An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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

2005 NOVEMBER/DECEMBER

Searching for Venus

ON6UG and G3RUH receiving the Venus Express on 8.4GHz during the Martlesham Microwave Round Table held over the weekend of 12/13 November this year

…. see inside this issue for a report of this excellent amateur microwave event

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- **Dutch microwave beacons now off the air**
- **Galileo launch imminent**

MANY THANKS TO ALL OUR CONTRIBUTORS THIS MONTH ... WITHOUT YOU THERE WOULD BE NO SCATTERPOINT!

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From the Editor's Desk

You'll notice that, for the first time in the history of this newsletter, there is no activity news in this issue! This is because there is so much else to report and we do have a page limit to get within the normal postal charges. Fear not, the first issue of next year will see all the backlog cleared!

We have a lot to report on the Martlesham Round Table which was held just a few weeks ago. Not only was it a huge success for us in the UK but it left our overseas visitors with the impression that we really can put on a decent event. Hopefully they will return and bring their friends. The UKuG AGM also took place at Martlesham,.The Committee's Annual Reports are included in this edition of Scatterpoint for those of you unable to be there.

Please note that we now have a new secretary, Ian G8KQW and another new committee member, John G3XDY. I'm delighted that they have joined the Committee. They are very active on several microwave bands and I know they will have lots to offer the Group.

Meanwhile, have a good time over the coming Festive Season. Take care ... oh, and please make a start on that 24GHz transverter!

73 from Peter, G3PHO, Editor

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News, views and articles for this newsletter are always welcome. Please send them to G3PHO (preferably by email) to the address shown lower left. **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.

WANTED

I now have a big TWT for my 10GHz EME system sitting in the shack, looking at me with a big square cynical smile on its WG output, saying 'Now feed me with lots of volts and milliamps' .

Before I embark on the tortuous process of designing and building yet another (bigger) TWT PSU, it occurs to me that somebody, somewhere, may have a suitable power supply without a tube that they'd like to turn into cash. The requirements are Vhelix = 9kV at <20mA, Vcollector = 4.5kV at >350mA, and Vheater = 6.3V at >1.8A.

The tube I have was apparently used in a Varian 6900 series TWTA, and one of these with a zapped tube would be ideal, although I guess that's a really long shot!'

73, Chris GW4DGU

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E-mail: chris@chris-bartram.co.uk

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

NEWS & VIEWS

Office of Deputy Prime Minister
ODPM News Release 2005/0216
27 October 2005

The Government today laid revised planning regulations for the installation of antennas including satellite dishes so that householders can use a wider range of antennas and satellites in order to access digital and broadband services. The revised regulations will continue to protect the environment from inappropriate development, particularly in designated areas where there are greater restrictions on the position of antennas.

These changes will help to meet the Government's aim of expanding access to digital television and broadband internet and will help householders to install digital television and broadband technologies.

The amended regulations take account of the wide variety of antenna technology now available, so that all types of microwave antenna, whether they are satellite dishes, MESH antennas, wireless antennas or any other type of antenna, will be subject to the same permitted development regulations.

ODPM will issue a revised Householders Guide on the siting of antennas explaining the new regulations and encouraging people to be aware of environmental considerations when siting antennas.

Full information can be found at the ODPM website:

http://www.odpm.gov.uk/index.aspid=1002882&PressNoticeID=1979

FREE SOFTWARE

As an avid reader of Elector I thought you might like to know that the November 2005 edition is claiming to supply a free cd with PCB CAD software

Nick Atrill, G6GFO

GALILEO LAUNCH IMMINENT

The launch date of the first Galileo satellite GIOVE designed and built in Guildford by SSTL has been announced as 28th December.

For further details see:

http://www.southgatearc.org/news/november2005/giove_satellite.htm

This a great achievement for SSTL which was founded by the Chairman of AMSAT-UK Martin Sweeting G3YJO.

Regrettably it also serves as a reminder that the implementation of the full Galileo systems is moving steadily closer. I believe that, allowing for slippages, the full system will by up and running by 2012 at the latest. As has been previously mentioned, one of the Galileo transponders has been allocated 1260-1300 MHz and I realistically can't see Amateurs Transmitters in that band being able to co-exist with consumer Galileo receivers.

73 Trevor M5AKA

ULTRA WIDE BAND ANYONE?

The European Radiocommunications Organisation (ERO) is holding a consultation on the implementation of Ultra Wide Band (UWB) technology in the microwave bands. UWB is a wireless version of USB designed for use in PC's and TV's (it can handle High Definition TV). Go to:

http://www.southgatearc.org/news/november2005/ero_uwb.htm

73 Trevor M5AKA

Dutch microwave Beacons now QRT

From: Hans v Alphen <pa0ehg@amsat.org>
Date:Tue, 18 Oct 2005
To: microwaves@blueyonder.co.uk

With much regret I must inform you that the beacons are off now. I did use your (UKuG) letter for the management but it did not help. With help of some colleague amateurs I am trying to find a new location and get the beacons on air again. Thanks very much for your help and support.
Today has been a very bad day for me.
More info at: www.pa0ehg.com

Best 73 Hans PA0EHG

13.8 volts from your Car Battery
Modifying the Vanson SDR-120W
-by Chris, G3WIE

When I started on microwaves a year ago, I had to rediscover /P operating. Given that I was only running QRP (1 watt) from a borrowed 144MHz-10GHz transverter, a morning's operation from the cigar lighter socket in my car seemed quite possible but I soon discovered that the transverter required a stable 13.6 volts, not a gradually reducing 12.6 volts and I've seen others describing the same problem in Scatterpoint through 2005. Looking around the local Maplin shop, I found a 120 watt DC-DC converter which supplied a range of laptop computer voltages: 15-16-18-19-20-22-24 volts selling for £30 (stock number: L40BB). Gambling that I'd be able to modify this to reduce the lowest voltage to 13.8 volts, I bought one. It turns out that you have to change just a single resistor. This article describes how I did the modification.

You will need:

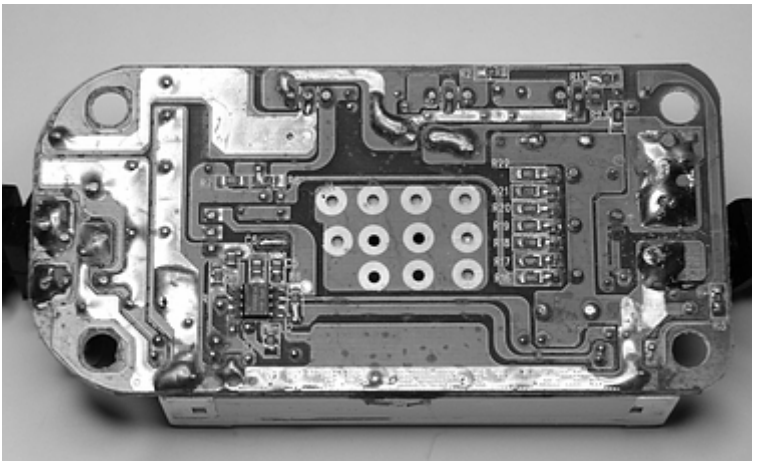
- a 5mm flat-blade screwdriver which you are prepared to modify (to remove the tamper-proof screws holding the case together)
- a set of needle files to do the screwdriver modification
- four 12 mm x 3mm self-tapping screws to replace the above!
- a temporarily-modified soldering iron to remove an SMD resistor
- a replacement SMD resistor or small wire-ended one

Dismantling the unit:

The case is held together by four tamper-proof self-tapping screws. To remove these, modify a 5mm flat-blade screwdriver by filing a rectangular notch 1.5 mm wide and 1.5 mm deep in the centre of the blade. Now you can remove the screws without wrecking your small pliers!

Set the voltage selector switch to the 15 volt position, remove the silver-coloured top of the case, then lift the PSU assembly out of the other half of the case. The brass screen fitted underneath the circuit board may jam on the plastic pillars, but if you bends the screen to get access it can be straightened afterwards Slide the screen and its insulation out from under the three clips on the heatsink. The clips may jump off – replace them again as they hold semiconductors on to the heatsink.

Fig 1 (right) shows a picture of the unit with the shield removed:



Modifying the unit:

On the underside of the unit, towards the end nearest the input cable, you will see a row of surface-mount resistors labeled R16 to R22, connected in series. The volt-

age selector switch connects the junctions of these resistors to ground – increasing the total resistance from the top of R16 to ground produces a lower output voltage, so increasing the value of R22 will reduce the voltage at the 15V setting without affecting the higher voltage outputs.

First, note the value of R22 (130 ohms in my unit), then remove the resistor. I don't have two small soldering irons, so I modified my one and only iron by wrapping two turns of 16swg tinned copper wire round the bit and bending it so I have a double-tipped iron. File a point on the wire and you're ready to go.

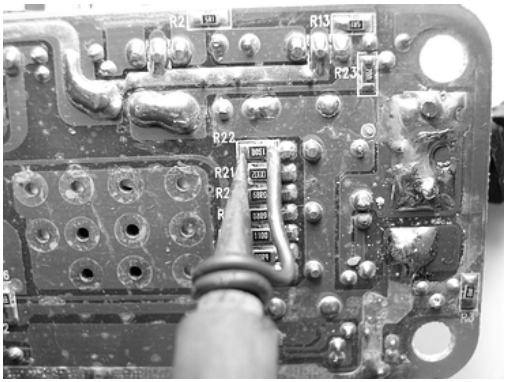


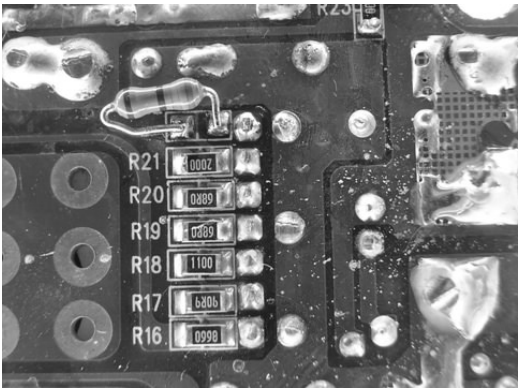
Fig 2 (left) shows the idea - it's a posed photograph but this technique does work.

Usually the resistor will stick to the tips of the iron but be ready with a pair of pointed tweezers in case it doesn't.

Now fit a replacement resistor. **Fig 3 (right)** shows how I fitted mine.

Plug the converter into your car and check the output. In my case 390 ohms at R22 produced an output voltage of 13.8volts off load, but I fitted a 330 ohm to provide a bit extra to compensate for the voltage drop along cables.

Finally, reassemble the unit, ensuring that the clips that held the screen are holding the semiconductors against the heat sink.



In use:

I use the converter to power my entire station which draws about 3 to 4 amps on transmit and 1 amp on receive. The converter runs cold even on a hot day. I have managed to short circuit the output at least twice. Each time, the 16 amp fuse I had fitted in the battery supply blew but the converter survived!

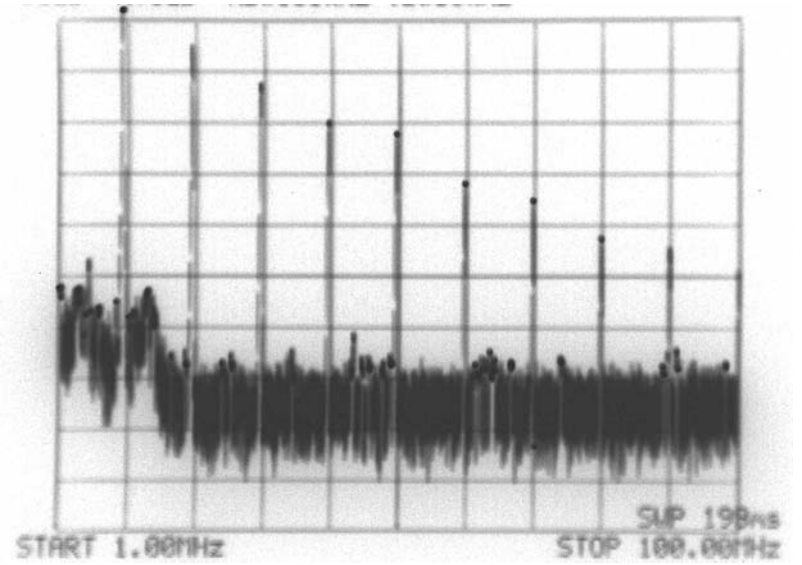
A distribution amplifier for the G4JNT GPS-DO

- by Paul, M0EYT <m0eyt@ntlworld.com>

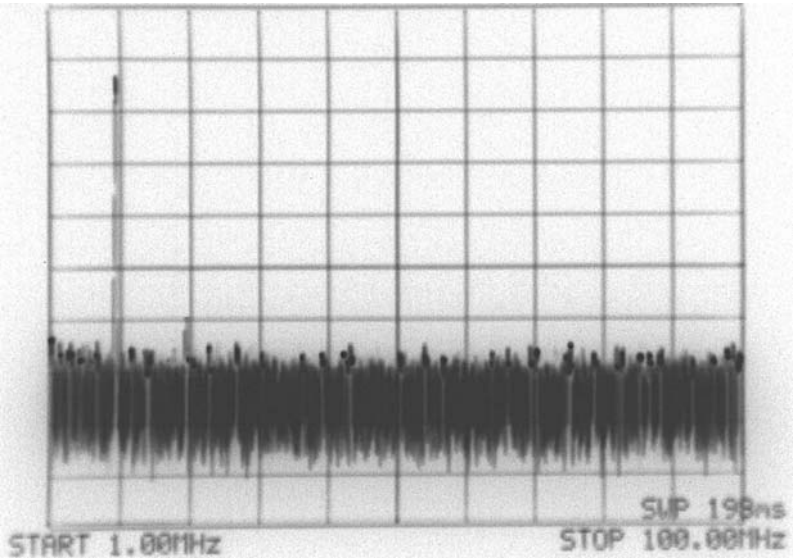
A while back, Scatterpoint published an article by Andy, G4JNT, on making a simple GPS disciplined oscillator based on the cheap Jupiter GPS boards. Since I had a couple of these modules spare, I decided to make one. I used a good quality 10MHz oscillator from John, G8ACE, as the ovened source – then the simple circuit from Andy to lock the oscillator to GPS. The output was locked on 10MHz,and I was very pleased with the results. Then I looked at the 10MHz output on the spectrum analyser.

At this point, I noticed that the 10MHz output and its harmonics extended up over 1GHz – it does make a nice marker generator as is but, since I wanted to lock a receiver to this GPS-DO, I needed to clean the output up a bit. After some hours wasted trying to get good results with multi pole filters I'd bread boarded, I needed a new solution. I looked around the garage for inspiration and found an old box of 10Mbps Ethernet LAN cards that I'd kept. Whilst looking at the isolated BNC sockets on them, I noticed the transceiver modules, so decided to "Google" them and sure enough, one module was a multi-pole filter for the RX and TX paths.

After hooking one from the board, I checked it on the spec-an with the results below:

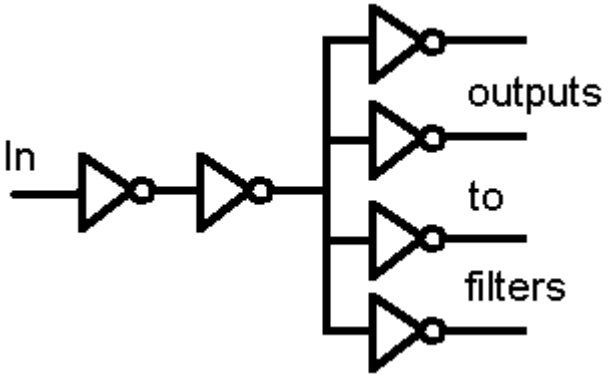


10MHz output before filtering



10MHz output after filtering

The output from the JNT GPS-DO is first buffered by a 74HC04 Hex Inverter, 2 gates in series, then the second gate driving the remaining 4 gates.



74HC04 4-output buffer

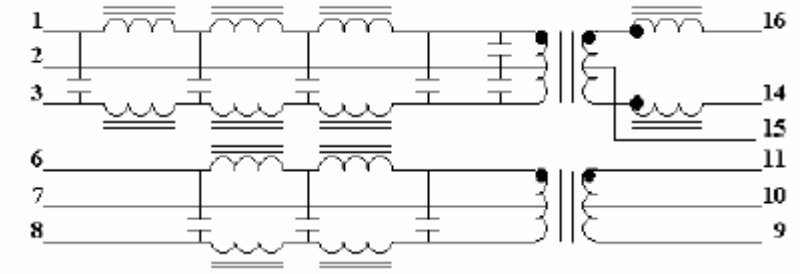
The 10MHz output from the 74HC04 of course contains harmonics. Each output is fed via a 27 ohm resistor, then into the filter network. The filters are marked 'YCL 20F001N' – a data sheet is available at:

http://www.wwtc.edu/nsf/BAW_2000/Hubs/20f001n.pdf

Each YCL 20F001N package contains one 7 pole TX filter and one 5 RX filter – you can either use the two filters to drive 2 separate outputs, or as I did, wire both filters in series to get further

rejection of unwanted harmonics. The pin outs for the filter block are on the schematic diagram below:

Schematics:



The other good thing about these filter blocks are the isolated outputs – if you use the isolated BNC socket commonly found on the old LAN cards, you can get rid of problems caused by earth loops too.

I found once I had built the buffer/filter circuit, the outputs resembled a clean sine-wave on the oscilloscope. I'm sure the output from my old Wavetek synthesiser is cleaner now too. I did make a PCB for this buffer/filter; it is for surface mount DIL packages. Please email me if you want a copy of the PCB layout and I'll mail it over. **73 from Paul, M0EYT**

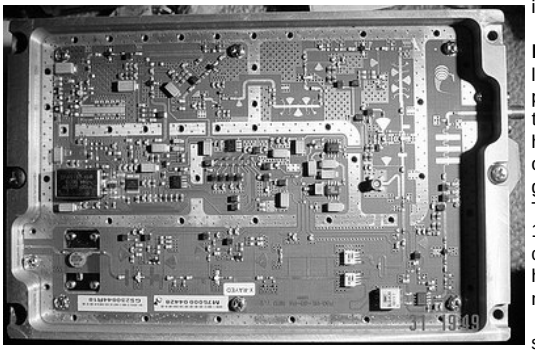
6cm couldn't get cheaper! Get on this excellent band for around £15 (plus postage!)

The DMC DXR700 transverters currently available for **only NZ$30** on the **Wellington (NZ) VHF group surplus list <www.vhf.org.nz/tradingtable/mwave6.pdf>** look as though they'll make a VERY good basis for a high performance transverter (or beacon) for 6cm. These are modern devices (I guess designed in about 1998) and the quality of assembly is extremely high. In my case, I'm also planning to set-up one of these units as the front-end of a spectrometer for the 6888MHz ethanol masers, which are amongst the strongest extra-solar sources in the sky (until they get blatted by UWB ...)

I ordered a couple of these units from **Leon Toorenburg, ZL2AOC** in Wellington, New Zealand **<leon.toorenburg@survey-lab.com>** who seems to act as the manager for the Wellington group's surplus 'operation'. They arrived along with a couple of PAs within a few days of payment. These are my initial comments ....

The unit consists of independent transmit upconverter and receive downconverter pcbs housed in a very solid diecast chassis.

Both pcbs employ a very similar synthesised oscillator operating in the 2GHz region and have an inbuilt 10MHz VCTCXO. This should be good enough for casual operation, and would be easy to lock to an external reference if you're trying to do something more complex. My guess is that with suitable choice of reference frequency, the close-in spectrum will be good enough for any usual amateur application. The microwave VCO employs a dual resonator, which should give reasonable phase noise beyond the loop bandwidth. The synthesiser controller is a LMX2326,

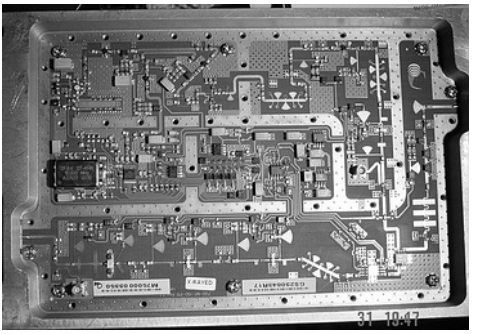


integer-N device in TSSOP, which is still current.

The receive strip (shown here on the left) has an isolator on the input, which is followed by a two-stage FET amplifier. A two-phase downconverter rejects image noise from the amplifier. A directly coupled quadrature hybrid drives a pair of Hittite mixers. A quick bit of reverse engineering of the input hybrid suggests that it's usable from about 5.5 - 7.5GHz. The output hybrid of the downconverter is a 50 - 100MHz packaged device, which for a 144MHz if could be easily replaced by, say, a 100 - 200MHz hybrid from Mini-Circuits, or a discrete component hybrid.

On transmit (see photo below), there is a single mixer, followed by a voltage variable attenuator. A three stage FET amplifier looks as though it will produce around 50 - 100mW.

To get the system working, there may need to be a little bit of snowflaking but probably not a lot. (Famous Last Words?!!) A means of programming the synthesisers will be needed. That's a relatively simple job for a PIC or Atmel microcontroller which could probably handle the T/R sequencing as well. There's space in the package for a controller PCB.



The transverter will require external filtering on the receive input/transmit outputs. I think that the Wellington Group have suitable filters in their catalogue.

I'm currently tracing the circuits. Don't expect this to be a one-evening process! Once I'm happy, I'll put PDFs in the files section of the UKuG website at : **<www.microwavers.org>.**

Simon, ZL1SWW, has added quite a lot of info to his web site **<www.qsl.net/zl1sww>** regarding the DXR700. This includes sequencer/controller boards and programmed chips, as well as info on modifying the VCO to cover 5616MHz and using a common 10MHz VCTCXO.

For the money, these units seem to represent a way to get on 6cm with a potentially high performance transverter. I'll keep people informed of my progress.

73 from Chris, GW4DGU

New Hittite x2 Multiplers for 24-30GHz

For the frequency source enthusiasts, I have just been sent an email about a pair of new surface mount x2 Hittite active multipliers ... no wire bonds either !

There are two for 10-15GHz in, 20-30GHz out, with >10dBm output and quite low additive phase noise.

For further information, look at: **http://www.electronics-express.com/showArticle.jhtmlsssdmh=dm4.158560&articleID=174400108**

Otherwise look them up on **www.hittite.com**

They may be quite useful if you can get some free samples!

Murray G6JYB

Programming a DMC 23GHz Brick Oscillator

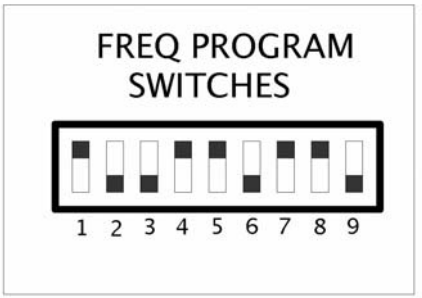
- by Chris Bartram, GW4DG

Despite my usual attitude to modifying surplus kit, I'm in the process of putting a 'quick converter' together using surplus bits in order to see if my 2.4m dish is accurate enough to use on 24GHz EME (and for some 22GHz radio astronomy). A year or two ago I brought a DMC-110366 PLO brick, believing the seller that it might be useful as a 1.3GHz signal source. In fact the brick operates on around 23.5GHz and has good close-in noise performance and stability.

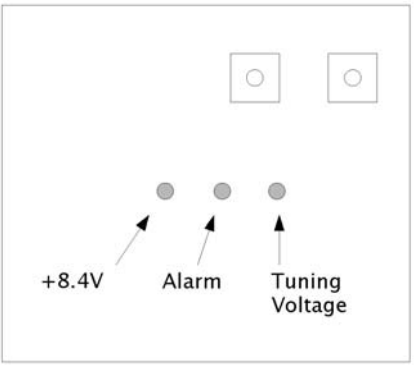
After much playing with the DIP switches, I've managed to extract a very useful frequency from the unit: 23.616GHz, which is 24048 - 435MHz. As I've always used 70cm as an IF for 3cm, I'm rather pleased!!

The brick requires a single +8.4VDC supply at about 1A max. There are alarm (essentially a lock detect) and tuning voltage outputs. The output level seems to be of the order of +8dBm at the 'XMTR LO' SMA output and around +4dBm from the 'RCVR LO' output. I say 'seems' as I don't have a calibrated power meter and the spectrum analyser calibration is a bit suspect at 23GHz...

Alignment is a matter of setting the DIP switches and then adjusting the DRO centre frequency, using the only unmarked adjustment on the top panel of the unit. Monitoring the tuning voltage output should show the effects of tuning the DRO. The best setting is when the tuning voltage is at the centre of its limits.



Location of DIP switches on DMC-110366 23GHz LO Module for 23.616GHz Output (435MHz IF = 24048MHz)



DMC 23GHz LO Power and Control Connections

Some DMC " 23GHz Whitebox" information from Steve, G8JMJ

Editor's note: The following plea for information appeared recently on the UKuG Internet Reflector: "Does anyone have any information on the various modules within the DMC "white boxes" for 21/23GHz ? Are they any use ?" The previous pages describe GW4DGU's findings regarding the oscillator contained in the equipment but here's some more information, this time from Steve, G8JMJ. who posted this on the reflector in reply to the query above.

The DMC-110366 oscillator brick uses some form of a dual loop, but I've not had the time to analyse it properly yet. A few points:

- The unit has two crystals, a 14.000MHz (TO5 can style) PCB mounted and what appears to be another one buried on the PCB below, contained in a small oven (will confirm and measure it's frequency).
- The sapphire trimmer on the top of the unit trims the 14.000MHz oscillator and can be used for fine frequency adjustment. The other oscillator can be adjusted by removing the large screw-in plug on the side of the module.

The bit switch positions have the following step sizes.

1 =3D 1.75MHz
2 =3D 3.50MHz
3 =3D 7.00MHz
4 =3D 14.00MHz
5 =3D 17.5MHz
6 =3D 35.00MHz
7 =3D 70.00MHz
8 =3D 140.00MHz
9 =3D 280.00MHz

The big toggle switch buried inside the module (accessible through a hole on the top) switches the DRO into free-run mode to allow for frequency setting with the loop open.

It should be noted that, although the 'synth' circuitry can step these relatively large steps, the DRO cannot and so will require manual retuning before 'locking' occurs. Not all codes are valid. I have had the unit locked where the LSB (1.75MHz) step switch is in-operative.

On the other bits, the LNA runs from +8.4VDC as does most of the entire box. The gain at 24GHz was only about 17db. I've not measured NF yet.

The TX up converter works reasonably well at 24GHz with an IF of 200 to over 1300MHz (obviously lower conversion gain at the top end). The TX image filter will retune so that the top end of it's response is at about 24.1GHz, insertion loss about 1.5db but with about 1db of ripple. Bandwidth, from memory, is about 300MHz.

I have forgotten the rest of the 'results' but if anyone wants them I will repeat the measurements.

Just one last point ... I have removed all the RF 'lumps' from the main assembly and powered them from a separate 8.4VDC supply. Most connections can easily be worked out. For example, if you take the base off the TX mixer/amplifier unit the actual function of the connections is shown in the copper on the PCB. They include output monitor/alarm etc. The actual lump runs from a single 8.4VDC rail ... most convenient.

Regards from Steve, G8JMJ <steve@g8jmj.tv>

More info can be found at: **http://www.xertech.net/Tech/DMC/20Gsyn.html** *(editor)*

UK MICROWAVE GROUP ANNUAL REPORTS 2005

CHAIRMAN'S REPORT .... 13 November 2005

The past year has seen the **UK Microwave Group** make excellent progress in many fields:

- UKuG is now firmly on the microwave "map" and is fully recognized by RSGB, IARU and OFCOM as the representative body for UK amateur radio microwave enthusiasts.
- The newsletter, Scatterpoint, as well as the UKuG website and internet reflector have continued to keep the Group's profile at a high level
- The Group published its first book, the Proceedings of UKuG, in April this year
- A microwave "elmer" list has been established to help beginners and others without suitable test equipment
- Former UKuG Committee member and co-founder of the Group Sam Jewell, G4DDK, is now the RSGB RadCom microwave columnist ... this must be good for the Group!
- Membership has remained at just under the 300 level and spans over 20 countries in Europe, North America, Australasia and Japan.
- UKuG, in collaboration with the Martlesham Radio Society and staff at Rutherford Appleton Laboratories, has once again staged two excellent and well received Microwave Round Table events. These are now attracting regular visitors and speakers from overseas, including the USA and Europe.
- Our contest and microwave activity programme has been highly successfully. Attractive UKuG Certificates and Trophies have become the goal of many of our active members.

It's in the field of **representation** where the Group has done much of its most valuable work. UKuG is represented on the RSGB Spectrum Forum by G3PHO, G6JYB and G3PFR (who is also the RSGB Microwave Manager). After my last Chairman's report in November 2004, there was a virtual explosion of government consultations put out by OFCOM. UKuG were quick to respond to many of them. We are extremely fortunate to have an enthusiastic and very knowledgeable committee member in the shape of Murray, G6JYB, who has 'burnt the midnight oil' on many occasions, preparing responses to OFCOM and papers for RSGB and IARU meetings, all on our behalf. With Murray, G6JYB and Mike Dixon, G3PFR, at Spectrum Forum level, we now have a most effective team to fight our cause in spectrum matters and, believe me, we need all the expertise we can get as our microwave bands have never been threatened so much as they are today.

You can find out what UKuG has submitted on your behalf by visiting our **website** at **www.microwavers.org**, where the various papers are now available for download in PDF format. These paper also include some individual responses to OFCOM consultations as well as the more formal UKuG ones. My thanks go to all those of you who responded to OFCOM on an individual basis. As a result of all this effort, the RSGB and IARU have a high regard for our Group.

Scatterpoint, our Group **newsletter,** has continued to attract new members to UKuG. I would like to think that people join the Group for more than just the newsletter but the fact remains that Scatterpoint is often the major attraction! Our printers, Mensa Printers of Sheffield, do a great job at a very economical cost. They also produced our Proceedings book in April this year and I think you will all agree that it was of very good quality. Of course we would all like improvements to Scatterpoint such as colour and more pages but both these would increase costs so much that our subscriptions would have to go up to a level many might find to be too much. At the time of writing this report, around two thirds of our membership receive Scatterpoint in PDF format, via email, and the other third in paper format. We could make the email version in colour at no extra cost but the download would be unacceptable for those of you with 56K modems and a dial up ISP (and there are many of you still in that situation).

Scatterpoint is **your** newsletter and relies entirely on material submitted by you the readers. When none is forthcoming the editor is forced into trawling the internet for items so please think about that when a particular issue fails to meet your own high standards!

Microwave Round Tables have been a feature of the UK microwave scene for many years, the first taking place in Winchester back in the early '70s. Since then these events, though fewer in number these days, have come a long way and the UKuG has a lot to do with their recent success. The quality of the meetings held at **Martlesham and RAL** is now as good as any I've been to overseas. I emphasis quality, not quantity. We haven't yet been able to emulate the famous Microwave Updates of the USA as here in the UK we just don't have the quantity of surplus microwave gear that seems to abound in the USA and which brings a special flavour to the meetings. Still, for the past couple of years we have run Martlesham as a two day/whole weekend

affair including the Saturday night dinner. If you have not yet been to this event then you owe it to yourself next year. The fact that well known overseas microwavers such as W1GHZ, WA5VJB, WA1ZMS and ON6UG are prepared to come to Martlesham and give us one or more talks tells me we must be getting it right! The annual meeting at **Crawley**, though a much smaller event than the two just described, should not be missed out of this report. Derek, G3GRO and the Crawley club members have done a great job over the years and it's my concern that we as UKuG haven't been involved with them as much as we perhaps could be. Hopefully we can help out a little more this coming year. My grateful thanks are extended to all those who help to organise these microwave roundtables year after year. We are looking for a possible microwave meeting venue in the Midlands and/or North of England. If you have any ideas, contacts, etc please let me know. Ideally it should have a lecture room, test equipment facilities (or a room in which imported test gear could be set up), and a space for general chit chat and fleamarket. It would be great if the facilities were free of charge for the day!

This year saw UKuG publish it's annual **Proceedings** for the first time. 100 copies were printed and all but one were sold in a few weeks. Once again I would like to thank Steve, G4KNZ, who did all the compilation work in just a few weeks. We plan to bring out a 2006 Proceedings next April and we are also in the very early stages of planning another book, most likely a **compendium** of past newsletter technical articles. In addition, UKuG is to investigate the production of our own **certificates** for distance (DX) and locator square achievements on the bands above 1GHz.

UKuG issued it's own **Contest Certificates** for the first time last year and awarded various **trophies** such as the G3RPE, G3KEU, G3JMB and G3VVB trophies. In addition we awarded the G3BNL Trophy, on behalf of the RSGB, to John Hazell, G8ACE.

The annual **Contest program**me and adjudication of entries has, in recent years, been the responsibility of Steve Davies, G4KNZ. He does a tremendous but often thankless task each year as he just can't satisfy every single person's own preference. Clashes with other events are bound to occur ... it's up to you to make a choice on any particular weekend .... microwave contest or rally!

The contest scene this year has created much controversy with regard to **talkbac**k (liaison). Traditionally this has always been via 144MHz ssb in the UK but there has been a surge in the use of the Internet microwave chat room run by ON4KST. This is undoubtedly a wonderful and convenient method of arranging microwave skeds with operators many hundreds of kilometres away but its use in contests, where most portable operators do not have internet access, has been questioned. Feelings run hot on both sides of the fence! For the coming year, we have made no hard or fast rule on the use of KST in our contests. It's left to individual operators. We'll see how things develop over next "season". We are not alone as the use of the internet in HF and VHF contests is still being hotly discussed by groups the world over!

Intelligent debate on microwave issues such as talkback and contest rules form a vital part of our Internet forum, the **UKuG Reflector**. It saddens me though that, at times, one or two folk allow themselves to go over the top when they have strong opinions and descend into a violently abusive mode. Please remember that we are involved in what we may call an amateur pursuit (many call it a hobby) .... it is not and should not be one's whole life, so please keep your microwaving in perspective!

UKuG has forged strong **links with a number of overseas microwave groups**, The North Texas Microwave Society, The San Bernardino Microwave Society, Packrats (Philadelphia, USA), NZ Break In Magazine (ZL1UJG), AMSAT (via ON6UG) as well as individual and helpful microwavers such as Paul Wade W1GHZ and Paul Drexler, W2PED, the latter having been very generous in donating prizes for our Martlesham Round Table. Friendships like these are what international microwaving is all about. If you get the chance to go to overseas amateur microwave meetings then do so!

Finally, I would like to thank all the members of **the UKuG Committee** for the work they have put in this year. Many have taken on specific responsibilities and I'm extremely grateful for that. I am also grateful that most decided to stand for re-election for the coming year and I look forward to working with them and the two new members over the coming months. At this point, however, I wish to give notice that I will not be offering myself for re-election as Chairman in November 2006. Three years in a job like this must be enough for both the membership and the incumbent! New blood (preferably a lot newer/younger than mine!) is needed if the Group is to maintain its progress.

I hope you are all enjoying and benefiting from your membership of the UK Microwave Group. Please feel free to contact the Committee at any time.

Best wishes,

Peter Day, G3PHO
Chairman

SECRETARY'S ANNUAL REPORT ... 11 November 2005

I am really sorry I am unable to make the AGM this year. My work circumstances are even more extraordinarily demanding than usual and I am heavily involved as the senior technical architect on a major government contract.

I would like to thank all those members who have joined and renewed their membership this year. The process this last 12 months has been far easier than the transition year. Using e-mail to advise members that their renewal was due and, where appropriate, acknowledging receipt of renewal and welcoming new members, makes the whole job much easier. We have developed simpler joining and renewal forms that we believe are far easier to understand - well, there have been far fewer mistakes this year anyway!

We currently have around 275 paid up members (with many others due to renew). In fact we have one especially enthusiastic member who has actually paid up until Christmas 2008. Our attrition rate is about 25 members per year but that includes about 10 members who were due to renew in October, so it may actually be a lot better once they get their 1st nudge reminder later this month! To make joining and renewal easier for everyone, we are extending the pay by PayPal scheme to all members if they wish to use this, however, we will be asking for a small additional contribution to cover the cost of this service.

I have been an active committee member of the UKuG since its foundation about 5 years ago but this year, I have decided to take a break. I have got too many other commitments and, although the UKuG secretary job is probably the easiest of them, all I have decided to stand down. I am not sure who is the lucky person who will be my successor but please give him or her your full support, as indeed I will.

Finally, many thanks to Martlesham Radio Society for hosting the AGM once again. This really is the most prestigious of the UK Microwave events and I am really sorry that I have missed it.

Good luck everyone.

Martyn Kinder, G0CZD

TREASURER'S REPORT .... 5 November 2005

The balance sheet for the period 01Jan05 to 05Nov05 was provided by our treasurer, Steve Davies, G4KNZ, at the Martlesham Round Table. The full sheet for the whole of 2005 will be published in the January 2006 Scatterpoint. The following notes were not written by Steve but are merely comments by the Chairman, based on the sheet shown at Martlesham:

The Group's finances are in a very healthy state. The major expenses for the year so far have been incurred though printing costs (Scatterpoint and the Proceedings) plus postage on the same.

The Group committee has already decided, in view of this favourable balance, to keep subscriptions at present rates, at least for the coming year. We have also discussed the possibility of helping unattended beacon projects by either purchasing certain items for the beacon (e.g an ovened oscillator module) or with money subsidies. Such help would be on an individual basis and would demand certain conditions to be met so that it would (a) reach the right person and (b) have a end guaranteed result in the form of a working and licensed beacon.

The Group also needs this sound financial base in order to fund future projects such as books, certificates, awards and CDs.

Unlike many other special interest group committees, UKuG committee does not incur much in the way of committee member expenses other than postage, since almost all of our work is done via email and internet phone.

Noise figure results Martlesham Microwave Round Table 2005

12/13 Nov-05 **Tcold = 23.5 deg 296.50 deg K**

Band	Call-sign	System	Gain (dB)	NF (dB)
50MHz	G8KBB	Preamp with N connectors	33.5	2.46
	G8KBB	Preamp with BNC connectors	58.4	3.23
70MHz		No devices presented for testing		
144MHz	G4DZU	BF981 Preamp	20.1	1.02
	G4DZU	Small Diecast box	21.1	0.37
	G3LTF	ATF54143 Preamp	26.6	0.22
432MHz	G0MRF	Broadband preamp ATF54143	21.1	0.46
	G4KBC	ATF54143 Preamp	20.5	0.28
	G3LTF	ATF54143 Preamp	21.3	0.35
1.3GHz	M0SPS	Preamp - ATF10135	14	1.17
	G0RUZ	DB6NT Preamp 132-AH	34.1	0.50
	G0RUZ	DB6NT Transverter MKU 13G2	28.3	0.62
	G4DZU	WD5AGO 2 stage (small box)	32.5	0.37
	G4DZU	WD5AGO 2 stage NE326/ MGF1412	32.9	0.38
	G4DZU	Angle Linear Preamp	13.5	0.93
	G4DZU	DJ9BV Preamp	16.3	0.50
	G1OGY	DJ9BV with relays	16.9	1.25
	G0MRF	Broadband preamp ATF54143	17.6	0.65
	G4KBC	ATF58143 Preamp	16	0.45
	G3LTF	FHX35LG/ATF10135 Preamp	35.6	0.48
2.3GHz	G0RUZ	DB6NT Transverter MKU 23G2	33.3	0.50
	M0SPS	Preamp ATF10135	10.8	1.95
	G0RUZ	DB6NT Preamp 232AH	30.4	0.60
	G3XDY	Transverter (no preamp)	34.9	9.20
	G3LTF	Preamp ATF36077	15.5	0.41
	F5VHX	Preamp ATF36077	13.8	0.37
3.4GHz	G3XDY	DB6NT Transverter in Relays	20	1.50
	G3LTF	ATF36077 Preamp V2	15	0.48
	G3LQR	NE325 DJ9BV, ATF36077	29.5	0.74
5.7GHz	G3XDY	Transverter - DB6NT inc relays	19.8	1.57
	M0EYT	Transverter - DB6NT inc relays + Preamp	33.3	1.12
	G0EWN	Transverter DB6NT inc relays	27.3	1.15
	G3LQR	Transverter	15.3	2.10
10GHz	G3XDY	Transverter DB6NT inc relays	16.5	1.90
	G0MPP	Preamp G3WDG PHEMT	4.5	1.60
	G8AOL	Transverter (G3WDG)	28.6	1.85
		Transverter w/o preamp	19	4.80
	G8AOL	Transverter w/o preamp & inc coax in front of mixer	16.7	7.10
	G8AOL	Preamp only	11.8	1.00
	G4ZXO	Transverter DB6NT inc relays WG input	25	2.34
	G0EWN	Transverter DB6NT inc relays WG input	22.5	2.22
24GHz	G8PSF	Transverter (DB6NT Mixer and Preamp)	21.7	7.32
	G0EWN	Transverter (DB6NT Mixer and Preamp)	20	6.10
	G4LDR	Transverter (DB6NT Mixer and Preamp)	16.3	8.33
	G4ZXO	Transverter (DB6NT Mixer and Preamp)	23.1	4.35

				DUT NF	346A NF	346A NT	DUT NT
Noise	G4DZU	Ailtech No 1613	**144MHz**	4.50	4.9	5.5	5.90
Head			**432MHz**	5.00	5.43	5.45	5.88
			1.3GHz	6.03	6.87	5.3	6.14
	G4DZU	Ailtech 4166	**1.3GHz**	6.41	6.87	5.3	5.76
			10GHz	2.66	1.91	5.61	4.86

MARTLESHAM MICROWAVE ROUNDTABLE 2005

Many said it was the best yet. With around 120 attendees on the Sunday, 80 on Saturday and 60 at the Dinner that evening, we're inclined to agree! This report cannot do justice to the event since everyone present has their own perspective and story to tell. Microwavers from the USA, Belgium, Germany as well as the UK flocked to the British Telecom establishment at Adastral Park, Martlesham to hear the talks, test their latest construction project, share experiences, trade at the fleamarket and enjoy the socialising that only such an event can give.

The Saturday saw a most entertaining series of lectures, demonstrations of space vehicle reception and antenna testing (courtesy of G4DDK), along with the usual test facilities. The strong demand for the latter is evident from the Noise Figure measurements chart (many thanks to G3XDY) found elsewhere in this issue of Scatterpoint.

Saturday's lecture programme started with Murray, G6JYB, explaining the challenges facing us in the microwave spectrum. It's understandable that one could come away from such a talk feeling quite despondent about the future of our frequencies but Murray gave us food for thought as to how we might meet the authorities half way in some of these problem areas .... for example by opting for narrower but more protected slices of the spectrum.

We were delighted to welcome our main speaker from overseas, Brian Justin, WA1ZMS, the most successful amateur sub millimetre wave operator in the world. He has made two way contacts and VUCC (5 grid squares) on just about every available band from 24GHz up. Some of the bands have since been changed or withdrawn by FCC but Brian and his pal have already made the QSOs and got the certificates! He treated all of us on Saturday to a most interesting lecture on basic oscillators and mixer design at these high frequencies and a look at some of the paths and gear he has used. If that weren't enough, he gave another lecture on Sunday, this time on low noise oscillators, designs he has used to great effect to make narrowband contacts as high as 241GHz.

Our own Brian, G4NNS, treated us to a most informative talk on the subject of getting his EME dish into focus and how he has arranged to feed it on various bands.

Saturday evening saw some 60 microwavers at the annual dinner held at the Court Yard Marriott Hotel, just a few minutes drive from BT Adastral Park where the microwave meeting was taking place. Most of us were staying overnight at the same hotel so some fairly serious drinking took place by one or two folk, such that at least one well known EME-er (not Brian!) had a sizeable 'hangover' on Sunday morning! Sadly, some of us made an unwise choice of main course and the UKuG Reflector was echoing complaints for days afterwards! Steps have been taken to make sure it doesn't happen gain. Apart from that, the rest of the meal was very good and breakfast was it's usual good value.

Sunday's programme was tightly packed. The UKuG AGM batted first and two new committee members were elected. Committee reports can be found elsewhere in this issue. This was followed by G3PFR's annual report from the RSGB Spectrum Forum for which he is Microwave Manager. He gave a lucid account of the recent IARU meeting at Davos, pointing out the valuable contributions made there by the UKuG Committee papers submitted via RSGB. He reiterated much of what Murray has said on Saturday regarding our need to change our attitudes to future demands for spectrum allocations.

Next in the lecture room was Dave Robinson, WW2R/G4FRE who spoke on digitally controlling surplus microwave oscillators His talk was very well received. After lunch we were treated to a most informative lecture on the latest AMSAT space missions, especially the Venus Express which Freddie, ON6UG, was able to receive out in the car park later that day. He was aided in his lecture by James, G3RUH. Our thanks go to both of them.

Then came WA1ZMS's second talk. The room was packed for this and most of us went away in some amazement over how he had succeeded so well in making narrowband DX contacts at frequencies up to and over 240GHz.

He was followed by John, G4EAT, who whetted everyone's appetite for 24GHz on hearing how he had put together an efficient home station on this band, such that he has been able to work into Holland and Belgium as well as the UK. His present DX exceeds 200km on this difficult band.

After G3PHO's review of the past year's microwave activity, including contests, some useful discussion on the 2006 contest programme, headed by Steve, G4KNZ, concluded a most excellent weekend.

Our thanks go to the Martlesham Radio Society for arranging the venue and the hotel. The unsung heroes of MRS include Graham "the MC", Ian " the food", Robin " the registration man" and John "the test man" (aka G3XDY) who gave up their whole weekend for us to have a good time. We can't thank you enough!

MICROWAVE CONTEST RESULTS

UK Microwave Group 5.7GHz Cumulatives 2005

		22-May	19-Jun	24-Jul	21-Aug	18-Sep	23-Oct	Points	Mult	Total
1	**G4WYJ/P**	2342	2887	1035	2910	1727	1508	**8139**	14	**113,946**
2	**G(I)3ZME/P**	0	3397	0	4079	1176	0	**8652**	13	**112,476**
3	M0EYT/P	1657	1733	2221	2299	0	0	**6253**	13	**81,289**
4	G3FYX/P	0	0	1141	2343	1380	1410	**5133**	15	**76,995**
5	G(W)3PHO/P	1625	3009	2549	1387	899	2008	**7566**	10	**75,660**
6	G4ALY	1650	2710	1943	2275	1654	578	**6928**	9	**62,352**
7	G4LDR	604	1026	1268	2347	784	320	**4641**	11	**51,051**
8	G0MJW/P	0	706	785	920	0	0	**2411**	7	**16,877**
9	G8BKE/P	0	948	0	0	0	0	**948**	5	**4,740**
10	G0UPU	0	0	0	298	284	0	**582**	2	**1,164**

(Note: Callsigns in BOLD type are certificate winners)

Congratulations to the winner, Jim, G4WYJ/P, who operated portable from Ditchling Beacon in IO90WV and was one of the few stations who managed to be QRV in every session. As the leading operator, he will receive the **G3KEU Trophy**. Jim was using a DB6NT transverter with 6W PA to an 80cm offset fed dish at 3m agl, with the transverter and PA mounted at the dish. Best DX was 550km to GI3ZME/P in IO74AI and a total of 14 squares were worked over the series.

The **G3ZME group** (operators G3UKV, G4NKC and M1RKH), who entered one of the sessions from GI, providing a welcome new square (IO74) for many, was not far behind. The group had excellent scores for the June and August sessions but were beaten mainly due to only being able to claim 13 multiplier squares compared to G4WYJ's 14. Equipment was a DB6NT transverter plus 10W PA, to a 1m dish mounted 3m agl.

This contest again proved popular, combined with 10GHz, and there were a couple more entries compared to 2004 and slightly higher scores on average. The best activity periods were June, July and August, while October was somewhat disappointing. Thanks to all those who sent in entries, however small ... they are all appreciated.

A similar format is expected to be repeated in 2006, combined 5.7 and 10GHz events but with just 5 sessions (none in October) instead of 6.

Steve G4KNZ, contest adjudicator

UK Microwave Group 10GHz Cumulatives 2005

Open Section

		22-May	19-Jun	24-Jul	21-Aug	18-Sep	23-Oct	Points	Mult	Total
1	**G4EAT**	5758	4559	4727	6189	1858	3580	**16674**	21	**350,154**
2	**G(W)3PHO/P**	3174	5021	6411	6016	2168	3506	**17448**	15	**261,720**
3	G4ZXO/P	4157	3865	2709	4933	3423	3337	**12955**	17	**220,235**
4	G8KQW/P	0	2340	4045	5364	2467	3235	**12644**	16	**202,304**
5	G3FYX/P	0	0	3058	5424	2601	3234	**11716**	16	**187,456**
6	M0EYT/P	3800	3271	0	3248	2596	0	**10319**	16	**165,104**
7	G4ALY	3576	2971	3131	3909	2148	1278	**10616**	12	**127,392**
8	G4LDR	1062	1219	1921	3570	1267	1176	**6758**	14	**94,612**
9	G3JMY	1030	1508	1835	1565	1527	724	**4927**	11	**54,197**
10	G0UPU	553	267	529	616	159	410	**1698**	7	**11,886**

Restricted Section

		22-May	19-Jun	24-Jul	21-Aug	18-Sep	23-Oct	Points	Mult	Total
1	**G4WYJ/P**	2333	3401	1481	3406	2070	2319	**9140**	13	**118,820**
2	**G1MPW/P**	1984	2152	1496	2990	0	0	**7126**	15	**106,890**
3	G6KIE/P	1630	2152	1798	3100	0	0	**7050**	15	**105,750**
4	G3YGF	2149	1824	1042	2312	1417	0	**6285**	15	**94,275**
5	G0MJW(/P)	1207	1764	1556	3025	130	0	**6345**	14	**88,830**
6	M(W)0GHZ(/P)	0	3352	0	0	1789	1395	**6536**	11	**71,896**
7	G3UYM/P	1036	0	0	2155	890	990	**4181**	8	**33,448**
8	G8BKE/P	0	1732	0	0	0	0	**1732**	8	**13,856**

(Note: Callsigns in BOLD type are certificate winners)

Congratulations to the winner of the open section, John G4EAT, who again won the **G3RPE Trophy** 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 PA, to a 60cm offset dish mounted 20m above ground. John's best DX was DJ5BV, at 464km, worked in both the July and October sessions.

Congratulations to Jim G4WYJ/P , the winner of the restricted section and the G3JMB Trophy, who was operational portable from Ditchling Beacon, with good scores, for all sessions. Jim was running just under 1W to an 45cm prime focus dish mounted at 3m above ground, with the transverter and PA mounted at the dish.

A good number of entries was received for both sections, just slightly down on 2004 (when there was a total of 20 entries). The combination with 5.7GHz appeared to worked well again and this arrangement will continue in 2006. There was good support from Europe, with quite a number of French, Dutch and Belgian stations worked. Thanks to all those who sent in entries, however small, they are all appreciated.

The best scores were achieved in the August session (as was the case in 2004), with almost every participant active in this session and some good DX worked by some stations - for example, G3PHO/P worked 623km from IO84 to IN88. There was no particular poor session, though quite few stations were not QRV in October, but those that were active turned in reasonable scores for the day.

A similar format is expected to be repeated in 2006, but with just 5 sessions (none in October).

Steve G4KNZ, contest adjudicator

UK Microwave Group 24GHz Cumulatives 2005

		10-Jul	07-Aug	04-Sep	02-Oct	QSOs	Best DX	Points
1	**G8KQW/P**	177	653	708	1099	21	184km	**1807**
2	**G3FYX/P**	276	469	708	1026	19	167km	**1734**
3	G3PHO/P	512	620	0	906	19	135km	**1526**
4	G(W)3UKV/P	658	601	0	716	15	184km	**1374**
5	G0MJW/P	418	617	203	0	17	137km	**1035**
6	G0EWN/P	523	438	0	477	13	134km	**1000**
7	G8BKE/P	29	562	206	118	9	103km	**768**
8	G4MAP/P	305	122	0	418	11	94km	**723**
9	G4LDR	0	421	291	0	15	89km	**712**
10	G0JMI/P	82	0	186	108	4	93km	**294**
11	G4EAT	57	57	0	226	2	226km	**283**
12	G3UYM/P	57	57	0	0	2	57km	**114**

Note: The QSOs column shows the scoring QSOs in the best 2 activity periods and not the total for the whole of the sessions entered

UK Microwave Group 47GHz Cumulatives 2005

		10-Jul	07-Aug	04-Sep	02-Oct	QSOs	Best DX	Points
1	**G3PHO/P**	0	200	0	77	7	98km*	**277**
2	**G8KQW/P**	0	78	46	195	7	93km*	**273**
3	G3FYX/P	0	74	0	60	4	59km	**134**
4	G8BKE/P	0	0	0	59	1	59km	**59**
5	G0JMI/P	0	0	46	0	1	93km*	**46**

** one way*

Note: The QSOs column shows the scoring QSOs in the best 2 activity periods and not the total for the whole of the sessions entered

(Stations shown in BOLD type will each receive certificates)

ADJUDICATOR'S COMMENTS

Congratulations to Ia**n G8KQW,** who won the **24GHz cumulatives** with an excellent score in October that beat the overall scores in 2004 and some 21 QSOs over the two scoring sessions. Ian's equipment consists of a transverter with 2.5W PA, and a 0.48m dish. Best DX was 184km in the August session. Ian narrowly beat Roy, G3FYX, who operated (with Ian) from the same sites but with only a 0.5W PA and thus didn't quite make as many contacts.

Congratulations to **Peter G3PHO**, winner of the **47GHz cumulatives**, who only just beat Ian G8KQW by several points. Peter was using a DB6NT system, with 22mW TX, to a 35cm offset fed dish. Best DX was 98km one way in the October session.

Highest activity was in October, and conditions were good enough to allow some reasonable paths to be worked on 24GHz, including a **226km path between G4EAT and PI4Z**. Most of the activity was portable but 24GHz did include 2 fixed station entries. Compared to 2004, activity, entries and scores were all increased on 24GHz (11 entries in 2004), while on 47GHz there was a modest decline (6 entries in 2004), though more stations were logged. From the logs received, a total of 22 stations were active overall on 24GHz (compared to 15 in 2004), while on 47GHz, 10 stations were active (7 in 2004).

The move from 24.192GHz to 24.048GHz has still left a few stations behind (your author still included) who have not yet got around to moving frequency, and were unable to participate; hopefully this will be rectified in 2006! Thanks to all those who sent in entries, even if only for one session.

The combination of 24 and 47GHz seems to work well, as 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 is expected to be repeated in 2006.

Steve, G4KNZ, Contest Adjudicator

Editor's comments:
There is a malicious rumour spreading around the millimetre band operators that my environmentally-friendly 47GHz power supply (shown right) was not quite up to the job and only just lasted out the final cumulative ... it's just not true, honest!

Photo Left: A gathering of millimetre band men at Merryton Low Triangle, IO93AD, for the October 2005 UKuG Millimetre Bands Cumulative Contest. Stations shown, left to right, are:

G0EWN/P (24GHz), G7MRF/P (24 & 47GHz), G8VZT/P (24 & 47GHz) and G3PHO/P (Lower dish 47GHz, higher dish 24GHz)

Photo right: Dave, G8VZT (in white hat), adjusts his 24/47GHz cassegrain fed dish while Gordon, G0EWN, looks on. This photograph was also taken at Merryton Low Triangle, during the October UKuG Millimetre Bands contest