An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

December 2015

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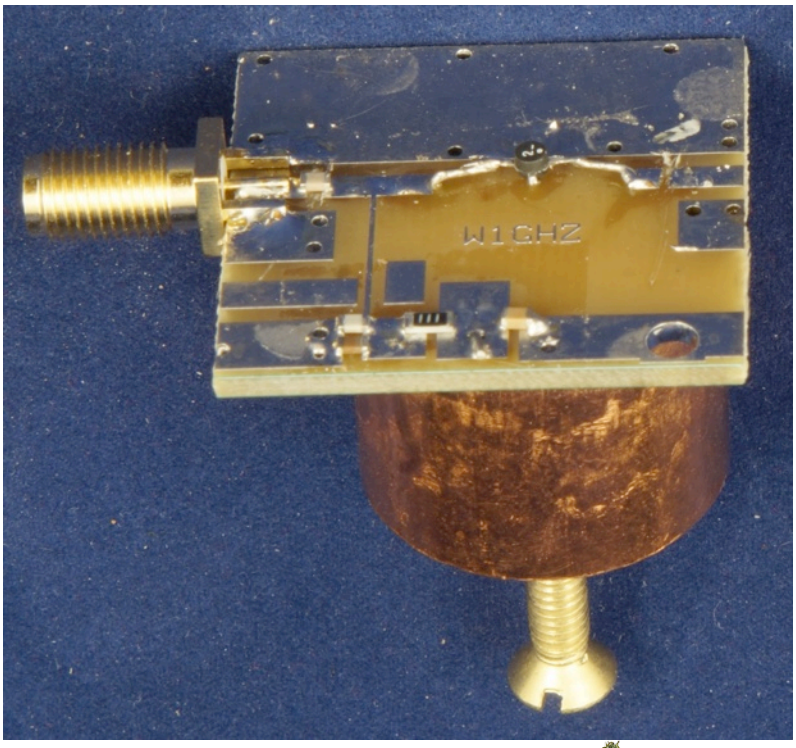
A Simple Microwave Oscillator
By Paul Wade W1GHZ



In this Issue

UK Microwave Group Contact Information

Chairman: G8DTF
Robert E Price
Email: chairman @microwavers.org
Located: Manchester IO83sm
Address:
Birchfield Drive
Boothstown,
Manchester M28 1ND
Home Tel: n/a

General Secretary: G3XDY
John Quarmby
Email: secretary @microwavers.org
Located: Suffolk JO02ob
Address:
12 Chestnut Close,
Rushmere St Andrew
IPSWICH IP5 1ED
Home Tel:
+44 (0)1473 717830

Membership Secretary:
G8DKK Bryan Harber
Email: membership @microwavers.org
Located: Hertfordshire IO91vx
Address:
45 Brandles Road
Letchworth
Hertfordshire SG6 2JA
Home Tel: n/a

Treasurer: G4BAO
Dr. John C. Worsnop
Email: treasurer @microwavers.org
Located: Cambridgeshire JO02cg
Address: 20 Lode Avenue
Waterbeach
Cambs CB25 9PX
Home Tel:
+44 (0)1223 862480

Scatterpoint
Editor: G8BHC
Martin Richmond-Hardy
Email: editor @microwavers.org
Located: Suffolk JO02pa
Address:
45 Burnt House Lane
Kirton
Ipswich IP10 0PZ
NB editor & scatterpoint email addresses go to both Bob and myself

Scatterpoint
Activity News: G8DTF
Bob Price
Email: scatterpoint @microwavers.org

Contest & Awards Manager: G3XDY
John Quarmby
Email: g3xdy @btinternet.com
Located: Suffolk (JO02OB)
Address:
12 Chestnut Close
Rushmere St. Andrew
Ipswich
Suffolk IP5 1ED
Home Tel:
+44 (0)1473 717 830

Beacon Coordinator:
GW8ASD
Tony Pugh
Email: beacons @microwavers.org
Located: Essex (JO01)
Address: Gwersyllt
WREXHAM
LL11 4AF
Wales
Home Tel:
01978 720183

UK Regional Reps

John Cooke	Scotland	GM8OTI	john@marwynandjohn.org.uk
Gordon Curry	NI	GI6ATZ	gi6atz@qsl.net
Chris Bartram	Wales	GW4DGU	

Assistants

Kent Britain	USA	WA5VJB/G8EMY	wa5vjb@flash.net
[Vacancy, p5]	Trophies		
Noel Matthews	ATV	G8GTZ	noel@noelandsally.net
Robin Lucas	www.beaconspot.eu	G8APZ	
Chris Whitmarsh	24GHz and up	G0FDZ	chris@g0fdz.com
Mike Scott	Chip Bank	G3LYP	
Tony Pugh	Beacon Coordinator	GW8ASD	gw8asd@gw8asd.co.uk

Editor's bit

My plan was for this issue to be a December+January edition,but I thought you might wish to mull over the contest rules for 2016. Please also note the choice of QRM-free Crimbo tree.

Season's Greetings to you all!

73 de Martin G8BHC (notoriously QRT)

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 and/or Dropbox.

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

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!)

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

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UKµG Chip Bank – A free service for members

The catalogue is now on the UKµG web site at www.microwavers.org/?chipbank.htm *Latest Stock Update was September 2015 – so do take a look!*

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 mislabelled. G4HUP's Inductance/capacitance meter with SM probes is ideal for this (Unsolicited testimonial!)

The chipbank catalogue has been updated (September) to reflect donations received at the various RTs this year.

Quite a few resistors and inductors have been added as well as a few other bits and pieces. Have a look at the website and stock up for your winter projects!

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

Mike G3LYP

The Chip Bank was mentioned at a recent Codgers breakfast and was new to one of the non-microwavers so he Googled it. It turns out "The Chip Bank" is a takeaway in Kilmarnock. Hat tip to Bob Barrett G3YCY for the picture. Ed.

UKµG Project support

The UK Microwave Group is pleased to encourage and support microwave projects such as Beacons, Synthesiser development, etc. Collectively UKuG has a considerable pool of knowledge and experience available, and now we can financially support worthy projects to a modest degree.

Note that this is essentially a small scale grant scheme, based on 'cash-on-results'. We are unable to provide ongoing financial support for running costs – it is important that such issues are understood at the early stages along with site clearances/licensing, etc.

The application form has a number of guidance tips on it – or just ask us if in doubt! In summary:-

- Please apply in advance of your project
- We effectively reimburse costs - cash on results (eg Beacon on air)
- We regret we are unable to support running costs

Application forms below should be submitted to the UKuG Secretary, after which they are reviewed/agreed by the committee

www.microwavers.org/proj-support.htm

UKµG Technical support

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, what is more important, 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.comThe current list is available at

www.microwavers.org/tech-support.htm

Still Wanted: Trophies Manager

Dave Powis G4HUP retired as Trophies manager at the AGM and we thank him for all his work in discharging this task. We now need a replacement.

Please contact the Chairman or Secretary if you would like to help with this duty.

Loan Equipment

Don't forget, UKµG has loan kit in the form of portable transceivers available to members for use on the following bands:

5.7GHz **10GHz** **76GHz**

Contact John G4BAO for more information.

Heelweg Microwave Meeting 2016

NB The location for the "Heelweg Treffen" will change in 2016 –we are going back to Heelweg city.

Map https://goo.gl/maps/nT8Q5ovRNrQ2 De Radstake http://www.radstake.nl

Expert required

We have been offered a contract to recommission some monopulse radar trackers for an instrumentation project (a photo of the trackers are attached).

The system has all of the RF components required minus the magnetron.

We are looking for someone who can identify the components used in the system, document the system and then produce a prototype Tx/Rx control board that gives us Az & El sum and difference. We will digitise this output in to a PC where we process the signals and then output the dish servo drive voltages.

Do you think this would be of interest to any of your members?

Kind regards

Marek Mamczur

Dynamic Laser Solutions Ltd.

Unit 5

Barwell Lane

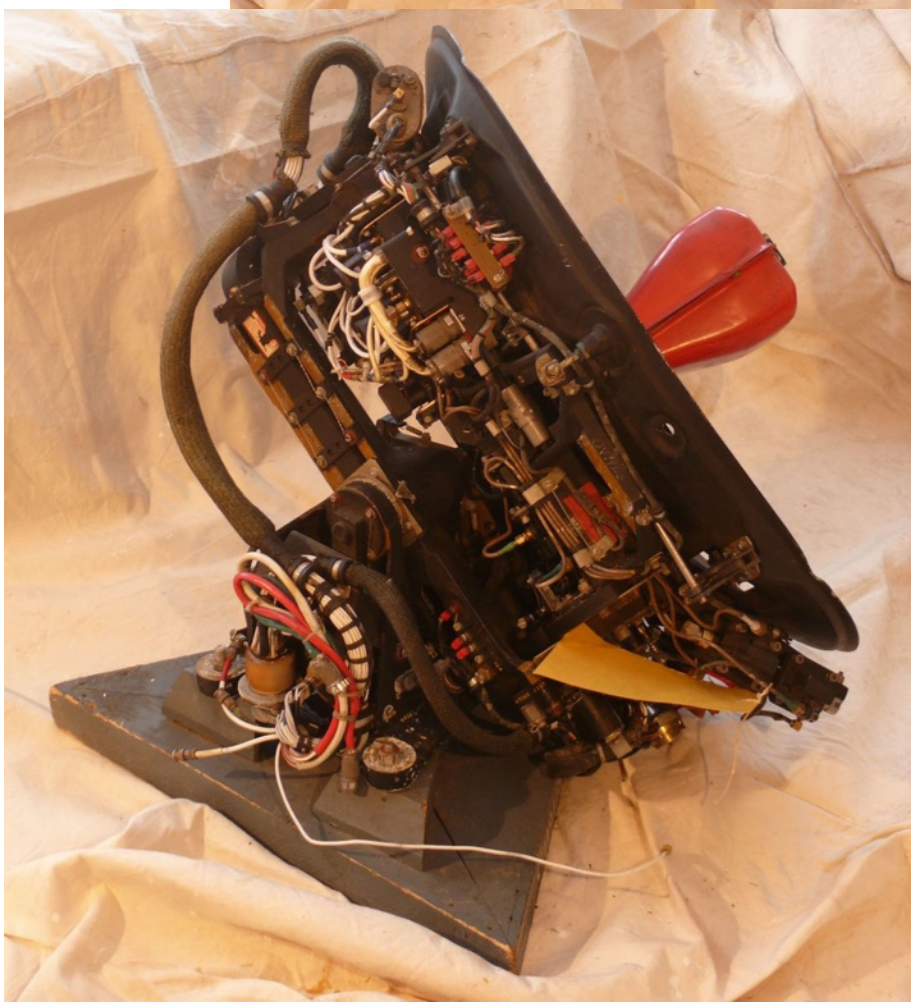
Gosport

PO13 0EQ

Tel. +44 (0)2392 987260

Tel. +44 (0)7789 261038

www.dynamiclasersolutions.com

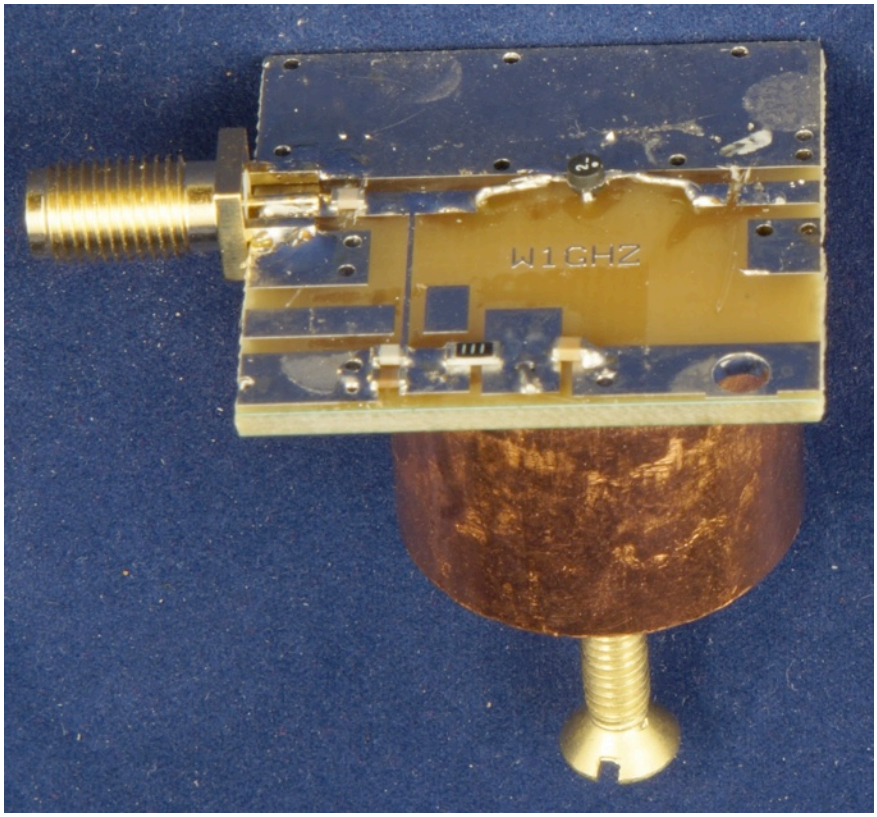


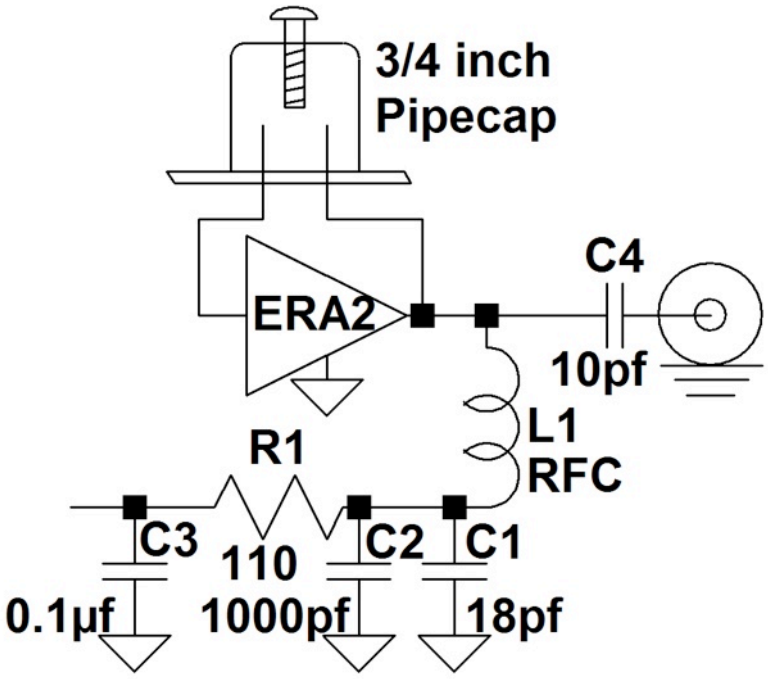
A Simple Microwave Oscillator

Paul Wade W1GHZ ©2015 w1ghz@arrl.net

In the course of microwave experimenting, we occasionally need a test signal. Perhaps we don't have a signal generator for the desired frequency, or need a second signal to test a mixer. Here is a simple oscillator that you can build with little time, effort, or expense.

The oscillator is really simple – a MMIC across the terminals of a pipe-cap resonator, so the output is fed back to the input through the pipe-cap. As long as the gain is greater than the resonator loss, it should oscillate. The one shown in Figure 1, with a ¾ inch pipecap, tunes from about 4 to 6 GHz. I built it on a scrap of PC board from a prototype, but hacking up a PCB with an X-Acto knife would also work. I built one once on a scrap of thin brass, using Teflon feedthroughs for the probes in the pipecap.





The schematic diagram is equally simple – the only other components are a bias network, with some sort of RF choke and some bypass capacitors. Mine has a printed quarter-wave choke at around 5 GHz, which probably limits the frequency range – the pipe cap tunes from about 2.8 GHz to around 7 GHz. A few small turns of fine wire might make a better broadband RF choke.

The MMIC I used is an ERA-2, which has good gain up to about 6 GHz. The input and output probes in the pipe-cap are about 8.5mm long, a reasonable length for the 3 to 6 GHz range.

Other frequencies are possible using other sizes of pipe-cap or larger resonator. The tuning screw acts as a quarter-wave resonator, and the probes are small coupling capacitors for input and output, with lengths proportional to frequency. Use a MMIC appropriate for the desired frequency – if it has much gain at the third harmonic, the oscillator may switch modes during tuning and give erratic results.

My oscillator provides an output of a few tenths of a milliwatt, but this is easily amplified with another MMIC. An output amplifier also isolates the oscillator from the load, keeping it more stable.

So give it a try – you may not need one today, but it's a fun project and someday it may come in handy.

New Masthead System

John Quarmby G3XDY

In early 2015 I decided it was time to renew the cables on my tower and make some other changes I had been planning. The existing cables were 24 years old and showing their age.

The upgrade consisted of the following work:

1. Fit a new higher capacity cable for the rotator. The existing one used 0.5mm2 conductors and this was replaced with 0.75mm2
2. Replace the existing control cables. Several cables had been added over the years to increase the number of control lines available, these are now consolidated into one 12 core0.5mm2 cable
3. Replace existing UR43 cables with lower loss modern versions. I used LMR195 equivalent for these for the IF feeds for 3.4GHz (432MHz IF) and 5.7/10GHz (144MHz IF). The 3.4GHz feeder also transports a 10MHz GPSDO output to the masthead to lock the transverter local oscillators.
4. Replace H100 and W103 cables with LMR400 equivalent. This reduced the cable weight a lot, as the LMR400 type is aluminium cored (copper plated) and aluminium foil shielded. Originally the H100 carried the 432MHz and 1.3GHz preamp outputs back to the receive converters, with the W103 split between 70 or 144MHz transmit, 432MHz transmit, and 2320MHz preamp output. One feeder now carries the receive preamp outputs for 432/1296/2320MHz and the other is just for either 144 or 70MHz depending on which antenna is installed.
5. Replace the LDF4 going up the tower with a more robust feeder system. Frequent failures in the LDF4 have been experienced, and a new, lower loss, and more rugged system was put in place using a mix of LDF5 and LDF4 with better support where the cable bends.
6. Replace the existing 60cm offset fed dish for 9/6/3cm, as this was starting to rust. Also move the 9cm feed to the 80cm dish forming a dual band feed for 13/9cm.
7. Add elevation control for the two dishes.
8. Upgrade the 432MHz and 1296MHz preamp to include an extra relay for switching the TX feeder between the two bands.
9. Prepare for future installation of a 24GHz system.

Most of the upgrades were completed in September 2015. The modifications to the 432/1296 preamp needed a complete rebuild of the preamp box, as the waterproof seal on the box had failed (after 30+ years) and there was insufficient space for the extra relay, this was completed in December 2015. This step also involved making changes to the way the 432MHz preamp was powered, with modifications needed to the 432MHz transverter and the 432MHz SSPA, and a new 3 way coax switch in the shack to switch the SSPA outputs from 432, 1296 and 2320MHz to the LDF5 feeder.

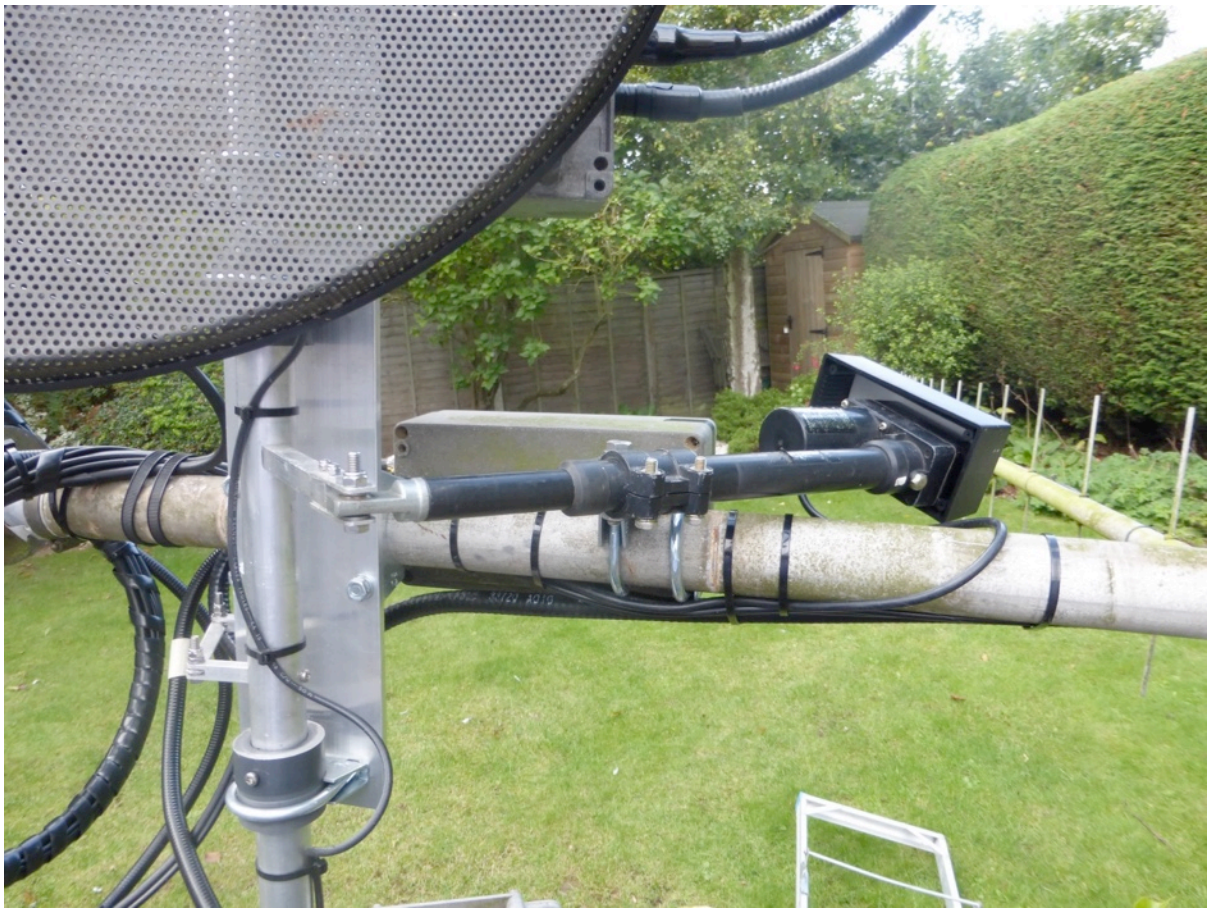
The DC cables now terminate in a waterproof plastic box on the head unit about 50cm down from the top bearing. This contains an interconnect strip for the 12 way control cable and power distribution for 17V DC supplied to the masthead. There are connections for 5 plugs on the top of the box and one below, plus four cable entry glands. All the coax cables except the LDF5 terminate in a waterproof diecast box, with four incoming cables below and five bulkhead sockets on the top of the box which terminate the cables for the turning loop. Inside the box is a diplexer that combines the outputs from the 2320MHz preamp and the 432/1296 preamps (there is already a diplexer in the 1296MHz preamp which combines the 432MHz signal). See picture below:

The main transmit feeder now comprises a 6.5m length of LDF5-50 from the shack up to the top of the bottom section of the tower, where this transitions to 4.5m of LDF4 with a cable carrier that prevents the bend radius becoming too small, see picture:

At the top of the photo you can see the 7/16 connector pair used to join the LDF4 to the LDF5, all enclosed in glue filled heatshrink sleeving. The cable carrier is made from aluminium plate and angle and will allow +/- 90 degree bends in the cable as the mast is raised or lowered, whilst maintaining a safe bend radius. The cable form is enclosed in a long length of spiral cable wrap to keep the bundle together whilst allowing the cables to move relative to each other as they bend.

Beyond the 4.5m of LDF4-50 there is another 7/16 connector pair and then a 4.5m length of LDF5-50 up to the top mounting bracket. This cable is also securely clipped to the head unit. The turning loop is FSJ4-50 (not FSJ4-50B – the B version doesn't use a stranded copper core so is less good where a lot of bending occurs) which is terminated on the 2320Mhz preamp box and is routed via a Narda relay either to the 2320MHz antenna relay or back out again over a 1.5m length of LDF4-50 to the 432/1296MHz preamp box.

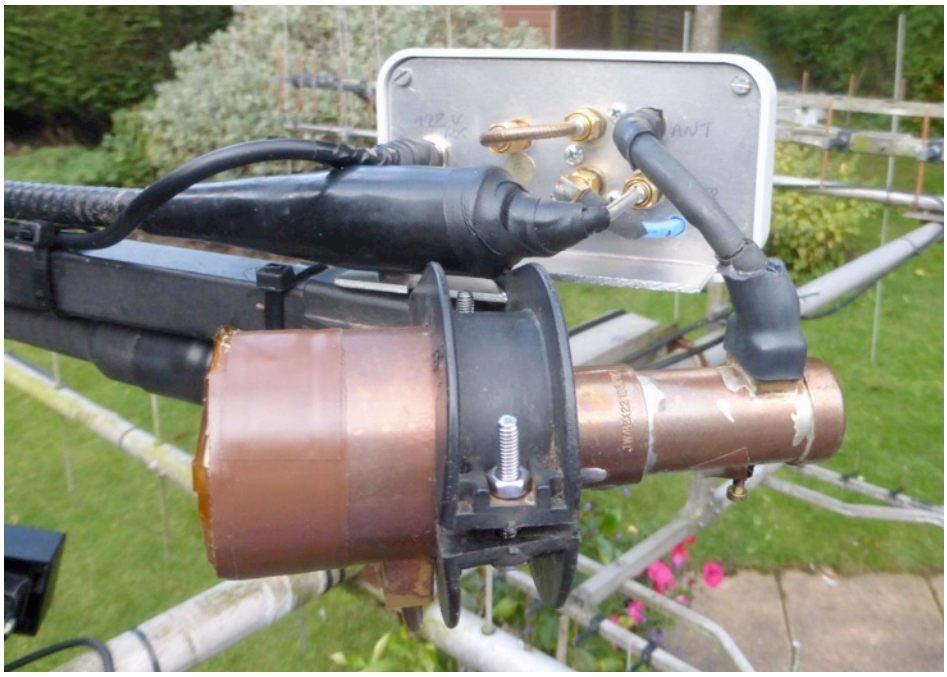
The new elevation system is shown in the picture below. The cross arm is thick wall 30mm diameter aluminium tube running in PVC sleeve bearings, with further pvc collars as thrust bearings. A 6 inch throw satellite jack rotates the tube over about 60 degrees travel, and a pot driven by a lever provides position feedback, see photo below.



The transverters for 9cm and 6/3cm are now mounted on the rear of the dishes, see the photo below:

The spare cross arm space towards the top of the picture is available for future installation of a 24GHz system. The box on the stub mast between the two transverters is the 2320MHz preamp.

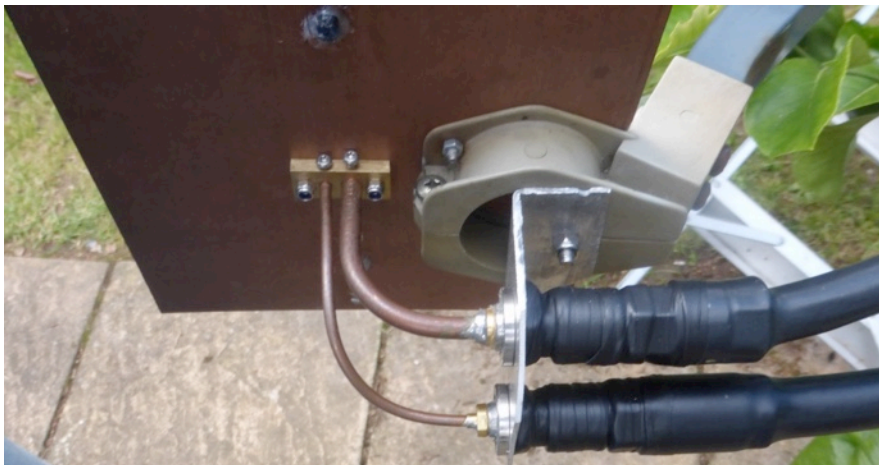
The picture below shows the feedhorn for 5.7/10GHz with a preamp for 10GHz mounted in a small waterproof housing behind it. The top feeder is FHJ2-50 on 10GHz, that below the feed support arm is LDF4-50 for



5.7GHz. The horn has a cover made from Kapton sheet to try and keep spiders out!

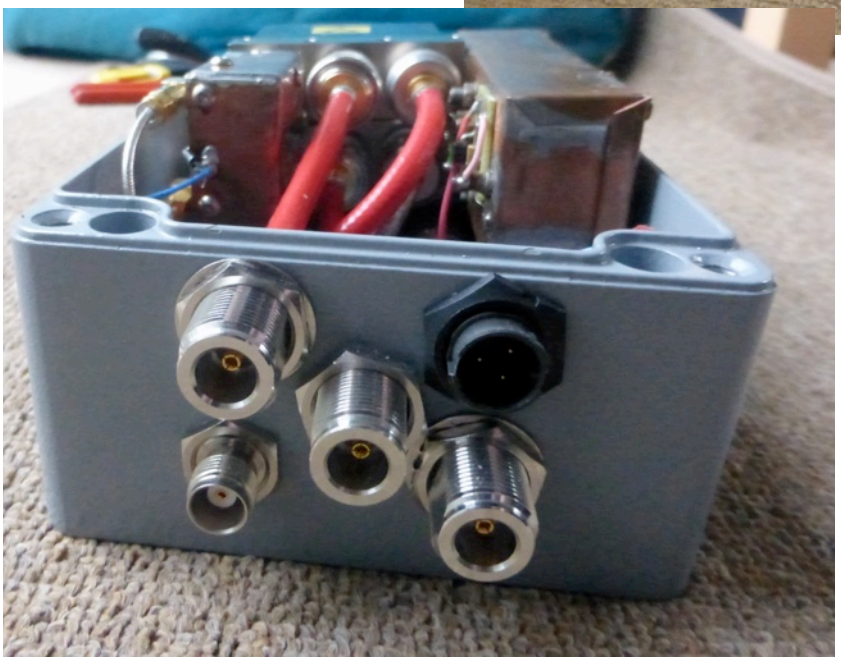
The dish feed for 3.4GHz and 2.3GHz consists of a dual dipole and reflector feed for 2.3GHz, which is a simplified version of the feed used before, but with a single central support using 0.25 inch semi rigid cable (RG401). The 9cm feed consists of a ring feed which passes around the semi rigid coax for the 2.3GHz feed. This feed is located very close to the groundplane and has little effect on 2.3GHz performance. With careful adjustment over 20dB return loss was achieved on 2.3GHz and 17dB on 3.4GHz, with about 15dB of isolation between the antennas at 3.4GHz (more at 2.3GHz). The relay configurations used for antenna changeover ensures the 2.3GHz antenna is not connected to the 2.3GHz preamp when transmitting on 3.4GHz, and vice versa. The feed can just be seen in the photo below, inside the polycarbonate radome made from old 2L drinks bottle:

The photo (right) shows the feeder arrangement with the thicker semi-rigid cable used on 2.3GHz and the UT141/ RG402 on 3.4GHz.



The new preamp for 432 and 1296MHz is shown in the picture below. Most of the internal coax cable is RG401 (.25 inch) hand formable cable. The 432MHz preamp is the copper box at the top, and comprises a tuned input line with a NE32184 device with a simple resistive drain load. The output from this preamp is combined with the signal from the 1.3GHz preamp in a diplexer which forms part of the 1.3GHz preamp at the bottom. This uses an ATF54143 HEMT in a design by YU1AW in the first stage, followed by a MGA54543 high dynamic range MMIC. There are three changeover relays stacked up, with 432MHz antenna changeover at the bottom of the pile, the transmit switch between 432 and 1296MHz in the middle, and the 1296MHz antenna changeover at the top.

The three N types below are (R-L) 1.3GHz antenna, transmit feeder, and 432MHz antenna. The combined preamp outputs are on the TNC socket, and there is a 3 way Switchcraft connector for control/power



EME 24 GHz Activity Report

ORPB POLE PHOENIX PARC DU RADOME
22560 PLEUMEUR-BODOU

Guy Gervais F2CT F4KJM TM8PB op

Activity weekend – 2015 October 24-25

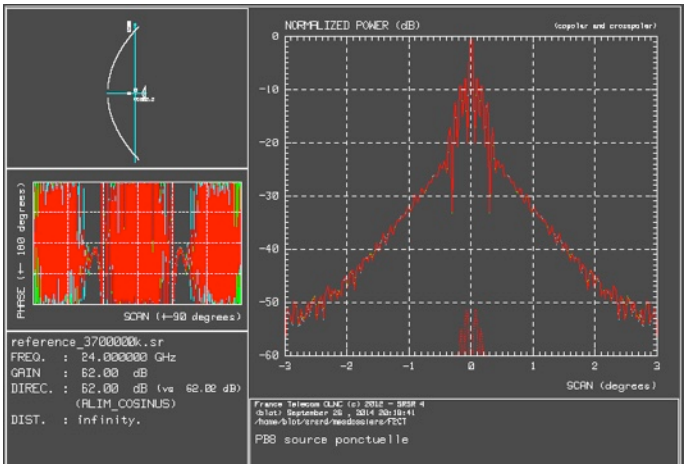
Abstract:

In May 2015 , new tests on 10GHz EME were made with Cassegrain 13m PB8 dish with an optimized septum feed . More than 25 qsos were made in CW and SSB with only some watts at feed due to high losses in the coaxial RX/TX links.

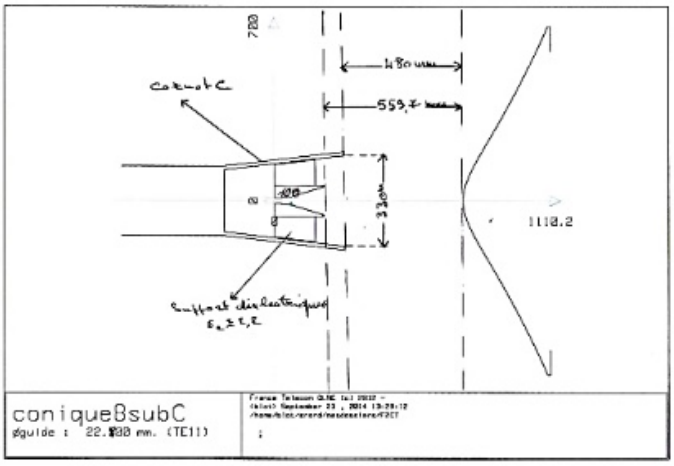
So we decide to design a 24GHz feed with the help from Jean Pierre Blot , antennas engineer .

The new simulations and design draft from Jean-Pierre Blot :

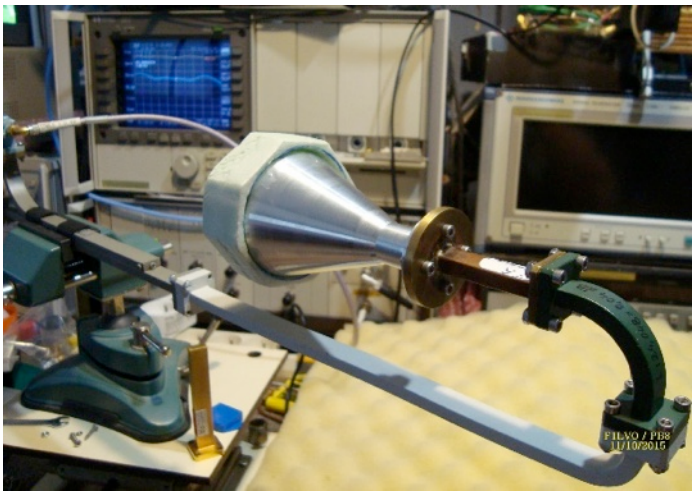
24 GHz feed



Simulation



Sub-reflector position



Feed assembly

RL @ 24048 GHz : - 30dB

24 GHz setup :

Receiving :

DB6NT LNA 1,5 dB NF, Homebrew converter 432/24048 MHz

Transmitting:

12 W SSPA, Homebrew transverter 432MHz/24 GHz

The Shack :

K3 + 432/28MHz tvt + Doppler shift compensation

PB8 with 24 GHz set up

Results:

Saturday 24 October at 1400 utc

- Sun noise test: 17,7dB (SF 106.3)

Saturday 24 October : 17h30 utc:

- Moon noise : 2,8 dB / 1kHz BW
- Echoes : 6,5dB / 1kHz BW

Sunday 25 October 1830 utc:

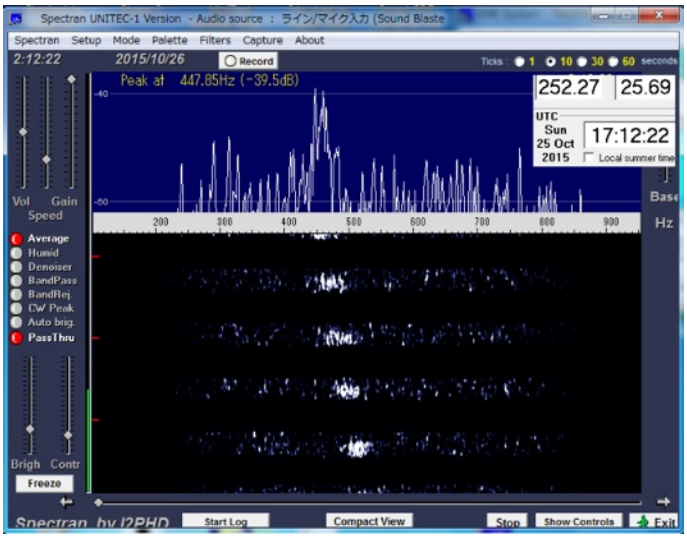
- Australia : VK3NX , VK7MO (JT)
- Germany : DL7YC only RX
- England: G3WDG ; G4NNS
- Denmark : OZ1FF (JT)
- Spain: EA3HMJ (JT)
- US : W5LUA
- France: F1PYR ; F2CT
- Netherland : PA0BAT ;
- Japan : JA1WQF ; JA4BLC ; JA6CZD ;
- Luxembourg : LX1DB
- Sweden : SM7FWZ only RX
- Czech Rep : OK1CA ; OK1KIR ;

Stations worked in SSB :

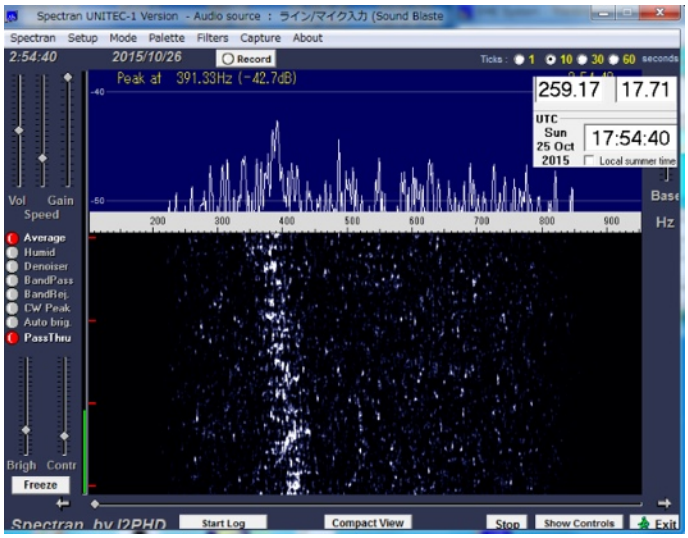
- LX1DB ; 55/53 ;

Stations worked in CW :

- LX1DB ; OK1CA ; OK1KIR ; JA4BLC ; PA0BAT



JA4BLC echoes



F2CT at JA4BLC

Stations heard in CW and JT : G3WDG ; OZ1FF ; F1PYR ;

On Monday morning, we put down the 24GHz feed system and found two failures :

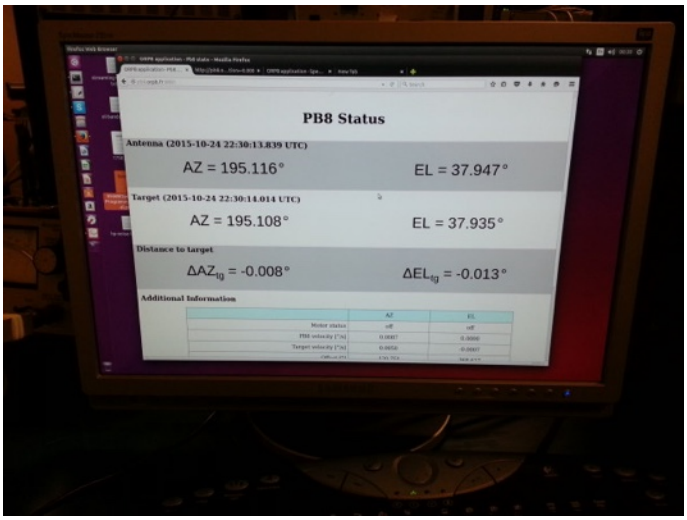
- Feed horn was at 4 lambdas from the phase center
- a ground solder on the TX semi rigid coax was broken ; power at the feed was only 2,48W !!!

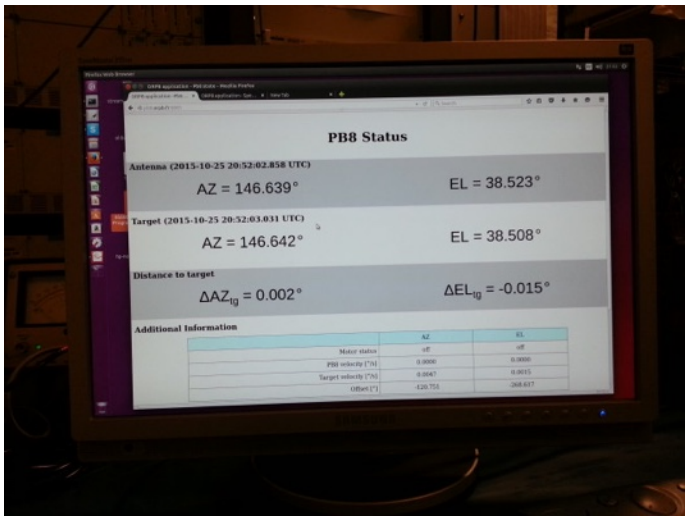
Projects:

We plan to make a new 24GHz optimized feed and to put the 45W TWT just near the feed.

Now the position accuracy on the new automatic tracking system accuracy is better than 0,05°.

On 24GHz, PB8 aperture is 0,067° .





On the upper line the Moon target ; on the lower the real position of PB8 ;
the error is between 0,008 and 0,015° !

ORPB society received his new call sign F4KJM that will be used during 2016 EME events.

The 6cm EME beacon will be soon on 5760,188 MHz with 20W at feed .

Call sign will be F4KJM/B ;

F4KJM will participate into the next Dubus and Arrl microwave contests

Many thanks to all ORPB society members for their oustanding help

- Lucien Macé F3ME : PB8 tracking system design and PB8 assembly
- André Gilloire : PB8 assembly
- Sylvain Meyer F6DBI : PB8 assembly
- Jean-Pierre Blot : 24 GHz feedhorn design
- Olivier Boeffard : tracking system design

Guy F2CT
TM8PB/F4KJM op

This month I ‘ave mostly been building…

A column (idea borrowed from the SBMS Newsletter and with a hat tip to Mark Williams’ character Jesse of the Fast Show) designed for those of you who don’t want to write a full technical article – but also those of you who do but only have a snippet to contribute such as a new project or a progress report.

Not a lot, apparently...

Activity News : November 2015

By Bob Price G8DTF

Please send your activity news to:

scatterpoint@microwavers.org

Introduction

It's been a quiet month.

From Neil G4BRK

Been a few ups and downs operating over the last month.

The Lowbands contest on 15 Nov was a bit of a disaster - my 23cm masthead preamp failed. GD8EXI was kind enough to point out my receive problem on KST after 20 mins of fruitless CQs at the start of the contest. Then we had visitors and lunch, so missed 2 hours due to that. GD8EXI was the best DX at 354km out of 11 contacts, nice also to work G6TRM/P in rare square JO01. Managed to work into JN19 5 minutes after the end of the contest on both 23 and 13. 13cm was quiet, with only 5 contacts, best being G4KCT at 256km. 9cm was broken – in replacing the 23cm masthead amplifier with the shack one I managed to disconnect the 9cm 24V relay supply and didn't work out what had happened until later. However after the contest there was some sign of tropo with JN05 worked on 2m. F2CT meeped me on KST for a sked on 6cm. When I found he was in IN93GJ I thought there was no chance, but listened anyway. After a while there was a hint of a signal, moving the 1.5m dish brought it up to 539 solid. Guy runs some power - think it was 70W. I didn't expect much from my 4W but he copied me fine at 529 and the QSO was completed. At 917km that was by far my best 6cm QSO from this QTH (previous best 479km). Very pleasing.

Back to reality in the 23cm UKAC on 17 Nov. Worked F8BRK in the first 5 minutes, then the power failed and was off for the rest of the contest. Barney to blame but at least the antennas survived.

Finally the SHF UKAC on the 24th gave 9cm contacts with G4ODA (new on the band) and G3XDY (rare to be able to make it on 9 with John). Usual locals on 6cm. An interesting one on 13cm with G3ZFP - he is in Dunstable (QTF 64) but called me when I was beaming South. Moving the beam to the right direction gave no signal at all. Must have been a reflection off something on the Ridgeway to the South of me. Otherwise conditions were quite poor.

From Ed, G3VPF

After several disappointing ventures out onto the high spots of west Dorset in the 23cms activity periods this year I decided that 2.5 Watts is not enough to attract attention away from the centres of activity. I have now rebuilt my system with a 30 Watt PA and a lower-loss aerial relay so hopefully will be able to do better next year. Will also replace the 20 year old Tonna Yagi with something with higher performance, although not sure what yet. Operation on all microwave bands has to be from various /P sites as I live in a deep valley south of the Ridgeway with no clear take-off in any direction.

Contest News

John G3XDY, UKuG Contest Manager

November 2015 Lowband Contest Results

Activity levels were generally described as poor, and conditions were viewed in the same vein in this final Low Band event of 2015. Best DX was down on previous events, and continental contacts were notable by their absence.

This year's result on 1.3GHz was a re-run of 2014, with M0HNA/P as winners and Richard GD8EXI as runner up. At least M0HNA/P didn't have as much of a problem with mud on site as last year.

On 2.3GHz M0HNA/P took the lead over Denis G3UVR as runner up. Numbers of contacts were down this year, with best DX of just over 300km.

3.4GHz saw M0HNA/P in top position, with G3UKV as runner up, with very low activity, and best DX of 216km.

The overall winner with a commanding performance was the "Combe Gibberlets" group consisting of G3TCU, G4SJH, and G3TCT. Overall runner up and leading fixed station was Martyn G3UKV, who was the runner up on 3.4GHz.

Certificates go to the overall Winner M0HNA/P and Runner-up G3UKV and to the following winners and runners-up:

1.3GHz M0HNA/P, GD8EXI, G4GSB (Low Power)

2.3GHz M0HNA/P, G3UVR

3.4GHz M0HNA/P, G3UKV

Overall

Pos	Callsign	1.3GHz	2.3GHz	3.4GHz	Total
1	M0HNA/P	1000	1000	1000	3000
2	G3UKV	261	448	585	1294
3	G3UVR	457	676	0	1133
4	G4BRK	380	567	0	947
5	G4KIY	314	457	0	771
6	GD8EXI	675	0	0	675
7	G4BAO	369	0	0	369
8	M5MUF	205	0	0	205
9	G4GSB	147	0	0	147
10	G1DFL	69	0	0	69

1.3GHz

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX km
1	M0HNA/P	IO91RF	22	4834	GD8EXI	426
2	GD8EXI	IO74PC	11	3265	G3XDY	456
3	G3UVR	IO83KH	16	2210	G3XDY	324
4	G4BRK	IO91HP	11	1835	GD8EXI	354
5	G4BAO	JO02CG	10	1786	GD8EXI	386
6	G4KIY	IO92WN	9	1518	GD8EXI	350
7	G3UKV	IO82RR	9	1262	G3XDY	265
8	M5MUF	IO92JP	7	991	GD8EXI	284
9	G4GSB	IO82XM	6	711	GD8EXI	250
10	G1DFL	IO91NL	4	332	G6TRM/P	139

2.3GHz						
Pos	**Callsign**	**Locator**	**QSOs**	**Score**	**ODX Call**	**ODX km**
1	M0HNA/P	IO91RF	7	1461	G4KCT	304
2	G3UVR	IO83KH	6	988	M0HNA/P	291
3	G4BRK	IO91HP	5	829	G4KCT	256
4	G4KIY	IO92WN	4	667	G3UVR	218
5	G3UKV	IO82RR	5	655	M0HNA/P	216
3.4GHz						
Pos	**Callsign**	**Locator**	**QSOs**	**Score**	**ODX Call**	**ODX km**
1	M0HNA/P	IO91RF	2	369	G3UKV	216
2	G3UKV	IO82RR	1	216	M0HNA/P	216

Low Band Championship 2015

The Low Band Championship continues to attract a dedicated band of operators. Numbers taking part are marginally down this year on 2014. Conditions were generally unexceptional, but with some good DX to be had during the June event which coincides with a European coordinated microwave contest.

1.3GHz

This year **Mike G8CUL** made his mark in the first three sessions to gain the maximum number of points. The *Combe Gibberlets* group (M0HNA/P) won the last two sessions but were pipped by a small margin in the April event so came out as runners up this year.

2.3GHz

G8CUL also won this band with maximum points, winning four of the five sessions. M0HNA/P was runner up with one win and three runner up spots in the sessions they entered.

3.4GHz

M0HNA/P sealed victory on this band with three wins from the four sessions entered. The runner up was Neil G4LDR who won the other two sessions.

Overall

Top of the overall table is the *"Combe Gibberlets"* group, with **Mike G8CUL** as runner up. A special mention goes to **M5MUF** who was the only entrant active in all five sessions this year.

Congratulations to the winners and runners up mentioned above, who will all receive certificates for their achievements.

Final Results

Final results, the best three events count towards the total

Overall

Pos	Callsign	3/8/15	4/19/15	5/3/15	6/7/15	11/15/15	**TOTAL**
1	M0HNA/P	1872	2463	0	2679	3000	8142
2	G8CUL	2000	2000	2000	1855	0	6000
3	G4LDR	1999	0	1319	1085	0	4403
4	G3UKV	1332	1471	0	0	1294	4097
5	G4BRK	0	1196	0	842	947	2985
6	G4KIY	1203	0	980	0	771	2954
7	G3UVR	638	582	0	0	1133	2353
8	G8EOP	797	492	0	355	0	1644
9	M0WXB/P	625	679	0	0	0	1304
10	G4NBS	814	0	0	320	0	1134
11	2E0NEY	0	902	0	0	0	902
12	M5MUF	165	311	186	369	205	885
13	M0GHZ	0	827	0	0	0	827
14	G4BAO	0	0	225	0	369	594
15	G3VKV	0	531	0	0	0	531
16	G4ZTR	0	467	0	0	0	467
17	G3YJR	0	418	0	0	0	418
18	G4CLA	0	341	0	0	0	341
19	G3TCT	0	0	0	262	0	262
20	G1DFL	24	127	0	61	69	257
21	G8DTF	0	208	0	0	0	208

1.3GHz

Pos	Callsign	3/8/15	4/19/15	5/3/14	6/7/14	11/15/14	TOTAL
1	G8CUL	1000	1000	1000	855	0	3000
2	M0HNA/P	715	984	0	1000	1000	2984
3	G4KIY	747	0	733	0	314	1794
4	G4BRK	0	720	0	343	380	1443
5	G3UVR	223	479	0	0	457	1159
6	G4NBS	814	0	0	320	0	1134
7	G3UKV	307	430	0	0	261	998
8	M0BTZ	0	0	924	0	0	924
9	M5MUF	165	311	186	369	205	885
10	G4LDR	386	0	174	298	0	858
11	G8EOP	271	260	0	181	0	712
12	M0WXB/P	191	420	0	0	0	611
13	G4ZTR	0	467	0	0	0	467
14	G3YJR	0	418	0	0	0	418
15	G4CLA	0	341	0	0	0	341
16	G3VKV	0	275	0	0	0	275
17	G3TCT	0	0	0	262	0	262
18	2E0NEY	0	258	0	0	0	258
19	G1DFL	24	127	0	61	69	257
20	G8DTF	0	208	0	0	0	208
21	M0GHZ	0	147	0	0	0	147

2.3GHz

Pos	Callsign	3/8/15	4/19/15	5/3/14	6/7/14	11/15/14	TOTAL
1	G8CUL	1000	1000	1000	1000	0	3000
2	M0HNA/P	736	479	0	679	1000	2415
3	G3UKV	447	479	0	0	448	1374
4	G4LDR	613	0	145	571	0	1329
5	G3UVR	415	103	0	0	676	1194
6	G4KIY	456	0	247	0	457	1160
7	G4BRK	0	215	0	218	567	1000
8	G8EOP	526	232	0	174	0	932
9	M0WXB/P	434	259	0	0	0	693
10	2E0NEY	0	321	0	0	0	321
11	G4BAO	0	0	225	0	0	225
12	M0GHZ	0	159	0	0	0	159
13	G3VKV	0	65	0	0	0	65

3.4GHz							
Pos	Callsign	3/8/15	4/19/15	5/3/14	6/7/14	11/15/14	TOTAL
1	M0HNA/P	421	1000	0	1000	1000	3000
2	G4LDR	1000	0	1000	216	0	2216
3	G3UKV	578	562	0	0	585	1725
4	G4BRK	0	261	0	281	0	542
5	M0GHZ	0	521	0	0	0	521
6	2E0NEY	0	323	0	0	0	323
7	G3VKV	0	191	0	0	0	191

UKuG Microwave Contests - 2016

John G3XDY, UKuG Contest Manager

Aims and comments:

Apart from proposals to add 76GHz to the 24/47GHz events, few comments were received on the 2015 events, so there will be no significant changes in 2016 to other events.

The low band events on 1.3/2.3 and 3.4GHz will continue in the same format as 2015, with an overall championship table based on the best three sessions out of five. The event dates will be similar to last year, with the March, May and June sessions running on IARU coordinated dates. To encourage operation on the new 2300-2302MHz segment, the same station may be worked for points on both 2320 and 2300MHz. Stations wishing to take part on 2300MHz are reminded that they must be in possession of the relevant Notice of Variation, and to take part on 2320MHz that they must register their station with Ofcom by emailing pssramateurs@ofcom.org.uk to provide the following information:

10. Name
11. Address
12. Call sign
13. Location of use
14. Frequency range used
15. Type of use
16. Regularity of use (e.g. evenings and weekends; 24/7; occasional)
17. Transmit power (i.e. EIRP) .

The high band events will continue on 5.7 and 10GHz only, the dates will continue to be on the last Sunday of May, June, July, August and September. The sessions will run between 0600 to 1800 clock time, with operators able to choose any 8 hour slot (or two slots with at least a 1 hour gap). As in previous years the overall table and trophies will be determined using the best three scores made by each station across the five events.

The millimetre events will continue as last year but with 76GHz added to the mix, so they will comprise the all band event in July covering 24GHz – 248GHz, and 24/47/76GHz events in June, August and September. The 24GHz trophy will be awarded for the July event, the 24GHz scores from the best three of the four events will count towards an overall score for the G0RRJ Memorial Trophy, and the best three session scores on 47GHz will determine the award of the 47GHz Trophy. The 76GHz events will contribute to the 76GHz championship where the best three session scores will count to the total.

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

THE RULES..

listed below are final and binding for 2016 (there are few changes from 2015). The following contests are scheduled for 2016:

- Low Microwave Bands - 1.3GHz/2.3GHz/3.4GHz (5 contest days). An overall championship will be decided on the best three scores out of five.
- 5.7GHz (5 contest days with 3 to count for the championship), on the same days as the 10GHz contests.
- 10GHz (5 contest days with 3 to count for the championship), on the same days as the 5.7GHz contests.
- 24GHz G0RRJ Memorial Trophy Contests (4 contest days with 3 to count for the championship).
- 24GHz Trophy awarded to the leading station on 24GHz in the 24GHz -248GHz event in July.
- 47GHz (4 contest days with 3 to count for the championship)
- 76GHz (4 contest days with 3 to count for the championship)

The full contest program and rules are published in the January 2016 issue of the Scatterpoint Microwave Newsletter and are also available on the Internet on the UKuG website at 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 the UK (G, GW, GM, GI, GD, GU, GJ) may enter a contest, and will be tabulated within the overall results tables, but will not be eligible for UK Microwave Group 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 the championships) unless specified in the rules for a specific event. 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 1000m 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 contest or cumulative activity period, unless the Rover rule is invoked. Contacts made using repeaters or satellites 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. Any contacts made by EME are scored at 1 point per kilometer up to 1000km, and will be scored at 1000 points above that distance.

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 medium. 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.

Entries: Contestants are asked to make sure their entries have been scored correctly and that all relevant bonus points and multipliers have been claimed.

Log entries must be submitted via the online log portal at http://microwave.rsgbcc.org/cgi-bin/vhfenter.pl. When uploading electronic logs, the format should be one of the following: ASCII text, RSGB Standard Format, Cabrillo, SDV and G0GJV log outputs, and IARU REG1TEST format (preferred). Paper logs may be entered using the online log editor at http://microwave.rsgbcc.org/cgi-bin/cover.pl

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 5 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 availability of 2.3GHz and 3.4GHz equipment. For 2016, there are five of these events, in March, April, May, June, and November. The March, May and June events are timed to overlap with UHF/SHF events in some other IARU Region 1 countries. The times for the November event are shortened to make portable operation more practical.

1. The General Rules listed above apply except as modified by these rules.
2. There are five contests, one each in March, April, May, June and November. The March, April and June events run from 1000 to 1600 UTC. The May event runs from 0800 to 1400 UTC to coincide with the RSGB UHF Contest. The November event is from 1000 to 1400 UTC.
3. Entrants in the May event need not start serial numbers from 001 if they are also participating in the RSGB UHF Contest.
4. To encourage operation on the new 2300-2302MHz segment, the same station may be worked for points on both 2320 and 2300MHz. Contacts on the new band segment should be identified in the logs by adding a suffix such as /L to the callsign.
5. Each event will be scored and tabulated separately. There will be an overall championship determined by taking the best three normalized scores from each entrant across the five events for each band. An overall champion will also be declared based on the normalized championship scores from each band.
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, station running less than 10 watts output. Championship certificates will be awarded to the winners and runners up for each band, and to the overall championship winner and runner up.

5.7GHz Contest Rules

The 5.7GHz and 10GHz contests are being run concurrently to grow activity on 5.7GHz. Although they are on the same days, they are completely separate contests. Any band or both bands can be used on any of the 5 days.

1. The general rules shown above apply.
2. There are five, monthly, events from May to September inclusive, and the events run from 0600 to 1800 UTC on a Sunday. Entrants can operate for a period of up to eight hours during each event, either as a single period or two separate periods with a minimum off time of 1 hour between.
3. Logs for all events entered should be submitted in the two weeks after each session.
4. Moving location during the contest is allowed - the Rover concept is applicable.

5. Certificates will be awarded to the leading station and runner-up, and to the leading fixed, portable and low power (<1W) stations.
6. The G3KEU Memorial Trophy will be awarded to the leading entry in the championship, determined from the best three normalized scores during the series of events.

10GHz Contest Rules

The 5.7GHz and 10GHz contests are being run concurrently to grow activity on 5.7GHz. Although they are on the same days, they are completely separate contests. Any band or both bands can be used on any of the 5 days.

1. The general rules shown above apply.
2. There are five, monthly, events from May to September inclusive, and the events run from 0600 to 1800 UTC on a Sunday. Entrants can operate for a period of up to eight hours during each event, either as a single period or two separate periods with a minimum off time of 1 hour between.
3. Logs for all events entered should be submitted in the two weeks after each session
4. Contestants may submit logs for any one of the following sections:

Open

No power or antenna restrictions (other than those laid down in the amateur licence).

The 'Rover' concept does not apply to this section.

Restricted

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

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

5. Certificates will be awarded to the leading station and runner-up in each section, and to the leading portable and fixed stations.
6. The 10GHz championship will be determined based on the best three normalized scores from each entrant over the five sessions. In addition to winners and runners-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 and portable station in each section.

24GHz G0RRJ Contest Rules

The 24GHz G0RRJ Contest will take place over four sessions, coincident with 47GHz events and also the all millimeter wave event in July.

1. The general rules shown above apply.
2. There are four monthly events from June to September inclusive, and the events run from 0900 to 1700 UTC on a Sunday.
3. Logs for all events entered should be submitted in the two weeks after each session
4. Moving location during the contest is allowed - the Rover concept is applicable.
5. Certificates will be awarded to the leading station and runner-up in each section, plus the leading home and portable stations.
6. The G0RRJ Memorial Trophy will be awarded to the leading entry in the championship, determined from the best three normalized scores during the series of events.

24GHz Trophy Rules

The 24GHz Trophy contest coincides with the 47GHz/76GHz and 122GHz - 248GHz events

1. The general rules shown above apply.
2. The contest will run from 0900 to 1700 UTC on a Sunday.
3. Moving location during the contest is allowed - the Rover concept is applicable.
4. Certificates will be awarded to the leading station and runner-up, and the winner will receive the 24GHz Trophy.

47GHz Contest Rules

The 47GHz contest will take place over four sessions, coincident with 24GHz/76GHz events and also the all millimeter wave event in July.

1. The General Rules listed above apply.
2. The contest will run from 0900 to 1700 UTC on a Sunday.
3. Moving location during the contest is allowed - the Rover concept is applicable.
4. Certificates will be awarded to the leading station and runner-up.
5. The 47GHz Trophy will be awarded to the leading entry in the championship, determined from the best three normalized scores during the series of events.

76GHz Contest Rules

The 76GHz contest will take place over four sessions, coincident with 24GHz/47GHz events and also the all millimeter wave event in July.

1. The General Rules listed above apply.
2. The contest will run from 0900 to 1700 UTC on a Sunday.
3. Moving location during the contest is allowed - the Rover concept is applicable.
4. Certificates will be awarded to the leading station and runner-up.
5. A certificate will be awarded to the leading entry in the championship, determined from the best three normalized scores during the series of events.

122GHz – 248GHz Contest Rules

The 122GHz – 248GHz contest coincides with the 24GHz Trophy, and 47GHz event in July

1. The General Rules listed above apply.
2. The contest will run from 0900 to 1700 UTC on a Sunday.
3. Moving location during the contest is allowed - the Rover concept is applicable.
4. The overall score will be determined by adding together the normalized scores from all bands entered.
5. Certificates will be awarded to the leading station and runner-up on each band and overall.

Other Microwave Contests

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

BATC run the UK section of the IARU ATV contest on the second weekend in June, plus other ATV events, see http://www.batc.org.uk/contests/contest_news.html

The first weekend in July is RSGB 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 Saturday, and the rules can also be found in the RSGB VHF contest rules.

The RSGB also runs a cumulative UK Activity Contest on 1.3GHz on the third Tuesday from 2000-2230 local time, and on 2.3GHz – 10GHz on the fourth Tuesday of every month, from 2000 – 2230 local time (subject to some variations in timing on 2.3GHz).

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 2016

Dates	Time UTC	Contest name	Certificates
6-Mar	1000 - 1600	1st Low band 1.3/2.3/3.4GHz	F, P,L
10-Apr	1000 - 1600	2nd Low band 1.3/2.3/3.4GHz	F, P,L
8-May	0800 - 1400	3rd Low band 1.3/2.3/3.4GHz	F, P,L
29-May	0600 - 1800	1st 5.7GHz Contest	F, P,L
29-May	0600 - 1800	1st 10GHz Contest	F, P,L
5-Jun	1000 - 1600	4th Low band 1.3/2.3/3.4GHz	F, P,L
19-Jun	0900 - 1700	1st 24GHz Contest	
19-Jun	0900 – 1700	1st 47GHz Contest	
19-Jun	0900 – 1700	1st 76GHz Contest	
26-Jun	0600 - 1800	2nd 5.7GHz Contest	F, P,L
26-Jun	0600 - 1800	2nd 10GHz Contest	F, P,L
17 -Jul	0900 - 1700	24GHz Trophy / 47 / 76/122-248 GHz	
31 -Jul	0600 - 1800	3rd 5.7GHz Contest	F, P,L
31 -Jul	0600 - 1800	3rd 10GHz Contest	F, P,L
14- Aug	0900 - 1700	3rd 24GHz Contest	
14- Aug	0900 - 1700	3rd 47GHz Contest	
14- Aug	0900 – 1700	3rd 76GHz Contest	
28 -Aug	0600 - 1800	4th 5.7GHz Contest	F, P,L
28 -Aug	0600 - 1800	4th 10GHz Contest	F, P,L
11 -Sep	0900 - 1700	4th 24GHz Contest	
11 -Sep	0900 - 1700	4th 47GHz Contest	
11 -Sep	0900 – 1700	4th 76GHz Contest	
25 -Sep	0600 - 1800	5th 5.7GHz Contest	F, P,L
25 -Sep	0600 - 1800	5th 10GHz Contest	F, P,L
13 -Nov	1000 - 1400	5th Low band 1.3/2.3/3.4GHz	F, P,L

Key:		
	F	Fixed / home station
	P	Portable
	L	Low-power (<10W on 1.3-3.4GHz, <1W on 5.7/10GHz)

Contest results are also published online – please follow the link from the UKuG Contests page at:

www.microwavers.org/?contesting.htm

73
John Quarmby G3XDY

Events calendar

2016

Jan 26	Heelweg	www.pamicrowaves.nl/
Feb 13	Tagung Dorsten	www.ghz-tagung.de/
Apr 9	CJ-2016, Seigy	cj.ref-union.org/
Apr 16–17	Martlesham Microwave Round Table & UKμG AGM	
Apr 23	RSGB AGM, Scotland	rsgb.org/agm
May 20 – 22	Hamvention, Dayton	www.hamvention.org/
June ?	"RAL" Round Table	
Jun 24 – 26	Ham Radio, Friedrichshafen	www.hamradio-friedrichshafen.de/
July ?	Finningley Round Table	
Jul 29 – 31	Amsat-UK Colloquium, Holiday Inn, Guildford	www.amsat-uk.org/colloquium/
Aug 19–21	EME2016, Venice	www.eme2016.org/
Sept 9–11	61.UKW Tagung Weinheim	http://www.ukw-tagung.de/
Sept 23–24	National Hamfest	http://www.nationalhamfest.org.uk/
Oct 3 – 7	European Microwave Week, London	www.eumweek.com/
Oct 7 – 9	RSGB Convention	rsgb.org/convention/
Oct 14–15	Microwave Update, Saint Louis, Missouri	http://www.microwaveupdate.org/
Nov 12 (tbc)	Scottish Round Table	http://www.gmroundtable.org.uk/

2017

Jun 23 – 25	Ham Radio, Friedrichshafen	www.hamradio-friedrichshafen.de/
Oct 7 – 8	RSGB Convention	rsgb.org/convention/
Oct 8 – 13	European Microwave Week, Nurembourg	www.eumweek.com/

2018

June 22–24	Ham Radio, Friedrichshafen	http://www.hamradio-friedrichshafen.de/
Sept 23–28	European Microwave Week, Madrid	http://www.eumweek.com/

And finally …

Christmas and New Year *Cheers* to you all!