stayed on in the bar well after midnight!

The organisation of the event seemed to go very well indeed apart from a "senior moment" in the lecture hall when neither the lecturer, the chairman or the "master of ceremonies" could persuade the DVD player to work for ON6UG's lecture ..... and with around 60 qualified radio amateurs in the hall! The UK Microwave Group committee arranged the two-day activity programme while Martlesham Radio Society sorted out test gear, hotel accommodation, the hotel dinner and the catering at Adastral Park and general administration. In addition they set up the online registration. Our thanks go to all who helped and in particular to two "unsung heroes", Robin Gape on the registration desk (he did a sterling job over the two days and sold loads of raffle tickets) and Iain whom attendees will recognise as the man with the food. He produces excellent sandwiches and drinks for us, year after year, even though he is not a microwaver. Thanks also to all the speakers, traders and visitors for helping to make what some have already called "the best one yet".

That said, the organisers have several ideas for even further improvements, so make sure you attend next year!

# MARTLESHAM MICROWAVE ROUND TABLE
# 13/14 NOVEMBER 2004
# N0ISE FIGURE MEASURING RESULTS

| Band | Callsign | System | Gain (dB) | NF (dB) | |
|---|---|---|---|---|---|
| **70** | G4ZTR | Spectrum Transverter | 8.5 | 4.80 | |
| **144** | G3LTF | ATF54143 high dynamic | 26.2 | 0.29 | |
| | G3LQR | ATF54143 high dynamic | 23.3 | 0.38 | |
| | G3IRQ | SSB Electronics ultra low noise preamp | 23 | 0.48 | |
| | G4DZU | H/B W6PO design | 19.5 | 0.80 | |
| **432** | G4KBC | ATF54143 boxed ATC input cap | 21.2 | 0.38 | |
| | G3LQR | ATF54143 | 20.2 | 0.40 | |
| | G3LTF | ATF54143 | 21.3 | 0.40 | |
| | G4KBC | ATF54143 unboxed | 22.7 | 0.60 | |
| | G4KBC | CF300 | 15.1 | 1.03 | |
| | G4KBC | ATF5413 boxed with ATC input cap | 21.31 | 0.41 | using MRS 5dB ENR Source |
| | G4KBC | ATF5413 boxed with ATC input cap | 21.24 | 0.43 | using G3SEK 9dB ENR source |
| **1296** | G3LTF | NE334 ATF10136 2 stage | 28.4 | 0.45 | |
| | G4DZU | WD5AGO preamp | 32.9 | 0.48 | |
| | G3LQR | ATF13484 | 23 | 0.50 | |
| | G4DZU | WD5AGO Mk2 | 30.6 | 0.52 | |
| | DL3IAS | DJ9BV | 15.2 | 0.58 | |
| | G4DZU | DJ9BV | 15.3 | 0.65 | |
| | G3LQR | WD5AGO NE325 | 24.5 | 0.66 | |
| | G3LQR | 2 stage WD5AGO FHX05 | 22.7 | 0.80 | |
| | G4DZU | Angle Linear preamp | 13.8 | 0.93 | |
| **2320** | G3LTF | ATF36077 | 16.1 | 0.40 | |
| | G4NNS | DB6NT Transverter MKU23G2 | 31.4 | 0.66 | |
| | G3LQR | NE325 | 13.1 | 0.85 | |
| | G3LQR | DJ9BV No2 | 11.6 | 1.84 | |
| | G3LQR | DJ9BV | 9.7 | 1.86 | |
| | G3LTF | MGA86576 + Interdigital Filter | 23.5 | 4.10 | |
| | G3XDY | G8LMW transverter + Interdigital filter | 7.9 | 8.60 | |

| Band | Callsign | System | Gain (dB) | NF (dB) |
|---|---|---|---|---|
| | | | | |
| **3,400.00** | G3LTF | ATF36077 DJ9BV Preamp | 16.90 | 0.90 |
| | G3LQR | DJ9BV Preamp | 15.00 | 1.15 |
| | G4BRK | Transverter & relays | 18.50 | 1.25 |
| | G3XDY | Transverter & Relays | 19.60 | 1.58 |
| | G3LQR | 2 stage ATF36077/FHX05 | 17.50 | 2.10 |
| | G3LQR | DJ9BV Preamp FHX05 | 7.40 | 3.00 |
| | | | | |
| **5,760.00** | SM7FWZ | Homemade DB6NT transverter | 24.00 | 0.90 |
| | G4BRK | DJ9BV & tvtr, no relay | 18.70 | 1.18 |
| | G4HUP | DJ9BV NE325 | 10.60 | 1.29 |
| | G3XDY | Homemade DB6NT transverter & relay | 20.50 | 1.48 |
| | M0EYT | DB6NT transverter & relay | 19.00 | 1.75 |
| | G4BRK | HEMT DJ9BV & DB6NT tvtr | 18.00 | 1.92 |
| | G4BRK | DB6NT tvtr only | 6.50 | 6.50 |
| | | | | |
| **10,368.00** | G3LQR | Single stage preamp | 9.40 | 0.98 |
| | G4ZXO | DB6NT tvtr only | 26.90 | 1.20 |
| | G4ZXO | DB6NT Transverter & preamp | 40.70 | 1.45 |
| | G3LQR | Two stage preamp | 21.50 | 1.60 |
| | G3LQR | ATF36077 | 12.90 | 1.66 |
| | G4WYJ | DB6NT transverter without relay | 14.60 | 1.67 |
| | G3XDY | DB6NT transverter | 20.50 | 1.68 |
| | M0EYT | DB6NT tvtr and wg transitions | 20.61 | 2.17 |
| | G4WYJ | DB6NT transverter | 14.50 | 2.26 |

## UK MICROWAVE GROUP COMMITTEE FOR 2004 –2005

**At the AGM, held at Martlesham this year, the following microwavers were elected to serve on the UK Microwave Group Committee until November 2005. Two new members were elected to replace retiring members G4KLX and G8OGO.**

| | |
|---|---|
| **Chairman:** | Peter Day, G3PHO (and Scatterpoint Editor) |
| **Secretary:** | Martyn Kinder, G0CZD |
| **Treasurer:** | Steve Davies, G4KNZ |
| **Other members:** | Murray Niman, G6JYB (Webmaster**)** |
| | Sam Jewell, G4DDK (also RadCom Microwave Columnist) |
| | David Wrigley, G6GXK |
| | Simon Lewis, GM4PLM |
| | Kent Britain, WA5VJB |
| | David Powys, G4HUP (* New member) |
| | Paul Marsh, M0EYT (* New member) |

# UK MICROWAVE GROUP ANNUAL GENERAL MEETING ANNUAL REPORTS

**The Annual General Meeting of the UK Microwave Group was held at the Msrtlesham Round Table on the 14th November 2004. Approximately 70 people attended the meeting. Here are the reports presented to the membership that morning.**

## (1) CHAIRMAN'S REPORT

Since our last AGM in November 2003, the UK Microwave Group has made excellent progress towards its ambition to become a more than just a group of like-minded individuals who gather together a few times a year for a chat and a few talks on their hobby. UKuG can now confidently say it is the representative body for UK microwavers. At the time of writing this report there were almost 250 paid up members on our books, well over twice what it has been in past years. Not all of these are in the UK of course and we are delighted that we appeal to microwavers the world over ... so much so that we now have members in 19 DXCC countries, from as far away as New Zealand, Australia and Japan, to the USA and our Continental neighbours in Western Europe. Indeed, the day may come when we might wish to change our name to something with a more international flavour!

On taking the Chair last November, my immediate task was to liaise with the RSGB Board to arrange the transfer of the Microwave Newsletter to the UK Microwave Group. This change has given the Group an increased relevance to UK microwavers. Although Scatterpoint had been published on a quarterly basis in the three years or so before the change over, the Group needed to have a more frequent newsletter for its members, one that would not be in competition with, or duplicate the work of any other similar publication. The changeover was approved with surprising ease, the RSGB even agreeing to the transfer all outstanding Microwave Newsletter subscription money and the subscription list over to the UKuG by the 1st of June this year. The subscription list formed the basis of our present database. There has been a little subscriber wastage since a few former RSGB subscribers decided not to renew their subscription on the changeover. Happily, this loss of old membership has been compensated for several times over by the influx of new members, especially from overseas.

The first edition of the new Scatterpoint came out in July/August. Apart from a bulk email problem with the October edition, the emailed PDF version of the newsletter has been very popular with about twice as many electronic Scatterpoints being delivered than paper ones. We have been asked to produce the email version on colour but this makes for a much larger file to be sent via the Internet and our members with a pay-by-the-minute dial up service would not be happy! The paper edition of Scatterpoint is printed by Mensa Printers of Sheffield. They are extremely obliging and charge modest rates, with no lower print limits. You will have already noticed the tremendous improvement in print quality when compared with the old RSGB Microwave Newsletter which was run off a Xerox machine! This high print quality is due to Scatterpoint being handled digitally all the way from the editor's desk to the printshop.

Your committee has also been busy with several other matters. By April this year we had become an Affiliated Society to the RSGB, believing that is much more desirable to be part of RSGB than to be outside it. This brings us several benefits in addition to the monthly RadCom received by our secretary! A particularly important one of these is that we have a direct line into the RSGB's Spectrum Forum, the body which has replaced the former spectrum committees such as Microwave and VHF. In fact we, as a special interest group, appear on the Spectrum Forum organizational chart that you can see on visiting the Forum's website. This means that we are now accepted as an important group, to be consulted whenever relevant spectrum issues come up to Forum's notice. This is possible a unique arrangement between a special group, parent society and a regional authority ---- certainly in Europe if not in the World.

As chairman, I am in frequent email contact with Mike Dixon, G3PFR, the RSGB Microwave Manager. He is a 'voice in the wilderness', trying extremely hard as a lone microwaver to carry the microwave torch into the lobbies of RSGB, OFCOM, IARU and other such organizations. However, for him to feel really effective and confident that he represents you, the UK Microwaver, he needs to hear much more from you, directly and via this committee! The UKuG Committee is presently preparing a number of papers for Mike to take to the IARU Region 1 meeting in early 2005 but we have a similar problem to Mike in that we don't hear much from you the members. Mike has detailed many of the problems facing the microwave spectrum, both now and in the near future. Please feel free to send your views and aspirations to him, not forgetting to include the Group Committee in your mailing list.

The transfer of the Microwave Newsletter to the Group also coincided with the transfer of responsibility for

microwave contests and trophies. The Group now administers the long-established 10GHz and 5.7GHz Cumulatives, millimetre band contests and those for the three lowest microwave bands. We offer unique certificates and trophies for achievement in these competitions. However, the Distance and Squares Awards remain the responsibility of the RSGB, as does the 10GHz Trophy Contest, held in May each year.

Last year, the Committee announced its intention to produce information for the newcomer to microwaves. The preparation of a CD is well under way and we hope to be able to announce more details in the near future. In the same same vein, we have established a network of "microwave elmers" across the UK. These are experienced microwavers who are willing to help any microwaver in their region by offering advice and use of their often quite sophisticated test equipment. The list can be found on our website: **www.microwavers.org**

Now a few words about our Committee: I am greatly indebted to our Secretary, Martyn Kinder, G0CZD and Steve Davies, G4KNZ, our Treasurer. They have worked tirelessly over the past months to make sure the UK Microwave Group got off to a good start in its revitalized form. This has involved almost daily emails, sometimes several per day, going backwards and forwards among the three of us. Our "Press Officer" is, by default, Sam Jewell, G4DDK. He is the Microwave Columnist for the RSGB's RadCom magazine and is ideally placed to publicize our side of the hobby to the 'uninitiated masses' beyond this Group. I greatly value his contribution in this field. I would also like to thank our webmaster, Murray Niman, G6JYB. He has produced a vibrant and valuable website that shows off the best aspects of our Group. Our other committee members have also been of great value over the past year and I thank them very much for their work.

A few weeks ago, in mid-October, Sam and I, together with five other UK microwavers, had the great pleasure of attending the famous Microwave Update in Dallas Texas (which incidentally is also the home of our overseas committee member Kent Britain, WA5VJB). Apart from having a fantastic time over there, we hope we tried to represent the rest of you and show our American friends how we do microwaves over here in Europe. We think we may have succeeded because I already have had five well-known US Microwavers tell me they are very keen to come over to Martlesham next year! This is good news for all of us as it lifts our profile worldwide when the likes of Al Ward, W5LUA, want to come to our version of Update!

Thank you all for your support over the past months.
The future is bright ... the future is UKuG !

**Peter Day, G3PHO, Chairman UK Microwave Group**

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## (2) SECRETARY'S REPORT

Firstly, I would like to apologize for not being present today. I am currently working in Scotland and the conflicts of excessive travel, working away from home, amateur radio and the demands of family life was just too much - something had to give!

As the Chairman will have already mentioned, we now have over 250 signed up members. However, this is still a little less than the 300 or so subscribers that there were to the RSGB Microwave Newsletter and sadly, perhaps worryingly, there are still a few well known UK call signs missing although we also have quite a few new members, balanced equally from the UK and overseas.

I would like to thank all those who subscribed promptly, and mainly without question, when we re-launched back in July. It was important that members registered at that time and in a timely manner, as the requirements of the Data Protection Act means that members have to agree to their details being stored on a computer. All the user data we received was transferred from the RSGB's very poorly formatted Excel spreadsheet. The easiest way to achieve a clean transfer was by expiring everyone's RSGB subscriptions and then crediting them with their outstanding Microwave Newsletter subscription balance transferred from RSGB.

Additionally, many members took this opportunity to make an additional donation and for this I would like to offer my special thanks.

As you all will be aware, I devised a renewal letter advising potential members of their RSGB credit status and used e-mail extensively to notify people of this. However, it was clear that not everyone reads their e-mail or simply chose to ignore the letter. As far as I am aware, I only missed one member during the letter production and this has since been resolved.

Where an e-mail address supplied was incorrect (and the mail bounced) or not provided, I used "snail mail". This is an expensive and time consuming method of writing to people and if this were the only way to do the job, then, quite simply, I wouldn't do it. I just would not have the time. So, please understand and bear with me when I send reminders, renewals etc. by e-mail. All my mails are virus checked when written and then rescanned by my mail server before dispatch. So, very importantly, please check your e-mail and notify me

of any change in e-mail address.

I hope that from today's meeting there will be some initiatives to further the state and status of Microwave Radio in the UK and abroad. You are aware that there are a number of demands on our allocated microwave bandwidth and it is important that as a group we are seen by others to be leading and directing Amateur Microwave Radio in the UK. The group has limited funds to support initiatives but we need an active membership that will not only support and guide but more importantly help the committee achieve these initiatives and objectives. Ideally, to demonstrate our value and help justify our allocation, not only should these initiatives have benefit to the amateur community but they should also have quantifiable benefits to the scientific and/or the commercial community.

Regarding 2005, the Chairman has asked me if I am prepared to stand for the post for the next 12 months. Although the job would be better suited to someone who does not work 50 hours every week, I am prepared to stand again but would happily stand down if another volunteer can be found.

Finally, very many thanks to BT and Martlesham Radio Society for allowing us to host our AGM here. Enjoy your day.

**Best wishes from Martyn,G0CZD**

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## (3) Treasurer's Interim Report (this are the present state of the Group's finances since formal subscriptions were asked from on July 1st this year).

The Group's financial year is January-December but since we only began to accept subscriptions from the middle of this year, the balance sheet for 2004 does not represent a complete financial year and so it is presented this time as an interim statement only.

**UK Microwave Group Summary of Accounts 2004 Covering period 01/Jan/2004 to 31/Dec/2004**

| Item | Income | Expenditure | Balance | Notes |
|---|---|---|---|---|
| Opening balance 01/Jan/04 | | | 1312.20 | |
| Subscriptions | 2330.44 | | Incl. £1043.64 from RSGB | |
| Donations | 0.00 | | | |
| Other income | 0.00 | | | |
| Subscription refunds | | 22.96 | | |
| Newsletter printing & postage | | 227.21 | | |
| Other expenses | | 50.50 | | |
| Sub-totals | 2330.44 | 300.67 | | |
| Closing balance 05/Nov/2004 | | | 3341.97 | |

**Note: minimal activity pending agreement to take over RSGB microwave newsletter**

**S. J. Davies G4KNZ**
**Treasurer**

**Some donations were receive at the Martlesham AGM and do not appear on this balance sheet which was prepared before the meeting**

# Improving the Dual-band 10 & 24 GHz Feedhorn for Offset Dishes

**Paul Wade W1GHZ ©2004**

Operating multiple bands in the 10GHz and Up contest is difficult with separate antennas ... after locating a station on 10GHz and peaking the dish, we must start over on a higher band, usually with a narrower beamwidth. Using a dual-band feedhorn for 10 and 24GHz would very attractive; the dish may first be pointed and peaked up on 10GHz, then switched over to 24GHz with no repositioning required.

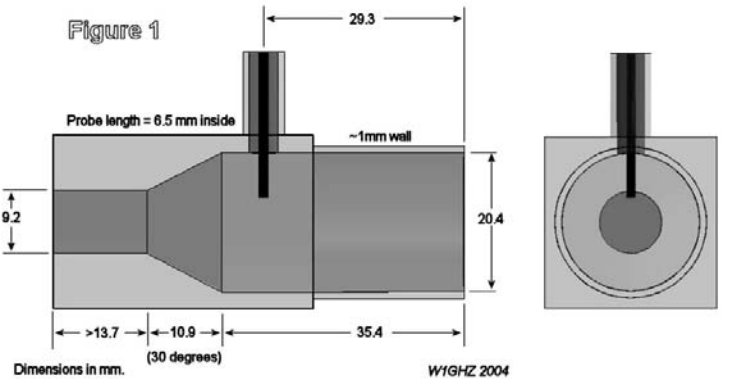
At Microwave Update 2001, Gary, AD6FP, and Lars, AA6IW, described (**1**) a dual-band 10 and 24GHz feedhorn for shallow and offset dishes. The design was based on previous work of W5LUA (**2**) and W5ZN (**3,4**) to develop a dual-band feedhorn more suitable for conventional deep dishes. With the offset dish, we have a distinct advantage – the equipment may be located very near the feedhorn without being in the radiation pattern, minimizing the large feedline losses at the higher microwave frequencies without decreasing gain. Other advantages include higher efficiency feedhorns, less critical focusing, and the ready availability of modest-sized DSS dishes with good surface accuracy.

Gary and Lars included computer simulated radiation pattern plots which look like potentially good feeds, but did not do dish efficiency calculations. However, they did include more important results – sun noise measurements and on the air performance! To calculate efficiencies, I took the published dimensions and resimulated. The results were good, so I wanted to make a feed.

## Dualband feedhorn operation

The basis of the dual-band feedhorn design is the W2IMU dual-mode feedhorn (**5**), dimensioned to feed an offset dish at 24GHz and excited from the rear with a circular waveguide section. For 10GHz, an excitation probe fed by an SMA connector is added on the side of the output section of the dual-mode horn. The tapered section of the dual-mode horn acts as a closed end at 10GHz, so that the output section behaves like a simple "coffee-can" feed at 10GHz. **Figure 1** is a sketch with the dimensions I used.

While the 24GHz dual-mode horn has a pattern suitable for an offset dish, the simple 10GHz horn has a much broader pattern**,** better suited to a deep dish, so it would have a lot of spillover feeding an offset dish. AD6FP improved the 10GHz performance by adding a conical horn to narrow the beam, and AA6IW enhanced it further by using a corrugated horn. The dual-mode horn is intended to eliminate edge currents in the rim of the horn, so the addition of the conical horn outside the rim has a much smaller effect at 24GHz. By varying the horn dimensions, it might be possible to make the patterns and efficiencies very close on the two bands. I had four different corrugated horns on hand, so I tried simulating with each of them. Results were promising, so I bored out the circular waveguide end of each horn on my lathe so that it could be slipped over the end of the dual-band horn.



## Construction

Gary and Lars built their horns with copper plumbing and hobby brass, soft-soldered together. I tried this construction, but wasn't happy with the dimensional accuracy, and it certainly didn't feel robust enough for rover operation. Then I experimented with turning the tapered section out of solid brass but found it difficult to get the taper right. Finally, I ran out of time before the 2003 contest and simply used a 25dB horn on 24GHz; at least it was easy to point.

Last fall, I was browsing through a tool catalog from MSC (**6**) and found some 60º countersinks (normal is 82º or more). This would make a 30º flare angle for the tapered section, while Gary and Lars used my HDL_ANT program to calculate a 27.8º taper angle. The 60º countersink would be an easy way to machine a 30º taper, but is 30º close enough to 27.8º ?

I simulated the horn with 30º taper using Ansoft HFSS software (**7**). The rear lobe is a couple of dB worse than with the 27.8º taper, but the calculated efficiency of 76% is close, and the best f/D is about 0.7, just right for a DSS offset dish. At 10GHz, calculated efficiency is still good, about 70%, but best f/D is about 0.38. At the 0.7 f/D needed for an offset dish, efficiency is down to about 47%, or nearly 2dB worse. A few additional trials at 24GHz suggested that a slightly longer output section might be a little better, if the countersink were long enough, but the improvement was not significant.

Another problem is that the nearest countersink size is ¾ inch, or 19.05 mm. I simulated with the inner diameter of the output section reduced from 20.4 mm. This change did not work well at all — the larger diameter is required.

The other mechanical problem is robust feedline attachment: WR-42 waveguide for 24GHz and an SMA connector for 10 GHz. Using brass or copper for the feedhorn would allow soldering, but both are heavy and expensive. Turning the feed from aluminum rod was the best choice, but the size would have to be large enough for the WR-42 hole pattern: 7/8" square, or 1.25 inch diameter. I found that 1" square aluminum was readily available in short lengths, so I ordered some, along with a ¾" 60º countersink. After a couple of hours with the lathe, my first attempt is shown **in Figure 2.** The machining was possible, but the ¾" countersink diameter is smaller than the 20.4 mm inner diameter that a small shoulder was left. I fiddled with a boring bar to minimize the shoulder so that I could at least measure the VSWR and make sure I was on the right track.

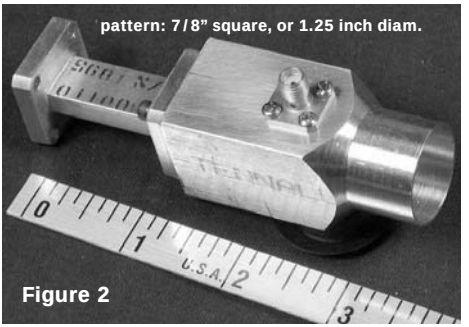


Figure 2

Some improvement was necessary to make a proper taper. Matt, KB1VC, attempted to make a custom cutting tool, but the results were not encouraging – the countersink is clearly the right tool. I went back to the MSC catalog and found a 7/8" countersink, slightly oversized. The HSS tool steel is too hard to cut with ordinary tooling, so I used a toolpost grinder to grind the countersink to the exact 20.4mm diameter. Now we are able to machine the correct taper cleanly.

## The basic machining procedure is:

1. Cut a piece of 1" square aluminum to about 2.6" long.
2. True up in 4-jaw chuck and face ends.
3. Drill a hole about ¼" diameter down the center, all the way through.
4. Drill ¾" diameter about 35 mm deep.
5. Bore out to 20.4 mm diameter. This leaves a small shoulder at the taper.
6. Countersink with 20.4 mm, 60º countersink to form the taper.
7. Turn down outside diameter to leave about 1 mm wall, about 16 mm long.

8. Trim end to leave output section length of 35.4mm.
9. Drill out circular waveguide diameter to 9.2mm diameter.
10. Mark out WR-42 holes in back end, drill and tap 4-40 thread.
11. Mark out and drill SMA holes in one side, with center 29.3 mm from open end.
12. Tap mounting holes for SMA 2-56 thread.
13. Clean up and degrease.
14. Fit SMA.


Figure 3: The countersink

### Corrugated horns

The four corrugated horns I have ready to try are shown here in Figure 4. I simulated the feed-horn with each of these, as well as with a plain conical horn. Patterns and calculated efficiencies are shown in the following figures at 24GHz, and at 10GHz with the phase center at the best location for 24GHz.

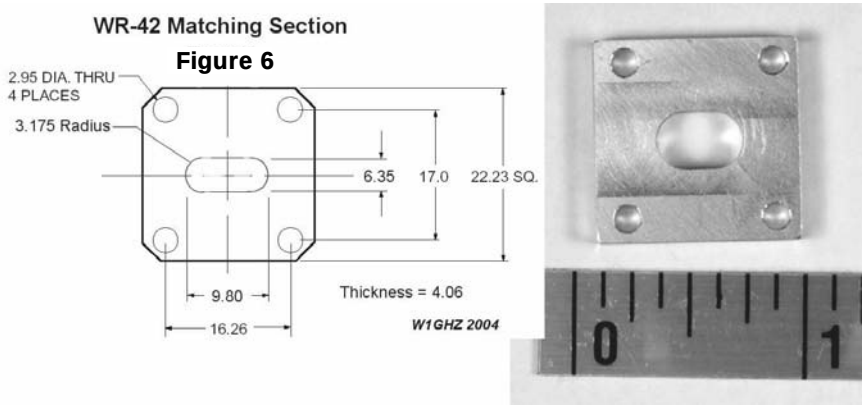
Figure 4:

The calculated efficiencies and phase centers are summarized in the table below. At 10GHz, efficiencies are listed at the 24GHz P.C. (phase center) as well as the optimum, assuming that the feed position would be more critical at 24GHz. Phase centers are measured from the center of the aperture; negative numbers are inside the horn.

All of the horns improve the performance at 10GHz while maintaining high efficiency at 24GHz. However, the best f/D and the phase centers for the two bands are not the same. The best choice appears to be the Chaparral horn, with phase center differing by only 1.3 mm, so that the optimum position for 24 GHz is only 0.04λ off at 10GHz. The result is excellent calculated efficiency for both bands, 76% at 24GHz and 74% at 10.368GHz. This is comparable to the best single band feeds – a dual-band feed that does not compromise performance.

### Figure 5:Dual band 10&24 GHz Feed - Calculated Horn Performance

| | 24GHz | | | 10GHz | | | Offset f/D=0.7 at 24GHz P.C. | |
|---|---|---|---|---|---|---|---|---|
| **HORN** | **Effciency** | ***f*/D** | **Phase Centre** | **Efficiency** | ***f*/D** | **Phase Centre** | **24 GHz** | **10 GHz** |
| none | 76% | 0.72 | 1.2 mm | 71% | 0.38 | 0 mm | 76% | 47% |
| Conical | 76% | 0.8 | -26 | 67% | 0.7 | -31.2 | 74% | 66% |
| RCA | 75% | 0.93 | -24.8 | 77% | 0.7 | -5.8 | 69% | 68% |
| Chaparral | 78% | 0.81 | -23.6 | 75% | 0.65 | -24.9 | 76% | 74% |
| CD-80 | 77% | 0.88 | -29.1 | 78% | 0.76 | -4.9 | 68% | 65% |
| Surplus | 79% | 0.8 | -6.2 | 76% | 0.7 | -22 | 77% | 70% |




## Performance

The temperature in New England is considerably below freezing, and the sun was not high enough for sun noise measurements until well after the this paper was written for MUD 2004. I hope to have some results on my website (**8**) very soon.

Thus, the only testing so far is for VSWR. At 10.368 GHz, the VSWR is about 1.25 with no tuning. At 24.192 GHz, the VSWR is about 2.5 with the circular waveguide connected directly to WR-42 rectangular waveguide. This was predicted in simulation, since the characteristic impedance of circular waveguide is different from rectangular guide. A matching section, shown above in **Figure 6**, was simulated and optimized; it is a quarter-wavelength section of rectangular guide with the dimensions chosen to provide the required impedance to match the circular guide to WR-42. To make machining easier, a radius was added at the corners, and increased until the ends are simply ¼ inch diameter; a slight increase in the wide dimension was required for the same impedance. The matching section improves the measured VSWR to about 1.05. I believe European 24GHz operation is at 24.048GHz; VSWR there is about 1.04. Adding the various corrugated horns to the basic feed has only a small effect on the VSWR on either band.

## References:


1. Gary Lauterbach, AD6FP, and Lars Karlsson, AA6IW, "Dual-Band 10/24 GHz Feedhorns for Shallow Dishes," Proceedings of Microwave Update 2001, ARRL, 2001, pp. 181-190.
2. Al Ward, W5LUA, "Dual Band Feedhorns for 2304/3456 MHz and 5760/10368 MHz," Proceedings of Microwave Update 1997, ARRL, 1997, pp. 158-163.
3. Joel Harrison, W5ZN, "W5ZN Dual Band 10 GHz / 24 GHz Feedhorn," Proceedings of Microwave Update 1998, ARRL, 1998, pp. 189-190.
4. Joel Harrison, W5ZN, "Further Evaluation of the W5LUA & W5ZN Dual Band Feeds," Proceedings of Microwave Update 1999, ARRL, 1999, pp. 66-73.
5. R.H. Turrin, (W2IMU), "Dual Mode Small-Aperture Antennas," IEEE Transactions on Antennas and Propagation, AP-15, March 1967, pp. 307-308. (reprinted in A.W. Love, Electromagnetic Horn Antennas, IEEE, 1976, pp. 214-215.)
6. www.mscdirect.com
7. www.ansoft.com
8. **www.w1ghz.org**


**EDITORS NOTE: Paul's article has been somewhat shortened for Scatterpoint purposes. The complete article, including computer analysis charts of the horns, can be downloaded from Paul's excellent website as listed in reference 8 above.**


There's not as much activity news this month as we normally get, since we have come to the end of the summer contest season ...

**From G4NNS (IO91FF)** sends a reported dated 4 Nov 2004: Last weekend's ARRL 2.3GHz and up EME session was very successful. I started with just two skeds but ended up working 7 stations including one new "Initial", taking the total to 20. Stations worked with my relatively QRP set up, 9W and 3.7m dish, were OK1UWA, IQ4DF, WA7CJO, F6KSX, DL0EF, OK1CA and F2TU. I heard but did not work.. IK2RTI, PA0EHG, W7SZ. I think it's quite tough for the stations working multiple bands, having to change feed systems etc. As I am currently building for 2.3 and 5.7GHz that is an experience yet to come.

**From: Chris, G8BKE [ctowns@care4free.net]**
Sent: 20 October 2004: I was out /P on Sunday in the last 10&5.7GHz cumulative. The WX was very cold but bright. It was good to hear **two** GM portables on (but not worked) 10GHZ ... GM3SBC and GM4LBV. I also failed to work G8EWN/P at Alport heights . Activity seemed quite low couple with poor conditions.

**Barry, G8AGN (Sheffield, IO93)**
**<B.Chambers@sheffield.ac.uk>**
Has been continuing his laser experiments and reports that Gordon, G0EWN (also of Sheffield) has built a laser Tx as per G0MRF's design. He tested it out successfully across the 600m Redmires Reservoir path. Barry also took the opportunity to test out his new Mk2 Tx and a clip of the PWM audio is on Barry's web site.

**www.shef.ac.uk/laser_files/laser.htm**
On the website there is also a very surrealist picture of the laser shining over the surface of the water. Many thanks to John G7JTT for the excellent PWM circuit.

**From: Paul Gaskin, G8AYY (Birmingham)**
4 November 2004: Good News!
I have managed to fix the intermittent fault affecting the operation of the 21V O/P inverter in the G4JNT001 module. This was causing FM noise to appear on the 2556MHz O/P of the G4DDK004 module on both battery and mains 12V supplies. Bench testing was done with the G4DDK004 O/P terminated in 50 ohms of course. I found that my Drake 2880 converter is an excellent way of extending the range of a multimode scanner to cover 2556MHz. I listened on this frequency to get best sensitivity to the FM noise.

**Adrian, G8PSF (Enfield)** is on track for completing the rebuild of his 24GHz transverter for early next year by using one of the TOSHIBA 500/800 millwatt PAs and a preamp and filters in front of a basic DB6NT transverter. A tested bench "mockup" (alright then "muckup" !) proved the feasibility of the improved system. However, Adrian is urgently looking for another preamp for the receive arm, with a reasonably decent spec (see "WANTED "column in this issue). A lot of transmit mixer level got lost in his filter and isolator chain which means he has to use the one and only preamp (surplus acquisition) as a gain transmit driver block in front of the Toshiba PA! Current tests with an accurately proven HP432A power meter revealedthe following: "barefoot" DB6NT barefoot on transmit: 360 microwatt o/p from the anti-phase diode pair.Then, with a filter inline, less than 200uW and, with an isolator, even less! With just the filter in line, approx 500 mW RF is available from the Toshiba PA but without a driver gain block! Adrian hopes to raise the output to better than 700, maybe 800 or so milliwatts, proven by other users, with a gain block driver (with extra attenuation to tame the surplus gain, obviously!) All this information may prove helpful to other builders incorporating Toshiba PAs. Granted, Adrian`s approach to arriving at a solution is

probably not the only method possible! However one has to use what one can in the way of acquired components in any amateur configuration! Economic solutions are essential to a lot of us in amateur radio! A 24GHz antenna consisting of 35cm ex BSB offset dish fitted with a DK2RV rectangular horn feed was taken to the November Adastral Park Microwave Roundtable Annual meeting for gain measurement at G4DDK's excellent Antenna Test Range. The result was a healthy almost +35dB gain achieved. Finally, Adrian reports delight in this years Adastral Park microwave event. He thinks the whole event just gets better and better each year!

**From Allan, G8LSD:** I found an old RadCom April 1968 and the cover picture was of Dain Evans contact to France on 13 cm. The path was exactly the same 35 k path as David Bowman, Derek Atter and I used for the first Laser cross chanel contact! Dain used a DET22 with 8 Watts input and a second experimental transmitter of 2.5 Watts input it was chopped at 1 kHz and gave a mean output of 400 mW.

**From: Roger, VK5NY**
**<vk5ny@picknowl.com.au>**
The **10368.450 GHz beacon** now operational from its new site at Crafers (**PF94)** formally located at Mt. Lofty. It gives line of sight to the horizon out to the west into the Great Australian Bight towards VK6 and also to the east VK3. The new location gives a much better coverage without obstructions. A new antenna (slotted waveguide) has been installed.

The **1296.450 MHz** beacon is on air again with 8w from Mt. Lofty PF94.

The beacons were activated in time for the Spring VHF-UHF Field Day on the weekend of November 6th & 7th. Beacon signal reports would be most appreciated.

**From: Kevin Murphy, ZL1UJG [rfman@xtra.co.nz]:**
The DX season has started here already! Nick ZL1IU (Bay of Islands) and Ray ZL2TAL (New Plymouth) have worked to VK2DVZ on 1296MHz, as well as lower frequencies (12 and 13th October, 2004). That's good DX in any country! VK has only been worked on 1296MHz by about six other ZL stations. There is extra effort this year to try working the path on 13cm.

**From: "Paul Drexler W2PED" <pdrexler@hotmail.com>**
I thought you might be interested in hearing that we've made *some* progress on the 24GHz LNA project. I've been working with prototype testing of a single MMIC device for evaluation purposes and we were finally able to power it up and do some testing last week. We were measuring NF well under 2dB, so needless to say we were quite pleased. Now I'm off to work up the circuit board artwork and bias board scheme. It's too early to say just when they'll be available but wanted to keep you posted.

**From:Mike, G0JMI <mike.karen1@tesco.net>**
I only managed four QSOs in the October 10&5.7GHz Contest in mid October:
I was active from my home QTH on 10GHz only - Alton, Hants: IO91MD. I worked:
G4ZXO/p (IO90WV/65Km) SSB
G4NNS(IO91FF/42Km) CW
G1JRU(IO90HU/44Km) SSB/CW
G4LDR(IO91EC/47Km) CW
I was running the usual 10w to the Flyswatter.

**Photo (left):** David, G0MRF and the far left and Sam,G4DDK(second from the right) working on the new amateur transponder project to be launched as part of the ESA SSETI Express satellite which is due to be launched in April 2005.

Further details vcan be found in the September 2004 issue of Scatterpoint and at : **www.uk.amsat.org**

# 10GHz Cumulatives 2004

**Open Section**

| | | 23-May | 20-Jun | 25-Jul | 22-Aug | 19-Sep | 17-Oct | Points | Mult | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | G4EAT | 5493 | 5036 | 6020 | 5459 | 2165 | 1998 | **16972** | 24 | **407,328** |
| 2 | G3PHO/P | 5796 | 5794 | 1815 | 6770 | 4372 | 0 | **18360** | 17 | **312,120** |
| 3 | G4BRK | 3427 | 0 | 0 | 5391 | 3110 | 711 | **11928** | 18 | **214,704** |
| 4 | G4ZXO/P | 0 | 2969 | 3064 | 4603 | 3457 | 2354 | **11124** | 17 | **189,108** |
| 5 | GW8AWM/P | 3463 | 3623 | 4189 | 3224 | 3660 | 0 | **11472** | 15 | **172,080** |
| 6 | G3LRP | 2931 | 1982 | 4009 | 4478 | 2592 | 2004 | **11418** | 14 | **159,852** |
| 7 | M0EYT/P | 0 | 3290 | 3681 | 4232 | 0 | 1042 | **11203** | 14 | **156,842** |
| 8 | G4DDK | 4753 | 2986 | 2956 | 4124 | 1720 | 0 | **11863** | 13 | **154,219** |
| 9 | G4ALY | 1858 | 2957 | 3975 | 4093 | 2136 | 1561 | **11025** | 11 | **121,275** |
| 10 | G(W)3ATM/P | 2280 | 0 | 2881 | 3167 | 0 | 0 | **8328** | 12 | **99,936** |
| 11 | G4NNS | 2139 | 1574 | 1923 | 2195 | 1364 | 939 | **6257** | 11 | **68,827** |

**Restricted Section**

| | | 23-May | 20-Jun | 25-Jul | 22-Aug | 19-Sep | 17-Oct | Points | Mult | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | G8LSD/P | 3950 | 1105 | 3773 | 4022 | 0 | 0 | **11745** | 18 | **211,410** |
| 2 | G4WYJ/P | 2557 | 1461 | 1903 | 3517 | 0 | 0 | **7977** | 13 | **103,701** |
| 3 | G1MPW/P | 0 | 1568 | 1919 | 2295 | 2362 | 620 | **6576** | 14 | **92,064** |
| 4 | G6KIE/P | 0 | 1568 | 1919 | 2145 | 2362 | 620 | **6426** | 14 | **89,964** |
| 5 | M0GHZ | 0 | 0 | 2120 | 2427 | 2476 | 958 | **7023** | 12 | **84,276** |
| 6 | G0MJW(/P) | 827 | 0 | 513 | 2127 | 1595 | 0 | **4549** | 15 | **68,235** |
| 7 | G0EWN/P | 1375 | 790 | 221 | 3010 | 168 | 435 | **5175** | 11 | **56,925** |
| 8 | G3LTF | 1899 | 1682 | 500 | 0 | 682 | 0 | **4263** | 11 | **46,893** |
| 9 | G8BKE/P | 583 | 0 | 0 | 0 | 0 | 828 | **1411** | 7 | **9,877** |

Congratulations to the winner of the open section and the **G3RPE Trophy**, **John G4EAT**, who won convincingly, due in the main to the large number of different locator squares worked. John's 10GHz home station comprised a DB6NT transverter and a 10W solid-state PA, to a 60cm offset dish mounted 20m above ground. John's best DX was DJ5BV, at 435km, in the July session.

Congratulations to **Allan G8LSD/P**, the convincing winner of the restricted section. As a result, he becomes the first microwaver to receive the **G3JMB Trophy** (for which he is immensely proud, as Jack was his father-in-law). Allan only managed four operating periods this year, from Chanctonbury Hill on the South coast but this was sufficient! Allan was running just under 1W to an 80cm prime focus dish tripod mounted at 3m above ground.

In both sections, the number of locator squares worked was a major factor in determining one's position in the results table. For example, in the open section, positions 3 to 9 all have a similar points score, and are separated by the multiplier – ranging from 11 to 18.

A good number of entries was received for both sections, a similar number to 2003 (when there was also a total of 20 entries). The combination with 5.7GHz appeared to worked well again and this arrangement will continue in 2005. There was very good support from Europe, with quite a number of French, Dutch and Belgian stations worked.

As per 2003, **there were no entries again for the wideband-only section** (100mW or less) and this will now be discontinued in 2005.

The best scores were achieved in the August session, with almost every participant active in this session, and some good DX worked by some stations - for example, G3PHO/P worked 657km to near Paris. The only poor day in the series was October, when quite a few stations were not QRV and propagation was markedly poor. Propagation rarely rose above the mediocre in all events.

# 5.7GHz Cumulatives 2004

**Open Section**

| | | 23-May | 20-Jun | 25-Jul | 22-Aug | 19-Sep | 17-Oct | **Points** | Mult | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | G3PHO/P | 3828 | 2794 | 1656 | 2610 | 3456 | 0 | **10078** | 10 | **100,780** |
| 2 | G4WYJ/P | 2634 | 1955 | 1993 | 1864 | 1480 | 1373 | **6582** | 13 | **85,566** |
| 3 | G4ALY | 1420 | 1529 | 2215 | 2040 | 2725 | 1385 | **6980** | 8 | **55,840** |
| 4 | G4BRK | 1645 | 0 | 0 | 1475 | 846 | 467 | **3966** | 9 | **35,694** |
| 5 | G3LRP | 990 | 392 | 315 | 621 | 373 | 1517 | **3128** | 8 | **25,024** |
| 6 | G4NNS | 1104 | 792 | 941 | 584 | 625 | 566 | **2837** | 8 | **22,696** |
| 7 | G8BKE/P | 361 | 0 | 0 | 0 | 0 | 322 | **683** | 4 | **2,732** |
| 8 | M0EYT/P | 0 | 0 | 0 | 0 | 0 | 566 | **566** | 4 | **2,264** |

Congratulations to the winner, **Peter, G3PHO/P**, who operated portable from a variety of sites and grid squares in the North. Peter was using a DB6NT homebuilt transverter plus a 12W PA, to a 1.2m prime focus dish at 2m above ground. Peter's best DX was F1PYR/P at 620km, in the May session. As leading operator in this contest, he will receive the **G3KEU Memorial Trophy** at next year's RAL Microwave Round Table

Although the rules provided for two sections – open and restricted – nobody marked their entry as being for the restricted section (0.5W or less), and so all entries have been combined to the one section. In 2005, there will be just one (open) section.

Entries were slightly lower than 2003, but this contest again proved fairly popular, combined with the 10GHz cumulatives and this will be repeated for 2005. As with 10GHz, thanks to a number of regular European stations who have given much support throughout the year.

The best activity periods were May, August and September, but there was much less to choose between sessions, compared to 10GHz. Conditions were generally average, perhaps slightly better propagation than on 10GHz.

**Steve Davies G4KNZ**
**Adjudicator, November 2004**

**Photo (right)** shows the home station microwave antennas of Ralph, G4ALY. Located deep in South West England in IO70VL, he is very conscious that not everyone knows he is around! Please turn your antennas his way during the next microwave activity event. He is **DX** to most of you!

# 24GHz Cumulatives 2004

**UK Microwave Group 24GHz Cumulatives 2004**

| | | 04-Apr | 09-May | 06-Jun | 05-Sep | QSOs | Best DX | Points |
|---|---|---|---|---|---|---|---|---|
| 1 | G3PHO/P | 392 | 564 | 228 | 404 | 13 | 154km | **968** |
| 2 | G3UKV/P | 84 | 258 | 192 | 0 | 5 | 111km | **450** |
| 3 | G0MJW/P | 93 | 194 | 0 | 92 | 4 | 137km | **287** |
| 4 | G8BKE/P | 84 | 49 | 128 | 139 | 8 | 61km | **267** |
| 5= | G8ACE/P | 0 | 0 | 0 | 174 | 3 | 92km | **174** |
| 5= | G3PYB/P | 0 | 0 | 0 | 174 | 3 | 92km | **174** |
| 7 | G3UYM/P | 154 | 0 | 0 | 0 | 1 | 154km | **154** |
| 8 | G3FYX/P | 0 | 0 | 0 | 139 | 3 | 61km | **139** |
| 9 | G4LDR/P | 0 | 0 | 84 | 0 | 4 | 41km | **84** |
| 10= | G0JMI/P | 0 | 0 | 0 | 27 | 1 | 27km | **27** |
| 10= | G1JRU | 0 | 0 | 0 | 27 | 1 | 27km | **27** |

*Note: QSOs is the scoring QSOs in the best 2 activity periods*

**Adjudicator's comments:**

Congratulations to the overall winner, Peter G3PHO, who made good use of the rover rules, operating from up to 3 sites in one day. Peter's equipment consists of a home-built transverter, with a 2W PA, and a 60cm offset dish with pyramidal horn feed. Best DX was a rainscatter contact with Harold G3UYM over 154km in the April session.

The highest activity was in September, when the weather was excellent, being hot and sunny. The activity in all sessions was almost exclusively portable.

From the logs received, a total of 15 stations were active overall, the same number as in 2003. The move to 24048MHz has left a few stations behind (your adjudicator included) who have not yet got around to moving frequency and were unable to participate; hopefully this will be rectified in 2005! Thanks to all those who sent in entries, even if only for one session.

**Steve, G4KNZ Adjudicator**

**Photo above:**

**GW3PHO/P in IO81LS (Blorenge) operating 24 & 47GHz during the September 2004 Millimetre Bands Contest.** (photo by GW8AWM)

# 47GHz Cumulatives 2004

**UK Microwave Group 47GHz Cumulatives 2004**

| | | 04-Apr | 09-May | 06-Jun | 05-Sep | QSOs | Best DX | Points |
|---|---|---|---|---|---|---|---|---|
| 1 | G3PHO/P | 0 | 149 | 89 | 310 | 6 | 94km | **459** |
| 2= | G8ACE/P | 0 | 0 | 0 | 174 | 3 | 92km | **174** |
| 2= | G3PYB/P | 0 | 0 | 0 | 174 | 3 | 92km | **174** |
| 4 | G3FYX/P | 0 | 0 | 0 | 139 | 3 | 61km | **139** |
| 5 | G3UKV/P | 0 | 74 | 44 | 0 | 3 | 89km | **118** |
| 6 | G8BKE/P | 0 | 0 | 0 | 100 | 2 | 61km | **100** |

*Note: QSOs is the scoring QSOs in the best 2 activity periods*

**Adjudicator's comments:**

Congratulations to the overall winner, Peter G3PHO, who entered the 47GHz events for the first time. Peter's equipment consists of a DB6NT-based system, with 22mW transmitter and a 35cm offset dish with a dual horn feed for separate TX/RX.

As per 24GHz, the highest activity was in September. From the logs received, a total of 7 stations were active overall. Thanks to all those who sent in entries, even if only for just one session.This year, the 24GHz and 47GHz cumulatives reverted to being run concurrently and this was generally well received. Often the same dish is used for both bands, and 24GHz is often used to align the dish before a 47GHz contact is attempted, so this combination works well.

A similar format has been kept for 2005, but running on consecutive months (July, August, September and October).

**Steve Davies, G4KNZ, Adjudicator**

**Photo above:**

**Peter, G3PYB/P, enjoying the sunshine during the September 2004 Millimetre Bands Contest, when he was located,along with G0MJW/P and G8ACE/P, at Hackpen, IO91CL.**

**(Photo by G0MJW)**