

scatterpoint

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

2006 JANUARY

Have you met Miss June?

Well here she is! Miss June is the 10GHz transceiver shown here to the right and is the proud rover companion of Wayne Yoshida, KH6WZ who paraded her among other less attractive systems at Microwave Update in San Diego last year. Yes, she **is** portable, American style! Notice the lavish care Miss June has had on her beautiful and stylish wooden frame. One assumes she is taken outdoors exactly as you see her here ... uncovered for all to admire!



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

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From the Editor's Desk



A very Happy New Year to all our UKuG members! By the time you receive this issue it will almost be the end of January 2006. Time certainly flies by these days! By now, you'll hopefully be well into your winter (or summer?) microwave construction project. How's that 24GHz transverter coming along? Are you on 3.4GHz yet? This issue shows you how to put out 40 watts on that band!

Once again, there is much pressure on available space so if your contribution has not been published this time please be patient ... it will be soon!

The centre fold pages contain all you need to enter the annual UKuG Microwave Contests this year. Full contest rules and dates can be pulled out of the middle of this edition, if you receive the printed Scatterpoint, and pinned onto your shack notice board as a constant reminder of the Sundays when you will find lots of activity on the microwave bands! Please try to come on for at least some of those days and please send in logs as either actual entries or checklogs.

Every log helps to establish the barometer of activity.

Thank for supporting UKuG

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.

According to the Secretary's latest database, the following operators have joined the UK Microwave Group during 2005 and early 2006. A very warm (if somewhat belated) welcome is extended to them ...

9H1GB	G3TCU	G8JMJ	M1CNJ
EA5GIY	G4BEL	G8KQW	M1FHX
GOJBA	G4CTD	G8OFA	M1ZEM
GOMPP	G4HJW	G8SHE	NE8I
GORUZ	G4IEV	G8XLM	ON4IY
G1EPL	G4IIO	GM3UAG	RS96257
G3GNR	G4NKC	GW8RAK	SP6LB
G3JMX	G4RQI	LA3EQ	ZL1TPH
G3NYK	G4WYJ	M1BWS	

It's nice to see several overseas members in the list and also a good number of M1 licensees. We hope you will all enjoy your membership and that your callsigns will be heard far and wide on the microwave bands!

Please write or email the editor with news of what you are doing these days.

SUBSCRIPTION ENQUIRIES SHOULD BE SENT TO THE UKuG GROUP SECRETARY AT THE ADDRESS SHOWN AT THE TOP OF THIS PAGE AND NOT TO THE EDITOR OF SCATTERPOINT



NEWS, VIEWS, WANTS & GOTS

DANISH MICROWAVE BEACON NEWS

From: Palle Nielsen, OZ8AFC

<palle_nielsen@gmx.net>

Here in Denmark we have rebuilt the beacon OZ5SHF and added some new bands:

1296.900MHz

5760.900MHz

10368.900MHz

24048.900MHz

All the beacons were electrically constructed by Erik, OZ5BZ and mechanically made by me, OZ8AFC.

Donations by local microwavers have made these beacons possible. **Regards from Palle, OZ8AFC**

GB3SEE BEACON

From Denis Stanton. G0OLX:

<denis@procom-pescot.co.uk>

Date: Wed, 21 Dec 2005

GB3SEE is now back on air, running just under 1 Watt output to the same 16 slot thin walled waveguide antenna.

The antenna is now mounted on top of a pole about 10 foot above the tower. This would have cleared the cellular antennas but, during the down-time, more antennas have spouted and we need to be another 3 feet higher to clear them .. maybe next year!

Regards from Denis, G0OLX

AUTOMATIC BEACON MONITORING by Andy Talbot, G4JNT

I've written a first try at some software designed for automatic monitoring and logging of microwave beacon reception using a PC + soundcard. It is designed to automatically track a slowly drifting carrier provided it stays within a 3.6kHz channel bandwidth. The software measures the Signal to Noise ratio in bandwidths as low as 0.244Hz, and can detect signals that are not normally audible. Measurements can be saved to a file at regular intervals for later plotting. The algorithms include tests to detect if the carrier is stable, or if the beacon is keying, and exclude these unstable periods from the log.

The whole thing is an experiment with the detection and tracking algorithms and also in using Visual Basic for real time DSP. The software will undoubtedly need extensive modifications and updating. All the detection parameters are made adjustable at this stage, and I'm not even sure if the detection algorithms are particularly sound - yet. Of particular interest is how the software will cope with rainscatter.

If anyone is interested in having a play with this currently rather embryonic software, it can be downloaded from www.scrbg.org/g4jnt

If you already have Visual Basic installed with its run libraries, it should be possible to just download UWBCNMON.EXE. These may also be present if other VB files have been installed in the past. Otherwise, download the complete UWBCNMON.ZIP archive, decompress that and run setup. After that, any later updates will need only the smaller .exe file. The description of the software is contained in the .PDF file, listed separately on the web site.

One of the first enhancements to be added will be to add automatic tuning via the serial port for a limited range of transceiver types (Icom and my DDS board initially) for when signals or local oscillators drift by more than a few kHz. After that, another change will be to add a wideband signal search routine for cases where the exact frequency is not known and the beacon cannot be heard by ear.

Andy G4JNT

Wanted

Copy of manual for Marconi TF1066B/6 UHF signal generator (10-470MHz)

It has no output at the low end of the lower bands which could be due to setup or low emission in the oscillator. What is the oscillator valve type and does anyone know of a source?

Neil, VK2EI <neilsan@tpg.com.au>

Wanted

I have a problem with my Hewlett Packard 8672A 2-18GHz signal generator. I can be contacted by email or on 01255 425965 .

Gus Coleman, G3ZEZ

A Check List for putting the Toshiba 20 and 40 watt 3.4MHz Linear Amplifiers on the air

..... by John Jaminet, W3HMS



Editor's Comment: This very useful article by W2HMS should be of interest to those readers who have bought, or intend to buy, the very economically priced 9cm SSPAs from "Pyrojoseph" on Ebay.

Introduction

This paper was created from several messages received on the Internet Lists in September/October 2001 by Steve, **N2CE1**, at DEMI, Rick, **K1DS** and an article in the MUD 2003 Proceedings, pages 66-70, by Dave, **WW2R**. Important new info was received from Owen, **K6LEW** in November 2001 on the importance of voltage regulation. It is incorporated in the text. In addition, our own **N3TWT-ATV** experiences with 24/7 operation in FM ATV (key down for months on end!) service are reflected in this update.

Basic Information

There are **two** versions of this amplifier:

- a. 20 Watts output @ 3.4GHz with 1mW input.
- b. 40 Watts output @ 3.4GHz with 1mW input.

Supply Voltage: + 12.6VDC (exactly)

Vendor Info on the 20 Watt Amplifier

This is a Toshiba 20W Linear Microwave Amplifier for use in the 3.44 to 3.68 GHz range. It is sold in the original manufacturers packaging.

Heat sinking: Required...it gets hot..

Size: 5" x 8" x 1 ".

Weight: About 2 pounds.

Input power: For full output, this is about 1 milliwatt or 0dBm.

Specifications: The specs on these amps are very "tight" and are typically as follows:

Linear Gain = 42.5dB; Gain: Ripple = .1dB

Linearity is -45dB; Return Loss (in and out)= 25dB;

DC Power Supply current: Typically +12 VDC at 10.6 amps.

Power Jack: The DC power and control connector is a DB-15 male.

DB-15 Pinout. There are 3 rows of 5 pins each.

The ground is made from pins 3,7,10,11 connected together.

The +12VDC lead is made from pins 1,2,12,13 connected together

All VCC and ground pins need to be connected to handle the 10.6 amps.

Pin 9 is the enable pin (TTL) which must be connected to ground in transmit to switch the internal power supply on.

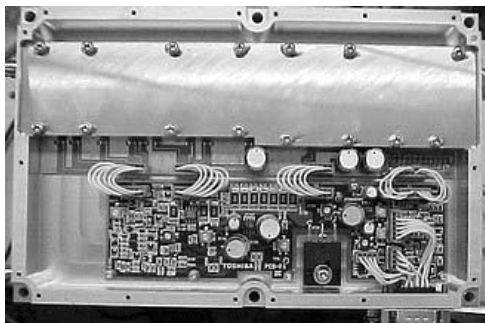
When pin 9 is not grounded, the 12VDC supply draws about 15mA. and the amp is in stand-by mode.

This is a Class A amp and as a linear amp, it will draw about 10.6A with no signal input.

Pins 4,5,8,15 are assorted alarm output pins low true....no more is known..

The 40 Watt Amplifier

This is a new Toshiba UM2683A 40W Linear Microwave Amplifier for use in the 3.4 to 3.6GHz range. It is sold in the original manufacturers packaging. This amplifier differs from the "2683B" "20W" version on other auctions because there is a TMD0305-2 MMIC instead of the discrete circuitry in the front end. The TMD305-2 part is a 3.4-5.1GHz amp with 2 watt output and 22dB Power Gain. Turning the two pots at the far left on the lower board in the photo fully clockwise (shutting down the attenuator) and peaking the power with the third pot (2nd and 3rd stage bias) yielded 46dBm, 40 watts @ 3.456GHz using 12.0 - 12.6VDC (as measured at the connector) with about 0dBm input power.



Power supply requirement is 12.6VDC @ 15amps after readjusting gain and bias.

Size

The size of these amps is 5 x 8 x 1 inch and weight is almost 2 pounds. Input power required for full output is about 0dBm. DC power and control connector is a DB-15 male.

Pinout is as follows:

Ground are pins 3,7,10,11; +12VDC are pins 1,2,12,13;

All VCC and ground pins need to be connected to handle the 15 amps.

Pin 9 is the enable pin (TTL) which must be grounded to switch the internal supply on.

When not grounded, the 12VDC supply draws only about 15mA. and the amp is in a stand-by mode. Since this is a linear amp, it will draw about 14-15 amps without signal input. Pins 4,5,8,15 are assorted alarm output pins low true...no more is known. Only new amps are being shipped.

Heat Sink Requirements

These amplifiers get VERY HOT! Heat sinking is required, particularly for FM ATV service many hours per day. We have found that the heat sink should be about 2.5 or more times the size of the amp and be blown with two high cfm blowers of no less than about 85 cfm capacity. We use two 12VDC blowers for twice the air flow and for redundancy in case of the failure of one blower.

In physics, we learned that heat rises and so it does indeed! Resist the temptation to mount the fins anyway but pointing UP as we have seen some disastrous results with the fins pointing down.

Even with fins up and 2 blowers we find the amp runs about 20 degrees higher than the temperature on the amp chassis, even in winter. We have mounted a small RS dual indoor and outdoor thermometer permanently on the chassis. We use the outdoor probe on the hottest part of the amp and heatsink. As I write this, an amp under test is showing 75F from the chassis probe and 55 F on the chassis. In summer, in a non-air conditioned space, the difference can be 30 degrees F.

The results of poor heat removal have been small fires at the interior of the final amp shielding as revealed by the charred parts of two amps. Photos are available.

We recommend you use a very stiff power supply designed for 24 hour per day operation with at least twice the normal load of 15 amps. In our case this is 30 amps adjusted to give 12.6VDC on the amp terminals. Note that some commercial power supplies arrive giving 13.6VDC output. In some cases, the output is adjustable internally by a pot that is tough to find and adjust; a design indeed by Murphy, de Sade, or the village idiot.

Overall System View

When the amplifier is integrated into a system such that relays, etc. are involved, the TX mode requires that the amplifier Pin 9, the PTT, be grounded for the amplifier to amplify, i.e. it turns on the power supply built into the amplifier. For RX, removing ground from Pin 9 places the amplifier into standby, drawing perhaps as much as 15mA, while the T/R relays all reposition for receive.

There is no feed-through via the amp. Changing from RX to TX involves just grounding Pin 9. There are no relays internal to the amplifier for switching RF between RX and TX, hence, external relays for switching between RX and TX are required.

Critical Voltage Levels

Please refer to Step 9 (below) which is VERY critical. These amplifiers, especially the 40W version, will go into "foldback" and be hard to recognize in so doing. The 12.6 VDC \pm 0.2 is critical because the output FET regulator has an extremely narrow window due to the heavy current drain.

If you allow your primary voltage to get outside of this window, the FET bias voltage, as adjusted by R150 as measured on Pin 1 of the regulator interconnect to the amp section, you will note the need for drive in excess of 0dBm for 40dBm output (40W). (W3HMS used about 950 microwatts drive for 40 watts output). Excess drive is not good and indicates foldback which generates excess heat causing the "final" to generate more heat than it should.

These amps should draw 15 amps key down, not 14 amps, though some do vary. The set-up is simple enough but it has been necessary for several amps to be readjusted. This is because some operators did not see the importance of the relationship between the primary voltage at 12.6VDC and the 10.3VDC from the regulator controlled by R150 and measured at Pin 1. This 12.6VDC should be measured inside the unit with the cover off while the amp is under load, i.e. key down or Pin 9 grounded on the subminiature DB 15.

Given that this pin is hard to use when the amp is fully set up, we found that we had about 0.09 VDC drop under load between the terminal strip on our chassis and internal pin 1 of Plug 6. Knowing this, we now do set up by putting 12.66VDC under load on our terminal strip. With the amplifier off the air, thus no load, we see 13.05VDC on our terminal strip.

NOTE: You do NOT need any RF drive for this set up as the amp runs in Class A. If you have a power supply with remote sensing use it. If it does either voltage or current drain sensing, use voltage sensing. The voltage MUST stay steady at 12.6VDC or something will surely be damaged, most probably the regulator, to be followed shortly thereafter by the costly output FET.

It is not necessary to monitor the drive level if you have reliable and repeatable equipment for the "exciter". Once you establish 0 dBm at the input port to the amplifier it should stay adjusted. If somehow the equipment is not reliable as to its output, and there is time to adjust, then monitoring the input level would be necessary.

Most modern transmitting equipment of today is reliable such that once power levels are set, the input level to the amp should remain set.

In an NTMS Feedpoint "article, also cited in MUD Proceedings 2003 on Page 66, Dave Robinson, WW2R, discussed his experience with this amp. In one tune up case of a new amp, we could not find the voltage controlled by R150 as addressed above so we followed Dave's advice to tune R150 and R138 for maximum output.

One could easily think about installing two VDC measurement jacks and make R150 an external pot so as to monitor and adjust both the 12.6 and 10.3VDC (at the VR) levels. No, the better choice is to monitor the output from a known and acceptable starting level. If you see the output begin to vary, then it is time to check the input level.

To clarify this point, R150 adjusts the output of the regulator BUT it does so in a very narrow window based on the primary input voltage of 12.6VDC and the amount of current being drawn and R138 will adjust this on the 40W version.

In summary

This is to say that R150 adjusts for 10.3VDC ONLY when the primary voltage is 12.6VDC with the amp under load (Pin 9 grounded) and the amp is drawing current.

If 12.6VDC in either direction is exceeded by about 0.3 - 0.4 VDC, adjusting R 150 will NOT regain 10.3VDC.

Thus, make absolutely certain you have sufficient heat sinking mounted to the amp for any tests or operation. The devices in this amp are extremely expensive and will not accept much heat.

This amp gets VERY hot very quickly without a heat sink attached. One could also use a muffin fan blowing across the heat sink. One of the "alarm" functions available on the subminiature DB 15 appears to provide a "temperature" alarm. It is not known what the temperature should be when this function is energized but there is a voltage on one of the alarm lines that appears to relate to an increase in temperature. This amp does not self protect, i.e. shut down, so be very careful !

Perhaps the voltage could be used to control a relay which would remove PTT-ON from pin 9 but we do not know how much current it can handle. It may not be enough to control a relay, but it might control a NPNB transistor which could in turn control a relay, but this is not sure.

Output Power Monitoring

In an NTMS Feedpoint "article, also cited in MUD Proceedings 2003 on Page 66, Dave Robinson, WW2R, found a terminal in the amp which provides 5VDC equal to 40 watts output. This terminal is in a 6-pin connector at the right end of the amp, 3rd pin from left, when the shielded amplifier box is above the connector.

Another way to say it is the output connector will be on your right and the input connector on your left. This is the forward voltage, + voltage where 5VDC = 40 watts output. Doug connected a wire to an empty pin on the DB15 connector. I chose to drill a hole on the closest wall in a clear spot for a feed-through capacitor and then connected a 0-10VDC meter via a shielded cable.

Conversion Steps

- ◆ Obtain power plug DB-15 male at RS or other. RS # is 276-1502 for about \$2
- ◆ Find and install heat sink size about 5" by 8" (size of amp) or larger and muffin fan if desired
- ◆ Calculate and obtain the attenuator value needed if you have more than 1mW output from your rig. FYI, the DB6NT units have about 200+ mW output and I will use 24dB of attenuation.
- ◆ Connect DB 15 power plug pins # 3,7,10,11 to ground.
- ◆ Connect DB 15 power plug pins 1,2,12,13 as the + 12.6VDC lead usable at 15 amps load.
- ◆ Connect a switch or relay to ground pin #9 for XMT
- ◆ Install antenna relay and necessary DC power
- ◆ Remove cover to see the 4 pots R217, R210, R136 on 20 watt model, R138 on the 40 watt model, and R150. These first 3 are the first 3 counting from the left and R150 is directly to the right of the voltage regulator
- ◆ Counting from left, turn pots R217 and R 210 fully clockwise
- ◆ Connect exactly + 12.6VDC power and power up
- ◆ Measure +12.6VDC at pin 4 on P6 to ground
- ◆ Connect input signal on 3.4561GHz (3.4001 in Europe) at the level of 1mW or 0dBm
- ◆ Monitor supply current and regulate to 15.0 amps with R138 on 40W model and R136 on 20W model
- ◆ Connect up the antenna or dummy load using good quality N or SMA fittings*
- ◆ If needed, adjust R150 for 10. VDC (CRITICAL) on right hand pins of P3

- ◆ Peak the power output with the third pot (This is R136 or R138) to yield 40 watts output

Testing

We have found that the output connectors can become quite HOT if the SWR is higher than desired, often too hot to touch! N fittings are desired but SMA fittings may simply have to be used per your individual needs. We recommend a careful "touchy/feely" exam even as little as 3 minutes after the on the air test commences.

Input for inclusion or questions can be made to: W3HMS@aol.com

73 from John, W3HMS

FAREWELL TO TWO MICROWAVERS ...

The European and UK Microwave scene is much the poorer this month after the recent loss of two well known microwavers

Dermot Cowley, EI2AK

Dermot had been a member of the UK Microwave Group for some years and was a long time subscriber to this newsletter in it's previous life as the RSGB Microwave newsletter. He was a keen VHF/UHF and microwave constructor and operator and gave several UK operators their first microwave contacts with Ireland. The Telford DXpedition group G3ZME/P remember him well as they met with him during one or two of their expeditions to EI to put various microwave bands on the map. Sadly Dermot, who was in his 70s, had contracted cancer from which he never recovered and died in mid October 2005.

Some of Scatterpoint's readers may remember him attending the Martlesham Microwave Round Table meeting some years ago, along with his friend Michael, EI5GG.

Now that Sam, G18GJX, is also a Silent Key, the microwave bands in the Emerald Isle sound very empty these days.

UKuG sends its sincere condolences to Dermot's family.

Steve Mitchell, G8JMJ

It came as a tremendous shock to many of us when we read, on the UK Microwave Group reflector, of Steve's sudden passing on the 2nd

of December 2005 He was a young man, just 46 years old, with a wife and three children. Steve was well known among the UK microwave fraternity as he often attended rallies (along with his son James) and came to the 2005 Martlesham, just a fortnight before his death, to set up a "fleamarket" table upon which he has some excellent millimetre wave items for sale.

Steve had only just had an article published in Scatterpoint about one of his latest projects, converting the DMC white boxes for use on 24GHz. He had also just become a member of UKuG.

Grant, G8UBN and a long time friend writes: " I have known Steve for several years and in that time he has always been helpful and willing to pass on his knowledge and experience gained from both amateur radio and the RF industry over the last 25 years."

Steve's funeral took place at The Priory Church in Great Malvern on Friday 16th December 2005. Grant went to see Steve's family before that and took along a card on behalf of all his amateur radio friends, listing the names and call signs of those that wished to pass on their condolences - there were quite a few.

The UK Microwave Group also sent a floral tribute.

Microwavers everywhere will join with us in sending our sincere condolences to his wife and family on their unexpected and sad loss.

UK MICROWAVE GROUP CONTEST PROGRAMME: 2006

Aims and comments:

The calendar is fairly similar to 2005, with the same format for the combined 5.7GHz and 10GHz cumulatives, and the combined 1.3GHz/2.3GHz/3.4GHz events. These have encouraged a lot of new activity on these bands, since their introduction in 2003.

On the higher bands, 24GHz is combined with 47GHz, as per 2005. Often the same dish used for both bands, and 24GHz is often used to align this dish before a 47GHz contact is attempted, so that a number of operators expressed the wish that it be continued. 76GHz is not included as an event in the calendar – operation on this band tends to be more individual tests, arranged to suit the weather and individual operators, rather than a specific contest date.

In planning the year's contests we have tried to avoid clashes and adjacent weekends with major VHF contests and events such as rallies and microwave meetings but, inevitably, this has not been possible in all cases.

Microwavers in Europe are most welcome to join in our UK contests. There is already a core of French, Dutch and Belgian stations who appear regularly in our summer contests. We would like many more to do the same!

THE RULES listed below are final and binding for 2006 (there are some changes from 2005).

The following contests are scheduled for 2006:

Low Microwave Bands - 1.3GHz/2.3GHz/3.4GHz (4 contest days).

5.7GHz Cumulatives (5 contest days with 3 to count for scoring purposes), on the same days as the 10GHz Cumulatives.

10GHz Cumulatives (5 contest days with 3 to count for scoring purposes), on the same days as the 5.7GHz Cumulatives.

24GHz Cumulatives (4 contest days with 2 to count for scoring), on the same days as the 47GHz Cumulatives.

47GHz Cumulatives (4 contest days with 2 to count for scoring), on the same days as the 24GHz Cumulatives.

10GHz Trophy (1 contest day, arranged by VHFCC, see the VHF listing for further information.)

In addition there are five non-competitive winter activity days.

The full contest calendar will be published in RSGB's Radcom and is also available with rules on the Internet at:

<http://www.g3pho.free-online.co.uk> and in downloadable PDF format at <http://www.microwavers.org>

General Rules (applicable to all events)

ALL THE CONTESTS (except the 10GHz Trophy) run from 0900 to 2000 UTC on a Sunday.

- The Contests are open to all comers (you do not have to be an RSGB or UK Microwave Group member), except for the 10GHz Trophy where contestants must be members of RSGB if they wish to submit logs. Stations located outside of the UK (G, GW, GM, GI, GD, GU, GJ) may enter a contest, and will be tabulated within the overall results tables, but will only be eligible for their own awards.
- Contestants are expected to enter in the true spirit of the event and to adhere strictly to any equipment or power restrictions that apply to the particular contest.
- Operators may enter as home station or portable (either mixed or separately); in multi-band contests, single-band entries are always acceptable.

Stations: Entrants must not change their location or callsign during the contest, unless the Rover rule is invoked.

In multi-band events, all stations forming one entry must be located within a circle of 1km radius.

Contacts: Only one scoring contact may be made with a given station on each band, regardless of suffix (/P, /M, etc) during an individual contest or cumulative activity period, unless the Rover rule is invoked. Contacts made using repeaters, satellites or moonbounce will not count for points. Contacts with callsigns appearing as operators on any of the cover sheets forming an entry will not count for points or multipliers.

Scoring: Contacts are scored on the basis of 1 point per kilometre for full, two-way microwave contacts and at half points for one-way (i.e crossband) contacts.

Exchanges: Contest exchanges on the microwave bands consist of RS(T) + serial number (starting at 001). In addition, the six (or eight) figure QTH Locator must be exchanged either via the microwave band or on the talk-back frequency. Where the Locator is not known, a full six-figure National Grid Reference (UK only) must be provided. In multiband contests, the serial number will start at 001 for each band (i.e a common sequence across the bands is NOT to be used). No points will be lost if a non-competing station cannot provide an IARU locator, serial number, or any other information that may be required. However, the receiving operator must receive and record sufficient information to be able to calculate the score.

Paperwork/Entries: Contestants are asked to make sure their entries have been scored correctly and that all

relevant bonus points and multipliers have been claimed.

All entries must be prefaced with a summary/cover sheet showing: Title of contest, name(s) of operator(s), location(s) of station, section entered, callsign used, band score(s), multipliers or bonus points, final claimed score. The sheet should also detail equipment used, particularly the power output, antenna and receiver for both the microwave band and the talkback. This is very important if the logs are entered in one of the restricted sections. Where the contest has a 'rover' facility, it is essential that each location used is clearly stated.

- Where Locator squares and / or countries are used as multipliers for bonus points, a summary list of the squares and countries worked must be attached to the contest cover (summary) sheet. This list should include the callsign and date of the first contact for each square/country.
- Log entries may be submitted directly on paper, using standard or self-prepared contest sheets, on a 3.5in diskette (IBM PC format), or via e-mail. For electronic entries, the format should be one of the following: ASCII text, Microsoft Excel, Microsoft Word, or the G4JNT contest software format. E-mail entries will be acknowledged to confirm receipt.
- All logs should be sent to the Contest Adjudicator, G4KNZ, *within 16 days of the end of the contest*. Late entries will be acknowledged but not used in the final ranking. G4KNZ's address is: 17 Haywood, Bracknell, Berks RG12 7WG, UK; or e-mail: steve.davies@nokia.com

Awards: Certificates (and trophies in certain cases) will be awarded to overall contest winners, individual section leaders and their runners up. Additional Certificates of Merit may be awarded at the discretion of the adjudicator. With these, as with the logs, the adjudicator's decision is final.

Special Rules: Applicable if called up for the specific contest:

Rover Concept: The 'Rover' concept is to encourage lightweight, low power portable activity. This allows the location of the station to be moved as many times as desired and by a minimum of 16 linear kilometres, at any time during the contest period. From each new location, stations worked from any of the previous locations during the event may be worked again, both stations involved in the contact gaining points. The serial number, however, will not revert to 001 each time a move is made but will carry on consecutively from the previous contact.

Low Band Microwave Contest Rules

First introduced in 2004, these contests aim to encourage operation on the three lowest bands in the amateur microwave allocation, particularly as there is growing UK interest in 3.4GHz equipment and triband antenna feeds for these three bands. By popular request, for 2006, the number of these events is increased to four, spaced out over spring through to autumn. The April and October events are aimed more at home stations, though portable operators are, of course, welcome to enter. The June and August events are more likely to suit portable operators, and the June event is also timed to overlap with UHF/SHF events in other IARU Region 1 countries.

1. The General Rules listed above apply.
2. There are four contests, one in April, one in June, one in August, and one in October.
3. There is only one section - open.
4. Each band will be scored and tabulated separately. The total points for each band will then be normalised by the adjudicator to 1000 and the normalised band totals added up and tabulated.
5. Each session will be scored separately - there are no cumulative scores.
6. For each session, April, June, August and October, certificates will be awarded to
 - the leading entry on each band
 - the overall leading entry across the three bands
 - the runners up to both the above categories
7. All logs should be sent to the contest adjudicator, Steve Davies, G4KNZ, within 16 days of the end of **each** of the four contests.

5.7GHz Cumulatives Rules

The 5.7GHz and 10GHz cumulatives have been run concurrently because of the growth in activity on 5.7GHz, and the ease of combining the two bands on the same dish. Although they are on the same days, they are completely separate contests. Either band or both bands can be used on any of the 5 days, and any three days submitted for either band. One change for 2006 – by popular request, there is no longer an October session.

1. The general rules shown above apply.
2. There are five, monthly, events, from May to September inclusive.
3. Any three of the five events may be used for final scoring purposes. Logs for all events entered should be submitted.
4. There is one section - open.

5. Moving location during the contest is allowed - **the Rover concept is applicable.**

6. The final, total kilometre score for the best three cumulative sessions will be multiplied by the total number of different Locator Squares ("grids"), for example IO92, IO81, etc) contacted over the entire cumulative (ie up to the five events maximum). To claim this bonus it is therefore essential to submit logs for all events entered, not just the best three. Please include a separate check list of the squares worked with your cover sheet. A one-way contact to a new locator square can be counted as a square for the purposes of the multiplier.

7. Certificates will be awarded to the leading station and runner-up, plus the leading home station. The G3KEU Memorial Trophy will also be awarded to the leading entry.

8. All logs should be sent to the contest adjudicator, Steve Davies, G4KNZ, within 16 days of the end of the final session of the contest.

10GHz Cumulatives Rules

The 5.7GHz and 10GHz cumulatives have been run concurrently because of the growth in activity on 5.7GHz, and the ease of combining the two bands on the same dish. Although they are on the same days, they are completely separate contests. Either band or both bands can be used on any of the 5 days, and any three days submitted for either band. One change for 2006 – by popular request, there is no longer an October session.

1. The general rules shown above apply.

2. There are five, monthly, events, from May to September inclusive.

3. Any three of the five events may be used for final scoring purposes. Logs for all events entered should be submitted.

4. Contestants may submit logs for either of the following sections:

Open

No power or antenna restrictions (other than those laid down in the amateur licence) on either 10GHz or on the talkback band. **The 'Rover' concept does not apply to this section.**

Restricted

10GHz transmit output not to exceed 1.0 watt to the antenna.

No power restrictions on the talkback band. No antenna restrictions

Moving location during the contest is allowed - **the Rover concept is applicable to this section.**

(There is no separate section for portable stations.)

5. The final, total kilometre score for the best three cumulative sessions will be multiplied by the total number of different Locator Squares ("grids"), for example IO92, IO81, etc) contacted over the entire cumulative (ie up to the five events maximum). To claim this bonus it is therefore essential to submit logs for all events entered, not just the best three. Please include a separate check list of the squares worked with your cover sheet. This multiplier is applicable to both sections. A one-way contact to a new locator square can be counted as a square for the purposes of the multiplier.

6. The final results table will show entries in rank order for each section. In addition to the usual leader/runner-up certificates for each section, the following certificates/trophies will be awarded:

- leading entry in the Open section - The G3RPE Memorial Trophy

- leading entry in the Restricted section - The G3JMB Memorial Trophy

- leading home station in each section.

7. All logs should be sent to the contest adjudicator, Steve Davies, G4KNZ, within 16 days of the end of the final session of the contest.

24GHz Cumulatives Rules

For the last two years, the 24GHz and 47GHz cumulatives have been run concurrently, and this format is repeated for 2006. Often the same dish used for both bands, and 24GHz is often used to align the dish before a 47GHz contact is attempted, so a number of operators expressed the wish that this be continued. The activity is primarily portable, and the dates mainly fall in the summer months; the exception is October, where the date is chosen to overlap with the IARU Region 1 UHF/SHF Contest. The May session also is timed to coincide with the IARU event at the start of the month, at the request of several operators. Although they are on the same days, the 24GHz and 47GHz events are completely separate contests. Either band or both bands can be used on any of the four days, and any two days submitted for either band.

1. The General Rules listed above apply.

2. There are four sessions to the 24GHz cumulative in May, July, September and October. The best two sessions out of four will be used for scoring purposes.

3. There is only one section - open.

4. Operation may be from portable sites or home stations.

5. Moving location during the contest is allowed - **the Rover concept is applicable.**

6. Certificates will be awarded to:

- the leading station and runner-up for the two sessions combined

7. All logs should be sent to the contest adjudicator, Steve Davies, G4KNZ, within 16 days of the end of the final session of the contest.

47GHz Cumulatives Rules

For the last two years, the 24GHz and 47GHz cumulatives have been run concurrently, and this format is repeated for 2006. Often the same dish used for both bands, and 24GHz is often used to align the dish before a 47GHz contact is attempted, so a number of operators expressed the wish that this be continued. The activity is primarily portable, and the dates mainly fall in the summer months; the exception is October, where the date is chosen to overlap with the IARU Region 1 UHF/SHF Contest. The May session also is timed to coincide with the IARU event at the start of the month, at the request of several operators. Although they are on the same days, the 24GHz and 47GHz events are completely separate contests. Either band or both bands can be used on any of the four days, and any two days submitted for either band.

1. The General Rules listed above apply.
2. There are four sessions to the 47GHz cumulative in July, May, July, September and October. The best two sessions out of four will be used for scoring purposes.
3. There is only one section - open.
4. Operation may be from portable sites or home stations.
5. Moving location during the contest is allowed - **the Rover concept is applicable**.
6. Certificates will be awarded to:
 - the leading station and runner-up for the two sessions combined
7. All logs should be sent to the contest adjudicator, Steve Davies, G4KNZ, within 16 days of the end of the final session of the contest.

Other Microwave Contests

The first weekend of May sees the RSGB 432MHz -248GHz Multiband Contest staged in parallel with the Region 1 IARU UHF/SHF Contest. The 10GHz Trophy is run in parallel by the VHF Contest Committee on the same weekend, and the rules can be found in the RSGB VHF contest rules.

The first weekend of October sees the RSGB 432MHz -248GHz Multiband Contest staged in parallel with the Region 1 IARU UHF/SHF Contest. The 1.3GHz Trophy and the 2.3GHz Trophy are run in parallel by the RSGB VHF Contest Committee on the same weekend, and the rules can also be found in the RSGB VHF contest rules.

In addition there are many other Continental UHF/SHF Contests held over the summer months and interested UK microwavers are urged to be active during these. Their details may be found on the Internet.

UK MICROWAVE GROUP CONTEST CALENDAR 2006

Dates, 2006	Time UTC	Contest name	Sections
22 Jan	0900 - 2000	All-band Activity Day	Non competitive
19 Feb	0900 - 2000	All-band Activity Day	Non competitive
19 Mar	0900 - 2000	All-band Activity Day	Non competitive
23 Apr	0900 - 2000	1.3GHz/2.3GHz/3.4GHz	Open
06 May	1400—2200	10GHz Trophy	See VHFCC Rules
07 May	0900 - 2000	1st 24GHz Cumulative	Open
07 May	0900 - 2000	1st 47GHz Cumulative	Open
21 May	0900 - 2000	1st 5.7GHz Cumulative	Open
21 May	0900 - 2000	1st 10GHz Cumulative	Open, Restricted
04 Jun	0900 - 2000	1.3GHz/2.3GHz/3.4GHz	Open
18 Jun	0900 - 2000	2nd 5.7GHz Cumulative	Open
18 Jun	0900 - 2000	2nd 10GHz Cumulative	Open, Restricted
09 Jul	0900 - 2000	2nd 24GHz Cumulative	Open
09 Jul	0900 - 2000	2nd 47GHz Cumulative	Open
23 Jul	0900 - 2000	3rd 5.7GHz Cumulative	Open
23 Jul	0900 - 2000	3rd 10GHz Cumulative	Open, Restricted
06 Aug	0900 - 2000	1.3GHz/2.3GHz/3.4GHz	Open
20 Aug	0900 - 2000	4th 5.7GHz Cumulative	Open
20 Aug	0900 - 2000	4th 10GHz Cumulative	Open, Restricted
10 Sep	0900 - 2000	3rd 24GHz Cumulative	Open
10 Sep	0900 - 2000	3rd 47GHz Cumulative	Open
24 Sep	0900 - 2000	5th 5.7GHz Cumulative	Open
24 Sep	0900 - 2000	5th 10GHz Cumulative	Open, Restricted
08 Oct	0900 - 2000	4th 24GHz Cumulative	Open
08 Oct	0900 - 2000	4th 47GHz Cumulative	Open
22 Oct	0900 - 2000	1.3GHz/2.3GHz/3.4GHz	Open
19 Nov	0900 - 2000	All-band Activity Day	Non competitive
31 Dec	0900 - 2000	All-band Activity Day	Non competitive

Modifying the Yaesu FT736R for microwave transverter switching by Keith, GW3TKH

Until now, I have used a FT290R as the 2m IF for my transverters at home and portable. In transmit mode, this transceiver has a +9V phantom voltage on the RF at the antenna socket which is used to switch the transverter.

I recently acquired an old FT736R for use as a microwave IF in the home shack and investigated modifying it to provide a similar switching voltage. This turned out to be quite easy, as the FT736R has a switchable receive pre-amp supply applied to the antenna socket and is selectable internally with 'U' links. It is normally deselected (see the handbook), which is the condition we need, as some of the wiring is used in this modification.

Proceed as follows:

1. Remove the top cover, taking care with the speaker lead.
2. Referring to the 144MHz PA UNIT circuit diagram, remove the BLUE wire from feedthrough insulator 'PRE'. Insulate and tie back the wire.
3. Take a 10k 0.25W resistor, fit a small ferrite bead on each lead, solder between feedthrough insulators 'TX9V' and 'PRE'. This puts +9V on transmit at the ANT socket.
(If a dc short circuit is applied to the ANT socket, i.e. a 2m antenna, the max current drawn is <1mA, so no damage will occur.)
4. If necessary, the power is set up to the required maximum to drive your transverter. (see adjustment details by GM4PLM on www.mods.dk)
- 5). Replace the top cover, not forgetting to reconnect the speaker lead.

This modification is easily reversed if required and/or can also be applied to the 70cm PA. I have been using the FT736R modified as above, set to a maximum drive level of 500mW, to work with microwave transverters by DB6NT and SSB Electronics. No adverse effects have been noted!

73 from Keith, GW3TKH

NEW SOURCE OF HP TEST EQUIPMENT MANUALS ...

There is a new ad-hoc FTP site at www.agilent.com that will be used as a repository for third-party scans of unsupported HP/Agilent test equipment manuals:

<ftp://ftp.agilent.com/pub/manuals/>

These include some interesting HP Journal scans for the HP 8566/8568 analyzers and the 8970A noise figure meter.

The site was announced in a message from Dave Cunningham, of Agilent, on the HP Agilent equipment Yahoo internet group:

Anyone in possession of good-quality scans of obscure manuals, app notes, HPJ issues, and so forth may wish to contact Dave Cunningham of Agilent at [<dcunningham@agilent.com>](mailto:dcunningham@agilent.com) to ask about upload permission. It would be good to support Agilent in this effort by any means possible.

Information submitted by John, KE5FX

Interested in Radio Astronomy?

Then take a look at the website of the **British Astronomical Association's Radio Astronomy Group** and download their latest newsletter. You'll need a good broadband internet connection as it's a **14Mb** download but once you have it you'll be very impressed with both the quality of the material therein and the fact that several well known members of our own UKuG are very prominent! For example, there are contributions from Murray G6JYB, Martyn G0CZD and Brian G4NNS.

You find this and more at: www.britastro.org/radio
It's also worth taking a look at the parent BAA site at: www.britastro.org/

By the way, don't think you have to have a 20 foot dish and a sub 0.5dB NF preamp to take part ... you don't! In fact lots of interesting radio astronomy can even be done with a frame aerial at VLF and/or your present microwave receivers and antennas.

RF CONNECTORS

... A LOOK AT THE IMPORTANCE OF THE MOST MISUSED AND NEGLECTED COMPONENTS OF THE AMATEUR MICROWAVE SYSTEM

Editor's comments: The following two articles are intended as a reminder to all of us of the importance of using the right RF connectors for the job in hand. As amateurs, we often have to make do with whatever we have in the "junk box" but at microwave frequencies this approach can often lead to more trouble than it's worth. The first article is based on one originally written for engineers in the commercial field and which appeared in the RF Globalnet newsletter (obtainable for free by signing up at <http://www.rfglobalnet.com>) The second article is by one of our own UKuG members, Peter Blair, G3LTF. Our thanks go to both sources and especially to **Jim Pomager, Editor in Chief at RF Globalnet** for giving permission to use his article.

RF Cables And Connectors Don't Get No Respect ... But They Should !

... from an abridged article by Jim Pomager, Editor in Chief RFGlobalnet

Unlike active devices such as ICs, cables and connectors are quite possibly the most unglamorous components in the RF/microwave design world.

Like doorknobs in an architectural plan, RF cables and interconnects are rarely considered during the design process itself. Rather, these necessary evils are typically contemplated only after a project is all but complete. They truly don't get much respect.

However, these oft-neglected components can have a significant impact on overall system performance. In the commercial field, RF and microwave design engineers face enormous pressure to deliver quality products at lower costs. As a result, cable and connector vendors can end up being their best friends, helping them meet a variety of electrical, mechanical, and environmental demands. In fact, today's cable and connector suppliers are supporting designers with products that are smaller, faster, and more phase stable than ever before. Miniaturized products handle higher frequencies, conserve space

There are two key factors behind the continuing reduction in RF cable and connector sizes. First, the frequency ranges of RF/microwave systems have been creeping steadily higher (driven principally by the need for higher data rates in communication systems) and small-diameter coaxial cables are generally more efficient at carrying the higher microwave frequencies than are large-diameter cables. Hence, we have witnessed the rise of small-diameter, high-

frequency cable -- and the microminiature connector.

One line of connectors that illustrates this trend toward higher frequency and smaller size is the MMPX series from Huber+Suhner. These board-mount, microminiature, snap-on connectors are comparable in size to the diminutive MMCX connector and are compatible with the MMCX interface. They demonstrate linear VSWR at frequencies from DC to 65 GHz and have shielding effectiveness of -85 dB from DC to 26.5 GHz, -65 dB from 26.5 to 50 GHz, and -60 dB from 50 to 65 GHz. Applications include test and measurement, defense, and mobile radio. MMPX connectors are available in straight cable plug, straight cable jack, right angle cable plug, straight PCB jack, edge-mount, PCB jack, and adaptor configurations. For more information, visit www.hubersuhner.com.

Tensolite brings its SMP and SSMP lines of blind-mate push-on connectors to the microminiature party. The SMP series covers DC to 40 GHz and permits connector spacing as close as .170 inches for an assortment of military, space, and telecommunications applications. The SSMP series ratchets it up a notch in frequency (to 65 GHz) and down a notch in size (spacing to .130 inches) for smaller, lighter systems. SSMPs are offered in popular interconnection versions for cable assemblies, surface launch, edge launch, hermetics, adapters, and loads. For more information, you can download Tensolite's RF/Microwave Products Catalogue from their website at www.tensolite.com

The second major factor influencing RF cable and connector size is the shrinking of the RF/microwave system itself. With almost all package sizes getting smaller. As a result, cables and interconnects (all components, for that matter) must have minimal footprints, whether they are

on a board, in a base station, or on a tower.

Nowhere is this lack of space more evident than inside a wireless device. For this cramped environment, RF Industries introduced the MHF series of microconnectors and cable assemblies for Wi-Fi. These coaxial connectors have a mating height of 2.5 mm. They support dual-band applications in the 3 to 6 GHz range, including laptops, PDAs, and cell phones. Cable assemblies are available with a range of connectors, including SMA, MMCX, TNC, and Type N. For more information, visit www.rfindustries.com.

In the test and measurement arena, where cables are constantly being attached/detached from instrumentation, recent advances in interconnect technology can help save engineers a lot of time (and a little sanity). Winchester Electronics (USA) just released its QC-SMA series of SMA connectors, which cover the frequency range of DC to 6 GHz.

These connectors incorporate a push/pull style of mating, which allows them to be connected and disconnected without the need for special tooling. (This is in direct contrast to standard SMAs, which must be torqued for proper installation). Once QC-SMA connectors are mated, they can rotate 360 degrees without losing connection. In addition to test environments, these connectors can also be used in microwave subsystems, base stations, mobile radios, and other applications. For more information, download the QC-SMA datasheet at: www.winchesterelectronics.com/products/qc/qcsma.asp



Stainless steel connectors good or what?

...some notes by Peter Blair, G3LTF

This may only be of interest to microwave EME people! Some days back I asked the following question.... "Does anyone out there have any real data on the difference in loss between a standard gold plated SMA connector and a stainless steel one at frequencies of 1296MHz and 2304 MHz. I have a built in prejudice against using them at these frequencies but it is

only that, I don't have any data."

Chris, G4DGU, made the following sensible comment: "My qualitative view is that there's not a huge penalty - perhaps 0.02 - 0.05dB extra loss at 10GHz. My reasoning is that the centre conductor (which has the highest current density, of course) is gold-plated anyhow, and that losses in the outer are mitigated by the much lower current density. I've not seen any evidence of excessive temperature rise in a pair of mated s/s SMAs carrying 40W at 10.3GHz."

It proved difficult to find one for one comparisons and most SMAs are in fact stainless steel plated with gold. I found two manufacturers websites quoting figures for stainless steel gold plated of (0.03x square root of frequency in GHz) dB... but I couldn't find any figures that were clearly and definitely for non plated stainless steel. For comparison, 10cm of 0.141" coax is (0.038 x square root of the frequency in GHz) dB

I found some other interesting data however. A hermetically sealed connector is (0.05 x square root of the frequency in GHz)dB and brass SMA connectors are quoted as (0.06x square root of the frequency GHz)dB, clearly these are to be avoided. (If you can't tell the difference between brass and gold then try "Alchemist" in your Yellow Pages).

The Radiall website at www.radiall.com/vdocportal/radiall.jsp (then follow SMA and Literature, page 11-12)... has some interesting data. It quotes straight SMA connectors as 0.02dB flat from 1 to 10GHz (which doesn't seem right, it must vary as the square root of frequency) but quotes a right angle connector as 0.04dB at 1GHz, 0.05dB at 2.4 GHz and 0.09dB at 12.4 GHz. I suspect that much of this is a VSWR contribution but it would seem that a minimum length 0.141" cable with two straight connectors is a better solution than a right angle connector. Also in the Radiall data is a useful chart of power rating vs frequency for SMA connectors.

Now you might think that none of this really matters but at 1296/2320MHz with a low noise dish and feed then, if you have a NF of 0.35dB, changing the loss in front of it from 0.1 to 0.2dB will worsen the receive sensitivity by 0.5dB (see VK3UM eme calc programme at: web.telia.com/~u92010241download.htm)

73 from Peter G3LTF



ACTIVITY NEWS FROM THE WORLD ABOVE 1000MHz

After the absence of activity news in last month's Scatterpoint we now have a huge backlog of reports to include in this edition! Of necessity these have had to be shortened in some instances.

UK News

First off the line this month is fellow Yorkshireman **Doug, GW3ATM** (Monmouthshire, South Wales). He's been working out from what at first glance may seem an impossible location but, like all true Yorkshiremen, he has the tenacity to keep trying. With a flyswatter antenna on 10GHz and some useful rainscatter conditions at times, he's made 97 contacts during 2005, with 17 separate stations. His best DX so far is G4EAT in JO01HR (whom he has worked 8 times). His most frequently worked station is G4ALY in IO79VL. Doug is hoping to break the 100 QSO "barrier" during 2006, which is also **his 60th year as a licensed amateur. Many congratulations Doug!**

**From: G4BRK, Neil Whiting <neil@ignika.com>
Date: Sun, 27 Nov 2005 (IO91DP)**

I enjoyed my time in the Nov Low Band contest (*see results p. 19... ed*) but could only be on for part of it, with breaks for other commitments. It started out very poor on 23cm, signals very weak and not peaking properly. I think the heavy frost on the 35 element Tonna was detuning it. Around midday the beam started working properly and some more distant stations were found, the best being DJ5BV at 618km out of 17 QSO's.

9cm wasn't too bad ... 6 contacts but no DX, the best being G3PHO/P at 265km. Must have been chilly out /P! 13cm activity was poor with only 4 QSOs, G4BEL providing the best DX at 149km. I expect to be moving early in 2006 but am not sure how good the new QTH will be. Unobstructed hilltops in the W Oxford area tend to be rare and very expensive, so I have ended up in the middle of a flat region. It should be better in some directions but maybe not in others. Time will tell. Collecting squares again will be quite a challenge! **73, Neil G4BRK**

**From: G3XDY, John Quarmby <g3xdy@btinternet.com>
Date: 10 Oct 2005 (JO02OB)**

Here is a summary of recent operation on the microwaves from here in JO02PB:

21 August: Prior to the UK Microwave Cumulative I looked for French stations in their F8TD contest on 1.3GHz and up. In fairly ordinary conditions the following QSOs were made:

1.3GHz: F9OE IN78QG, F5HRY JN18EQ,,F1AJZ/P JN28OK, F1NPX/P JN29DH, F1RJ JN18AT, F/ON4SHF/P JO00XX

2.3GHz: F5HRY JN18EQ, F/ON4SHF/P JO00XX

5.7GHz: F5HRY JN18EQ

10GHz: F5HRY JN18EQ

In the August 3 and 6cm cumulative I worked F/ON4SHF/P, G8KQW/P, G3FYX/P, G4EAT and G4LDR on **10GHz**, plus F/ON4SHF/P, G3FYX/P, and G4LDR on **5.7GHz**.

30 August: DF9IC was a new square on 13cm (JN48) as he tested his new 13cm rig. He should be a very potent signal with 200W available in the shack! It was nice to work Roger G4BEL after many years on 13cm too.

31 August: F1PYR/P (JN19BC) was worked on 1.3/2.3/5.7/10GHz

4 September: An early morning session with enhanced tropo found SM7ECM (JO65) on 1.3GHz, followed by G0RRJ on 2.3 and 3.4GHz.

18 September: A few QSOs were made in the cumulatives on 5.7GHz with G8APZ, MOEY/P, G8OHM/P, and on 10GHz with the above plus G3FYX/P, G8KQW/P and G4EAT.

1st/2nd October IARU Contest: Conditions were poor on the Saturday, but improved on Sunday. Contacts of note were:

1.3GHz: Sat: F9OE IN78QG; DK6AS JO52JJ; DJ5BV JO30EM; DF9IC JN48IW

Sun: DL0GTH JO50JP; DK0X JO43WJ; SK7MW JO65MJ; DB7YAH JO42LH; DF0YY JO62GD; DL0B JO42HG; OZ1FF JO45BO; DL3IAS JN49EJ DL0VR JO31LG; DK3OS JO30EM; F1DBE/P JN19BC; DL0GTH JO50JP; G4ALY IO70VL; DL3IAS JN49EJ

I also had near misses on Sunday with DK0XA (JO43) and DF0YY (JO62), with signals heard both ways but not enough to complete a QSO. PI9A JO33FB, G8IFT/P IO82QL, PI4GN JO33II, PA0BAT JO31FX, DL0VR JO31LG, G4ALY IO70VL (by pure aircraft scatter).

I made a total of 18 QSOs on 9cm which is a personal best in a contest, despite the poor conditions. It is great to see increasing activity on this band.

5.7GHz: PA0BAT JO31FX, G8IFT/P IO82QL, ON4SHF/P JO20EP, F1DBE/P JN19BC,

10GHz:

PI4GN JO33II, PA0EZ JO22OF
Rather poor with contacts that usually work failing this time.
PE1MMP JO21VT, P19A JO33FB, G4MAP/P IO82QL, PA0WMX JO21XI, ON4SHF/P JO20EP, F6DKW JN18CS; PA0BAT JO31FX; DL0VR JO31LG, PA0EZ JO22OF, G8KQW/P IO81XW, DL4PLM JO31JF

Poor on Saturday but signals better on Sunday with a little rainscatter evident on Sunday afternoon.

I gave my new transverter system its first airing during the IARU Contest. This is a home built Elecraft K2 HF transceiver on 28MHz with a homebrew 28/144MHz transverter and control box which allows 6 transverters to be controlled from the K2 bandswitch for instant QSYing. It worked very well but it was a bit of a marathon to get it all finished and working in time.
73 John G3XDY

3cm EME DX News

From: GW4DGU, Chris Bartram

<yahoo@blaenffos.org> Wed, 11 Jan 2006

I was very pleased to work LX1DB on 3cm EME on Monday night with just 10W at the feed of my 2.4m offset dish. I thought, perhaps, that Stuart, GW3XYW had worked Willi previously but it turns out that he hasn't. To the best of my knowledge, noone but Stuart and I have made 3cm EME QSOs from Wales, so I guess that makes the QSO a 'first' GW-LX EME QSO on the band. I also have a strong suspicion that LX hasn't been worked on tropo from Wales, unless someone /P in the English borders has made a QSO. Any claimants?

Incidentally although I've worked well over 50 DXCC entities on 144 and about 35 on 432 since moving here three years ago, I still haven't worked LX on either of those bands!

Thu, 12 Jan 2006: I really don't want to sound boring, or as though I'm on an ego-trip, but yesterday evening/early this morning I made two more QSOs on 10GHz EME with my QRP system. The QSO with IQ4DF was a 'first' between GW and I by any mode on 3cm. IQ4DF runs 400W to a 7m radio astronomy dish, and they are LOUD! How they managed to copy 10W from my little antenna, I don't know, but they did, and the QSO was finished in about 15m.

Later, I worked AI, W5LUA, for my 'initial' #4. AI was also a very good signal, and the QSO also went in about 15min. AI was running 80W to a 4.5m dish.

I was running just 10W to my 2.4m offset dish, and due to a relay failure, had a receiver sensitivity very similar to that which most people have from their tropo systems. As 8ft dishes are available reasonably easily - there are some on Ebay at the moment, perhaps these results might encourage other people to have a try?

From: Dave Robinson, WW2R (aka G4FRE)
<robinda@nortel.com> 19 Dec 2005

Well, it's been a long time since I was last on the moon ... the last century to be precise! (K0RZ on 432MHz on 11/28/99 to be exact). I was given a 10 ft diameter C band 0.4f/D dish in December 04 but it wasn't until the Thanksgiving holiday 2005 that found the time to do something with it. Enthused by meeting/talking with WD5AGO, K5GW and W5LUA in person, in early December I made the final push to be QRV on 1296MHz.

I now have the dish with a VE4MA feed, WD5AGO style preamp (0.33db nf) and EME Electronics 2 x 2c39 air cooled amp producing 200W (150w at the feed). Before any comments on water cooling, the amp has been running at this power for the last 15 years and I have only had to change the tubes once!). The IF is the W7PUA DSP10 144MHz transceiver.

Sun noise was 11.2dB, and sky to 50 ohm was 6.6dB.

Results so far:-

11 Dec: worked **G4CCH** (569/549) K5SO 559/549 (random) , VE6TA 559/0, K9SQL 589/549. I heard OZ6OL and IW2FZR. The first signal I heard was G4CCH telling VE6TA that WW2R would be QRV that afternoon!

12 Dec: worked **G3LTF** 539/429, K5JL 559/529, F2TU 559/o(called me) K2UYH 559/549. **heard G3LQR**

18 Dec: worked W5LUA, K2UYH, SM3AKW and heard K5JL.

All QSOs were on cw . I don't normally manage to work 2 Brits on HF in a weekend let alone on 1296!

In 2006 I will work on getting the TH328 fully operational and making the mount a TRUE polar mount before progressing to higher microwave bands. The dish is good through 5760MHz. **73 from Dave WW2R**

47GHz Terrestrial World Record broken again

After the world record report in the September 2005 Scatterpoint, the intrepid western USA team of AD6FP and W6QI were not satisfied and set about extending it even further ... read on!

From: Gary, AD6FP, <ad6fp@lbachs.com>

Date: Tue, 01 Nov 2005

On the evening of October 30 W6QI and AD6FP completed a 47GHz contact over a 343km path, 30km further than the current record. W6QI operated from Frazier Mountain DM04MS, North of Los Angeles. AD6FP operated from Pilot Peak DM07BS near the northern entrance to Yosemite. The path is near line-of-sight with an obstructing peak about 20km south of Pilot Peak. Signal levels were easy copy with some slow fading, 30+dB margin on the Frazier end and 6+dB on the Pilot end.

Weather conditions were seasonal normal for California, temperatures in the mid 40s Fahrenheit range with ~ 60% relative humidity. Both Frank and Gary were returning from the Microwave Update 2005 conference that was held in Los Angeles and hosted by the San Bernardino Microwave Society. The stations used were the same as last time:

W6QI: 12" splash plate, 10 mw, 8 db NF

AD6FP: 36" Cassegrain, 30 w, 4 db NF

AA6IW had another 47GHz radio on the Frazier end with W6QI but due to local oscillator problems was not able to participate in the record-breaking contact. N2MJI accompanied AD6FP to the Pilot end and assisted in the navigation to the site and the radio setup which were both done after sunset thanks to a flat tyre on the way to Pilot. It took several hours to finally make the QSO due to problems at both ends: failing power inverter, failing local oscillator, aiming in the dark, etc.

The QSOs were also completed on 10 and 24GHz with very strong signal levels and 10GHz was used as the liaison frequency. To assist aiming, W6QI played back his 47GHz audio to AD6FP over the 10GHz liaison, allowing AD6FP to do the final peaking of the dish. Signal margins indicate longer peaks are possible but further attempts will have to wait for spring .

AD6FP Gary W6QI Frank

(Many congratulations from all of here at UKuG)

Meanwhile, on 134GHz !

Some remarkable things have been happening on these higher frequencies. Those of you who were at Martlesham 2005 will now be able to put a face to one of the calls in the following reports.... namely Brian, WA1ZMS... read on and stand back in awe! ...

From: Brian Justin <wa1zms@att.net>

I'd like to claim what should be a new world DX record for the **134GHz band** as well as a possible "first-on-band" for the USA. This QSO was between **W2SZ/4 and W4WWQ/4:**

Band: 134GHz

Date: Dec 8th, 2005

Time: 02:43z

W4WWQ/4 (WA4RTS assisting) 36-59-28N 79-20-41W FM06HX

W2SZ/4 (WA1ZMS operator) 37-31-00N 79-30-35W FM07FM

Distance: 60.1km

W2SZ/4 WX:

Temp: -6.7C

Dew Point: -16C

RH: 45%

Baro: 882mb

Atmos Loss: 0.185dB/km

W4WWQ/4 WX:

No data taken.

The former 134GHz DX record was held by JA1KVN & JA1ELV at 56.4km. The signal margin on both ends of our QSO was a few dB so there is a chance we could better our DX but first, I must investigate why one of the station's Gunn sources will not properly phase lock with good phase noise. Of course, you only find this out after you take the equipment into the field!

The equipment runs 5mW of TX power into a 30cm dish with a Cassegrain feed and a dual-mode horn. Receive function uses a sub-harmonic mixer. Both TX and RX functions get their LO power from a phase locked 69GHz Gunn source. The Gunn signal is fre-

quency doubled when in TX mode. The operating mode was FSK-CW. The RX IF radio was an ICOM R-7000 on both ends.

I'd like to thank Geep, WA4RTS for helping Pete, W4WWQ during the QSO.

NOTE: As of last year, the 134GHz band has replaced the former 145GHz Amateur band. The 145GHz allocation has been removed from the Amateur Radio Service world wide, with the USA being the last country to make the change.

73, Brian, WA1ZMS/4

Just a few days later

Several of you must have seen this coming ...

From: Brian Justin <wa1zms@att.net>

I'd like to claim what should be another new and latest world DX record of **79.6km** for the **134GHz band** as well as the very first ARRL VUCC claim.

This latest DX record QSO was between W2SZ/4 and WA1ZMS/4.

Band: 134GHz

Date: Dec 14th, 2005

Time: 02:56z

WA1ZMS/4 (roving alone) 36-59-28N 80-07-17W EM96WX

W2SZ/4 (W4WWQ operator) 37-31-00N 79-30-35W FM07FM

Distance: 79.6km

W2SZ/4 WX:

Temp: -10C

Dew Point: -14C

RH: 72%

Baro: 876mb

Atmos Loss: 0.250dB/km

WA1ZMS/4 WX:

Temp: -5.5C

Dew Point: -12C

RH: 60%

Baro: 928mb

Atmos Loss: 0.292dB/km

The gear is the same equipment that was used for last week's former 134GHz DX record. But this time the noisy Gunn source was cleaned up and the resulting improvement in phase-noise allowed us to copy the FSK-CW signals down into the noise floor by ear.

During last night's DX efforts, W2SZ/4 picked up the last three needed grids for the first ARRL VUCC claim on the 134GHz band.

I'd like to really thank Pete, W4WWQ for pushing me to "go for it" last night in an attempt to get the VUCC efforts completed during the cold night air. It was a LONG and late night. We started after work at 6pm.

We arrived home at 3:30am local time and got very little sleep as a result.

73, Brian, WA1ZMS/4

Congratulations to Brian and Pete on a great achievement ... editor

**THAT'S ALL WE HAVE ROOM FOR THIS MONTH.
73 UNTIL NEXT TIME from Peter, G3PHO**

UKuG LOWBAND MICROWAVE CONTEST RESULTS : 20th NOVEMBER 2005

	1.3	2.3	3.4	Total
G3XDY	758	1000	493	2251
G4BEL	753	489	398	1640
G3PHO/P	616	0	1000	1616
G4EAT	1000	0	0	1000
G4BRK	543	120	232	895
G4LDR	265	139	378	782
M0GHZ	293	359	107	759
G0MJW	286	174	263	723
G4RFR/P	287	426	0	713
G3UKV	364	0	318	682
G4HUP	446	191	0	637
G3TCU/P	149	0	0	149
G0JMI/P	50	65	30	145
G1EHF	137	0	0	137
G0UPU	11	20	29	60
GW3HWR	15	0	0	15

1.3GHz	Best DX	Located	Distance	QSOs	Score
G4EAT	DF6NA	JN49XS	692	36	8297
G3XDY	DF9IC	JN48IV	634	23	6290
G4BEL	DF9IC	JN48IV	714	27	6248
G3PHO/P	DL4PLM	JO31JF	589	19	5112
G4BRK	DJ5BV	JO30KI	618	17	4504
G4HUP	DJ5BV	JO30KI	434	15	3698
G3UKV	GM4CXM	IO75TV	376	17	3024
M0GHZ	DL4PLM	JO31JF	626	13	2428
G4RFR/P	G3LRP	IO93HO	318	17	2382
G0MJW	GM4CXM	IO75TV	524	16	2371
G4LDR	G3PHO/P	IO93PW	321	18	2202
G3TCU/P	G3PHO/P	IO93PW	301	10	1233
G1EHF	G4DDK	JO02PA	180	12	1134
G0JMI/P	G3PHO/P	IO93PW	326*	6	412
GW3HWR	G4ALY	IO70VL	122	1	122
G0UPU	G8AIM	IO82FH	46	3	94

* One way

2.3GHz	Best DX	Located	Distance	QSOs	Score
G3XDY	DJ6JJ	JO31LG	407	10	2461
G4BEL	G4RFR/P	IO90AS	227	9	1203
G4RFR/P	G4K1Y	IO92WN	236	8	1048
M0GHZ	G4BEL	JO02BI	190	8	884
G4HUP	G4RFR/P	IO90AS	270	4	470
G0MJW	G4BEL	JO02BI	124	5	428
G4LDR	G3XDY	JO02OB	111*	6	342
G4BRK	G4BEL	JO02BI	149	4	296
G0JMI/P	G4RFR/P	IO90AS	65	4	160
G0UPU	G4MAP	IO82XH	37	2	48

Here are the results for the Low-Band Contest of 20 November 2005:

There were 16 entries, 12 fixed stations and 4 portable, which was significantly up compared to the entries for the other low-band events earlier in 2005.

On 1.3GHz, John G4EAT won by a decent margin, operating on this band only, from home (JO01) with 4x23 ele yagis at 20m agl, and a 50W PA. John reported above average conditions and activity especially to the E and SE in the morning, and his best DX was 692km to JN49 square.

On 2.3GHz, John G3XDY won convincingly, also operating from home (JO02), with a 0.6m offset fed dish at 14m agl, and a 120W PA. Best DX on this band was 407km to JO31 square.

On 3.4GHz, Peter G3PHO won convincingly, operating portable from near Pocklington in the Yorkshire Wolds (IO93), with a 1.2m prime focus dish at 2m agl and a 15W PA. Peter's best DX on this band was 454km to IO70 square. In contrast to G4EAT, Peter reported poor conditions in the morning, but better in the afternoon.

Further west, conditions were generally not so good, and the freezing weather gave some stations equipment problems in the morning. One or two stations reported that the QSOs were an interesting mix of direct contacts, ones set up via 2m talkback, and ones set up by ON4KST.

The overall winner was G3XDY, who as well as leading on 2.3GHz, was runner-up on both 1.3GHz and 3.4GHz. On 1.3GHz, John was running 200W to 4 x 23 ele yagis, and on 3.4GHz, 15W to a 60cm dish.

Thanks to everyone who sent in an entry. Similar events are scheduled for 2006, this year in April, June, August and October - lets hope for plenty of activity again - and do please send in your entry, however small!

Steve Davies G4KNZ, Contest Adjudicator

3.4GHz	Best DX	Located	Distance	QSOs	Score
G3PHO/P	G4ALY	IO70VL	454	11	3193
G3XDY	DK2MN	JO32MC	399	6	1573
G4BEL	M0GHZ	IO81VK	190	8	1270
G4LDR	G3PHO/P	IO93PW	321	10	1208
G3UKV	G3XDY	JO02OB	265	6	1014
G0MJW	G3PHO/P	IO93PW	262	8	840
G4BRK	G3PHO/P	IO93PW	265	6	740
M0GHZ	G4BEL	JO02BI	190	4	342
G0JMI/P	G4LDR	IO81EC	36	3	95
G0UPU	G3UKV	IO82RR	92	1	92

Overall leader and runner up, plus each band leader and runners up will receive a UKuG Contest Achievement Certificate.

UK Microwave Group
Covering period:

Summary of Accounts 2
01/Jan/2005 to 31/Dec/2005

Item	Income	Expenditure	Balance	Notes
Opening balance 01/Jan/05			£3807.33	
Subscriptions	2498.58			
Donations	118.70			
Other income	513.72			Includes raffle proceeds Proceedings
Subscription refunds		7.13		
Newsletter printing & postage		1042.98		Includes Proceedings postage
Other expenses		574.93		Proceedings, RSGB, certificates
Sub-totals	3131.00	1625.04		
Closing balance 31/Dec/2005			£5313.29	

S. J. Davies, G4KNZ, Treasurer

Notes:

- ◆ **In 2005, the income has significantly exceeded expenditure and therefore UKuG now has an opportunity to support some additional activities.** These were discussed at the AGM at Martlesham in November 2005 and include items such as support for beacon projects, microwave "workshops" (at which newcomers to microwavers could receive information and help) and a possible UKuG book or two. At present, in addition to a Proceedings 2006 book, the Committee are also planning to produce a compendium of previous Scatterpoint and Microwave Newsletter technical articles.
Such projects need volunteer labour from the membership of course! If you are willing to help in projects such as new beacon development or running a one-day "microwave workshop" in your area, for example, then please contact the UKuG Secretary, G8KQW.
- ◆ In view of the surplus, **it is recommended subscriptions remain unchanged** for 2006.
- ◆ Regarding the **2005 Proceedings book**, it is difficult to see exactly in the summary (due to postage not being shown separately) but the Proceedings overall made a very slight profit, as was the intention.
- ◆ **The present membership**, as at 7 January 2006, consists of 290 members with some 19 subs renewals still outstanding. We have members in 22 different DXCC countries, including VK, ZL, JA and the USA. Sixty members are from overseas (ie outside the UK) and thus represent a fifth of the UKuG membership. Two thirds of the total membership receives Scatterpoint in PDF, emailed format whilst the rest get theirs as a printed newsletter sent by First Class post.
- ◆ **If you have any questions about the accounts or other committee matters then please contact the relevant Committee Officer ... Chairman, Secretary or Treasurer.**
- ◆ The UKuG Committee are always very receptive to new ideas so don't hold back if you have one!