An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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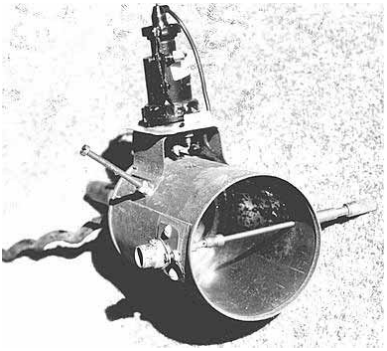

Remember the days when we built microwave gear in bean cans?

Shown left is a 1972 polarplexer for 3.4GHz. Items to note include the low loss coaxial connector and the sophisticated bellows tuning arrangement for the 726A/B klystron!

This museum piece was recently unearthed in G3PHO's extremely cluttered garage. Built around 1972, it was Peter's very first piece of microwave gear and went on to work a 133 mile path (WBFM) in from the North to the South Islands of New Zealand during 1976 ....

AH, THOSE WERE THE DAYS ME LADS!

In this issue ...

Latest News ...

- **Alan Walmsley G2HIO now Silent Key (p.15)**
- **Ofcom want microwave beacon update info**
- **Revised RSGB Bandplan now available**
- **UkuG "Firsts" certificates now totally free!**

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

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From the Editor's Desk

Welcome back after the Christmas New Year break and A Very Happy New Year to you all.

This edition contains the full rules and dates for th 2009 UkuG Contests. Please file them for future reference. They are also available at www.microwavers.org.

The world economic recession seems to be biting deeply as I write this editorial. A number of electronics businesses are having problems and a well known American comms company is going into liquidation. While this is very bad news for the company and its workforce, it may produce some items of interesting liquidation stock for we amateur microwavers!

Band conditions lifted for a short period over the Christmas season but UK activity levels remained poor. My own 5.7GHz beacon, GB3KEU, was heard in Holland (thanks Arie, PA0EZ!) but no 6cm contacts were reported between that country and my area day. Some of us seem to be forgetting to call CQ on a regular basis! This can still be done on a band like 23cm. From then there's no knowing to where the 23cm contact may lead!

73 from Peter, G3PHO

PHOTO CAPTION COMPETITION

Last month we published pictures, taken at the Martlesham Round Table, of three well known operators G4FRE, G3YLA and WA5VJB in typical postures! Only two readers responded but their entries are nonetheless very amusing.

From John G4BYV we have:

Dave G4FRE ... "I think the micro wave bands are open now"

Kent WA5VJB ... "This Eme is catching up on me"

From John, G4BAO we have:

Kent WA5VJB ...."Oh cr#p, did Barack Obama REALLY win? I'm getting my gun!"

Dave G4FRE ... "If this boring old f@#t goes on about EME any more, I'm leaving"

Jim G3YLA ... "For the hundredth time, yes! I AM that bloke off the telly!"

WEST COAST MICROWAVE & ATV MARATHON

UKuG member Peter Blakeborough, G3PYB, who is also the President of the British Amateur Televison Club, has come up with an idea that is sure to whet the appetite of both narrowband users of the microwave bands and ATVers alike.

Basically he proposes a full day out (Sunday 26th July 2009) during which ATV enthusiasts join forces with narrowband microwave operators who will be taking part in the 5/7/10/24GHz cumulative contest on that day. The aim will be for an ATV operator to co-site his equipment next to a narrowbander, with a view to relaying pictures of the contest activity to a central ATV base station from which live video will then be streamed to the BATC website, in the manner in which the Sheffield and Martlesham Microwave Roundtables were broadcast in 2008. This would give both parties unprecedented exposure to the world at large and would be a tremendous opportunity to show other amateur radio enthusiasts what our microwave and ATV activities are all about.

Coinciding with the narrowband contest would an ATV competition (exact details yet to be confirmed) for which awards would be made.

Narrowbanders need not worry that the ATV station by their side might cause interference as most of the ATV activity will be on the low microwave bands, especially 23cm. However there maybe the odd 10GHz ATV operator who wishes to come up to your portable location and video you so we're sure you'll come to some amicable arrangement when you are trying to dig out that weak 10GHz cw signal 1000km away!

Obviously, it 's likely that portable narrowband stations will be more involved in this activity than home stations but there is no reason why the latter cannot take part. The main thing is that we get offers from narrowbanders to accept an ATVer at their location that day and to get ATV operators who are prepared to join them.

At first it was envisaged that this "Marathon" would concentrate on the area up the West Coast of the UK, with possible TV links across the Irish Sea and over to the Western Pennines but it has since been suggested that the whole country could be involved.

We invite your participation!

Next month's Scatterpoint will include a list of those who are willing to take part and also a list of possible portable locations from which good TV signals can be transmitted over longish distances and where there is plenty of room for two (or more) stations, narrowband and ATV to be set up.

Please email Peter Day, G3PHO at: marathon@g3pho.org.uk with your callsign, your intended location on the 26th July and what equipment you be using... ATV or narrowband or both.

UK MICROWAVE GROUP SUBSCRIPTION INFORMATION

The following subscription rates now apply. **Please make sure that you pay the stated amounts** when you renew your subs next time. If the amount is not correct your subs will be allocated on a pro-rata basis and you could miss out on a newsletter or two!

Your personal renewal date is shown at the foot of your address label if you receive Scatterpoint in paper format. If you are an email subscriber then you will have to make a quick check with the membership secretary if you have forgotten the renewal date. From now please try to renew in good time so that continuity of newsletter issues is maintained. Put a **renewal date reminder** somewhere prominent in your shack (the editor suggests having it tattooed on your forearm!).
Please also note the payment methods and be meticulous with Paypal and cheque details.

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*** Paypal to ukug@microwavers.org**

or

*** a cheque (drawn on a UK bank) payable to 'UK Microwave Group' and sent to the membership secretary** (or as a last resort, by cash sent to the treasurer!)

The standard membership rate for 2009 is:

UK	**£6.00**
US	**$12.00**
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This basic sum is for **UKuG membership.** For this you receive Scatterpoint for FREE by email. If you want a paper copy **then the higher rates apply.**

High frequency-stability 3cm reception using an unmodified satellite LNB

- Bernie, G4HJW

During one of the Orwell truck-stop breakfasts last summer, it was mentioned that someone (it was actually John Owen, MW1FGQ) had suggested it was possible to use a satellite LNB in a narrow band role without modifying the LNB itself. I was intrigued but, after a few days fruitless cogitation on how this might have been achieved, the matter was forgotten. It was only whilst coming back from the Leicester rally a few months later that the penny dropped, with the consequent realisation that intermod, for once, could be an amateur's best friend. A few quick checks with a Thomson LNB and signal generator soon showed that the approach to be described actually worked quite well. A converter was quickly put together to show at Martlesham and it was here that Kent, WA5VJB, told me about Kerry's (N6IZW) article in the 2008 Microwave Update proceedings describing the same basic arrangement on both C and Ku band units.

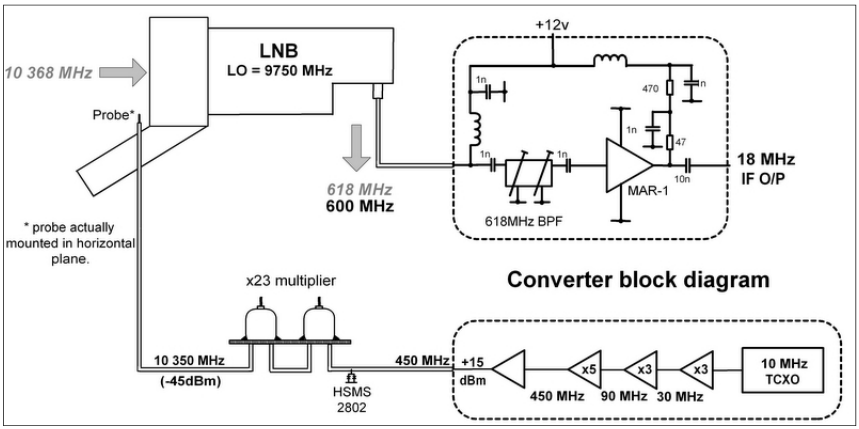
Pre-ramble: By down-converting not only the wanted signal but also a locally generated carrier leaked into the antenna, a satellite LNBs LO frequency drift can be totally cancelled, resulting in a receive converter whose stability is determined only by that of the locally generated carrier.

To obtain drift cancellation, the down-converted carrier is used as the LO in a second mixer. As the LNB LO drifts, both the down-converted wanted and carrier signals move by the same amount, resulting in a difference frequency, ie the 2nd IF, that remains unchanged.

In practice, this arrangement is simple to implement, and can provide sub 1dB 3cm noise figures quite easily. Two things of note:

- Current Sky type LNBs (anything manufactured within the last ten years) have a lower satellite band edge of 10.7GHz. On all five brands of LNB that I have measured, the image filter has (just) remained flat down to 10.368GHz. These extended range LNBs have dual 9.75/10.6 GHz LOs, the default frequency being 9.75GHz. Thus the 1st IF for a 10.368GHz signal is nominally 618 MHz. Image rejection at 8.514GHz averaged about 40dB on the LNBs measured.

- The level of leaked-in carrier need only be –60dBm or so, depending on the LNB used. To put this in context, a back-to-back schottky diode taken from an old LNB, connected directly across the feed to a dual pipe cap filter produced –30dBm at 10.35GHz when fed with 20dBm at 450MHz (x23 multiplication), some 30dB more than was required in this application! Mixing of the two down-converted signals can be achieved quite simply by adding gain after the LNB to the point where the amplifier starts to become non-linear. In fact, with more leaked-in carrier level, the last IF stage of the LNB can be made to mix, but there are good reasons for using external gain. For one thing, it allows some selectivity at 618MHz to be added prior to mixing (both to reduce the effect of any far-out spurious response and also to provide some second IF image rejection), and for

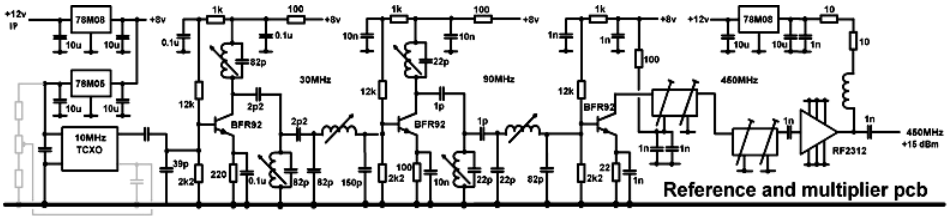


another, where a relatively low second IF frequency is used, the output impedance of the LNB will look like a low value inductive reactance, due to the dc coupling choke that all these units employ at their output. This will short out most of the IF signal present. It particularly applies in the design described, with its 18MHz IF.

A receive converter with an IF output at 18MHz

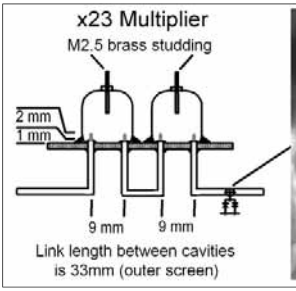
Several of these units have now been produced, housed either in a single stand-alone box with integral LNB or as three discrete modules, more suited for use with an external dish mounted LNB. The layout is shown on the next page

LO multiplier pcb: A 10 MHz TCXO is used as the reference, which is then multiplied up to 450 MHz in three stages (x3 x3 x5). This is followed by an RF2312 mmic amplifier to bring the power level up to +15dBm. Toko 7.5mm coils and helicals are used, allowing this multiplier assembly to be fitted within a 110 x 60 x 27 mm die-cast box **(see circuit diagram below).**



Final multiplier: Multiplication from 450 MHz to 10.35 GHz is done in a single stage. A pair of 15mm pipe-cap filters are used to select the 23rd harmonic generated by placing a back-to-back schottky diode pair directly across the filter feed coax, as mentioned earlier. No attempt is made to match the diode, either at it's output or input. Despite the mismatch, the RF2312 driver has remained stable on all eight units so far produced.

The pipe cap multiplier **(see photo and diagram right)** was manufactured as a separate item, with no attempt made to integrate it with the main multiplier pcb. This was done for one major reason. By using coax feed and interconnect between sections, hop-over is automatically kept to a minimum. The price to pay for this is the physically difficult task of cutting away part of the input coax shield to reveal the inner conductor. Even more difficult is soldering the SOT-23 schottky diode to that inner conductor!, but with care, practice and a few lost devices onto the carpet, it is possible. Units have been made with RG405 semi-rigid and/or flexiform cable, and even RG316.



Another advantage in keeping the final x23 multiplier separate is that it allows the multiplier and probe to be located up at the dish whilst feeding a relatively long interconnect coax at 450MHz into the shack, where the main multiplier with its 10 MHz reference can be kept at a more even temperature. Typical 2ppm TCXOs appear to have a temperature coefficient of about 6 degrees per KHz. Of course, there is no reason why an OCXO 10MHz reference should not be used to keep the drift to a much lower level.

Given that the multiplier is not short of output, it is logical to keep the pipe cap filter sections lightly loaded to obtain the maximum selectivity, and filter probe lengths of 2mm will suffice. This translates to a filter loss of about 6dB, and keeps adjacent 450MHz components 50dB down.

The location of the schottky diode is not particularly critical, but it makes sense to keep it reasonably close to the filter end of the feed coax – say 5 to 10mm from the filter pcb.

This assembly fits very comfortably into a Maplin 75 x 50 x 27 plastic box, where weatherproofing is required.

IF selectivity and mixer: There is very little to this section – just a Toko helical filter (252HXPK-2733F available through BEC) tuned to 618 MHz, and a MAR-1 mmic amplifier acting as the mixer. Power for the LNB is also fed in here, as shown in the overall bock diagram. Note that the supply rail is 12v, and the MAR-1 supply

bias resistor values reflect this. This value of supply voltage will select the LNB vertical mode in it's normal orientation, so it is necessary to turn the unit through 90 degrees to obtain horizontal polarisation.

Suitable LNBs: So far, no mention of LNB models has been made. Quite a variation of output level is noticed between types. This is primarily due to the degree of high pass filtering and the turn-over frequency that has been applied to the IF chain of the LNB. Nearly all units show a decrease in IF level below 800 MHz, although the Thomson 13553 remains flat down to about 200 MHz. Not surprisingly, this particular LNB requires the least level of carrier injection, and will show some life right down to –70 dBm at the probe. Other suitable LNB types are the MTI AP8-XT2EBL, available on Ebay for about £5, the older Cambridge G88 and the Fortec FSKU-V [including the Lidl IP-401, which seems to be a re-badged FSKU-V]. Most of the Grundig items are not too suitable, likewise the Skyware SX1019/S (these require a huge –20dBm or so of injection power). However, to put things in perspective, at least 75% of the LNBs in my increasingly large collection were happy with –50dBm injection.

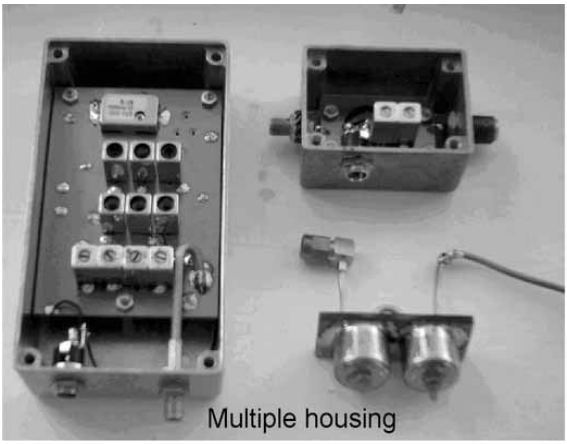
Increasing the gain of the external mmic stage will tend to compensate for the lower output LNB types, but this will also increase the amount of noise generated at the IF frequency by this stage. On all but early builds, a MAR-1 has been used, having a data-sheet gain at 618MHz of 17dB. This assembly will easily fit within a 52 x 38 x 29 die-cast box.

Dish fed probe placement: Alan, G3NYK pointed out that when applied near the focus of the dish, ie, directly in front of the LNB feed-horn, the effective level of injected carrier is going to increase 30dB or so in the forward direction. This may be seen as undesirable. However, as mentioned, with most LNBs there is about 20dB more injection than is required, so the probe may be placed in a well de-focussed position in front of the dish. In fact, for a mesh dish, it is quite sufficient (and convenient) to feed the probe through the back of the dish and fix 5 – 10mm in front of the dish surface. Adjustment is made easy by the noticeable amount of noise increase as the probe is brought towards the LNB. Fixing at a position that gives at least a 10dB noise increase should suffice.

An alternative approach that would keep all the pcbs indoor, on say a chimney mounted dish installation, where cable lengths are not too long, would be to feed/make the probe from RG223. If it were fitted directly in front of the LNB, a feed length of up to 6-7m would be possible before cable loss proved too great.

Compact portable version:
A compact 3cm monitor converter can be achieved by fitting all the boards into a 120 x 94 x 32 die-cast box, and attaching an LNB to the base. **(See photo below)**. Note that in this application, the LNB is again mounted 90 degrees out from its normal orientation so that horizontal polarisation can be obtained with a 12V supply rather than the 18V that it would otherwise require. If the same thing is done on a dish mounted LNB, remember that the unit will require additional waterproofing in that plane. Also, if a mini-dish is being used, the dish and LNB should both be rotated together since the illumination angle is different for the two planes.
Strong signal handling: To get a feel for the converters strong signal handling performance, a weak signal was tuned in and a signal generator set to give a signal 60dB above noise. The generator frequency was swished around the narrow band segment of the band. No degradation of the weak signal was noticed, as long as the generator signal was kept further than 5-10 kHz away from the wanted signal. It's not as meaningful as an intermod measurement, of-course (I only have the one 3cm signal generator...), but still interesting.

Single housing



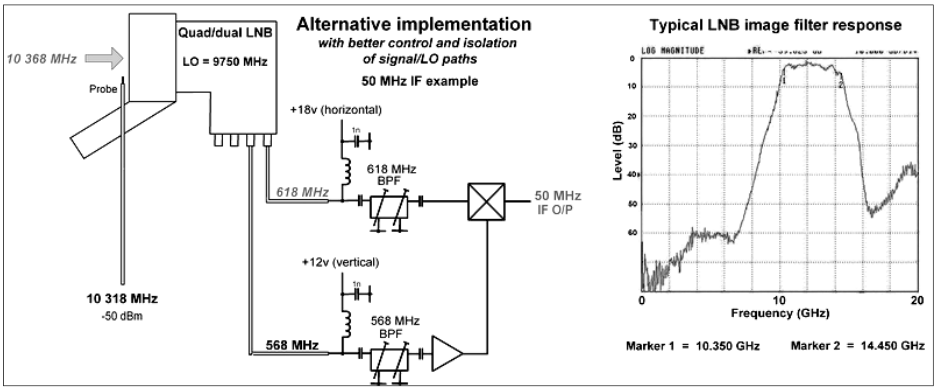
Multiple housing

In practice, there can't be many amateurs who suffer from a surplus of strong signals on the 3cm band, so the issue is somewhat academic for most people.

Gilding the lily: A purist might not be too happy with the 618MHz selectivity block placed between the LNB output and the external mmic stage. After all, it has to pass enough of the down-converted carrier at 600MHz yet provide sufficient 2nd IF image rejection a further 18 Hz down at 582MHz. With the Toko item used, image rejection is 25dB, which might not be considered enough. Adding a second Toko filter would give better image rejection but it would also reduce the level of the 600 MHz carrier too much. A more complicated approach that would remove this compromise and allow more control (and which would be necessary anyway for someone wanting a higher final IF frequency), would be to separate out the signal and carrier paths and have selectivity in each path tuned to the appropriate frequency. The signals could then be recombined for mixing.

If the purist was still not happy, and didn't like all that carrier being amplified along with the wanted signal, an additional change (and complication) would be to use a dual or quad output LNB **(see diagram below).** It would then be easy enough to put the probe in the vertical plane and take that signal from an output biased for the vertical plane. The wanted signal would be taken from a second output, biased in the horizontal plane. In this way, the amount of carrier signal present in the wanted signal path could be nulled out by 20–30dB or so.

Conclusions: Despite the low cost and simplicity of the basic version of this converter, performance is good and provides an excellent way to monitor the 3cm band. The design described seems to be quite docile and easy to set up – the hardest part being to align the x23 multiplier cavities. It is intended to take the current pcb artwork and productionise it, so that kits can be made available for the local radio club to use as a 3cm project. Legend and solder resist should simplify construction. If there is wider interest, more boards could be made available.



For anyone wishing to use a different final IF, beware the LNBs integral image filter (see typical response plot) and remember that as the IF is taken higher in frequency, the external carrier frequency will become lower and may fall in to the lower slope portion of the image filter response, reducing the level of carrier passing through. On the plus side, of-course, the image response will be even further down the slope. There are more comments at http://www.earf.co.uk/ext_lo.htm

NORWEGIAN BEACON NEWS

LA5SHF/B is now QRV from a new seaside QTH, JO29OG at near sea level. ERPi: 500 Watts. Antenna heading: 270 degrees (west) towards Scotland. Antenna: 4 x Quad with reflector. Transmitter: 20 Watts RF out. Frequency: 1296.820 MHz.

The 10GHz part is still not qrv yet but I 'm working on it.

Happy New Year to all from Jan - LA3EQ

OUR READERS SEND US "FOOD FOR THOUGHT"

From 'Frustrated of Bolsover'

Now, I admit to being a bit touchy at times, especially when frustrated over not being able to get something to work, or not being able to locate information on how to get something to work but, if you think that I've been around the microwave scene on and off for a while, how much more frustrated would a complete newcomer to the higher bands be?

Getting started

Without wanting to go over the old ground about WBFM, I think we should realise that the modern microwave gear is generally more expensive to buy or obtain and you do need access to more test gear to get it up and running.

On WBFM I was lucky enough to have the late Glen Ross almost on my doorstep (he in Coventry and me in Birmingham) to get a system set up and tested quite quickly. From that and talks by Glen to various clubs, we got a number of people on the 3cm band quite quickly. Then, there was usually someone available at short notice to test a new piece of gear and we also identified local spots where the Leicester beacon could easily be heard, like Bar Beacon, Walton Hill and even Frankley Beeches.

Compare that to now. Yes, there are beacons about, but you need to get initially set up to know your gear is on the right part of the band and, in my recent experience, there are fewer people available at short notice to help with this. The answer seems to be to wait for the next round table and, if the next one is a long way away or you need to pre-book, that can appear to be another barrier to entry.

Contests and Activity days

Whilst out with Richard (G3CWI) during a very enjoyable few hours out on the hills with his 3cm set up, it did strike me that the 'feeling' of the contest/activity day had altered a bit. What I mean is that, whilst there are a number of people still willing to spend time looking for a weak signal, the lower overall numbers mean that consequently they are a smaller number now as well.

Having said that, given that people are now having to spend more money and time on getting a system set up and, if they have a competitive streak, then their patience to look for people with stations as yet untested may be shorter than might have been in the past. Given that, they know there are some other well set up stations, possibly further away, that they have not yet worked and who might be getting away from them in the contest.

It's a pity that there are not as many encouragements to being active more often where it doesn't matter which day you are on, or for how long, but you get encouragement to work more people both near and far at any time. Maybe like a ladder of contacts made, or squares worked or activated. Perhaps not only on a 12 month basis, but by month as well? That might avoid people starting half way through a year feeling discouraged when other people have already worked a lot?

As people keep saying, the way to encourage activity is to be active. I'm possibly as guilty as anyone for sitting listening to white noise, but if there were a few more people who wanted to activate a square or wanted to work me from a particular square, I might be encouraged to transmit a bit more often and not to spend quite so long collecting aircraft reflections from the beacons...

Cheers - Dave, G0DJA

Is this Really Progress?

I have seen bad times, tough times but many good times as a microwave enthusiast. Times were hard in '64 when I got my ticket. Having spent ages building for 23cm, it still took me 6 months to get my first contact but that contact led to a meeting with Glen Ross, later to become G8MWR. Glen was a builder of gear; he was a talker; he was a communicator. I often wonder what Glen would have made of today's microwave world. I think he would have come to the same conclusion as myself and others and decided it may be time to move 80 metres and discuss our ailments. I never thought I would feel so fed up with a hobby that I have loved from the first QSO. Yes, you have guessed it, I don't keep up with technology, I see no logical purpose in using a PC to enter a chat room to contact my mate and discuss how many beacons I can hear. Surely that's what the bands are for! I find it incredible that someone is given an award for creating a web site that is killing the whole ethos of radio. That for me is like giving an award for productivity to the Grim Reaper during a flu epidemic!

The bands are empty whilst people sit in a chat room. Am I one of the few sane people left who can see the desolation of the lower microwave bands? On Saturday, 3rd January, conditions were great on 23/13/9cm. I say to my wife, "I'm going to spend an hour in the shack, wind up the tower and put the heating on in the shack and warm up the gear". With beacons belting through, I call CQ; call CQ, North/South/East/West, for an hour plus call on 144/175 ... **nothing**, not a peep. Switch off! Is this really the state of our hobby, in that the only way to get a contact is by using the chat room on a web site. It made me sad to see Roger, G0UPU, sell his equipment because he can't get contacts by using radio.

Another problem is digital modes. I wish someone would explain what they achieve using modes like 'JT What's it' - where is the achievement in one computer talking to another. To me it is lazy. It a complete dumbing down of the hobby. It's about time to take a step back and stop kidding yourselves ... things are getting worse! The hobby is dying and so is the enthusiasm of a lot of amateurs. We need activity on the bands as it used to be; we need people talking to each other on the bands. We don't need chat rooms or 'JT What's it'. You were given a voice, so get on the air and use it.

Never mind, with a bit of luck someone may hear my CQ calls. I am sure I will manage another contact in the next six months or maybe 80 metres is a better bet!

73 from George, G8AIM

Readers' comments on these letters, in support of or otherwise, are invited. The floor is yours!

UKuG MICROWAVE CONTESTS 2009

Aims and comments:

Some minor changes have been made this year. A 24GHz cumulative series has been retained coincident with the 5.7 and 10GHz cumulatives but 24GHz has also been re-introduced to the 47/76GHz event, to encourage operation on the higher bands. The existing 24GHz trophy will be awarded for the 24/4/7/76GHz events, and a new G0RRJ memorial trophy will be awarded to the winner of the 24GHz events coincident with the 5.7 and 10GHz cumulatives. Some experimental changes are being made to the Low Band events, with a squares multiplier in the April Low Band Contest, and a scoring system that rewards contacts with your own country in the December event.

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.

Entries will continue to be listed in one table but leading entries in certain categories marked, with certificates awarded where appropriate. These categories include Portable, Low-power, Radio-only talkback and New Entrant. The exception is that there will continue to be a separate Restricted section for the 10GHz cumulatives. 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 2009 (there are some changes from 2008). The following contests are scheduled for 2009:

- Low Microwave Bands - 1.3GHz/2.3GHz/3.4GHz (4 contest days).
- 5.7GHz Cumulatives (5 contest days with 3 to count for scoring), on the same days as the 10GHz/24GHz Cumulatives.
- 10GHz Cumulatives (5 contest days with 3 to count for scoring), on the same days as the 5.7GHz/24GHz Cumulatives.
- 24GHz G0RRJ Cumulatives (5 contest days with 3 to count for scoring), on the same days as the 5.7GHz/10GHz Cumulatives.
- 24GHz Trophy Cumulatives (3 contest days with 2 to count for scoring), on the same days as the 47/76GHz Cumulatives.
- 47GHz Cumulatives (3 contest days with 2 to count for scoring), on the same days as the 24/76GHz Cumulatives.
- 76GHz Cumulatives (3 contest days with 2 to count for scoring), on the same days as the 24/47GHz Cumulatives..
- In addition there are non-competitive activity days on the last Sunday in the month.
- The full contest program and rules are published in the January 2009 issue of the Scatterpoint Microwave Newsletter and are also available on the Internet on the UKuG website at http://www.microwavers.org

General Rules (applicable to all events)

The Contests are open to all comers (you do not have to be an RSGB or UK Microwave Group member). 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 500m radius. An operator may reside outside the station's area ("remote station"), connected to the station via a "remote control terminal". In such a case, the Locator for the contest is the Locator of the station's position. An operator may only operate one single station, regardless if it is locally or remotely operated, during the same event.

Contacts: Only one scoring contact may be made with a given station on each band, regardless of suffix (/P, /M, etc) during an individual 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 (ie 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 talkback 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 (ie 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.

Talkback: Talkback can be used to assist in setting up a QSO but note that the contest exchange must be made via the microwave band. It is not permissible to use the talkback as a means of checking the report or serial number – they must be copied via microwaves – and after the QSO is complete, care should be taken to avoid accidentally repeating the exchange via talkback. There is no restriction on the talkback methods that can be used – other amateur band, internet, phone, etc. In setting up the QSO, it is also permissible to send back received audio to the other station, for example to help with antenna alignment. An exception is that our contests do allow one way (cross-band) QSOs for half points, and in this case, the other band can be used by one of the stations.

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/or 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 are preferred to be received by email, but may also be submitted on paper. For electronic entries, the format should be one of the following: ASCII text, Microsoft Excel, Microsoft Word, or the G4JNT contest software format, IARU REG1TEST format. E-mail entries will be acknowledged to confirm receipt.
All logs should be sent to the Contest Adjudicator, G3XDY, ***within 16 days of the end of the contest***.
G3XDY's email address is: g3xdy@btinternet.com . Postal entries should be sent to 12 Chestnut Close, Rushmere St Andrew, Ipswich, IP5 1ED, UK

Awards: Certificates will be awarded to overall contest winners and individual section leaders and their runners up. Additional Certificates of Merit will be awarded to stations in certain categories, as indicated in the rules for each event. 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. For 2009, there are four of these events, in March, April and June and December. The March event is a shorter duration event, timed to overlap with the last 4 hours of UHF/SHF events in other IARU Region 1 countries, and it aimed more at home stations, though portable operators are, of course, welcome to enter. The April and June events are more likely to suit portable operators and the June event is also timed to overlap with UHF/SHF events in some other IARU Region 1 countries. This year, following feedback from the contest forum, there will be a squares multiplier in the April event as an experiment, and the December event will have a multiplier system to favour contacts with your own country to encourage more activity.

1. The General Rules listed above apply.

2. There are four contests, one in March, one in April, one in June and one in December. The March event runs from 1000 to 1500 UTC, and the April, June and December events run from 0900 to 2000 UTC.

3. There is one section, but the leading stations in a number of categories will marked in the results table, with certificates awarded (see below).

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. The April contest scores will be multiplied by the number of locator squares worked on each band, please include a list of squares worked with your entry. In the December event, scores for contacts with your own country (eg England to England) will attract a x3 multiplier, all other contacts will be scored x1.

5. Each event will be scored separately - there are no cumulative scores.

6. For each session, certificates will be awarded to the leading entry plus runner-up on each band, the overall leading entry and runner-up across the three bands, plus for each band the leading stations in each of the following categories: home station, portable station, and new entrant.

5.7GHz Cumulatives Rules

The 5.7GHz,10GHz and 24GHz cumulatives are being run concurrently to take advantage of the growth in activity on 5.7GHz and 24GHz. Although they are on the same days, they are completely separate contests. Any band or all bands can be used on any of the 5 days, and any three days submitted for any band.

1. The general rules shown above apply.

2. There are five, monthly, events, from May to September inclusive, and the events run from 0900 to 2000 UTC on a Sunday.

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 but the leading stations in a number of categories will marked in the results table, with certificates awarded (see below).

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 leading stations in each of the following categories: home station, portable station, low-power (1W or less), radio-only talkback, new entrant. The **G3KEU Memorial Trophy** will also be awarded to the leading entry.

10GHz Cumulatives Rules

The 5.7GHz,10GHz and 24GHz cumulatives are being run concurrently to take advantage of the growth in activity on 5.7GHz and 24GHz. Although they are on the same days, they are completely separate contests. Any band or all bands can be used on any of the 5 days, and any three days submitted for any band.

1. The general rules shown above apply.

2. There are five, monthly, events, from May to September inclusive, and the events run from 0900 to 2000 UTC on a Sunday.

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.

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**
- certificates to the leading home station, portable station, radio-only talkback station, and new entrant in each section.

24GHz G0RRJ Cumulatives Rules

The 5.7GHz,10GHz and 24GHz cumulatives are being run concurrently to take advantage of of the growth in activity on 5.7GHz and 24GHz. Although they are on the same days, they are completely separate contests. Any band or all bands can be used on any of the 5 days, and any three days submitted for any band.

1. The general rules shown above apply.

2. There are five, monthly, events, from May to September inclusive, and the events run from 0900 to 2000 UTC on a Sunday.

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, but the leading stations in a number of categories will marked in the results table, with certificates awarded (see below).

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 leading stations in each of the following categories: home station, portable station, and single session entry. The leading station will receive the **G0RRJ Memorial Trophy**.

24GHz Trophy Cumulatives Rules

This year 24GHz will be included with 47GHz and 76GHz to make up a set of Millimetre Wave Cumulatives. The dates mainly fall in the summer months; the exception is October, where is date is chosen to overlap with the IARU Region 1 UHF/SHF Contest. Although they are on the same days, the 24GHz, 47GHz and 76GHz events are completely separate contests. Any band can be used on any of the three days, and any two days submitted for any band.

1. The general rules shown above apply.

2. There are five, monthly, events, from May to September inclusive, and the events run from 0900 to 2000 UTC on a Sunday.

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, but the leading stations in a number of categories will marked in the results table, with certificates awarded (see below).

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, and to entrants making their first appearance on either band..

47GHz Cumulatives Rules

This year 24GHz will be included with 47GHz and 76GHz to make up a set of Millimetre Wave Cumulatives. The dates mainly fall in the summer months; the exception is October, where is date is chosen to overlap with the IARU Region 1 UHF/SHF Contest. Although they are on the same days, the 24GHz, 47GHz and 76GHz events are completely separate contests. Any band can be used on any of the three days, and any two days submitted for any band.

1. The General Rules listed above apply.

2. There are three sessions to the 47GHz cumulative in May, July, and October, and the events run from 0900 to 1700 UTC on a Sunday. The best two sessions out of three will be used for scoring purposes.

3. There is one section, but the leading stations in a number of categories will marked in the results table, with certificates awarded (see below).

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, and to entrants making their first appearance on either band.

76GHz Cumulatives Rules

This year 24GHz will be included with 47 and 76GHz to make up a set of Millimetre Wave Cumulatives. The dates mainly fall in the summer months; the exception is October, where is date is chosen to overlap with the IARU Region 1 UHF/SHF Contest. Although they are on the same days, the 24GHz, 47GHz and 76GHz events are completely separate contests. Any band can be used on any of the three days, and any two days submitted for any band.

1. The General Rules listed above apply.
2. There are three sessions to the 76GHz cumulative in May, July, and October, and the events run from 0900 to 1700 UTC on a Sunday. The best two sessions out of three will be used for scoring purposes.
3. There is one section, but the leading stations in a number of categories will marked in the results table, with certificates awarded (see below).
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, and to entrants making their first appearance on either band.

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 VHF contest rules.

The first weekend in July is VHF National Field Day which includes 1.3GHz as one of the bands.

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 VHF Contest Committee on the same weekend, and the rules can also be found in the VHF contest rules.

The RSGB also runs a Cumulative contest on 1.3GHz and 2.3GHz on the third Tuesday of every month, from 2000 – 2230 local time.

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

UKUG MICROWAVE CONTEST CALENDAR 2009

Dates, 2009	Time UTC	Contest name	Certificates
25-Jan	0900 - 2000	All-band Activity Day	Non competitive
22-Feb	0900 - 2000	All-band Activity Day	Non competitive
8-Mar	0900 - 1400	Low band 1.3/2.3/3.4GHz 1	F, P, N
29-Mar	0900 - 2000	All-band Activity Day	Non competitive
5-Apr	0900 - 2000	Low band 1.3/2.3/3.4GHz 2	F, P, N
26-Apr		(RAL Round Table)	
3-May	0900 - 1700	1st 24/ 47 / 76 GHz Cumulative N	
31-May	0900 - 2000	1st 5.7GHz Cumulative	F, P, L, R, N
31-May	0900 - 2000	1st 10GHz Cumulative	F, P, L, R, N
31-May	0900 - 2000	1st 24GHz Cumulative	F, P
7-Jun	0900 - 2000	Low band 1.3/2.3/3.4GHz 3	F, P, N
21-Jun	0900 - 2000	2nd 5.7GHz Cumulative	F, P, L, R, N
21-Jun	0900 - 2000	2nd 10GHz Cumulative	F, P, L, R, N
21-Jun	0900 - 2000	2nd 24GHz Cumulative	F, P
19-Jul	0900 - 1700	2nd 24/ 47 / 76 GHz Cumulative	N
26-Jul	0900 - 2000	3rd 5.7GHz Cumulative	F, P, L, R, N
26-Jul	0900 - 2000	3rd 10GHz Cumulative	F, P, L, R, N
26-Jul	0900 - 2000	3rd 24GHz Cumulative	F, P
23-Aug	0900 - 2000	4th 5.7GHz Cumulative	F, P, L, R, N
23-Aug	0900 - 2000	4th 10GHz Cumulative	F, P, L, R, N
23-Aug	0900 - 2000	4th 24GHz Cumulative	F, P
27-Sep	0900 - 2000	5th 5.7GHz Cumulative	F, P, L, R, N
27-Sep	0900 - 2000	5th 10GHz Cumulative	F, P, L, R, N
27-Sep	0900 - 2000	5th 24GHz Cumulative	F, P
4-Oct	0900 - 1700	3rd 24/ 47 / 76 GHz Cumulative	N
25-Oct	0900 - 2000	All-band Activity Day	Non competitive
29-Nov	0900 - 2000	All-band Activity Day	Non competitive
6-Dec	0900 - 2000	Low band 1.3/2.3/3.4GHz 4	F, P, N
27-Dec	0900 - 2000	All-band Activity Day	Non competitive

Key:		
	F	Fixed/home station
	P	Portable
	L	Low-power <1W TX
	R	Amateur radio only talkback (no KST or telephone)
	N	New band user (not logged in previous years events)

MICROWAVE ROUND TABLES .. Preliminary notices

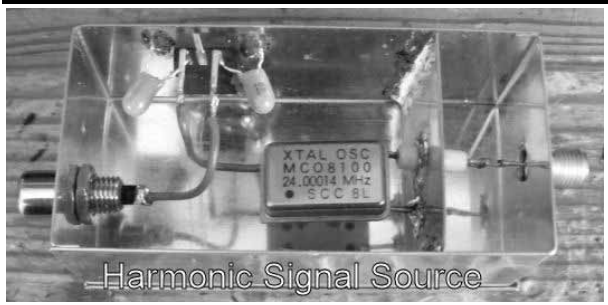
The following dates are now confirmed for your diary.
More details will follow the February 2009 and subsequent Scatterpoints:

26 April 2009: **UK Microwave Group Round Table:** Ruthford Appleton Laboratories (RAL)
After this RT was moved to Bath last year we are now back at our traditional home!

11-12 July 2009: **South Yorkshire (formerly Sheffield) Microwaves:**
(Saturday ATV workshop and Sunday RT)
The workshop is designed to prepare for the uWave/ATV Marathon on the 26th July (see.p3). The venue has been moved from the Sheffield A.R.C to the Finningley A.R.C, just south off the junction of the M18 / M180 near Doncaster, South Yorkshire.

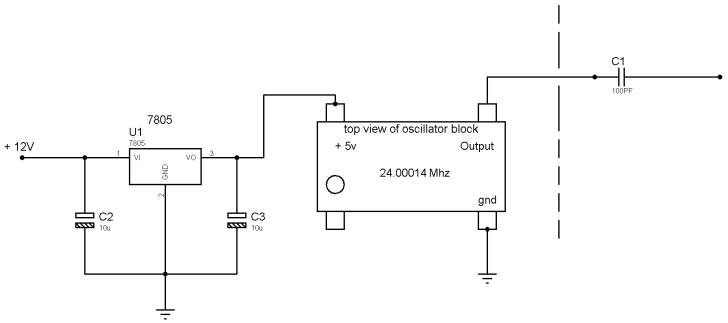
A DIY Harmonic Source Generator

by John, M0ELS



One night I decided to build a signal source generator, which would give me multiple frequencies right into the microwave spectrum. I remembered having copied such a circuit, into one of my many circuit books, or rather doodling books. It was time to switch on the soldering iron and 20min later a new project emerged.

The design is simple and there are many such circuits on the internet and in various books and I take no credit for it. The circuit consists of an old discarded 24.00014MHz oscillator block, nicked from a computer motherboard, a 7805 voltage regulator and several other components.



The 54th Harmonic comes out on 1296.0075MHz and with just a short piece of wire in the output socket, the signal can be easily heard. The signal is very stable after a couple of minutes warm up and unfortunately, I am unable to measure signal levels and they will vary from one osc block to another.

Many improvements can be added to the circuit such as an improved psu regulation, variable signal level output, and calibration. Other crystal oscillator blocks can also be used with a quick calculation to see where the harmonics will come out on.

Alan Walmsley, G2HIO now S.K

It is with sadness that, once again, we have to report the passing of one of our Old Timers, Alan Walmsley, who passed away peacefully at home in Derbyshire on the 2nd January this year. His grandson, Simon Ball in Northern Ireland, sent us the news a few days ago.

Although in recent years he hadn't been very active, Alan had been a long standing supporter of UK amateur microwaves and was always willing to help people get started in this aspect of our hobby. One of them was Jonathan, G4KLX, who made friends with Alan when G4KLX was based in nearby Cromford.

To Alan's wife Gillean and the rest of his family, we extend our deepest sympathy

ARE YOU A BEACON KEEPER?

If so, prepare yourself for an in depth appraisal of your present beacon system. Ofcom are requiring us to provide an updated situation report.

Brian G4NNS, Murray G6JYB and Graham G4FSG attended a meeting at Ofcom in London on Monday 12 January on behalf of the RSGB and UKuG. The primary topic was to review the current status of UK Beacons. Most of you will be aware that following the licence changes at the beginning of 2007, repeaters, beacons, special event stations, etc, are being dealt with by Notice of Variation (NoV) to an individual licence holder. The discussion was to address the next phase which is to migrate all Beacons to a regular NoV in line with the new process. Some of the more recently licensed beacons have NoVs but the majority do not.

To enable this to happen, G4FSG will need you all to do a little work! Over the next week or so he'll be sending to each of you the latest information that we have on your beacon, including all technical and close down information. For audit purposes you will need to formally respond to Graham, either confirming that the information is correct or giving him any amendments and confirming the rest. Graham is then required to submit all the details to Ofcom, not just the changes. Depending on the age of your beacon, the information held by Graham is in various degrees of sophistication from 'fully electronic' to 'scruffy bits of paper'! He will e-mail each of you individually with your details.

To comply with the request from Ofcom to make a single submission, Graham will need formal responses FROM ALL BEACON UK KEEPERS before he can submit ANY information. If anyone is unable to deal with this request over the next 6 weeks please contact G4FSG urgently and, where possible, nominate an alternative to deal with the request.

Graham's email address is:
graham.murchie@btinternet.com .
His postal address and telephone number can be found on page 2 under Treasurer contact details.

The UKuG Website
(www.microwavers.org)

has just been given a number of updates:

- 2009 Draft Contests
- 2009 Events Calendar
- 2007 Scatterpoint Archive online
- Tidied up Beacon pages (also via http://www.beacons.org.uk)

The new 2009 RSGB Bandplan comes into effect on the 1st of January 2009 and includes changes from 23cm to 24GHz and are based on the November-2008 IARU Region 1 Conference at Cavtat in Croatia. Full details of the conference results can be downloaded from:

www.iaru-r1.org/Cavtat 20papers.htm

The UK bandplan can be found at:

www.rsgb.org/spectrumforum/bandplans/

In the microwave bands the principle changes are:

a) The designation of an extra 50kHz below the beacon sub-bands for co-ordinated 10W ERP max 'Local' beacons (not personal ones) in the 23cm-24GHz bands

b) Adjustments to other assignments in the middle of the 1296 narrowband section

c) Changes across 23cm in support of further replanning for Digital Voice/Data/TV modes (and the new IARU-R1 1240MHz narrowband reserve frequency)

d) Amendments to the 3.4GHz bandplan to support amateur and Amsat developments in 3400-3410 (recognising that 3410+ may become 4G telecomms and is no longer preferred).

Best wishes for 2009 from **Murray G6JYB**

UKuG "FIRSTS" AWARDS

Certificates now free of charge

In addition to a range of contest trophies and certificates, the UK Microwave Group also offers an attractive certificate for those operators making a First QSO between, for example, G and GI on 47GHz. The award extends across the whole of the UK microwave bands. Full details can be found at:

www.microwavers.org.

Until recently we have levied a small charge to cover the printing and postage costs but the Committee are now very pleased to announce that this award will completely free from January 1st 2009.

By Robin Lucas, G8APZ

Another year over and the festive season is now behind us. The general consensus appears to be that 2008 has not been kind to us on the microwave bands with conditions at rock bottom for many weeks at a time.

At the beginning of January 2008, I mentioned making New Year Resolutions - mine was to get on 13cm. I didn't achieve this, for various reasons, but I did buy an 80w SSPA and had a box milled for it.

Having too many projects running alongside each other means that some tend not to be completed, so I'm loath to add another project to the list. There is a lot to be said for running projects one at a time, rather than many in parallel.

That said, for some years I have been collecting parts for a personal 24GHz beacon. I shouldn't be adding to my projects but I hope this one will become a reality. It is only by setting goals that we can hope to achieve them!

The New Year brings a new activity and contest calendar. The first two activity periods are listed below and are all day events, so even the busiest amongst us should be able to be QRV for a few hours.

CONTEST and ACTIVITY REMINDER

January

25-Jan 0900 - 2000 All-band Activity Day (Non competitive)

February

22-Feb 0900 - 2000 All-band Activity Day (Non competitive)

"LIFTS" NOT SO COMMON?

Back in the 1970s and 1980s it seemed that we had lots of lifts. I remember looking forward to the phenomenon of "autumn lifts" every year, and indeed still do.

Sadly, they appear to be less frequent than they were in the past, and a number of stations have made comments to this effect.

In a recent discussion, Carl, **SM6HYG** had noted the less frequent lifts, and referred to the days when there were widespread conditions lasting over 5 or more days. Carl will have a look back through his old logbooks and analyse his findings. It would be interesting if others could also do the same.

One of the questions which was asked after Jim Bacon, **G3YLA** gave an excellent talk at Martlesham was on this very subject. The question was "why don't we get as many autumn openings as we used to?".

Jim's response suggested that changes in the Atlantic weather systems were responsible, and as a result we don't get so many stable high pressure systems.

PROPAGATION TESTING SKEDS

From: Gordon Fiander, G0EWN

2008 has not been a great year for microwave activity with only a few infrequent, very modest openings. The autumn period has been poor though.

The last couple of years have seen very good openings coinciding with the Christmas period, although this year they have not been spectacular.

With tropo conditions bouncing along at rock bottom for weeks on end, interest and activity have inevitably declined, the 'Activity Day' of November 30th being a case in point.

My solution has been twofold - firstly a very busy spell of constructing in preparation for trying EME in 2009. This has included all manner of projects including

filters, two complete transverters, VSWR/power metering, re-cabling, antennas, PSUs and amplifiers mainly for the **23cm**/**13cm** bands. The second has been to start a propagation testing sked with **ON4IY**.

Many of you will be aware that for many years Ralph, **G4ALY** and Peter, **G3LRP** conducted a regular evening sked eventually culminating in tests which started at **23cms** and progressed upwards finishing with **3cms**, covering all allocations between.

As a newcomer to microwaves in 2004, it was great to be able to listen in and confirm at least the RX was working. At the time I couldn't hear any beacons (my reception was of the **G3LRP** end of things - I never heard Ralph on **3cm)**. Sadly, as far as I am aware this series of skeds has come to an end.

More recently I have become aware of a twice daily sked on **23cm** between **G0FNP** Scarborough and **G3AUS** IO80DN, Devon on 1296.200. 19:30-20:00. Whilst SW is a very poor direction I have been able to work **G3AUS** on ssb a number of times, even under these poor conditions. (Aircraft reflection/ weak tropo).

Listening to moans about poor conditions on the KST chat I resolved to find a sked partner. Ideally this should be someone at the normal limit of your system under poor conditions. Looking at possible stations I asked Christophe, **ON4IY** for a regular sked on **23cm**, on **1296.220** at **20:00**. We are now testing every second day.

Though its early, results are interesting. Despite poor conditions we haven't failed so far on this 515km path. It would seem there is weak tropo present much of the time aided by some occasional aircraft reflection peaks in signals.

One thing that struck me was that the normal reporting system is not particularly useful for these regular skeds. Christophe and I look for both callsigns. Once copied we send a report. Once we have copied our report we send rogers then finally after hearing rogers send 73s.

Most skeds/ qsos take 6-10mins to complete using 1 min TX periods. However often reports fail to do justice to the signal received for one reason or another. It might be worth using a different reporting system perhaps similar to the system used for moonbounce signals.

Christophe uses a 1.5m dish with 150w and uses an SD receiver. At my end it is a 44el WiMo yagi with around 120w from a 2C39BA amplifier and **G4DDK** LNA.

So far no one has tail ended the QSO though reports from other stations would be welcome. I am logging the tests and information such as weather and Hepburn prediction.

Best wishes, Gordon, **G0EWN**

GETTING STARTED - UK

From: Steve, G4GXL

I don't know how many people joined the group as a result of the BATC streaming of the Sheffield forum. After several years of having **10GHz** on my 'to do' list I joined up after watching the presentations.

I'm happy to say I am now very nearly QRV - no actual QSOs yet but everything seems to be working and I hope to get the first one in the log before the end of the year.
73, Steve, **G4GXL**

GETTING STARTED - USA

Scott, **N0EDV** wrote to let us know what he's been up to lately in the microwave world...

I attended Microwave Update in October 2008 in Bloomington, Minnesota (USA) and bought a Downeast Microwave **10GHz** - 144 MHz transverter system.

The basic transverter puts out 10mW. I also bought their external 3W amplifier kit. I have the transverter built and operating and I have the 3W amp finished and the **10 GHz** system is working well. I hope to use it during the winter snow scatter season here in Wisconsin.

The kit went together well, with only minor issues (all of them self induced by middle age!) Tuning of all the pipe caps was much easier with the use of a spectrum analyser...how does one get by without one?!

Hope to work you all across the pond someday. Well, a guy can dream, can't he???
Scott, **N0EDV**

For some photos, and an account of the build, go to **http://corbenflyer.tripod.com** and select the "My Ham Radio Page" from the menu bar on the left. It may be useful to anyone thinking of getting on **3cm** via this route.

CONTESTS - DECEMBER 2008 LOW BANDS

From: Keith GW3TKH

The weather was dry and still on a contest Sunday, must be the first this year! I travelled to Cefn y Galchen, IO81LS, where the temperature was minus 3 degrees C and there was frost and ice everywhere which made erecting antennas painful.

I was set up by 09:40 listening for beacons (except for the South Coast beacons, none was very strong). Nothing was heard from outside the UK.

23cm:
GB3MHL 529 (JO02PB), GB3CLE 529 (IO82RL) GB3FM 529 (IO91OF), GB3IOW 529 (IO90IP)

13cm:
GB3SCS 599 (IO80UU), GB3LES 589 (IO92IQ) GB3MHS 519 (JO02PB)

9cm:
GB3SCF 599 (IO80UU), GB3OHM 529 (IO92AJ) GB3ZME 529 (IO82RP), GB3MHS 519 (JO02PB)

There were few contest stations on, but those that I worked were generally excellent signals. My best DX on **23cm** was **GM4CXM** IO75TW 467Km, on **13cm G3RGK** IO91ON 157Km, and on **9cm G8AIM** IO92FH 116Km.

Talkback was intended to be on 2m but **MW0MAT/p** was operating in the RSGB 144Mhz AFS Contest, just 500m down the hill, so talkback was microwave only! Only two others were heard but not worked on **23cm**, **G3AUS** and fleetingly, **G3XDY** on CW.

Thanks to Ray, **GM4CXM** for his perseverance in making my first **23cm** QSO with **GM**, it took 30 minutes to complete! Thanks also to Neil, **G4BRK** for talkback via **9cm** and **'KST** to set up the QSO.

73, Keith

From: Ray James, GM4CXM, Glasgow

The last "low bands UKAC" was certainly blessed with an abundance of activity from all parts of the UK and I was left in the unusual position of having missed tests with some of the stations available.

Due to a PC problem I was unable to appear on KST until the first hour was almost up so it was pleasing to note that my CQ calls produced contacts for a change.

Conditions were very changeable. It appeared pretty good through to the south east at the start but a failed attempt with Chris **GW4DGU** to the south identified things could change later and this was borne out as the contest progressed. The following were worked on CW, except where indicated:

G8KQW(IO91) 588km, **M0GHZ**(IO81) 521km, **G4BRK**(IO91) 517km, **G4BAO**(JO02) 506km, **G8OHM**(IO92) SSB, **G3UKV**(IO82) **G8ATB (**IO83) SSB, **G3OHH**(IO83), **GW8ASD**(IO83) SSB, **G3LRP**(IO93), **G0HIK/p**(IO84), **GI6ATZ** (IO74), **G3JYP**(IO84), **GM0USI**(IO75) SSB, **GM0UHC**(IO85) SSB

Gotaways included **GW4DGU** who received one aircraft reflection from me and **G4RGK** who received me occasionally and I heard one aircraft reflection from Dave.

Thanks to everyone who came on. It was impressive and hopefully this activity level can continue or get even more popular during UKuG as well as RSGB UKAC events in 2009.

73, Ray

BEACONS

From: David Wrigley, G6GXK

Tom **G4TWJ** and myself have just inaugurated our **5.7GHz** equipments by receiving the **GB3ZME** Beacon here in Rochdale (100km) giving it the first northerly reception report.

We tried a small horn and a 21.6dB flat panel and both worked well hand held. We had hoped to hear the Sheffield beacon but the Pennines got in the way. **73 David**

Whilst doing some admin work on the website (www.beaconspot.eu) I noticed that Ferdinand, **DC8EC** had added a different locator for **OE2XRO** (JN67LB) on **10GHz** in one of his spots. The beacon keyer sends a wrong locator!

On checking with Ferdinand he sent some details of the beacon location on the Hoher Sonnblick Mountain. The problem with changing the keyer information is that the beacon is in the weather observatory at 3106m asl. There is no road access, and on foot, the climb can take six or seven hours! The mountain still has snowfields even in July and August.

It can also be reached by an aerial cableway, in which the very small "gondola" is open to the elements! (Beaconspot has the correct locator).

OE2XRO on 10GHz is housed above the observatory on Sonnblick Mountain

At the beginning of December, enhancements were made to www.beaconspot.eu - It now receives spots from the DXC as well as being able to send spots.

Distances are now shown for every spot and every beacon shows the ODX for that beacon, together with the spotter's locator and distance.

LATE DECEMBER CONDITIONS

From 21st December onwards, until the end of December, there were many days on which the conditions looked as though there could be a big opening. It didn't happen, although there were occasionally some very good long DX paths worked by some stations on **23cm** and a few on **13cm**. The bands above **13cm** did not seem to be open.

On Sunday 21st the noon upper air soundings for Bordeaux and Paris showed a strong inversion layer at approx 1km. and later on, John **G3XDY** worked three **EA**s on **1.3GHz**

They seemed to be taking part in some form of activity day which happily coincided with good tropo.

All of the QSOs were initiated on 144MHz and moved to **1.3GHz**. **EB2FJN/p** was worked in **IN83QE** for a new square, with signals peaking S5 on SSB. Shortly afterwards, John worked **EA1BLA/p** and **EB1BXW/p** who were operating together from **IN53XK**, but with weaker signals. The distance was 1180km for this pair of QSOs.

All signals suffered from slow deep QSB but would come up out of the noise for comfortable SSB QSOs.

Nobody else from **G** appeared to be in on this excellent tropo.

On 23rd Dec, both Dave, **G0DJA**(IO93) and **G8APZ**(JO01) heard **F6FHP** (IN94) on **23cm**, but 10w each was not enough to make a QSO.

At lunchtime on 24th Dec, **DJ5BV** had big signals from **GB3MHL** and **GB3USK** but the path from Essex was not there. Later on that evening, there was some **23cm** enhancement when **G0EWN**, and **G0DJA** (both IO93) heard the **HB9EME** beacon in JN37, and **F6FHP** (IN94) near Bordeaux heard **GB3IOW** at 579. John, **G3XDY**(JO02) worked **F6FHP** at 579 with some QSB.

Tony, **GW8ASD** (IO83) worked **F6FHP** at 947km for a new square on **23cm**, and also worked Gerd, **DJ5BV** (JO30) with up to 53 reports at 748km.

Conditions were up again on 27th Dec, when **GM4LBV** heard **GB3MHL** at up to 539 with heavy QSB during the morning.

In the afternoon of 31st Dec, **G4BAO** (JO02) was fortunate enough to catch an opening on **9cm** when he worked **OZ6OL**(JO65) in the afternoon at a distance of 865km with reports 529/449. John was using a 45cm Sky minidish with around 25W, whilst Hans **OZ6OL** was using his 5m EME dish!

...AND FINALLY

That's all for this month. With 1cm of snow on the ground as I write this, I'm looking forward to the Spring, and some decent conditions.

Today (6th Jan) **G4EAT** and I both heard **GB3MHK** on **24GHz**. It was very good to hear it again, and I hope it will be heard further afield before too long. **73, Robin G8APZ**

Please send your activity news for this column to:

scatterpoint@microwavers.org

WW2R/G4FRE WINTER VISIT - DAVE'S DIARY

I stayed in England for a week after the microwave round table in **IO82UC**. The following is a summary of activity. Few QSOs, but I heard some interesting beacons. American airlines managed not to lose my 0.6m dish this time so I now use that on **6cm**/**3cm**. Kent, **WA5VJB** retuned one of his 5-12GHz PCB LPY to 3400 using the test gear at Martlesham and I use that to feed the dish on 3400 - better performance than the 2320 **F9FT** on 3400!

10 Nov Monday night activity night. Low activity. Worked local **G3VKV** on 1296 and 2320. 2320: **GB3MHS** was a good signal - refurbishment has helped the signal strength. **GB3LES** was loud as always. 3400:**GB3OHM** loud with dish.
11 Nov Visited **GW5NF** to investigate GW microwave EME possibilities.
12 Nov Went for a drive, identified/evaluated a couple of good higher band microwave paths back to Malvern.
13 Nov Assembled **5.7GHz** gear with an **N5AC** GPS locked LO, brought over from the USA. Heard **GB3OHM** with its 2 speed keying and **GB3FNM** on tropo. **GB3OHM** although only 40km away has almost continual a/s from Birmingham Elmdon airport flights on 5760 but much less on 3400. Also heard **GB3CCX** on **3cm** which sounded much nicer than last Christmas, and was more frequency stable.
14 Nov Worked **G3VKV** on 5760 and 10368 (my only QSOs!). Heard **G4FSG** on **6cm** but not enough a/s for 2 way, nil from **G4BRK**. I heard **G4FSG** on **13cm** via a/s.
3cm: Heard **G4DDK** on a/s. Heard **GB3MHX** on a/s, but nil from **G3CWI**.
15 Nov 5760: Heard **GB3FNM** on tropo, and **GB3ZME** on backscatter (Malvern Hills block the direct path) Heard **GB3SCC** on a/s and heard **GB3MHC** on a/s.
16 Nov 5760: Heard **GB3SCC** on a/s. gear dismantled, returned to USA.

The **6cm** transverter returned to the USA with me, but I am working on converting the 7G transverter obtained at Martlesham to **6cm** to leave in the UK. I am also working on retuning one of my old 24192 transverters to 24048 to leave in UK next time.

The Equipment:
23cm 60W/1db NF/23 el F9FT **13cm** 60w/0.5db NF F9FT yagi **9cm** 7W/0.8db NF 0.6m dish LPY feed. **6cm** 3w/1.2db NF/0.6m dish (dual 6/3cm feed) GPS locked. **3cm** 1w/1.5db NF/0.6m dish (dual 6/3cm feed).

FOR SALE AND WANTED

Wanted. Alcatel or similar synthesiser required capable of retune to 5688MHz for use with an Alcatel 24GHz system. Please contact G3ZEZ on 01255 425965 or email gus@kestrel84.freeserve.co.uk 73 Gus Coleman G3ZEZ

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December 2008 Low Band Contest Results

Overall

Pos	Callsign	1.3GHz	2.3GHz	3.4GHz	Total
1	G8AIM	153	976	1000	2129
2	G4BRK	424	1000	592	2016
3	GW3TKH/P	144	575	628	1347
4	GM4CXM 1000	0	0	1000	

Band scores

(The raw band scores below have been normalised to produce the overall scores shown above)

1.3GHz

Pos	Callsign	Locator	QSOs	Best DX		Points
1	GM4CXM IO75TW	16	G3XDY	564km	5303	
2	G4BRK	IO91HP	12	GM4CXM	517km	2246
3	GW3TKH/P	IO81LS	6	GM4CXM	467km	813
4	G8AIM	IO92FH	7	G3XDY	190km	762

2.3GHz

Pos	Callsign	Locator	QSOs	Best DX		Points
1	G4BRK	IO91HP	7	G3LRP	218km	781
2	G8AIM	IO92FH	7	G3XDY	190km	762
3	GW3TKH/P	IO81LS	6	G8AIM	116km	449

3.4GHz

Pos	Callsign	Locator	QSOs	Best DX		Points
1	G8AIM	IO92FH	3	G3XDY	190km	441
2	GW3TKH/P	IO81LS	3	G8AIM	116km	277
3	G4BRK	IO91HP	3	GW3TKH/P	116km	261

Adjudicator's comments ..

Numbers of contacts were up a little from some of the previous 2008 Low Band events. Conditions were average or thereabouts as reported by entrants, with ON4IY the sole contact recorded in any log from outside the UK on 1.3GHz.

Congratulations go to **George G8AIM** who won the overall contest and the 3.4GHz band. **Neil G4BRK** took the runner's up spot and led on 2.3GHz. **Ray GM4CXM** was the leader by a considerable margin on 1.3GHz. All will receive certificates.

73 from John, G3XDY

JUNE 2008 LOWBAND CONTEST RESULTS — REVISED
(THE REVISED TABLE OF RESULTS WILL APPEAR NEXT MONTH)

Following publication of these results in October, it transpired that at least one email entry failed to arrive, possibly due to spam filtering. Please enquire if you do not receive an email acknowledgement for your log within a day or two of submission.

As a result, the tables are transformed with the "Combe Gibberlets" (G3TCU/p, G4SJH/P and G1EHF/P) overall winners and also the leaders on 13cm. Ray GM4CXM made a good score from "up North" to win 1.3GHz by a large margin. Peter G3PHO/P won the 3.4GHz band by some distance. Congratulations to all the winners

2008 CUMULATIVE CONTEST RESULTS

5.7GHz Cumulative Results 2008

Pos	Callsign	Overall Score	Total QSOs	Scores					Multipliers	Best DX	km
				Session #1	Session #2	Session #3	Session #4	Session #5			
1	G4EAT	140292	51	2322	2960	2224	2512	1899	18	DB6NT	784
2	G4WYJ/P	52569	29	1382	1052	0	0	2345	11	F1GHB/P	345
3	M0GHZ	29120	23	1361	0	0	1067	1212	8	F1PYR/P	403
4	G(W)3ZME/P	24192	19	231	835	700	0	1489	8	F1GHB/P	518
5	G4BRK	16044	17	812	387	0	0	1093	7	G3PHO/P	259
6	GW3TKH(/P)	10640	11	0	362	0	164	994	7	G4EAT	252

5.7GHz Cumulatives 2008

Entries increased again this year and ,despite the indifferent weather conditions, scores were also up on last year. **John Wood G4EAT** made a first appearance on 5.7GHz this time and ran away with the event, with well over twice the score of Jim Gale G4WYJ/P who operated from Ditchling Beacon.

G4EAT made three very impressive rain scatter contacts in the June event, indeed the QSO with DB6NT probably represents the UK rain scatter record for 5.7GHz.

Congratulations to G4EAT as winner of the G3KEU Trophy, and G4WYJ/P will receive the runners up certificate.

10GHz Cumulative Results 2008

Open Section

Pos	Callsign	Overall Score	Total QSOs	Scores					Multipliers	Best DX	km
				Session #1	Session #2	Session #3	Session #4	Session #5			
1	G4EAT	508734	117	5430	6185	7227	3058	3433	27	DB6NT	784
2	G4ZXO/P	151248	55	3198	1625	0	0	4630	16	M0DTS/P	389
3	M0DTS/P	104897	46	3404	0	2127	1608	2538	13	G4UVZ	401
4	G(W)3ZME/P	92496	54	561	1494	0	2825	3389	12	M0DTS/P	291
5	G4BRK	43296	28	2429	729	0	0	778	11	M0DTS/P	302

Restricted Section

Pos	Callsign	Overall Score	Total QSOs	Scores					Multipliers	Best DX	km
				Session #1	Session #2	Session #3	Session #4	Session #5			
1	G1MPW/P	126072	62	1847	804	2871	1837	2286	18	F1GHB/P	349
2	G6KIE/P	117912	55	1937	24	2468	2178	2290	17	F1GHB/P	349
3	G3CWI/P	112602	77	3425	750	1999	2265	2353	14	G4ZXO/P	300
4	G4WYJ/P	92484	45	2167	947	0	0	3492	14	M0DTS/P	390
5	G0EHV/P	45680	34	1561	0	1212	1280	1727	10	G4ZXO/P	389
6	M0GHZ	39195	29	1464	0	0	1256	1635	9	G4DDK	250
7	GW3TKH(/P)	8630	16	0	287	0	462	977	5	G4ZXO/P	225

10GHz Cumulatives 2008

Entries recovered from last year's low point, despite the inclement weather during most of the summer season. The rain did help by providing some very good scatter contacts, particularly in the May, June and July sessions. This was reflected in increased overall scores in both sections this year. The best DX in the contest was recorded between G4EAT and DB6NT in the June event at 784km.

John Wood G4EAT again triumphed in the Open section by a very large margin, helped by a good haul of rain scatter contacts to the East that other stations missed out on, and a good collection of French stations. This year's runner up is Peter Horbaczewskyj G4ZXO/P, operating at Ditchling Beacon.

In the Restricted section **Steve Cooke G1MPW/P** took the honours, closely followed by Dave Banks G6KIE/P operating alongside him. They provided some additional interest in the final session by operating from JO03 square. Richard Newstead G3CWI/P took full advantage of the Rover rules to log the largest number of contacts in this section.

Congratulations to G4EAT as winner of the G3RPE Memorial Trophy, and to G1MPW/P as winner of the G3JMB Memorial trophy. Runners up G4ZXO/P and G6KIE/P will receive certificates, as will David Millard M0GHZ as leading fixed station in the Restricted section.

24GHz Cumulative Results 2008

Pos	Callsign	Overall Score	Total QSOs	Scores					Multipliers	Best DX	km
				Session #1	Session #2	Session #3	Session #4	Session #5			
1	G3ZME/P	1203	5	0	0	0	318	83	3	G3PHO/P	116
2	G4EAT	382	3	0	20	0	57	114	2	G3UYM/P	57
3	GW3TKH/P	166	2	0	0	0	0	166	1	G3ZME/P	83

24GHz Cumulatives 2008

Three entries were received for this event, as compared with two last year, but activity was very limited with only 7 stations noted across the logs. Most contacts were made in the last two sessions. There is no doubt that 24GHz is very different from the lower bands and selecting appropriate locations for making a good score is not easy.

The UKUG has a continuing focus on promoting activity on this band, so next year this event will continue to run in parallel to the 5.7 and 10GHz events, but a 24GHz section will also be re-introduced to the mm-wave band cumulatives. Separate trophies will be awarded for these different events.

Congratulations and the 24GHz Trophy go to **Telford & DARS G3ZME/P** as winner, and a certificate to G4EAT as runner up and leading fixed station.

47/76GHz Cumulatives 2008

No entries were received for this event. Next year there will be a 3 session contest with a 24GHz section which is hoped will encourage activity.