An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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QSO over 130 km on the 122 GHz frequency band

By Wolfgang Hoeth OE3WOG

In this Issue

Don't forget that

Every Monday evening is Microwave Activity Evening

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Dropbox: *Please note* that you do NOT have to subscribe to Dropbox in order to download your copy of Scatterpoint.

Tales of your microwave-related presents from Santa are eagerly anticipated for the January edition.

Take care operating high voltage equipment after a seasonal sherbert or two.

73s de Martin G8BHC

PS I've been asked to note that our Treasurer is now also active on HF. Rumours that he has been buying medical books to aid operation on 80m have been much exaggerated.

Articles for Scatterpoint

News, views and articles for this newsletter are always welcome.

Please send them to

editor@microwavers.org

The CLOSING date is the FIRST day of the month

if you want your material to be published in the next issue.

Please submit your articles in any of the following formats:–

Text: txt, rtf, rtfd, doc, docx, odt, Pages

Spreadsheets: Excel, OpenOffice, Numbers

Images: tiff, png, jpg

Schematics: sch (Eagle preferred)

I can extract text and pictures from pdf files but tables can be a bit of a problem so please send these as separate files in one of the above formats.

Thank you for you co-operation.

Martin G8BHC

UK MICROWAVE GROUP

SUBSCRIPTION INFORMATION

The following subscription rates apply.

UK £6.00 US $12.00 Europe €10.00

This basic sum is for **UKuG membership.** For this you receive Scatterpoint for **FREE** by electronic means (now internet only) via the Yahoo group.

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!

You will have to make a quick check with the membership secretary if you have forgotten the renewal date. 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.

Please also note the payment methods and be meticulous with PayPal and cheque details.

PLEASE QUOTE YOUR CALLSIGN!

Payment can be made by: PayPal to

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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!)

Colour codes

Editorial & Events

Activity & Contests

Technical

Nanowaves (optical)

Commentary

Reproducing articles from Scatterpoint

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UK Microwave Group Report to RSGB Spectrum Forum

By John Worsnop G4BAO

Introduction to UKuG

The UK Microwave Group represents the interests of amateur microwave radio enthusiasts in the UK. Its Committee is an elected body representing the interests of UK amateur microwave enthusiasts. The UKuG is open to membership for both UK and overseas microwavers. UKuG is now 14 years old, having been formed at the Martlesham Microwave Roundtable in November 1999 and it is affiliated to the RSGB. Membership has remained largely static at around 400 since the last report.

Events organised and supported during 2013

- Martlesham Microwave Roundtable with UKuG AGM - April
- Microwave Roundtable and buildathon organised by the Finningley Club – July.
- Microwave Roundtable with Construction contest organised by the Crawley Club - September
- Exhibited at RSGB Convention – October, and members made presentations on Microwave topics.
- Scottish Microwave Roundtable, Burntisland near Dunfermline - November
- Rutherford Appleton Laboratories Microwave Roundtable organised by the Harwell Club
- UKuG displays at the East Suffolk rally.
- BATC, Finningley. Talk by G8DKK on LNBs for ATV use.

Club outreach

We attended the Felixstowe Club's East Suffolk Wireless revival with UKuG displays The Group continues to support the Finningley, Crawley and Harwell Clubs with their Microwave Round Tables.

Technical Support

A number of UKuG members provided technical support as part of our scheme including microwave filter alignment and transverter testing. We have made available a "member's loan" 5.7GHz transverter system, and it is currently being used to good effect by GM0USI. The group are currently building a 10GHz transverter system for the same purpose and will be built from the new GW4DGU "Plug and Play" modules which were kindly made available by GW4DGU for a reduced price. The "Chipbank," the groups completely free chip component supply service, is proving popular both by post and at our Round tables

Newsletter

Scatterpoint, the e-newsletter of the Group, under the Editorship of Martin, G8BHC is published 10 times a year continues to attract top-line technical articles as well as being a comprehensive repository of reports of activity.

Beacons

The following new beacons came on air in 2013; GB3NGI on 10GHz and GB3ZME on 2.3GHz. Upgrades have been carried out to the Bell Hill GB3SC* cluster and to the Cambridgeshire 24GHz beacon GB3CAM. Some progress has been made in agreements with the Primary users over other new NoVs in

the pipeline, but as yet, no NoVs have been forthcoming. Sadly we lost the beacon cluster in Bristol. Beacon NoVs issued for 5.7 and 10GHz for GB3CSB, and the 47, 76 and 134GHz licences issued for the GB3CCX cluster at Cheltenham have not yet been implemented. I'm afraid that this does not help our case when we complain about licence delays.

The group has re-purposed the GB3CEM 10GHz beacon, kindly donated by the estate of the late G4PBP and it has been installed as GB3PKT at Clacton. We are still awaiting the NoV for the beacon.

Reverse DDS (RDDS) control kits, are still made available to beacon builders free of charge through the Group, and allow current and future beacons to be locked to high stability 10MHz or other sources. For the second year running, none have been taken up. The Reverse DDS solution provides for MGM modulation facilities, if required. Odd frequency offsets, used by many beacons, can be accommodated.

Beaconspot.eu is still the most up to date source of real time VHF/Microwave beacon data currently available and is fully integrated with the DX Cluster. While originally designed for the microwave bands much use is also being made by VHF operators this year.

Spectrum news

The UKuG organised a co-ordinated response with BATC to Ofcom's consultation on 2.3 and 3,4GHz, providing "boiler plate" responses for members to base their submission upon. A good response was returned.

Terrestrial

1296 and 10368MHz continue to be the most popular terrestrial microwave bands, with increasing activity on 2320MHz, boosted by the SHF UKAC contests. As per last year, activity seems still to be clustered around this and other contests. The UK 76GHz and Nanowave records were broken this year, but activity on 76GHz is limited to a small group in the South and West.

EME

There continues to be plenty of 23cm activity pretty much any time the moon is up and this band is attracting more very small JT mode stations to participate, much in the way that 144MHz EME has evolved. Microwave activity on EME in Europe is much higher than in the USA where most eme is done on 144 JT65 with a little activity on 1296.

UKuG Awards

Just one 70 squares award on 1.3GHz this year, so uptake is slow and we continue to maintain the distance records and firsts databases. We have had some initial drafts of a distance award certificate design and we expect to be able to relaunch the distance awards in Jan 2014. We have had communication with SOTA about distance awards and are waiting on feedback from them on the proposed categories.

UKuG Contests

The entry level on the lower bands has dropped by 33% year to date, also reflected in entry levels on 5.7GHz and 24GHz. On the brighter side we had many more entries and some real competition in the mm-wave event in July, with entries on 4 bands for the first time I'm aware of. The 10GHz contests this summer attracted 25 different entrants, up from 17 in 2012, a 50% increase. So its a mixed bag!

Submitted by G4BAO on behalf of the UK Microwave Group, October 2012

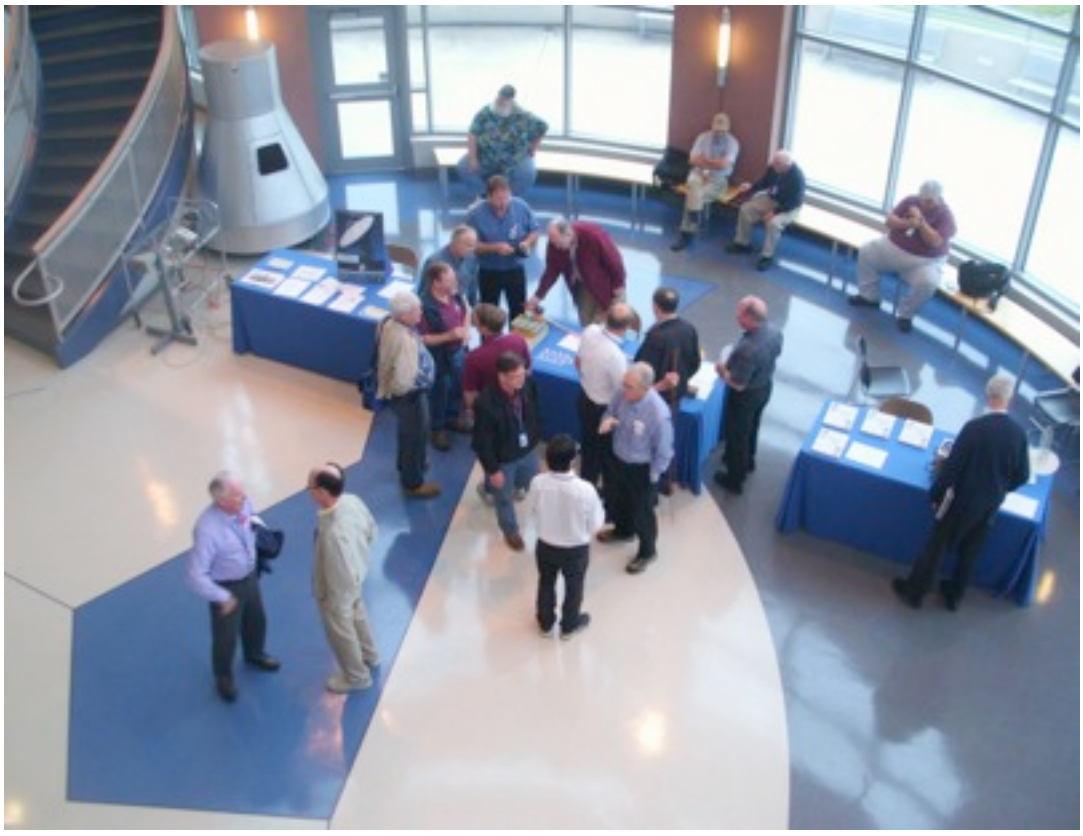
Visit to Microwave Update 2013

By Roger Ray G8CUB

Microwave Update this year was in Morehead Kentucky. Not the easiest place to get to, but it fitted neatly in between meeting friends in New England, and seeing our neighbours who were just finishing a year's contract in Washington.

As it turned out, I was one of only two visitors outside North America. I had flown from Manchester (New Hampshire) via Detroit to Lexington, and then hired a car to get to Morehead. Once I found the correct building in the vast Morehead State University complex, registration was very much like a professional conference.

The first morning was a tour of the faculty, labs, anechoic chamber, clean room and control centre. Then I cadged a lift up to the 21m dish situated some half a mile away.



Registration area with Jeff Kruth WA3ZKR standing in the centre of the picture, behind the desk. Jeff was both responsible for most of the MUD organisation, and setting up the space-science facility at the university.

The 21m dish as seen from the campus – can I have one please?!

Equipment rack in the control room. The other side of the room looked like NASA mission control, which nicely looked directly towards the dish. All IFs (up to 3GHz) and control lines from the dish are brought back to the control room via fibre-optics.

Just to prove that I was there (thanks to Bill Rogers K2TER for the picture – he is organising MUD 2014 in Rochester NY state). The dish had been fitted with a 77GHz transverter and feed, for MUD. Al Ward W5LUA is working away in the local control room under the dish. He was showing 7.5dB sun noise on the Flex-radio display. Very constant, but I guess that is what you get with auto tracking accurate to 1/1000 of a degree! Later moon noise was measured as 0.8dB. Unfortunately an eme sked with Sergei RW3BP in Moscow on Saturday evening failed, possibly due to dense cloud cover.

Friday evening was a 'swop meet' back at the Hampton hotel. I struggled to find anything of real interest to buy (that would fit into hand luggage). I did find some new Agilent 3.5mm connectors -$3 for small ones, $5 for big ones! The trader said they were reverse SMA, they weren't, although the 'reverse sma' could have been 2.4mm – but those were all gone! A mistake here, was showing Kent Britain the stall – he proceeded to buy all the trader had.

Saturday the proceedings started at 8.00am, with a series of brilliant lectures. Of particular interest to me, were Tom Williams round up of 76GHz pre-amp production. Paul Wade's locked VCXOs, Jeff Kruth's Antenna feeds for the big dish (400-470MHz so not all

microwaves) and noise source calibration. Also a brilliant talk by Brian Justin WA1ZMS on setting up a 47GHz experiment to investigate whether the figures we are using for earths curvature apply above 24GHz.

At the end we heard a recording of the signals on FM and SSB between Robert KF6KVG and Goran AD6IW during their record breaking 252.5km QSO on 77GHz (June 2013) - just slow fading. Shows what can be done with a perfect LOS path – they just had to wait for the valley in between to cool enough to give a low dew point.

Lectures over it was just the evening banquet to attend. This was slightly quirky from a European standpoint. On the doors opening most people rushed to a table at the side. This was where the door prizes were laid out, I later found.

The meal was buffet style, where all courses were collected together. Drinks were water and iced tea, not a drop of alcohol to be seen.

The meal was over quite quickly. Then a long but interesting talk by the radio science head Dr.Ben Malphurs KJ4HVE. Interestingly about half of the students are licensed amateurs, on the space science courses. A lot of their work is building and communicating with Cubesats, on amateur frequencies. They hope to be building the satellite for moon orbit, for the Flashlight project – which will attempt to investigate water in deep craters in the moon's polar regions.

The door prize raffle was called. Now I saw why everyone was so keen to see what was on offer. Prizes included £100 vouchers for transverters, plus there were kits of all variety, components dishes etc. It was near the end my number was called, but I still picked up a brand new 38GHz multiplier block.

Banquet over, I made a 4.30am start in thick fog for Lexington airport. I boarded the 7.10 flight to Atlanta on route to Washington. Unfortunately the plane's navigation system failed. Eventually I left 4 hours late. Landed at 12.05 in Atlanta, and just got on the 12.22 flight to Washington!

Roger Ray G8CUB

1st edition of FUNcube Handbook

Thanks to the very good work of Richard Limebear G3RWL, the first edition of the free "FUNcube Handbook" is now available.
See
amsat-uk.org/2013/11/07/1st-edition-of-funcube-handbook-now-available/

Download pdf

funcubetest2.files.wordpress.com/2010/11/funcube-handbook-en_v1.pdf

AMSAT-UK website **amsat-uk.org/**

HEELWEG MICROWAVE MEETING 2014


SATURDAY JANUARY 18th 2014

LOCATION:

CAFÉ/ZAAL "DE VOS"
HALSEWEG 2
7054 BH WESTENDORP

INFO@PAMICROWAVES.NL

PE1FOT/PA7JB/PA3CEG/PA0BAT

OZ7IGY – The Next Generation Beacons platform

By Bo Hansen OZ2M

When is the last time you heard any of the OZ7IGY beacons? For about six to twelve months now the beacons from 28 MHz to 432 MHz have been using the new Next Generation Beacons platform that features frequency and time locked to GPS and transmitting both digital modulation and CW. Furthermore the new 23 cm beacon should be on air as you are reading this. Later in the autumn the new 24 GHz beacon should follow suit.

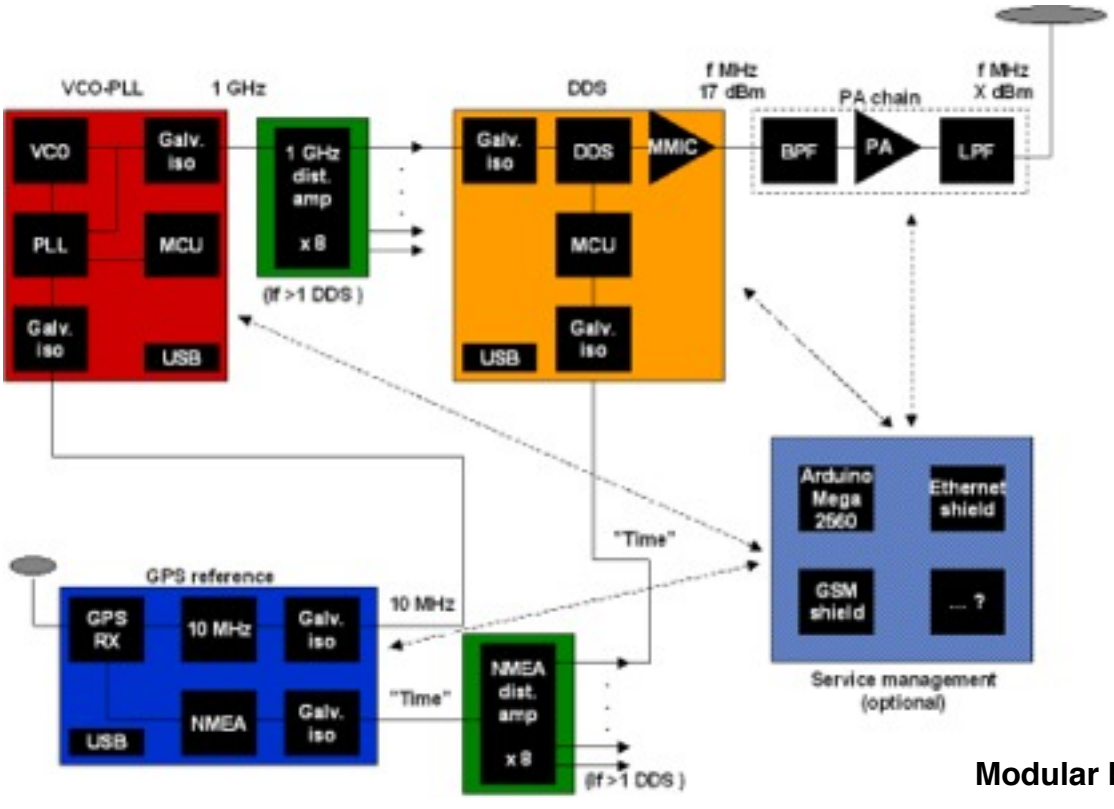
The OZ7IGY Story

The OZ7IGY 144 MHz beacon dates back to the International Geophysical Year in 1957. Today OZ7IGY transmits on 28 MHz, 40 MHz, 50 MHz, 70 MHz, 144 MHz, 432 MHz, 1,3 GHz, 2,3 GHz, 3,4 GHz, 5,7 GHz, 10 GHz and 24 GHz. Most of the hardware used by OZ7IGY was old land mobile equipment. For the higher microwave bands most of the technology is dedicated radio amateur beacon designs with surplus power amplifiers.

The New Platform

Given the latest developments in digital modulation techniques and RF-circuits it was decided that it was time for OZ7IGY to take advantage of these technologies. This is what the Next Generation Beacons platform is all about. A "by product" of the platform is also a new digital modulation scheme designed for beacon purposes – PI4 and a decoding program called PI-RX. The key features of the platform are:

- The transmitted signal is time and frequency locked to the GPS system
- Usable from kHz to GHz with 4 µHz resolution
- The 10 MHz GPSDO, VCO-PLL and DDS have galvanicly isolated ports for increased EMC performance
- Uses a 1 GHz low phase noise VCO, 138 dBc/Hz at 10 kHz
- Currently implemented modulations are CW, FSK441, ISCAT, JT4, JT6M, JT65, JT9, Opera, PI4 and WSPR. No S/W reloading is necessary to change modulation
- USB management interface for changing frequency, callsign, locator, modulation, sequence etc.
- Easy to add new sequence and modulations
- Designed for low power consumption, reducing the electricity cost, and continuous operation year after year
- Open source modular hardware and software

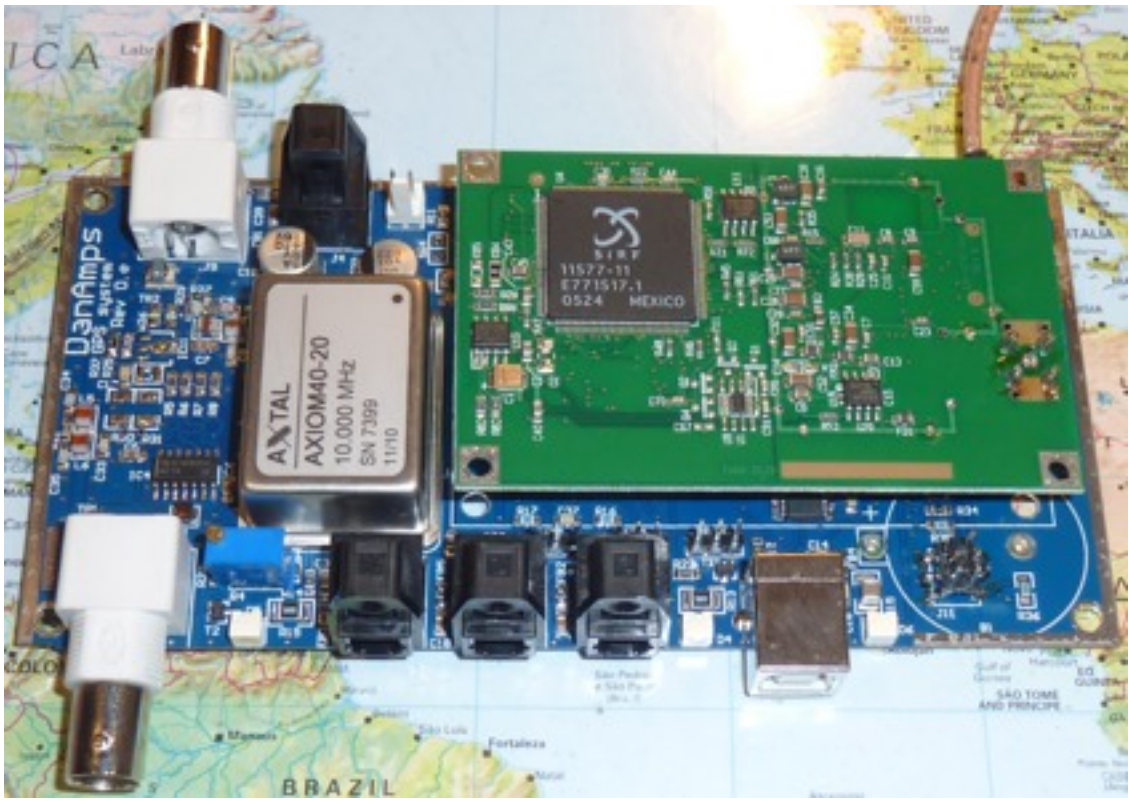


Modular block schematic

The hardware

The platform consists of a GPS locked 10 MHz reference, a 1 GHz VCO-PLL and DDS unit(s) plus optional distribution splitters if more frequencies are desired.

The GPSDO can also be used as a 10 MHz reference for lab use. Accuracy is better than 5 mHz after warm-up. USB and optical ports are available for setup and signal interfacing.



GPSDO – 10 MHz GPS disciplined oscillator.

The GPSDO, DDS and VCO-PLL all have galvanic isolation on the interface ports to increase noise immunity and provide additional EMC protection.

Digital synthesizer with USB control port.

1 GHz low phase noise oscillator/clock.

An optional service management interface using the Arduino platform can easily be added providing remote management via a cellular networks or via the Internet.

During the specification and design phases it was important to develop a beacon that would meet tough spectral purity requirements as many active VUSHF stations are located close to OZ7IGY. Thus phase noise performance of the local oscillator/clock and exciter was important. At 10 kHz the exciter phase noise has been measured to –133 dBc on 432 MHz.

The Modulation and Decoding Software

There are many benefits of adding digital modulation to a “classic” CW ID beacon. It is possible to automate statistical monitoring and use it for “below human ear " signal monitoring because the signal-to-noise performance of digital modulation is superior to CW. A 10 dB or more monitoring “gain” is not unlikely depending on the operators' CW skills.

In the above list of available MGMs PI4 is one of them. What is PI4 you may ask? Well, PI4 is a digital modulation designed for beacon purposes. It has its roots in JT4 by Joe, K1JT, but is faster yet losing only a little more than 1 dB. Furthermore, is it possible to use the same sequence every minute, i.e. PI4 (24 s), CW (~15 s at 12 WPM) and carrier (~20 s).

Since 30 March 2013 all of the new OZ7IGY beacons have been using PI4 instead of JT65C2 and the decoder program PI-RX has been very well received. Like all other developments performance has be steadily improved when it comes to decoding sensitivity, robustness and general features making beacon monitoring easy and fun. With the summer release even decoding of auroral signals have been possible. It is probably still possible to improve the decoder performance and this is where you can help! If you receive PI4 signals that you find should have been decoded please submit your wav files for further analysis. We believe that there are sill propagation modes out there that we have not yet fully characterised. Not just using PI-RX but in general.

Why PI4?

The reason for using PI4 for the OZ7IGY beacons is based upon the requirements below:

- The analogue part of the identification must be frequent both to identify the beacon but also to handle QSB
- The beacon, must be readable even when the path is distorted i.e. by rain scatter, aurora etc. Who says we have finished detecting new propagation techniques? So the beacon must also be "forward compatible"
- It must be possible to decode the MGM part even if the receiver is not frequency locked
- Today most beacons identify themselves every 30-45 seconds. But waiting for the identification always seems too long and, like waiting in a telephone queue the perceived waiting time always seems to be too long
- A 2 min sequence is too long and the shorter the better
- Identical sequence every minute
- It should be possible to calibrate to the beacon. Thus a carrier is needed to zero-beat on. Today this is specified to be about 20-30 seconds
- The analogue identification should be readable by all of us not just the very high speed CW operators. Thus 12 WPM/60 LPM as already specified seems to make sense
- Must fit into the current 1 kHz beacon to beacon spacing structure
- The MGM must be transmittable via a class C amplifier to save power

PI4 is specifically designed with beacons and VUSHF propagation in mind. It is far more robust to path irregularities and equipment inaccuracies than e.g. WSPR and JT9. Both these modes require a long sequence. JT65, modes are in between WSPR/JT9 and PI4, and JT4, when it comes to robustness but cannot fulfil the requirement for an identical sequence every minute without other sacrifices unless using the JT65B2/C2 submodes. The JT4 submode JT4G has better path robustness than PI4 but takes about twice as long to transmit thus it will not fulfil the sequence requirements. PSK2K, FSK441, JT6M and ISCAT are "fast modes" but are not as sensitive as the other modes. Furthermore, tuning into a mixed mode PI4 beacon is just like tuning into any other CW beacon with an 800 Hz beat tone. For these reasons PI4 is the MGM used by the OZ7IGY Next Generation Beacons.

A simple mixed mode PI4, CW and carrier PC program is also available – PI4-TX.

On-air Experience

Mixed mode beacons are relatively new and users, and developers, all have to learn how to use them and understand the benefits they provide. The first new OZ7IGY beacons have been on air since 30 October 2012 and user reports have been received form all a round the compass showing great interest in digital decoding, signal propagations and frequency calibration possibilities. Listeners who have no prior experience with MGMs find the new beacons odd and misplaced while digital mode fans agree that it's about time they had some permanent digital signals to listen to. The aim for OZ7IGY is to bridge the past with the future without falling into the trap of “digital haut couture".

As well as the OZ7IGY beacons the IW9GDC/B has been QRV since the beginning of August and DB0JG will soon be on the air using the platform. Furthermore, Brian, WA1ZMS, is in the process of upgrading his transatlantic beacons on 2 m and 4 m.

So how does the Next Generation Beacons platform perform on the air? Does it meet the spectral purity requirements? The answer is yes it does. Frank, IZ8DWF, reports that he cannot hear IW9GDC/B anywhere else than on its frequency despite he lives just 4 km away with LOS across the Messina Straight. Also stations operating close to OZ7IGY are very satisfied. It is far better now than the old LMR converted beacons were.

References

OZ7IGY status page: www.rudius.net/oz7igy

The Next Generation Beacons platform: www.rudius.net/oz2m/ngnb

PI4: www.rudius.net/oz2m/ngnb/pi4.htm

PI-RX: www.rudius.net/oz2m/software/pi-rx

PI4-TX: www.rudius.net/oz2m/software/pi4-tx

Scottish Microwave Round Table Notes

John Cooke GM8OTI

The third Scottish Microwave Round Table was held on Saturday 2 November 2013, at the Museum of Communication (MOC), Burntisland.

Measurement facilities were available right from the start, run by Brian Flynn GM8BJF and David Stockton GM4ZNX, and a number of people brought along odd lengths of cable, connectors and preamplifiers for test. There was also space for a few traders' tables and a fair amount of gear was bought and sold.

Attendees were welcomed to the meeting by John Cooke GM8OTI, UK Microwave Group (UKuG) GM representative, and Prof. Tom Stevenson who outlined the MOC facilities which included a plentiful supply of tea, coffee and biscuits throughout the day.

Chris Bartram GW4DGU (UKuG Chairman) gave a short address, updating attendees on the current situation and likely outcome from Ofcom regarding the low microwave bands. Chris also emphasised the need for more people (especially, at this meeting, from GM) to become involved in the work of the UKuG, to provide a better balance of representation over the UK.

The first talk was given by Brian Flynn GM8BJF on Noise Figure Measurement Using Natural (Free!) Noise Sources. This was an excellent reminder of what is available to all of us (the sky and the ground!), and a good description of how to make use of it.

Kevin Avery G3AAF (who also had a trader's stand at the event) gave a very informative talk on the practicalities of SMD Construction.

The usual plentiful (and very good) buffet lunch was provided by the MOC staff (included in the entrance fee), and the Museum "store" was opened over lunchtime for visitors to eye the amazing collection of communications equipment that cannot all be put on show.

For the first afternoon session, Ray James GM4CXM gave a two part talk on Low Band Contesting and the Airscout software by DL2ALF. There was some discussion as to why, after a period of fairly high activity, there now seemed to be a dearth of activity on the low bands in GM. No conclusions were reached but lots of encouragement given for more activity!

The final talk was by Chris Bartram GW4DGU who described his ideas about designs for a New, High-Performance Transverter for the Low Bands. Chris hopes to have hardware available for this some time next year.

The formal part of the meeting concluded with the award of the GM4LBV trophy for the GM Construction Competition. This had been announced only a month before the meeting, and there were only two entries, from GM8BJF and GM8OTI (who had been badgered into entering something by GM8BJF in the pub after the previous week's Lothians RS meeting!). The trophy (a waveguide to croc clip transition) was won by Brian Flynn GM8BJF. Brian must now write up the entry for "Scatterpoint" and it will be taken forward to next year's UK Microwave Group G3VVB Projects Trophy competition. GM microwavers please remember to submit something next year, to avoid a repeat of the Lothians RS monopoly! Built, modified, hardware or software.

In the evening, many attendees (and some YL/XYLs) moved on to the Kingswood Hotel for an excellent meal, followed by an auction of microwave related publications which raised over £70 for MOC funds. This was followed by musical entertainment provided by Chris Bartram GW4DGU, Ian White GM3SEK, Nadine White MM0WNW and John Cooke GM8OTI - some video has already been posted on YouTube, linked from the GMRT website.

Thanks go to the MOC Staff for all their efforts before and during the event; to the organisers (Ray James GM4CXM, Ian White GM3SEK, Brian Flynn GM8BJF, Roger Blackwell GM4PMK, David Stockton GM4ZNX and Colin Wright GM4HWO); and to Lothians RS members Peter Dick GM4DTH, Andy Sinclair MM0FMF and Alan Masson GM3PSP for local support.

Photos etc. are gradually appearing at

www.rayjames.biz/microwavert/id15.html

73
John GM8OTI

Site database and dist/bearing printouts

Andy Talbot G4JNT

A comprehensive list of useful sites with their locations is contained in the the site database SITES.DAT, which can be downloaded from www.g4jnt.com/SiteDatabase.htm

This database is useable with Mike G0MJW's terrain plotting and propagation analysis tool

I've just discovered my original GEOG2 software suite written for DOS back in the 1990's is difficult to use on Win7 operating system (I firmly stay with XP where it [mostly] all runs in a command prompt window) In Win 7 users have to resort to DOXbox. So, to keep the functionality of the only three remaining programmes in the suite that are still useful these days, I've written an updated version for Windows.

SiteCalcWin combines the functionality of SITECALC, LOCATION and GETSITE from my original GEOG2 software suite, all in a single package.

A location can be specified by typing in any unique part of a site name - the database is searched for a match - or the location can be entered as 6 or 8 character Locator or 8 or 10 character NGR. The type/format is recognised automatically . This can be defined as a home or base location, and the distance and bearing is then calculated for any other site, entered the same way by name, Loc or NGR

A .TXT file listing / distance bearing from any site can be generated. This file can be exported to a word processor or for direct printout. The printout can optionally be restricted to sites at a maximum or minimum distance (or both) , or only those within a certain azimuth sector - all of which saves making a large listing for sites with limited visibility. It's also useful for finding listed sites close to a given location.

Links to SitecalcWin and G0MJW's terrain profile and propagation tool are at the bottom of www.g4jnt.com/SiteDatabase.htm

One minor warning, NGR conversion is done using the GBR36 Geoid, rather than WGS84 as used by GPS. So lat / long values generated from NGRs will appear a few tens of metres out from those defined via GPS. The NGR / WGS84 conversion is horribly complicated and I just can't be bothered for a level of accuracy that is unimportant here.

Andy G4JNT

UKµG Chip Bank – A free service for members

The catalogue is now on the UKµG web site See www.microwavers.org/?chipbank.htm

Non members can join the UKuG by following the non-members link on the same page and members will be able to email Mike with requests for components. All will be subject to availability, and a listing of a component on the site will not be a guarantee of availability of that component.

The service is run as a free benefit to all members and the UK Microwave Group will pick up the cost of packaging and postage.

Minimum quantity of small components supplied is 10. Some people have ordered a single smd resistor!

The service may be withdrawn at the discretion of the committee if abuse such as reselling of components is suspected.

There is an order form on the website with an address label which will slightly reduce what I have to do in dealing with orders so please could you use it.

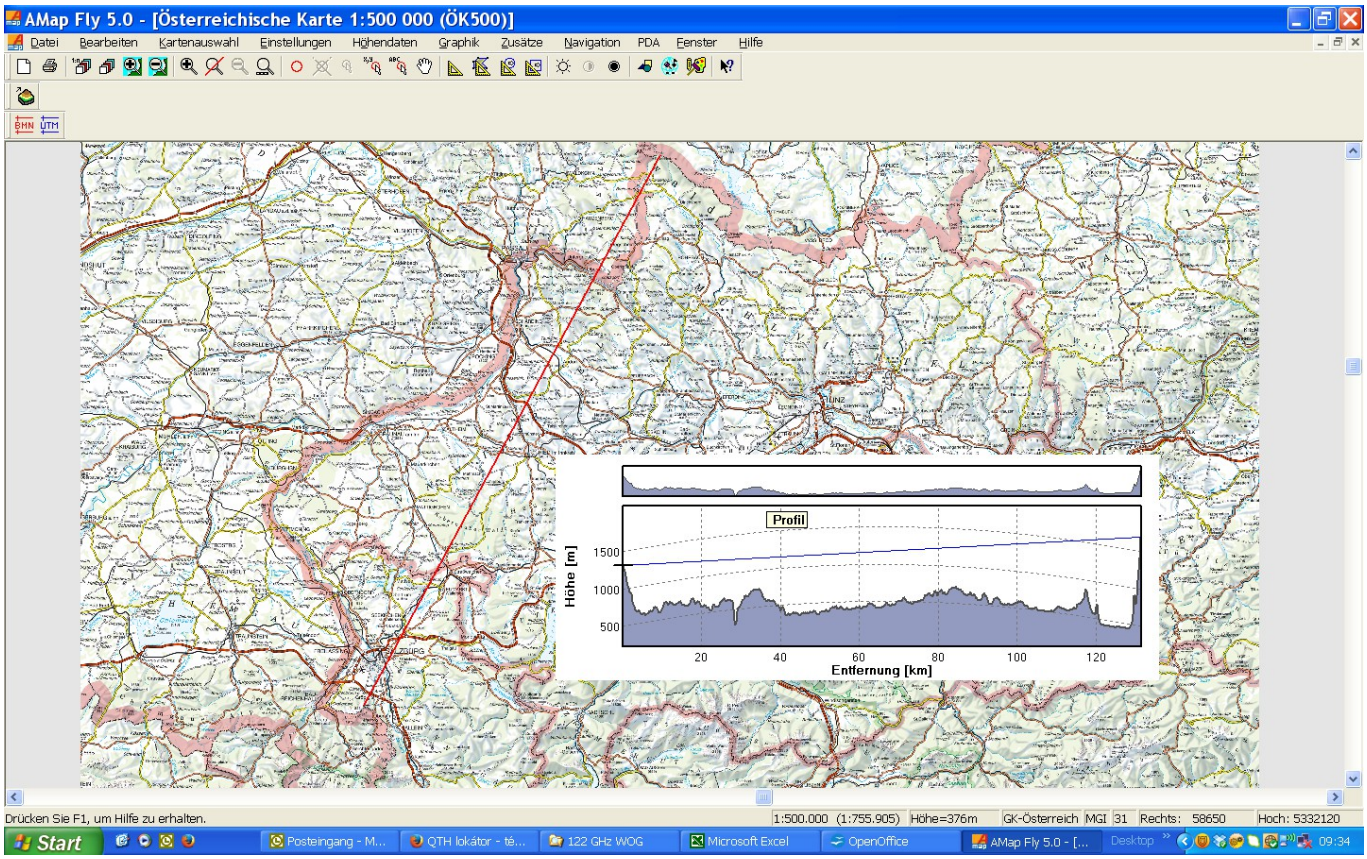
Also, as many of the components are from unknown sources, if you have the facility to check the value, particularly unmarked items such as capacitors, do so, and let me know if any items have been miss labelled. G4HUP's Inductance/capacitance meter with SM probes is ideal for this (Unsolicited testimonial!!)

Don't forget it is completely free, you don't even have to pay postage!

73, Mike, G3LYP

QSO over 130 km on the 122 GHz frequency band

By Wolfgang Hoeth OE3WOG



June 2009 was the beginning for experiments on 122GHz in OE. The first QSO was applied over a distance of 1,5 km. Since that, we constantly have improved our equipment and activities. Today, we are a small group of 5 Hams and we do QSO`s on 47, 76 and 122 GHz on a regular basis.

Highlights on 122 GHz so far are: 54 km IARU R1 distance record, first cross country QSO`s between OE to DL and OE to OK.

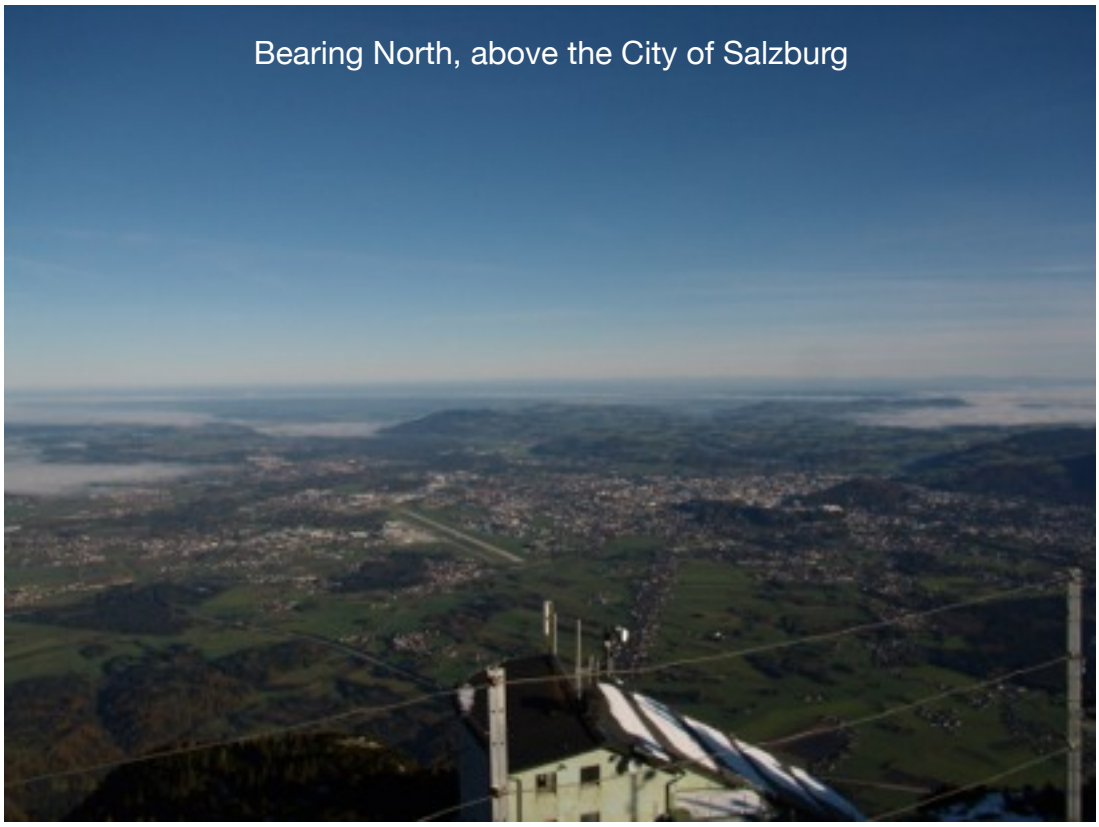
One of the latest improvements of our SHF/EHF equipment, is the implementation of a PLL system, designed by Hans Wimmer, OE2JOM. This application gives us the the required frequency stability and accurateness to find a RF signal within a SSB receiver bandwidth. On all our SHF/EHF equipment we have now the PLL in use and we have replaced the +60°C OCXO`s.

On the antenna side we are using massive aluminium dishes with diameters of 400mm and 470mm which are manufactured from Rudi, OE5VRL on a CNC lathe. CW transmitter and transverter are installed in the front of the dish, the feed is a tubular waveguide and the opening fits with the focus point.

The equipment is simple, because there are no active elements involved. The basic element of the CW transmitter and/or the TX/RX harmonic mixer is a single GaAS FlipChip MA1310E Diode.

Description

A external GPS reference (i.e. G3RUH) delivers a solid 10 MHz signal to the OE2JOM PLL. The PLL controls a crystal in the 100 MHz range. The output of the PLL is fed into a 13,5 GHz DRO which delivers +15dBm output. This 13,5 GHz signal is fed into a 40 GHz linear amplifier as used for 38 GHz microwave link equipment and is a surplus device. Due to overdriving of the input stage and the huge gain of the amplifier it is possible to provide



approximately. 100 mW on the WR28 waveguide output. This LO chain is the same for a CW-TX or for an up&down converter (transverter).

In the RF head we are using the boards available from Kuhne, DB6NT. The diodes are cemented to the stripline with silver epoxy glue. The feed is a brass or a copper tube with the correct diameter for that particular frequency, for 122 GHz we are using 1.6mm dia.

The diodes are placed exactly across the tube opening inside of the RF head. The feed is attached to the RF head and fits into the support arms of the dish. The equipment is installed at the front of the dish and the feed opening is exactly in the focus. This mechanical design is identical for all SHF/ EHF Transverter or CW Transmitter beginning from 10 GHz up.

The QSO

Sites were: Mount Plöckenstein in Oberösterreich, JN68WS14qp, 1,360m a.s.l and Mount Geiereck on the Untersberg Mountain in Salzburg, JN67MR13bk, 1,708m a.s.l. The radio path was 132 km and LOS. A special permission was required to drive up to the Plöckenstein, TNX to OE5RFO to open the doors. On the Untersberg we have

used the cable car and had a short walk to the summit.


DL3MBG (front) and OE3WOG

On Saturday the 19. October 2013, we OE3WRA, OE3WOG and DL3MBG took the cable car to Mount Geiereck, meanwhile OE5VRL and team drove up to Mount Plöckenstein. At around 08:00h UTC we had the equipment in service on both sides and ready to go.

To align the antennas properly we started with 24 GHz, having no problems to find each other because of 2 Watt RF output and 2dbNF on both sides. We had to use step attenuators in the IF path to bring the signal down to a readable value on the S-meter. (>50db).

After we have made the QSO`s we changed the equipment to 47 GHz and calibrated the antennas again in azimuth and elevation. We made the QSO´s and repeated the whole story on 76 GHz. On 76 GHz the signals where less as expected but still 55 in SSB.

In the meantime, we had wonderful weather and an outside temperature of +23°C. So as a consequence, the frozen snow on the ground got melted and one leg of our tripod sank into the ground and we were slightly out of the correct antenna direction. But we figured that out first as we moved to 122 GHz because after the frequency and equipment move we heard nothing on 122 GHz.. :-((


OE5VRLP JN68WS

Back to 76 GHz and after a new antenna alignment, WOW we got 3 more S-units. Immediately we changed to 122 GHz and Yes we heard the constant CW carrier sent from OE5VRL/P. We changed to TX on our side and got the confirmation on 2meter talk back that we are also heard on OE5VRL/P`s location.

The signal in both way was quite stable in amplitude and no large QSB was observed. We completed our QSO´s on 122 GHz and with less of 2h total operation time we had accomplished 12 QSO`s on 4 frequency bands.

Conditions

It was a bit chilli in the morning but it warms up with the rising sun. Visibility was in the range of > 200 km. We did not use any electronic devices or software to encode or decode CW, it was done with a simple key and by human ear.

A closer look

Technical details: Untersberg:

Operator OE3WRA/P, OE3WOG/P, OE/DL3MBG/P

470 mm massive parabolic dish, CNC made by OE5VRL, gain at 55% eff. and 122 GHz = 51,5dB, beam width 0.4°,

Receiver: Transverter made by OE2JOM, GPS referenced, IF 146 MHz,

Transmitter: CW-TX made by OE3WOG, GPS referenced, RF power output 1,2 mW

Technical details: Plöckenstein:

Operator OE5VRL/P

1.21 m massive parabolic dish (the monster) donated by OE5MKM, alucast, weight 35 kg, gain at 55% eff. and 122 GHz = 59.9dB, beam width 0.16°.

Receiver: Transverter made by OE5VRL, GPS referenced, IF 144 MHz

Transmitter: CW-TX made by OE5VRL, GPS referenced, RF power output 0.8 mW

The gain of the antennas on 76 GHz are 4.1dB, on 47 GHz 8.3dB, and on 24 GHz 14.1dB lower, compared to 122 GHz..

These QSOs override the world DX record of WA1ZMS/4 and W4WWQ/4 from January 18. 2005 over a distance of 114 km.

Thanks to:

- Helga (YL of OE5VRL) for the precise weather forecast
- OE5MKM he donated the monster (1.2 metre dish)
- OE5DRL for making videos
- OE5RFO providing site access
- OE2JOM for loaning his122 GHz transverter
- The microwave group in Hohenbachern-DL, for lab support
- Various SHF/EHF groups in DL and OK for hints & kinks.

Watch the movie on YouTube

www.youtube.com/watch?v=JlgoepVF43E

73 de OE3WOG, OE3WRA, OE5VRL, DL3MBG

EME-2014

Pleumeur-Bodou, France
23–27 August

From Guy Gervais F2CT

Outline programme

- Saturday 23 August : arrivals
- Sunday 24 August : tour with visits to Telecom Museum, Planetarium, Granit-Rose coast and 7 islands
- **Monday 25 August : 1st conference day**
- **Tuesday 26 August : 2nd conference day with gala dinner**
- Wednesday 27 August : departures
- 27 – 30 August : extras for those interested by visiting Brittanny and south west France.
- After the Conference 3 extensions stays will be proposed .....

1 Leisure stay at Belambra TREGASTEL

- August 27 to 30 in half board arrangement

2 Discover SAINT MALO- MONT SAINT MICHEL and others famous places at spa NOVOTEL DINARD

- August 27 to 30 transfer by bus and on half board arrangement
- Airport Rennes
- Train to Paris

3 Come with us to discover BASK COUNTRY – Transfer by bus from TREGASTEL

- 27 to 31 of August
- Stop overnight in LA ROCHELLE August 27
- Stop for lunch in the Bordeaux vineyard August 28
- 3 nights and 2 full days for discovering Bask country, with Corine, F2CT and other EME Hams,
- tapas diner in Spain and others many typical surprises
- Full board arrangement
- Airport Biarritz direct to Paris

All information and prices will be given with the conference program.

The web site is on line www.eme2014.fr/

See also this link which currently has more information.

UKµG Technical support

Another free service for members!

While many of you will have taken advantage of the "test equipment rooms" that we run at the Round Tables, sometimes that project just cannot wait for the few occasions per year when we hold them. One of the great things about our hobby is the idea that we give our time freely to help and encourage others, and within the UKuG there are a number of people who are prepared to (within sensible limits!) share their knowledge and, more importantly, test equipment. Our friends in America refer to such amateurs as "Elmers" but that term tends to remind me too much of that rather bumbling nemesis of Bugs Bunny, Elmer Fudd, so let's call them Tech Support volunteers.

While this is described as a "service to members" it is not a "right of membership!"

Please understand that you, as a user of this service, must expect to fit in with the timetable and lives of the volunteers. Without a doubt, the best way to make people withdraw the service is to hassle them and complain if they cannot fit in with YOUR timetable!

Please remember that a service like our support people can provide would cost lots of money per hour professionally and it's costing you nothing and will probably include tea and biscuits!

If anyone would like to step forward and volunteer, especially in the regions where we have no representative, please email john@g4bao.com

The current list is available at www.microwavers.org/tech-support.htm

Region	TechSupp. volunteer	Facilities
NW England, N Wales Wales	David Wrigley G6GXK 07811776432 Chris Bartram GW4DGU	Spectrum Analysis to 24GHz Power measurement to 76GHz Freq Measurement to 26GHz Freq sources to 47GHz NF Measurement to 10GHz Antenna Test range to 24GHz
NE England Yorks and Humberside	Peter Day G3PHO microwaves@blueyonder.co.uk	Available from Spring 2013 Spec Analyser to 24GHz Power measurement to 24GHz (up to 5W on 24GHz), RF sources to 24GHz, direct freq measurement to 3GHz. Setting up/tuning up transverters, etc + general advice.
S and SW England	Brian Coleman G4NNS Paul Marsh M0EYT pjmarsh@uhf-satcom.com	Spectrum analyser to 24GHz Power measurement to 26 GHz Scalar Network analyser and sweeper 2 to 15GHz Antenna test range 2.3, 3.4, 5.7, 10 and 24GHz Wavegide directional couplers for 10GHz and 24GHz Coax couplers 1.3 – 26GHz. Power measurement to 12GHz High power dummy load @ 10GHz (500W) Frequency measurement to 22GHz Spectrum analysers to 6 and 18GHz Frequency generation to 18GHz.
SE England and London	Allan Wyatt G8LSD allan@virtual-museums.org	not known
East Anglia, Essex & Suffolk Herts.	Sam Jewell G4DDK sam@g4ddk.com Bryan Harber G8DKK Letchworth, Herts	Spectrum analysis to 24GHz Power measurement to 24GHz Direct frequency measurement up to 3GHz VNA to 3GHz RF sources to 24GHz
West Anglia East Midlands	John Worsnop G4BAO john@g4bao.com	Spectrum analysis to 24GHz Power measurement to 24GHz Direct frequency measurement up to 18GHz VNA to 1.3GHz RF sources to 24GHz High current PSUs at 12, 28 and 48V
W Midlands	Richard Bown G8JVM richard@g8jvm.com	power measurement to 18 GHz Sig gen to 1.3 GHz but can mix up to 3cms SA to 1.3 GHz but can down convert from 3 cms and probably other lower bands , check NF to 3 cms with IFs of 144 and others , check Freq measurement to 18 GHz, Rb standard
Scotland	John Cooke GM8OTI gm8oti@gmail.com	Lot of mutual assistance in GM via GM microwave reflector including David Anderson GM6BIG and Ian Ropper GM0UHC
N Ireland	Gordon Curry GI6ATZ	

Contest Results

By John Quarmby G3XDY

10GHz Contest August 2013 – Errata

Unfortunately GW4HQX/P was omitted from the table for the Radio Talkback section in August, although his score was correctly tabulated in the Highband Championship tables. He should occupy second position with a score of 681 points, with G4GSB/P in third place.

5.7GHz Contest September 2013

Although G3ZME/P found eight stations to work during the event, entries remained at a low level. Conditions were normal, with F2CT/P operating from the Pleumeur Bodou Earth Station, providing some added interest for those near the south coast.

This month G3ZME/P again won the unlimited talkback section, with G4LDR as runner up and leading fixed station in this event. In the radio talkback section GW3TKH/P is the only entrant.

10GHz Contest September 2013

Normal (i.e. flat) conditions were the order of the day again for this contest. Congratulations go to GW4HQX/P who won the Radio Talkback section, with G4GSB/P as runner up. In the Unlimited section G4LDR was the clear winner, with G3ZME/P second. The leading Restricted section entrant was GW4HQX/P.

24GHz Contest August 2013

G4BAO made an appearance in the entries for the first time this year in this event. Surprisingly, the other three entrants all achieved identical scores, so GW3TKH/P is the winner of the Radio Talkback section and G4LDR and G8CUB/P share the leadership in the Unlimited Talkback section.

Highband Championship 2013

5.7GHz (G3KEU Trophy)

Congratulations to the Telford and District ARS who were the clear winners this year, winning three of the five events. They will receive the G3KEU Trophy.

Runner up and leading fixed station is Neil G4LDR. The leading radio only talkback entrant was G(W)3TKH/P and leading low power station was G4SJH/P.

10 GHz (G3JMB and G3RPE Trophies)

This year the Open section was won by a fixed station for the first time for several years, with Neil G4LDR taking top spot with wins in two events and runner-up spot in a third. Telford & D ARS (G3ZME/P) were runners up, also winning two events but with fewer points from their final runners-up spot in September. Congratulations to G4LDR who will receive the G3RPE Memorial Trophy.

In the Restricted section Nick G4WLC/P had an unassailable lead after four events, so he switched to the Open section for the final contest of the series. He wins the G3JMB Memorial Trophy. Runner-up is Pete G(W/J)4HQX/P who used the roving rules to good effect, winning two of the events. Leading fixed station is Dave G4RGK.

Overall entry levels have increased nearly 50% to 25 this year on 10GHz, even though the other bands seem to have not been as popular.

24 GHz (G0RRJ Memorial Trophy)

Keith GW(J)3TKH/P had this in the bag after the first three events, and ended up winning four of the contests and being a close second in the fifth, to cement a strong win. Congratulations to GW3TKH on a fine achievement and he will receive the G0RRJ Memorial Trophy. Runner up and leading fixed station is Neil G4LDR.

All those mentioned above will receive certificates.

Feedback on the new format of these events would be welcome prior to setting the 2014 rules. Please send comments to me at g3xdy@btinternet.com

5.7GHz Contest September 2013

Unlimited Talkback Section

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX km
1	G3ZME/P	IO82QL	8	1220	G3XDY	265
2	G4LDR	IO91EC	5	1060	F2CT/P	294

Radio Talkback Section

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX km
1	GW3TKH/P	IO81LS	7	785	G4BEL	226

10GHz Contest September 2013

Radio Talkback Section

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms	Power	Category
1	GW4HQX/P	IO81LS/KR	9	1082	G4BEL	226	0.2	R
2	G4GSB/P	IO82WM	1	70	G3VKV	70	1	R

Unlimited Talkback Section

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX km	Power	Category
1	G4LDR	IO91EC	10	2524	GM0USI/P	570	25	O
2	G3ZME/P	IO82QL	13	1737	G3XDY	265	8	O
3	G4WLC/P	IO81WU	10	1703	F6DKW	461	2	O
4	G8CUB/P	IO92XA	5	614	GW4HQX/P	208	5	O
5	G8DTF	IO83SM	3	575	G4LDR	275	2.5	O
6	G4BAO	JO02CG	4	284	G4WLC/P	167	0.1	O

24GHz Contest September 2013

Unlimited Talkback

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX km
1=	G4LDR	IO91EC	1	124	GW3TKH/P	124
1=	G8CUB/P	JO01DH/IO92XA	1	124	G4EAT	52
3	G4BAO	JO02CG	2	44	G8CUB/P	33

Radio Talkback

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX km
1	GW3TKH/P	IO81LS	1	124	G4LDR	124

5.7/10/24GHz Championship Tables

Final tabulation, the best three events count towards the total

5.7GHz

Pos	Callsign	5/26/13	6/30/13	7/28/13	8/25/13	9/29/13	TOTAL
1	G3ZME/P	1000	0	1000	808	1000	3000
2	G4LDR	568	801	820	612	869	2490
3	G(W)3TKH/P	502	0	0	1000	643	2145
4	G1EHF/P	0	1000	0	0	0	1000
5	G4SJH/P	317	0	0	671	0	988
6	G4WYJ/P	0	288	0	0	0	288
7	G4WGE/P	0	38	0	0	0	38

10GHz Open

Pos	Callsign	5/26/13	6/30/13	7/28/13	8/25/13	9/29/13	TOTAL
1	G4LDR	948	882	1000	686	1000	2948
2	G3ZME/P	1000	0	547	1000	688	2688
3	GW/J3TKH/P	0	1000	459	0	0	1459
4	G8DTF	527	404	0	378	228	1309
5	G8CUB/P	0	457	353	347	243	1157
6	G4EML/P	0	298	480	0	0	778
7	M0DTS/P	342	386	0	0	0	728
8	G1MPW/P	0	704	0	0	0	704
9	G4BAO	0	0	0	686	113	686
10	G4WLC/P	0	0	0	0	675	675
11	G3PHO	0	0	365	0	0	365
12	G8KMH/P	304	0	0	0	0	304
13	GW4NOS/P	96	0	0	0	0	96
14	G8AIM	0	0	21	0	0	21

10GHz Restricted

Pos	Callsign	5/26/13	6/30/13	7/28/13	8/25/13	9/29/13	TOTAL
1	G4WLC/P	1000	943	787	962	0	2905
2	GW/J4HQX/P	781	563	1000	467	1000	2781
3	G4SJH/P	960	0	0	1000	0	1960
4	G4GSB/P	164	483	478	24	65	1125
5	G1EHF/P	0	1000	0	0	0	1000
6	G4RGK	0	0	390	523	0	913
7	G4WYJ/P	0	694	0	0	0	694
8	GM8OTI/P	518	0	0	0	0	518
9	G0EHV/P	322	141	0	0	0	463
10	G0API/P	0	0	119	0	0	119
11	G4WGE/P	0	85	0	0	0	85

24GHz

Pos	Callsign	5/26/13	6/30/13	7/28/13	8/25/13	9/29/13	TOTAL
1	GW/J3TKH/P	920	1000	1000	1000	1000	3000
2	G4LDR	718	1000	213	302	1000	2718
3	G3ZME/P				1000	1000	2000
4=	G0API/P	0	0	1000	0	0	1000
4=	G8KQW	1000	0	0	0	0	1000
6	G4BAO	0	0	0	0	266	266

October 2013 Lowband Contest Results

As an experiment, an extra session of the Lowband events was introduced to coincide with the October UHF Contest (RSGB) and IARU Region 1 UHF Contest. Those entrants that commented noted that activity was higher than would otherwise been the case, but there are some issues with running this event on the same weekend as the RSGB Trophy Contests on 1.3 and 2.3GHz due to dilution of activity and the complications of duplicate contacts if entering both events. One option under consideration is to run this event on the Sunday of the May UHF Contest next year, where entrants could benefit from the extra activity without having to decide whether to enter the RSGB Trophy event or the UKuG one.

1.3GHz

Congratulations to Tony Collett G4NBS as the winner on 1.3GHz with a good score including a good haul of continental DX. G1EHF/P was runner up, with a couple more contacts but less DX in the log.

2.3GHz

Tony G4NBS wins this band as well, but by a smaller margin, with G8CUL and G1EHF/P also vying for the top places with similar numbers of contacts. Unusually there were more entries on this band than on 1.3GHz.

3.4GHz

G1EHF/P won the 3.4GHz section by a substantial margin, with Neil Whiting G4BRK as runner-up.

Overall

The "Combe Gibberlets" G1EHF/P continue their winning ways with overall victory in this event, with Tony G4NBS in overall runner up position with wins on 1.3 and 2.3GHz.

The final Low band contest of 2013 is on 24th November from 10:00-14:00.

73 John G3XDY
UK Microwave Group Contest Manager

October Low Band Contest 2013

Overall

Pos	Callsign	1.3GHz	2.3GHz	3.4GHz	Overall	
1	G1EHF/P	896	903	1000	2799	
2	G4NBS	1000	1000	0	2000	
3	G8CUL	835	970	0	1805	
4	G4BRK	438	290	374	1102	
5	G4LDR	160	367	343	870	
6	G8DTF	0	245	0	245	

1.3GHz

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX km
1	G4NBS	JO02AF	40	10644	DF9IC	713
2	G1EHF/P	IO91RF	42	9533	GM0USI	575
3	G8CUL	IO91JO	35	8883	DF0MU	587
4	G4BRK	IO91HP	21	4661	GM0USI	510
5	G4LDR	IO91EC	9	1704	PA0EZ	488

2.3GHz

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX km
1	G4NBS	JO02AF	19	4136	DF0MU	495
2	G8CUL	IO91JO	18	4013	DF0MU	587
3	G1EHF/P	IO91RF	18	3736	PI4GN	547
4	G4LDR	IO91EC	9	1516	PA0EZ	488
5	G4BRK	IO91HP	9	1198	PA6NL	380
6	G8DTF	IO83SM	4	1013	G1EHF/P	287

3.4GHz

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX km
1	G1EHF/P	IO91RF	7	993	PA3CQE	400
2	G4BRK	IO91HP	4	371	G4CBW	170
3	G4LDR	IO91EC	3	341	G3XDY	223

Activity News : October

By Bob Price G8DTF

Please send your activity news to:

scatterpoint@microwavers.org

Introduction

This month we have some reports from both October and November of some interesting Millimetre band activity as well as the usual activity in UKAC and Microwave Group contests. I also note that we have seen a number of reports from new stations this month, some of whom are new to microwaves.

Millimetre Waves

From John G4BAO JO02

Pleased to report two very rare events these days, namely QSOs on 24 GHz! During the contest on the 29th September, operating from home, I worked Roger, G8CUB/P (IO92XA) at 33km and my local Roger, G4BEL (JO02BI) at 11km. I'm always guaranteed to get a good "Rogering" in 24GHz contests, but the temptation to sign off with "Roger Roger, Roger" was almost overwhelming.

From Doug Friend VK4OE QG63

I don't know if it's worth mentioning, but today Rex VK4REX and I had an SSB contact on 47.0881 GHz over a distance of approximately 132 Km. Signals after optimisation of beam directions were 52 each way. It may be that this sort of distance is 'old hat' for some of you fellows, but I do know how hard it is to find good line-of-sight paths in your country....

This was definitely a LOS path, from 'Howells Knob' near Maleny in the Sunshine Coast hinterland, Queensland (QG63JF), to a place at Eagle Heights in the Gold Coast hinterland, Queensland (QG62OC).

Rex was running about 30 mW to a Procom 47 GHz dish and feed, and I was running about 100 mW to a 26 dBi horn antenna. Both stations were operating portable.

We believe that even longer distances will be possible in the future, especially after I graduate to a dish antenna!

76GHz UK Record Brown Clee to Winter Hill 23rd November 2013

From John G4EAT in IO83

Spurred on by previous successful tests and after several weeks of planning, we proposed on the above date, to set a new 76GHz UK distance record from Winter Hill (IO83RO) to Brown Clee (IO82QL), a distance of 128km. A previous plan between the two sites in 2012 was cancelled due to rain and high winds. The new chosen date was arbitrary, but coincided with John's G4EAT family wedding in Derbyshire the day before.

Roger (G8CUB) was brave enough to join him by driving up with XYL Sue to Winter Hill from Essex on the day. The Wessex Millimetre-wave Group of Ian G8KQW/P and John G8ACE/P had driven north that morning to operate from Brown Clee.

The weather forecasters showed high pressure moving in and the "weather underground" website predicted cool weather, low dew point, low winds and 0% precipitation. The web site forecast changed little in the 7 days prior to the tests and proved to be very accurate.

The sun was shining on Brown Clee. Driving from the Derbyshire Peaks and bypassing Manchester there were clear blue skies with sunshine and temperatures +7C. However, approaching Winter Hill there was thick high cloud which we entered as we left the M61 at Bolton.

As a precursor, a low power beacon on 24GHz was used for alignment and proved that radio conditions were good for millimetre-waves.

At the peak of Winter Hill during our 76GHz QSO's we measured T ambient +3C, RH 75%. The calculated Dew Point was -1C ....perfect!! Our prayers were answered.

At 76GHz the calculated water vapour attenuation was 0.1588dB/km giving a total atmospheric attenuation of -32dB including oxygen over the 128km path. The FSPL -172db so -204db total path losses.

Mixed modes were used CW/SSB and FM and all four operators worked both operators at each end (4QSO's).

RST reports averaged 55 except Roger received 59 due to his HPA being almost 100mW.

On an earlier summer 2013 expedition, the Essex & Wessex groups had previously confirmed their 76GHz systems with good signals over a 94km path between Firle Beacon, Sussex and Ventnor, Isle of Wight. Due to the favourable weather at Winter Hill and Brown Clee the calculated total path loss was -204dB which compares with the Firle Beacon-Ventnor total path losses last June (+6C Dew Pt) of -202.5dB. Hence the very similar RST reports to last time!

Roger G8CUB brought his 24G and 47GHz systems as well and was able to work G8KQW/P on these bands too with strong signals. 24G signals were huge over a 60 deg arc and still copyable over 90deg+.
On 47G signal level was large 59+ up to a couple of deg either side of centre.

Thanks to Bob G8DTF for advising us on the Winter Hill access permission process and Jim G8UGL for arranging Brown Clee access.

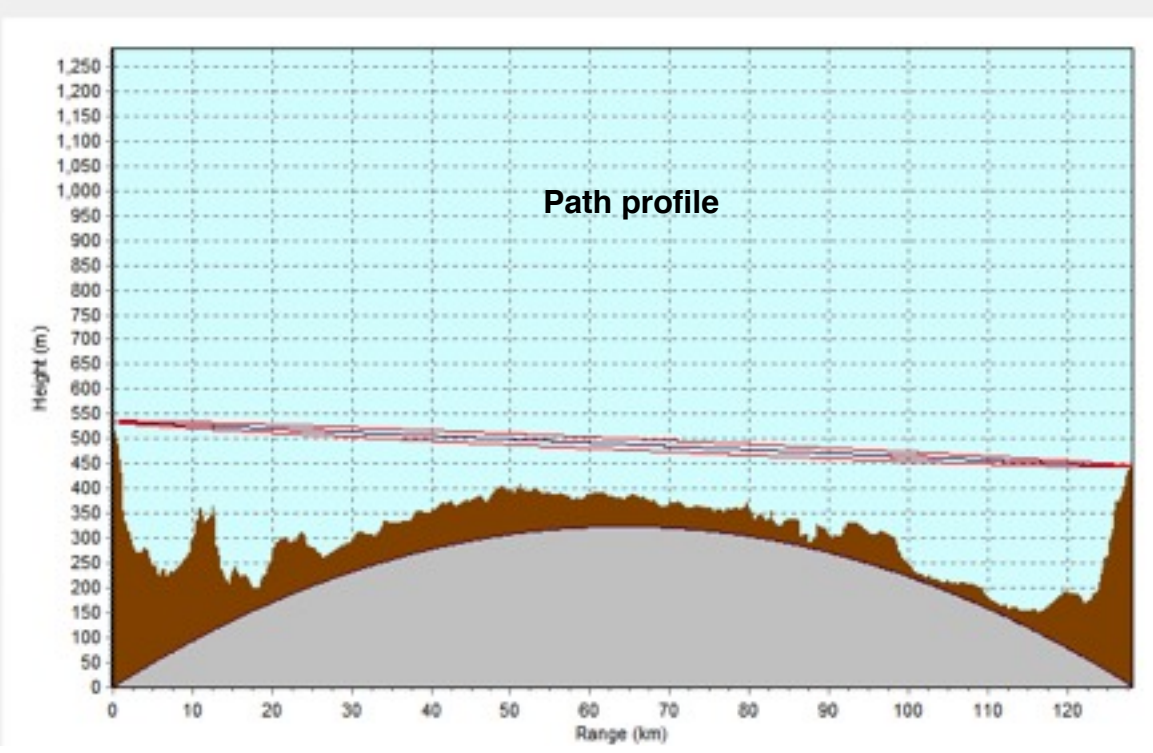
G8CUB tripod systems

RHS: 76GHz system.
RX 120mm 57G lens horn, 5dB NF WA1MBA pre-amp, fundamental mixer. IF 10,376 / 440MHz, LO / image rejected by WR-8 waveguide.
TX 120mm 57G lens horn, mixing as above via WG switch, PA 90mW.

Centre: 24G system.
2 x 20dB horns Simple system, no c/o relays.

LHS: 47G system.
Offset parabola, WG switch, 5mW tx.

Background: short mast with HB9CV antenna for 144MHz talkback.



Brown Clee K=1.0 Winter Hill

G4EAT 76GHz tripod system.

RHS: Rx module: MEDL fundamental Schottky mixer, connected to 130mm 57GHz Lens horn antenna. Synth LO.

Centre: Tx module: 13GHz synth, X-band PIN switch for A1 keying , 13GHz to 38GHz tripler followed by 10mW doubler, connected to 130mm 57GHz Lens horn antenna.

LHS: FT290RII IF rig.

On the ground:

24GHz 7mW FSK beacon with 90deg sector antenna

Weather meter confirming RH and T ambient.

G8KQW/P single tripod, 3 millimetre-wave systems.

Top: 24G 60cms antenna + 3W transverter

Centre: 47G 30cms dish + 30mW transverter

Bottom right Rx module: SLNA, SHM Rx, GPS locked LO

Bottom left Tx Module: oscillator-driver GPS locked, multiplied to 75.9762GHz, 13mW.

G8ACE/P operating 76GHz FM Tx with NEC 30cms Cassegrain antenna.

Rx on second tripod with NEC 30cms Cassegrain antenna + SLNA

The longest UK LOS path is believed to be around 203km. Calculations suggest for marginal signals we either need -10C Dew Point! (Not very common) or we need to raise our equipment system gains to improve the probability of success.

Additional Information & References:

Southgate ARC News site: www.southgatearc.org/news/november2013/uk_radio_amateurs_extend_76ghz_distance_record.htm#.UpOkR8TIZzU

G8ACE web site with report and video: www.microwaves.dsl.pipex.com

Weather forecast web site: www.wunderground.com/

October 23cm UKAC

From Eddie G0EHV/P IO94

I was out portable from the usual IO94 site and found conditions poor in the event, sudden QSB and regular 10s radar pulse QRM caused problems with weaker stations.

Best of my 36 QSO's was G4LDR at 413Km. I worked 2 new UKAC entrants from Scotland – GM4AFF and GM3WIL who I haven't worked for years!

Winter is now virtually here, setting up and taking down in the dark meant a smaller 35 element antenna rather than the 55 element.

From Bob G8DTF IO83

Conditions were not the best, but I managed to work the following stations. G0CDA, G8REQ, G3UVR, GW8ASD, G4NTY, G4JLG, G8HXE/P, M0UFC/P, G4MVU, M0SDA, G1SWH and G6GVI all in IO83. GW4BVE/P, G3SMT and G6WRW/P in IO82, M0GHZ and G0LGS/P in IO81, G7RAU/P in IO90, G8BUN and G8EOP in IO93, G3PYE/P and G4NBS in JO02, G8OHM in IO92, GM4CXM in IO75 and G4BRK in IO91.

October SHF UKAC

From Eddie G0EHV/P IO94

13cms

As usual I was active in the UKAC (IO94ET) this month. Weather looked poor for going /P, but rain stopped to allow a trip out. Set up in the mud and darkness, but the site was well illuminated for a few microseconds with a huge lightening flash, the heavy rain came later!

Band conditions were poor, but I heard GB3CSB at reasonable strength before the contest, nothing after it.

14 QSO's in all, ODX being Dave M0GHZ at 378 Km – quite a struggle but made it for a new square. Nice to have a chat with Barry G4KCT for a new one as well, only IO93, but it made up for not working my own square this time out. Barry's XYL popped up as well for another QSO.

Some attempts via KST not successful, but always worth a try, briefly heard PE9GHZ, but again no QSO.

KST was again was problematic, mobile dropping out several times.

Took down in the dark and wet, maybe getting a bit too old for this game!

From John G4BAO JO02

On 10 GHz I'm now running 7 watts to a 6ocm dish and my best DX of the month was PI4Z (JO11WM) 265km in the 432 and up contest on the 5th. I had a great night in the October SHF UKAC. Just a shame that 10GHz Activity was so low as we could have had country wide QSOs via Rainscatter. You guys on the LF bands (13cm) missed all the fun! The scatter made SSB quite difficult at times, but I tended to work people in the contest on CW then briefly say "Hi" on SSB at the end if they were strong enough

I worked the following, all on CW, mostly via RS

G4ODA	IO92WS	60 km
G3XDY	JO02OB	72 km
G4WLC/P	IO81WU	166 km (59)
G4CBW	IO83UB	190 km (59+)
M0GHZ	IO81VK	190km

and my ODX was G8DTF IO83SM 226km on NBFM via RS

From Bob G8DTF IO83

13cm

I worked G6GVI, M0UFC/P, G1SWH, G3UVR and GW8ASD in IO83, G8CUL, G4BRK, G0MJW and G8NVI in IO91, G3VKV in IO81, GM4CXM in IO75, G8OHM and G4ODA in IO92 and G4KCT in IO93.

9cm

I worked G4JLG/P, M0UFC/P and G4CBW all in IO83.

3cm

I worked G4CBW in IO83, G4BAO in JO02, G4ODA in IO92, G3VKV and G4WLC/P.

November 23cm UKAC

From Bob G8DTF IO83

I had a few equipment issues during this contest. Power output was significantly down by the end. I did manage to work G8REQ, G3UVR, G1SWH, G8HXE/P, G4NTY, M0SDA and GW8ASD in IO83, GW4BVE/P in IO82, G0MJW and G8CUL in IO91, G8DOH and G8OHM in IO92 and G4KCT in IO93.

November Low Bands Contest

From Martin GM8IEM IO78

I was active on 23 cm from 1000-1400, but very few GM stations appeared on ON4KST for the first hour, and after that many of the regulars were absent. I only managed one QSO during the contest, GM3WIL (IO75QL) via aircraft scatter, though signals were in and out of the noise on tropo in the minutes before the aircraft enhancement. GM0USI (IO75UV) was briefly heard but not worked on AS, and on CW tropo GM3UAG (IO87XJ) was heard, but not well enough for a QSO; my CW was copied on tropo by GM8ZKU (IO97BJ), though Simon was receive only - he tells me he hopes to be transmitting early next year. Several other QSOs were attempted with more distant stations using aircraft scatter, but nothing was copied either way - thanks to all those who tried. A great shame there weren't more GM stations active, since there were plenty of planes flying over the Highlands that would have provided opportunities. Running the usual 150 Watts to a 67el WiMo, with VLNA23 on receive.

Unfortunately my 67el Wimo was damaged by the gales a couple of days ago (see attached photo) and has now been taken down. I hope to back again on the band shortly, once a repair/replacement has taken place.

November SHF UKAC

From Ross G6GVI and Daniel M6NNX.
Bolton Wireless Club

Foundation Licensee enters the 3cm UKAC

The 26-Nov session of the RSGB's 3cm UK Activity Contest saw the first entry by a Foundation Licensee. Whilst studying for his Intermediate Licence, Daniel M6NNX was keen to have a go with microwaves, using the only band above 1GHz permitted with his current Licence. So, using simple WideBand FM equipment borrowed from the Bolton Wireless Club, he made a QSO across town with Ross G6GVI.

Both stations were using modulated Gunn-diode transmitters (Solfan heads) with only around 10 milliwatts output, and receiving with converted LNBs and satellite tuners. Dan had a 16dB horn on his transmitter and just the feed-horn on the LNB, whereas Ross was using small dishes on both TX & RX. The path was just under 1km across Queen's Park, and was entirely obscured by trees, many of which still had some foilage: certainly not line-of-sight.

But once the dishes were optimised, the signals were “59+”, and even clearer than the 70cm NBFM link used for talkback!

Dan and Ross had done some preparatory tests over the preceding weekend: initially trying to make a direct link from their shack windows, until they discovered that the glass (particularly Pilkington’s K-Glass) was quite opaque at 10GHz! So the following day, Dan set up on his 10th-floor balcony whilst Ross went to the bottom of his garden, trying to find a clearer view through the trees. But experimenting with different beam-headings, they found that the best signals were obtained when Ross aimed his dishes “backwards”, to scatter off the wall of the house! This discovery enabled Ross to operate from the shelter of his shed for the Tuesday-night UKAC contact.

Operating this same equipment from hilltop sites over the summer months, BWC members have made a number of WBFM voice contacts over paths of 35 and 65km, and back in August 2000, Ross used exactly the same gear for an FM-ATV (colour video with sub-carrier sound) QSO over a 90km path.

Lots of X-band equipment of this type has been used by amateurs for WBFM telephony and ATV over the years, and there will be many amateurs who still have the bits stashed away in their attics – so why not dust them off and give them a new lease of life – and let your local M3 and M6 stations have a go with microwaves?

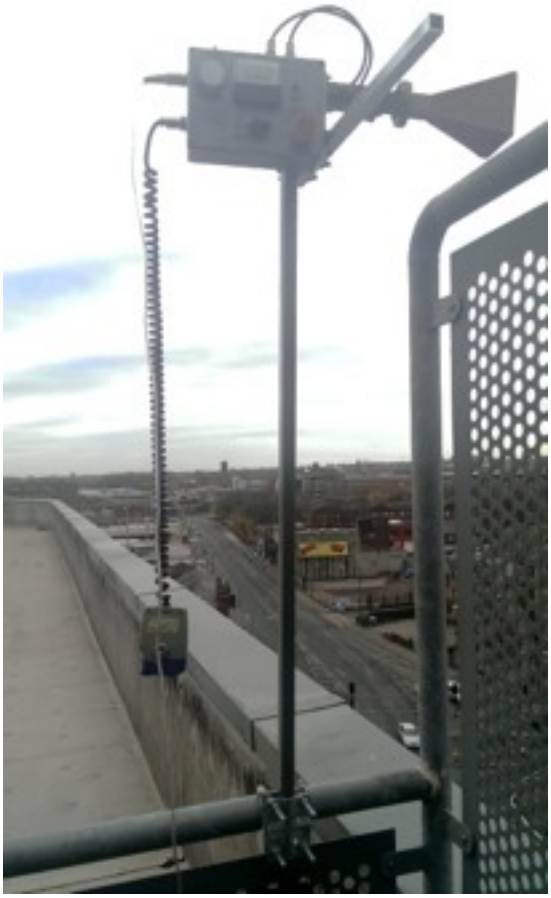
G6GVI, scattering off a wall behind the camera. The black dish with “penny-feed” is for TX and the offset dish & LNB for RX

From John G4BAO JO02

Even less activity on 10GHz than the November UKAC despite my efforts to promote it as the last one of the year. Sometimes I wonder why I bother. Propagation was flat, despite the high pressure, and I managed just 4 QSOs, ODX being G4CBW (IO83UB) who was 57 on SSB and we had a nice chat. A near miss with G8DTF, and nothing

with M0GHZ. In almost desperation, I ran up my 13cm EME system, 180W to a 1.9m dish at ground level and elevated around 17 degrees I managed QSOs via a mix of troposcatter and aircraft Scatter with 5 stations, ODX being G4LDR (IO91EC) who peaked at S9+ with aircraft enhancement. It has inspired me to try some more A/S on 13cms outside contests.

Any volunteers?..... No, we only operate on Tuesday nights, sorry ;-). Sigh!



M6NNX, operating from 10th-floor balcony. The RX LNB was just hand-held.

From Bob G8DTF IO83

Conditions for this UKAC were pretty dire. They were probably the worst conditions I have ever encountered. On the upside there were some new stations to work.

13cm

I worked G8CUL (IO91), G3UVR (IO83), G4MVU (IO83), G6GVI (IO83), GM4CXM (IO75), G8OHM (IO92), G8SFI (IO93), but failed with G8NVI (IO91), G4LDR (IO91) and G4WLC/P and G3VKV both in IO81. Conditions seemed to get worse as the evening progressed.

9cm

The one and only QSO was with G4MVU about 1km away.

3cm

I worked G3UVR, G4MVU and MW1FGQ all in IO83. I also worked Graham G3VKV at much reduced signal strength – it was a bit of a struggle and I think I also sent the wrong SN as well. Tried and failed with G4LDR (IO91) and G4BAO (JO02) although I did hear both at poor signal strength.

Other activity

From Tony G4CBW IO83

I managed to work Alan GM0USI/P on the Isle of Skye IO77AA on 3, 6 & 9cm on the 13th October. All contacts were via AS.

6cm has turned out to be a bitter-sweet band for me in that one of my best directions (100deg) is plagued with 59+30dB noise at 5760.100, but is wideband. I think it may be a 6cms WIFI system and appears to be centred on 5759.900 or thereabouts. It is so strong I can hear it above 5671.00 and hear it more or less through 360 degrees. I am still working out where and what it is. I have a small interdigital filter for 6cm and hope to try that in line with the transverter at some point to see if it has any effect on the QRM.

From Alan GM0USI/A in IO77

This trip to Skye was to a new house, but sadly no take off to the South. There is a site about 30mins away at IO77AA at Aird of Sleat in Skye. The WX on Sunday 13th Oct was amazing [it was great all week] - Tony G4CBW was monitoring Airscout and we proved lucky with air traffic - our midpoint was to the east of Dumfries, but we heard many reflections with planes nearer Glasgow as well.

We heard each other almost immediately on 3cm moving to 6cm and then 9cm. Signals were normally around 53, but on 6cm signals peaked at 58.

Mark GM4ISM was worked on tropo at 539. Sadly no signals from GB3NGI even on AS - Ben More on Mull is directly in my path... under better tropo conditions or a slightly different site it should be possible no doubt.

Here is a picture of the set up.

From Brian G1IKV JO00

Single contact for Sunday 1st December,

My call G1IKV/P, locator square JO00HV

Gear 2W, Dish 65cm dish. Using all GW4DGU boards and dish feed

Contacted G4CBW, locator square IO83UB

Distance 312 km

Signal both ways 3 and 1 to 3 and 2 with QSB

Time 13:40 to 13:50

Hope this gets into Scatterpoint my furthest QSO so far, for a newbie to 10GHz

[It has. Well done! Ed]

...and finally

I want to encourage you get on the air as often as possible and report your activity to clearly document use of the amateur microwave bands. This means not just DX, but also local activity with low power or WB equipment.

Please send your reports to Scatterpoint@ukmicrowaves.org, remember the deadline is the 1st of the month.

73

Bob Price G8DTF

RSGB & UKµG Contests 2013

Month	Contest name	Certificates	Date 2013	Time GMT	Notes
Dec	1.3GHz Activity Contest	*Arranged by RSGB*	17-Dec	2000 - 2230	RSGB Contest

73 John G3XDY, UKUG Contest Adjudicator

UKµG Contest Portal

The latest EME calendar is available from DL7APV's website

Events calendar

2014

Jan 18	Heelweg	www.pamicrowaves.nl/
Feb 15	GHz-Tagung Dorsten	www.ghz-tagung.de/
Apr 12	CJ-2014, Seigy	cj.ref-union.org/
April 26-27	Martlesham Round Table	
May 16-18	Hamvention, Dayton	www.hamvention.org/
Jun ??	RAL Roundtable	
Jun 27-29	Ham Radio, Friedrichshafen	www.hamradio-friedrichshafen.de/
July 1	Scatterpoint 10th Anniversary	www.scatterpoint.org/
July ??	Finningley Round Table	
July 25–27	AMSAT Colloquium, Holiday Inn, Guildford	www.amsat-uk.org/colloquium/
July 23- Aug 3	Commonwealth Games, Glasgow	www.glasgow2014.com/
August 23–26	EME2014, Pleumeur-Bodou near Lannion	
September ??	Crawley Round Table	
Sept 19–21	59.UKW Tagung, Weinheim	www.ukw-tagung.de/
Sept 26–27	National Hamfest	www.nationalhamfest.org.uk/
Oct 6-9	European Microwave Week, Rome	www.eumweek.com/
Oct 10-12	RSGB Convention	www.rsgb.org/rsgbconvention/
Oct ??-??	Microwave Update, Rochester, New York	www.microwaveupdate.org/

2015

Apr 11	CJ-2015, Seigy	http://cj.ref-union.org/
May 15-17	Hamvention, Dayton	www.hamvention.org/
Sep 28 – Oct 2	European Microwave Week, Paris	www.eumweek.com/

2016

May 20-22	Hamvention, Dayton	www.hamvention.org/
Oct 4-7	European Microwave Week, London	www.eumweek.com/