An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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In This Issue

Artist rendition of Es'hail-2. Photo: Es'hailSat

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Loan Equipment

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

5. 7GHz 10GHz 24GHz 76GHz

Contact John G4BAO for more information.

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

https://groups.io/g/Scatterpoint and/or Dropbox. Also, **free access to the Chip Bank**

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, OpenOfÞce, 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.

Roger G8CUB

Reproducing articles from Scatterpoint

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.com

The current list is available at

www.microwavers.org/tech-support.htm

UKµG Chip Bank – A free service for members

By Mike Scott, G3LYP

Non-members can join the UKµG 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 components on the site will not be a guarantee of availability of that component.

The service is run as a free benefit to all members of the UK Microwave Group. The service may be withdrawn at the discretion of the committee if abused. Such as reselling of components.

There is an order form on the website with an address label which will make processing the orders slightly easier.

Minimum quantity of small components is 10.

These will be sent out in a small jiffy back using a second class large letter stamp. The group is currently covering this cost.

As many components are from unknown sources. It is suggested values are checked before they are used in construction. The UKµG can have no responsibility in this respect.

The catalogue is on the UKµG web site at
www. microwavers. org/chipbank. htm

Chairman's thoughts - 72k km dx on microwaves

After years of promise we have, at last, got a working geostationary amateur radio transponder, thanks to our friends in Qatar and Amsat DL.
The new satellite, named Qatari Oscar 100, is already proving a bit of a hit with SSB stations appearing on the 250kHz wide narrowband transponder from China to Brazil. The 8MHz wide 'digital' ATV transponder has been providing amateur TV enthusiasts with a means to test their downlink LNB and various digital set top boxes with symbol rates from 2Mb/s down to 125kB/s. Uplink transmitters have been a mixture of SDRs and Portsdown with various testcard generators and some 'real' video to be seen. The recycling video beacon shows a made-for-purpose 'programme' on the Xspace Falcon launch and Mitsubishi satellite.
Whilst the narrowband signals can be received on a bare LNB, even without a dish, adding a 45cm (Sky size) dish improves results and a 1m dish provides exceptional signals.
An Octagon or similar phase locked LNB is recommended if you don't want to be continuously chasing signals. A DRO equipped LNB requires considerable dexterity on the receiver tuning control.
Most users opt to use an SDR, covering 739.5 to 739.8 MHz (approximately), to receive the narrowband signals, personally I dislike tuning an SDR and use mine purely as a wideband spectrum monitor. I further down-convert from 738MHz to 144MHz and receive on a 'satellite' transceiver. Suitable ones include the FT736, FT847, TS2000, IC910 and the IC9100. The forthcoming IC9700 should also be suitable.
On transmit the SGLabs 13cm transverter, using a transmit IF of 432MHz and proving 2W output, is widely used. With a suitable antenna 2W is enough to be heard on the downlink at good strength, so an add-on PA is not always .required.
The wideband transponder is a completely different game. The dish, ideally, needs to be 0.8m diameter, or greater, and the alignment is critical if you want to receive more than just the video beacon. This can be a problem in itself. Whilst many amateurs have had no problem receiving the video beacon signal, many of us have struggled to get a usable signal. Careful dish alignment and selection of the LNB helps. LNB locking (or not) is a subject in itself and, I hope, will be covered at the Martlesham Microwave Round Table (23/14April - www.microwavers.org and click on events).
Video transmitters for the satellite is something I have yet to get involved with, so I will say nothing more on that subject here.
For now, my interest is mainly with the narrowband transponder and all the various DX stations to be worked across the hemisphere that can be seen by the satellite. The fact that you can copy the two 10.489GHz beacons on a suitable LNB, without a dish reflector, and decode the AO40 format 400 baud data stream using Moetronix free program originally written to decode the AO40 data is truly remarkable. The CW beacon at 10.489550GHz is also interesting to receive.
I hope to hear (and maybe see) many of you on our new satellite in the future.

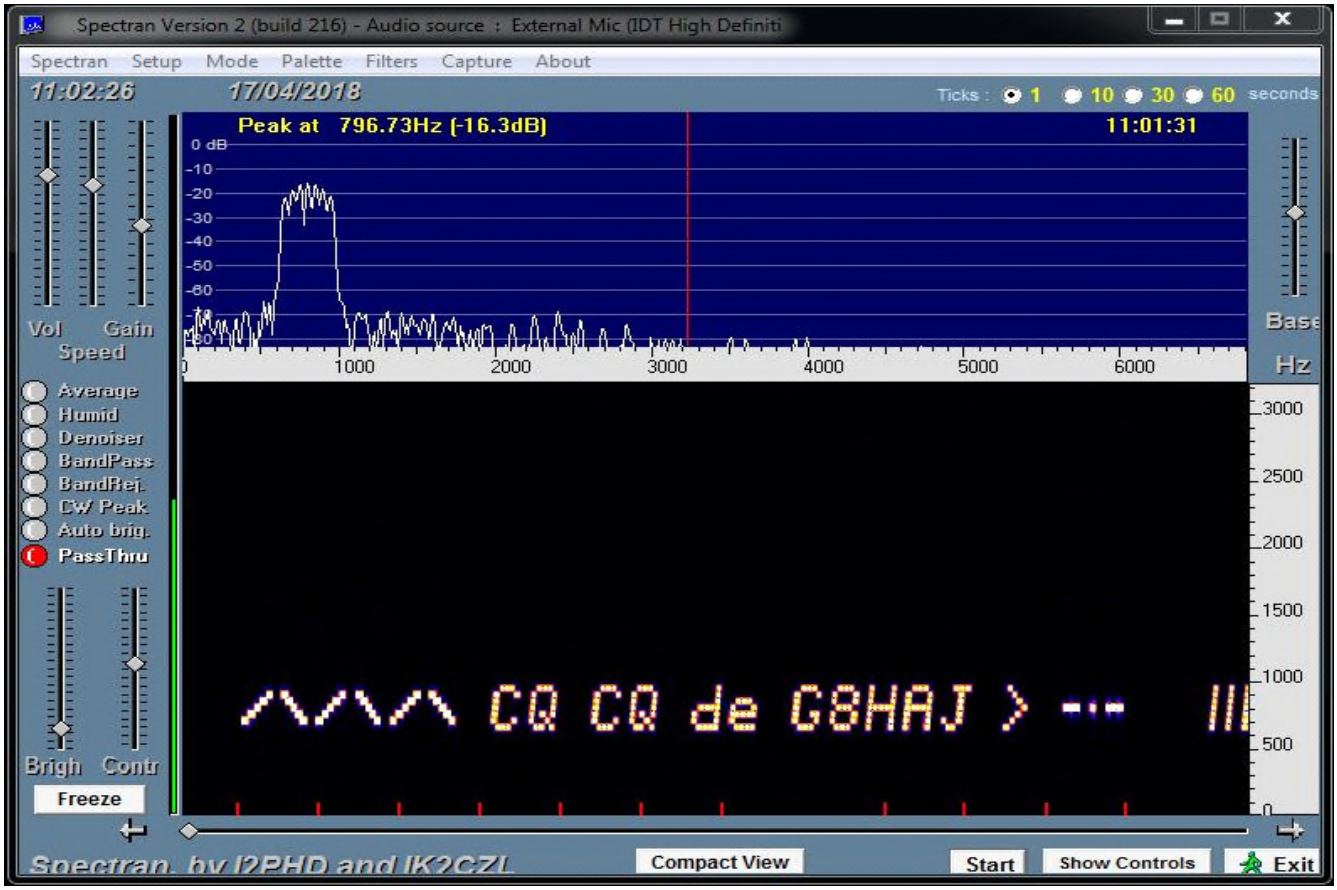
73 de Sam, G4DDK

Writing in the Waterfall

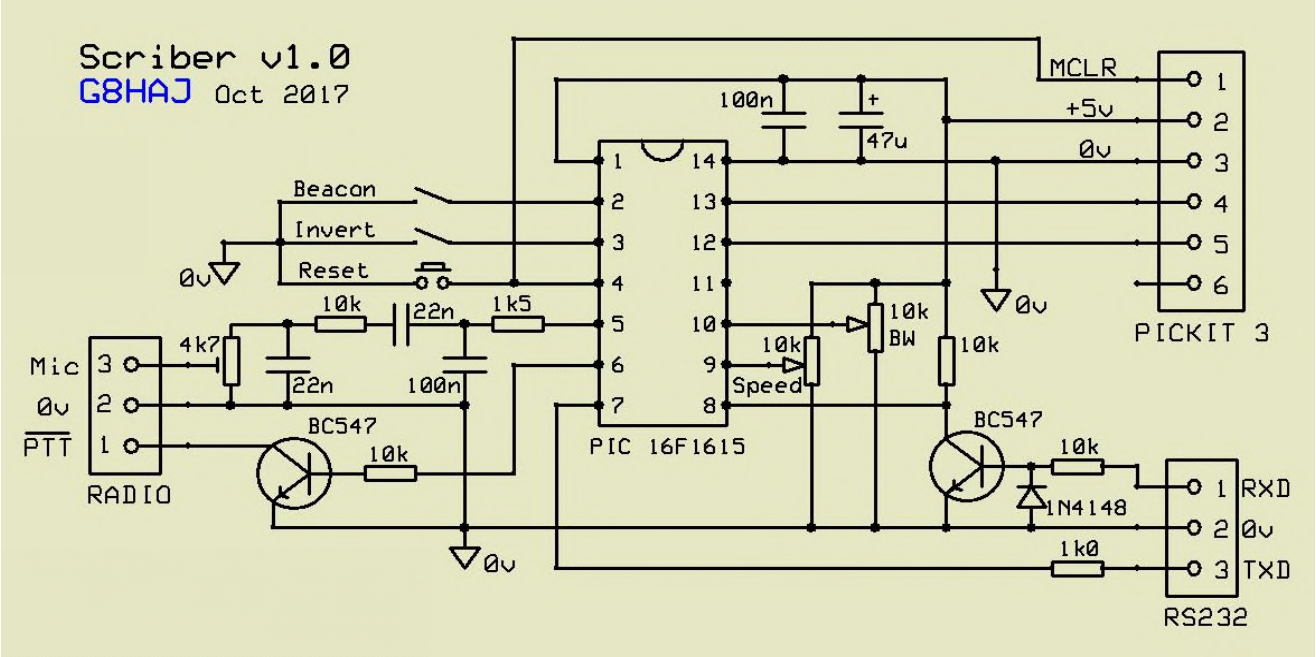
Graham, G8HAJ

Waterfall displays are especially useful on the microwave bands, their very narrow resolution bandwidths enable us to locate and beam up on signals that are well below audible levels. So wouldn't it be nice to take advantage of this high sensitivity and write text directly in the waterfall ?

SCRIBER is a versatile Multi-tone Hellschreiber generator in a 14pin DIL PIC16F1615 microcontroller. The audio signal synthesized by Scriber will write text directly on a waterfall display when sent through an SSB transmitter, no decoder required. Additionally a 31.25KHz PWM output is available that may be used to impose text, speech or data directly onto a millimeter or nanowave carrier in applications where spectral purity is less important.



Scriber sends polyphase multitone Hellschreiber (pp/mt hell), a new hybrid mode I've recently developed to improve on the older c/mt & s/mt modes, it is spectrally clean (>50dB), has a 6dB improvement in detection threshold over shaped c/mt hell and greater text clarity than s/mt hell.



Using Scriber

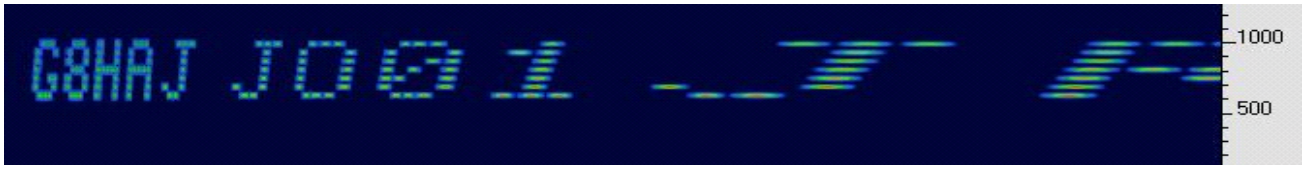
Scriber may be used as a stand alone beacon sending an 80 character internally stored message or used in full QSO mode via the RS232 interface, a simple audio interface is also available to convert speech to PWM.

For QSO use the receivers audio is fed to a PC running Spectran or Argo or similar spectrum display software. It is very useful to display Scribers output during transmission on the same display, this makes it easy to 'net' to a received signals frequency, adjust the sending BW and speed controls and view both sides of a QSO. A simple resistive mixer in the audio fed to the PC may be used to combine the RX and TX audio signals.

The Bandwidth and Speed controls are analogue (real knobs!) and may be set over a 100:1 range from a fast wideband 'chat' at 30 wpm using 500Hz Bandwidth, down to extreme narrow band QRSS at 2 characters/minute and 5 Hz Bandwidth.

This corresponds to a 20dB improvement in detection threshold at the slowest speeds.

The effect of varying the Bandwidth control in real time, as the bandwidth is reduced, the speed will decrease and the received S/N will increase. The above picture shows only a small portion of the 100:1 range of this control. The text rate is set at optimum for the BW selected when the Speed control is set at maximum.



The effect of varying the Speed control in real time, bandwidth is not changed but more integration time is available. This is useful when doppler spreading is present. The stretched vertical pixel columns in the last two characters clearly show the poly phasing of the raised cosine windows generated by pp/mt hell.

Further information

Rather than take up space here, please refer to my web pages for a more detailed description and source code download - www.g8haj.uk or just Google the call sign.

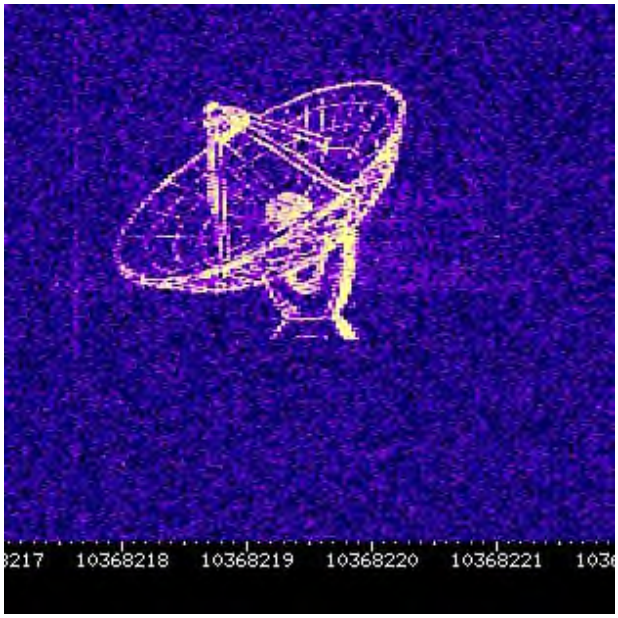
Footnote

I've done extensive bench testing and air testing via the SUWS websdr with very encouraging results BUT have never had a QSO yet - any takers to build a 2nd unit ? and try some experiments on 3cm's. I've a limited number of programmed PIC's available, please contact me via the web site if you'd like one.

2019 Update!

Brazil using 1mW via the QO100 Satellite

The screen shot above is courtesy of Roland, PY4ZBZ, the equipment had just been switched on, the text is still easily readable with large frequency drifts / doppler.



Images are also possible (details on the web site)

Digital ATV co-ordination on Es'hail-2

Narrowband DATV (150 kHz bandwidth) via QO-100 sent by Noel G8GTZ Feb 14, 2019 at 0950 GMT

AMSAT-DL has agreed to a proposal by the **British Amateur Television Club** (BATC) for the use of the bottom 100 kHz of the wideband transponder (10491 – 10491.1 MHz) for ATV co-ordination purposes.
The announcement on the BATC Forum says:
This is on an experimental only basis and stations must keep their power levels to a minimum and certainly not exceed power levels greater than 15dB above the noise floor as shown on the Goonhilly spectrum monitor.

This is sanctioned on an experimental only basis and AMSAT-DL reserve the right to move the WB beacon towards the band edge or implement DVB-S with a wider roll-off which would render the frequencies unsuitable for this purpose.

So another challenge but should be manageable and prove a useful facility although we do see the chat being the major tool for reports and contacts.

73 Noel G8GTZ

Cardiff Roundtable 16th March

CUARS will be hosting a meeting of the UK Microwave Group on Saturday March 16, 2019 at our campus in Cardiff. This one day event is a mix of talks, measurements, and socializing about activities in the GHz frequencies.

Location:

Queen's Building
5 The Parade
CF24 3AA
Cardiff

www.cardiffars.org.uk/roundtable/

Editors Comments

I was due to take over editing the magazine from Martin G8BHC after Martlesham.
However Martin suffered a heart attack and was hospitalised in February. He is fortunately recovering well, and I am sure everyone offers there best wishes for a speedy and full recovery.
So a little earlier than planned, I have taken over the editorship. This issue is a bit lacking in technical content, which should be rectified by the next issue, which will follow the Martelsham Roundtable. Going forward, the magazine can only be as good as its content. So get writing – please….

Roger G8CUB

Martlesham AGM 2019

Notice is hereby given that the 2019 Annual General Meeting of the UK Microwave Group will be held at 10:00am on Sunday, 14 April 2019 as part of the Martlesham Microwave Round Table event which takes place over that weekend.
This will include the election of the officers of the committee and the presentation of the Chairman's, Secretary's and Treasurer's Annual Reports.
This year the following Committee officers/members are standing down:
Sam Jewell G4DDK - Chairman
Barry Chambers G8AGN - mm-Wave Coordinator
Graham Murchie G4FSG
The following non-committee roles also need to be filled:
Activity News editor to take over from Neil G4LDR
Mike Scott, the UKuG Chipbank manager, wishes to stand down, a volunteer to look after the chip bank would be greatly appreciated.
Other existing committee members are prepared to stand again, however new members would be very welcome.
Any UKuG member wishing to stand should notify the UKµG Secretary, John Quarmby G3XDY, by **15th March 2019**.
If you have any agenda or AOB items for the AGM then please contact the UKµG Secretary, John Quarmby G3XDY by 15th March 2019, email: secretary@microwavers.org

Martlesham Microwave Roundtable 2019

The talks will take place at the BT Adastral Park site at Martlesham, Ipswich, in the Antares Building Foyer and Crucible lecture theatre.

Test gear will be located in a nearby room, and the flea market will take place in the Foyer.

Refreshments will be served on the first floor balcony.

Adastral Park is just off the A12 to Lowestoft to the East of Ipswich. From the Holiday Inn Ipswich follow signs for Felixstowe initially and then take the A12 signposted to Lowestoft at Junction 58. Adastral Park is right at the second roundabout on the A12.

Postcode to follow is IP5 3RE

For the latest information:

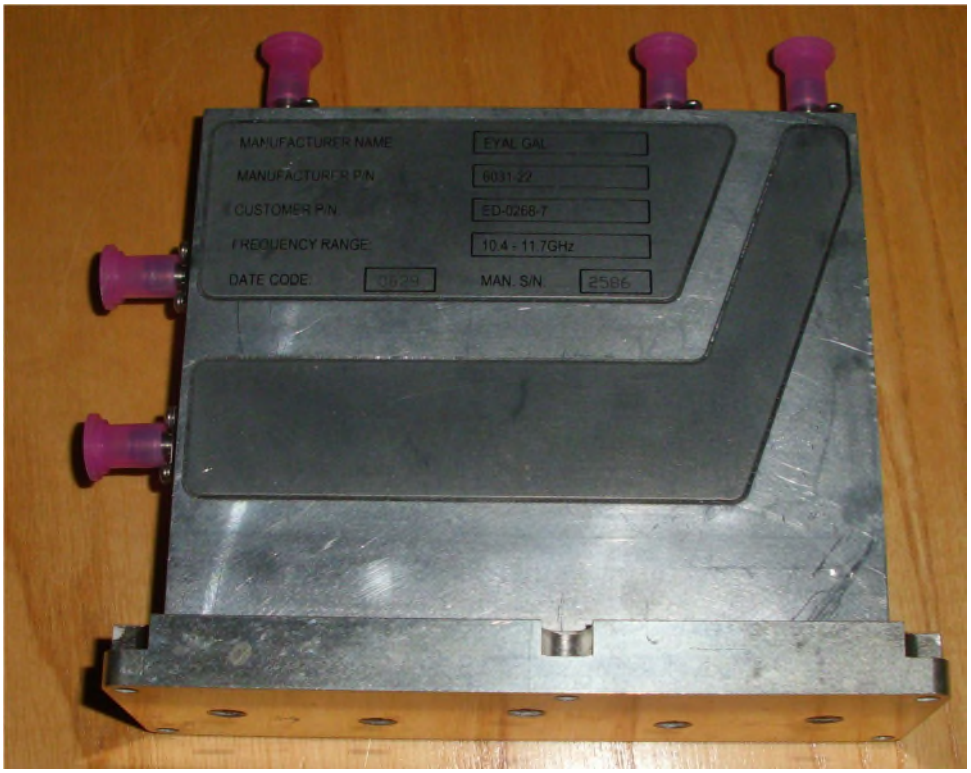
www.mmrt.homedns.org/

Eyal Gal Module for 10 GHz

by G8CUB

My original articles on these modules in Scatterpoint is now many years old. However I have recently unearthed three modules. These will be offered at Martlesham complete with mixers for the TX path, to the most deserving causes. Activity required on 10GHz within a reasonable period! Certainly not to add to anyone's junk box. Talking of junk boxes, there may lurk, one or two of these in somewhere. So to encourage their use, here is an updated, update on these modules.

11GHz Module



These units with the part number 6031-01 will work un-modified at 10.368GHz. They consist of a receive LNA & mixer, plus a transmit amplifier & output monitor. Thus just needing an LO, Tx mixer and filter, and a couple of relays to make a simple 10GHz transverter.

Measured performance on receive with a 432MHz IF, is as follows:
Conversion gain +22dB
System noise figure 2.9dB
Image rejection (9.94GHz LO) -24.5dB

Performance on transmit:
+32dBm output - 1dB compression
+53dB gain
Saturated power output on transmit is >2W.

Supply requirements:

	Receive (Tx Inhibited)	Full Output
+8.0V	380mA	720mA
+12V	50mA	1.93A
-12V	105mA	105mA

The IF response is flat 75-1700MHz, but a 144MHz IF would only give you 2dB image rejection, so is not practical. With the high transmit gain, it is necessary to either use an input attenuator, or use the AGC control to turn the gain down.

In my 10GHz systems I use the Eyal Gal block with an Elcom modified synthesiser. However there are now many possible LO options. I favour the ZL14G synthesiser from Wayne ZL2BKC. Other cheaper possibilities are the various ebay 13.6GHz offerings These can be made to work with modifications to the regulator, and loop filter.

The output power measured in narrow band mode was much greater than that indicated by the specification sheet (harmonics are quoted with a +26dBm power, and IP3 as >+38.5dBm).

Pin-out on the two connectors, left to right, is as follows.

Connector 1 (6 way)

1	2	3	4	5	6
n/c	+8V	-12V	0V	n/c	+12V

Connector 2 (5 way)

7	8	9	10	11
n/c	Tx Det	AGC	0V	Tx Mute

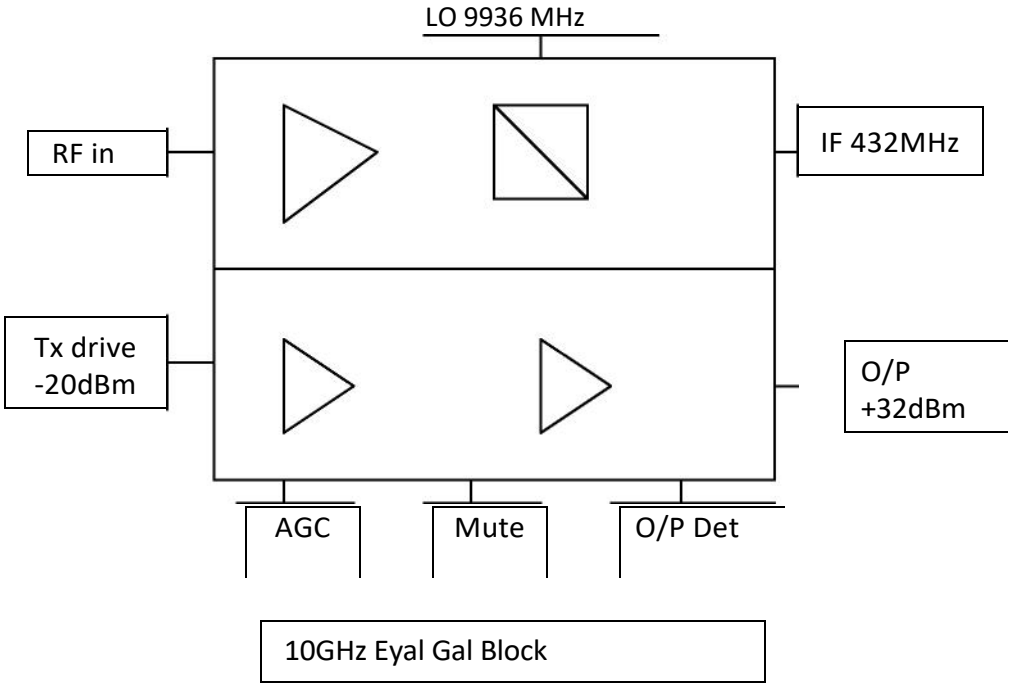
Connections to the unit are by two, 0.1” pitch single in line connectors. It is quite easy to solder wires straight on if you don’t have suitable mating plugs.
In my system, the 8.0V supply is provided by a 7808 regulator. The 12V supply is a direct battery feed. Both are internally regulated, so the exact voltage is not critical. The -12V is provided by a block DC-DC converter.

I have not had the courage to remove the -12V supply to see if the unit is internally protected, but equally I have not blown one up yet!

Tx Mute – 0V to inhibit
Tx Det – DC proportional to dB output power (log detector) Max ~ 4.3V
AGC – 0- 5V Control - from the data sheet turning the power down more than 10dB will limit he output power (I have not tried this, just left the pin o/c)

Local oscillator power required is +3 to +6dBm (9.936GHz). Around -21dBm Tx drive will give you full output (at max gain). The 2 SMA output connectors allow easy use of a coax relay, or the addition of a single stage low noise amp and/or PA.

Block diagram



Of the 6031 module for 10GHz, there are differences in module thickness, and derivation of transmit supply.
These 10.4 – 11.7GHz modules have a useful cut-off of the transmit response on the LF side and receive filtering is by the use of image rejection mixing / filtering.
The original modules looked at were -01 or -07 variants. These had the thicker bodies, and derived the transmit supply from the +12V.
More recent variants type -12 have the thinner bodies but still use the +12V for TX. The -22 variant has the thinner body, and takes the transmit supply from the +8V. Also the -22 types have come with test sheets showing the measured noise figure to be 1.3 to 1.6dB at 10.4GHz.

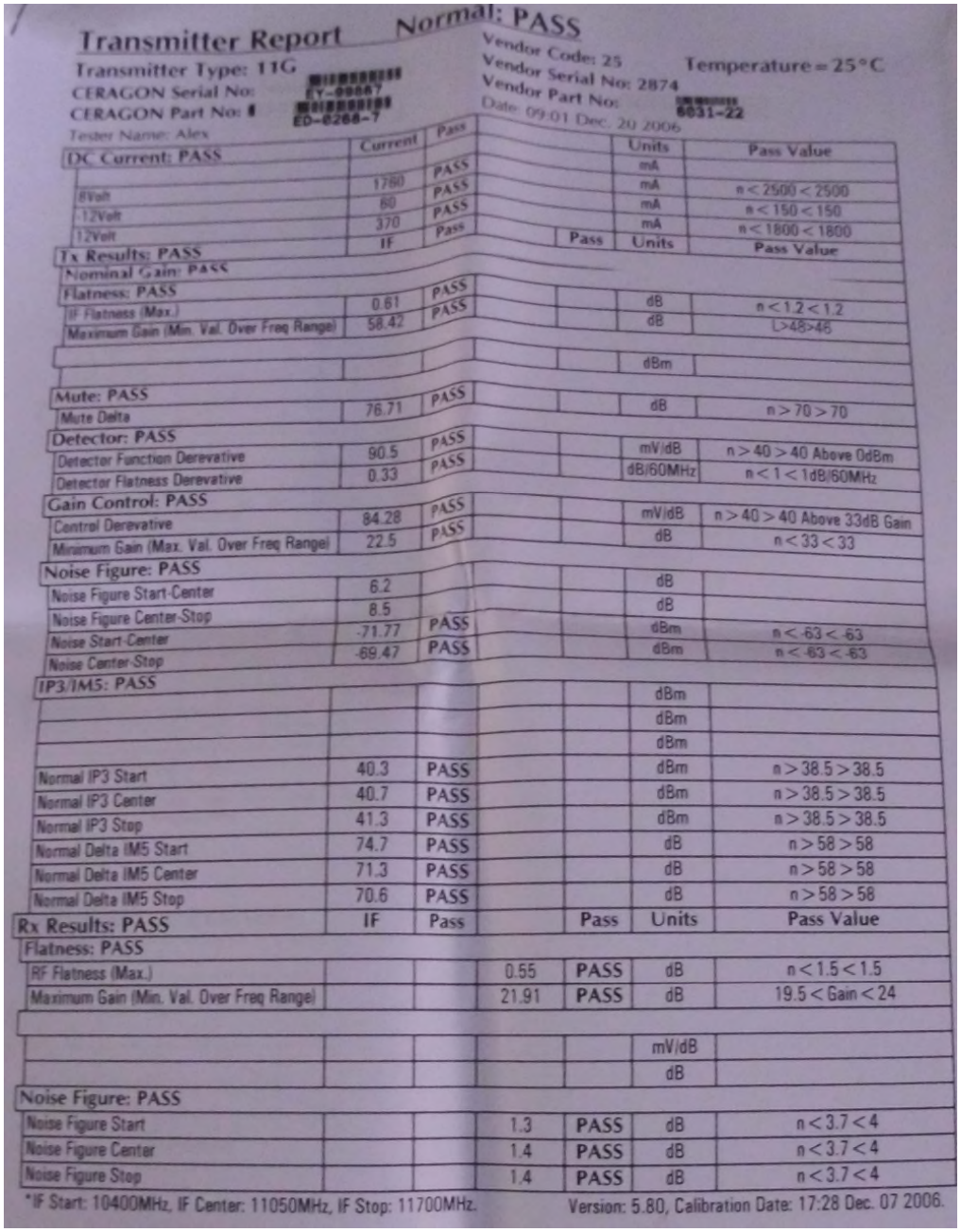
These must be first stage noise figures, as my measurements on the whole module vary between 2.3 & 3.3dB.

On the transmit side the unit is just a high gain amplifier. The 1dB compression point, measured now on quite a lot of modules, varies between 31.3 and 32.3dB, with the saturated output about 0.6dB higher. Although I have seen up to +33.5dBm.

-01 Module on the left, -22 module on the right

When using the -22 variant modules, the +8V supply needs a capability of at least 2.2A for maximum output, hence it is convenient to use a 3A regulator (78T08 or similar). This regulator needs to have sufficient heatsinking. Typical current on receive is 0.38A, while on transmit current is around 1.8A, peaking to 2.2A.

Also the -12V current requirement is less, around 70mA max. instead of 110mA. Current from the 12V supply is typically 20mA on receive, 780mA on transmit. Note that on 'transmit' i.e. TX un-muted, the receive side is still operational. The only module I have known to have a receive failure, is when the auxiliary antenna contact in the RX position was used to mute the module. Obviously the changeover period caused the problem, when using CW break-in. I have now used the TX aux. contact to control the mute line via a transistor.



Transmitter Report — **Normal: PASS**

Transmitter Type: 11G
CERAGON Serial No: [redacted]
CERAGON Part No: [redacted] ED-6268-7
Vendor Code: 25
Vendor Serial No: 2874
Vendor Part No: [redacted] 6031-22
Date: 09:01 Dec. 20 2006
Temperature = 25°C
Tester Name: Alex

	Current	Pass			Units	Pass Value
DC Current: PASS						
8Volt	1780	PASS			mA	
12Volt	80	PASS			mA	n < 2500 < 2500
12Volt	370	PASS			mA	n < 150 < 150
	IF	Pass		Pass	mA	n < 1800 < 1800
Tx Results: PASS					Units	Pass Value
Nominal Gain: PASS						
Flatness: PASS						
IF Flatness (Max.)	0.61	PASS			dB	n < 1.2 < 1.2
Maximum Gain (Min. Val. Over Freq Range)	58.42	PASS			dB	[illegible] >48>48
					dBm	
Mute: PASS						
Mute Delta	76.71	PASS			dB	n > 70 > 70
Detector: PASS						
Detector Function Derevative	90.5	PASS			mV/dB	n > 40 > 40 Above 0dBm
Detector Flatness Derevative	0.33	PASS			dBi/60MHz	n < 1 < 1dB/60MHz
Gain Control: PASS						
Control Derevative	84.28	PASS			mV/dB	n > 40 > 40 Above 33dB Gain
Minimum Gain (Max. Val. Over Freq Range)	22.5	PASS			dB	n < 33 < 33
Noise Figure: PASS						
Noise Figure Start-Center	6.2				dB	
Noise Figure Center-Stop	8.5				dB	
Noise Start-Center	-71.77	PASS			dBm	n < -63 < -63
Noise Center-Stop	-69.47	PASS			dBm	n < -63 < -63
IP3/IM5: PASS						
					dBm	
					dBm	
					dBm	
Normal IP3 Start	40.3	PASS			dBm	n > 38.5 > 38.5
Normal IP3 Center	40.7	PASS			dBm	n > 38.5 > 38.5
Normal IP3 Stop	41.3	PASS			dBm	n > 38.5 > 38.5
Normal Delta IM5 Start	74.7	PASS			dB	n > 58 > 58
Normal Delta IM5 Center	71.3	PASS			dB	n > 58 > 58
Normal Delta IM5 Stop	70.6	PASS			dB	n > 58 > 58
Rx Results: PASS	IF	Pass		Pass	Units	Pass Value
Flatness: PASS						
RF Flatness (Max.)			0.55	PASS	dB	n < 1.5 < 1.5
Maximum Gain (Min. Val. Over Freq Range)			21.91	PASS	dB	19.5 < Gain < 24
					mV/dB	
					dB	
Noise Figure: PASS						
Noise Figure Start			1.3	PASS	dB	n < 3.7 < 4
Noise Figure Center			1.4	PASS	dB	n < 3.7 < 4
Noise Figure Stop			1.4	PASS	dB	n < 3.7 < 4

*IF Start: 10400MHz, IF Center: 11050MHz, IF Stop: 11700MHz. Version: 5.80, Calibration Date: 17:28 Dec. 07 2006.

11GHz module original data sheet

Activity News: January and early February 2019

By Neil Underwood, G4LDR

Please send your activity news to:

scatterpoint@microwavers.org

Introduction

Just one item of activity news this month. I guess the colder weather, including some snow has not enticed many of you to venture out this month. On the other hand the middle of February has turned out to be very mild so perhaps there may be more activity reports next month. The big news in February has been the opening of the Es'hail (QO-100) satellite transponders for amateur use. I have already heard a number of well-known microwave operators on the narrow band downlink and seen several on the DATV downlink.

mm-Wave Band Report

From Neil, G4LDR, IO91

Monday 28th January was one of the coldest days this winter (in the south of England anyway). Noel G8GTZ and I decided we would try to extend the 76GHz DATV distance record we set two weeks earlier. Initially we checked the 28km path between Hannington (northwest of Basingstoke) and Cheesefoot Head (near Winchester) narrow band and then DATV pictures were exchanged again without difficulty. Noel then drove to Coombe Gibbet (south of Hungerford) to try the 38km line of sight path to Cheesefoot Head. Narrow band signals were good but unfortunately no DATV signals were exchanged in either direction. Noel decided to drive to the Walbury Hill PMR mast (about 2km from the top of Walbury Hill and 3km nearer to me at Cheesefoot Head. This time DATV pictures were received over the 35km path. Unlike on the 28km path where Full HD pictures were exchanged, only reduced bandwidth DATV (333ksymbols per sec) would work.

Noel and I had hoped to have achieved greater distances particularly with the low absolute humidity we had on the day meaning about 6dB less water vapour attenuation on the 35km path compared to a typical summers day (20deg C and 50%R/H). Perhaps we will get another opportunity if the weather turns cold before the spring

From Dave G1EHF

"Like many others, I have made a successful attempt at getting a signal into the Oscar-100 geostationary satellite and having a few SSB contacts. I started by building a 25 turn helix, which tuned up OK on 2.4GHz and responded to a hand waved in front, which I took as a good sign. In order to keep work to a minimum and to avoid heart-surgery, I decided not to re-programme the G4JNT LTC6946 synth board in my homebrew 13cm transverter and opted to simply raise the reference frequency from 10MHz to 10.367647MHz and then fit a filter suitable for 2.4GHz. The transverter provided an comfortable 10W out at this higher frequency. My next 'cheat' was to leave the Optima OSLO on the shelf and the access the excellent BATC WebSDR at Goonhilly (many thanks to the team!). With this set-up my first QSO's were fairly easy, with a clutch of Europeans and a 3B8 in the log.

I have to say that the sensitivity and stability of the transponder is excellent and the first QSOs can't help to impress due to the distances involved. That said, whilst further contacts and modes will be interesting, the job is effectively 'done' once a reasonable signal is established on the downlink and any further exotic callsigns achieved in the log will be simply down to activity, rather than technical or operating skills. The only thing that did occur to me is to wonder whether any stations outside the official footprint will be tempted to attempt access to the transponder via tropospheric modes. What do other think? Feasible?"

.....and finally

The deadline for activity reports to be included in the next issue is Friday 1st March 2019.

Beacon News

Sad News……

GB3CCX Narrow-band Beacons

Due to a Major increase in rental costs by the land owner. GB3CCX was turned off on Monday 25th February 2019 and removed from site.

The original 10GHz Narrow-band beacon was installed on Cleeve Common, 3miles (5Km) Northeast of Cheltenham in September 1997.
The 10GHz Beacon was partially rebuilt in new outdoor housing on site on 4th November 2016.

The 47GHz Beacon was installed on site on 4th November 2016.

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Contests

Low Band Championship 2018

Entries continue on an upward trend, with 36 stations entering one or more of the events this year. Conditions have been flat on most occasions, with perhaps the exception of the last event in November.

1.3GHz

For the first time this band has been won by a non-UK entrant, with Conrad PA5Y taking advantage of the high points per contact for working G stations to take victory over John G4ZTR who held onto second place. Conrad entered the first three sessions, and John the first two and last two, with both stations winning two sessions each.

2.30GHz

I have to repeat last year's pleas for more entrants on this segment. M0HNA/P had the field to themselves once again.

2.32GHz

M0HNA/P won the 2.32GHz section with three session wins scoring maximum points. In second place is Neil G4LDR with one session win and two runner up slots.

3.4GHz

This band was a re-run of 2017, with M0HNA/P winning four of the five sessions. Neil G4LDR was runner up with one session win.

Overall

Top of the overall table again is the "Combe Gibberlets" group (M0HNA/P) with a large margin of victory. Neil G4LDR was overall runner up and leading fixed station overall. No entrants were active in all five sessions this year.

Congratulations to the winners and runners up mentioned above.

73

John G3XDY

UKuG Contest Manager

UKuG MICROWAVE CONTESTS - 2019

Aims and comments:

There are a few minor changes to the rules from 2018.

The entry submission time will be 1 week after the contest (in line with RSGB and other contests), this should make for more timely adjudication.

In the mm-wave events the locator details exchanged should be 8 character (eg JO02OB57) to allow more accurate determination of distances.

The low band event dates will be similar to last year, with the March, May and June sessions running on IARU coordinated dates. 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:

1. Name
2. Address
3. Call sign
4. Location of use
5. Frequency range used
6. Type of use
7. Regularity of use (e.g. evenings and weekends; 24/7; occasional)
8. Transmit power (ie. EIRP) .

The high band events will continue on 5.7 and 10GHz, 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 UTC, 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 high band events will coincide with the French Journée d'activité dates.
The millimetre events will run as last year, they will comprise the all band event in June covering 24GHz – 248GHz, and 24/47/76GHz events in May, September and October. The 24GHz trophy will be awarded for the June 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 2019.
The following contests are scheduled for 2019:

- Low Microwave Bands - 1.3GHz/2.30GHz/2.32GHz/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 June.
- 47GHz Trophy (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 2019 issue of the Scatterpoint Microwave Newsletter and are also available on the Internet on the UKuG website at http://www.microwavers.org

General Rules (applicable to all events)
The Contests are open to all comers (you do not have to be an RSGB or UK Microwave Group member). Stations located outside 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 station worked is a Rover when each QSO from a different location may be counted. When operating as a Rover, a maximum of one scoring QSO can be made with any given station from each location visited. 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 (rounded up to the nearest 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. Entries must be submitted no later than 7 days after the conclusion of the contest session.

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 lower microwave bands, particularly as there is growing UK availability of 2.3GHz and 3.4GHz equipment. 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. Operation may take place on the following bands: 1240-1325MHz, 2300 – 2302MHz, 2310 – 2350MHz, 3400 – 3410MHz. The same station may be contacted for points on each of the four bands.
5. Each event will be scored and tabulated separately. There is an annual championship determined by taking the best three normalized scores from each entrant across the five events for each band. The overall champion will 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 four 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. 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 to the leading fixed, portable and low power (<1W) stations.
5. 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. 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.
4. Certificates will be awarded to the leading station and runner-up in each section, and to the leading portable and fixed stations.
5. 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 June.
1. The general rules shown above apply.
2. There are four events from June to October inclusive, and the events 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 in each section, plus the leading home and portable stations.
5. 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 millimetre wave event in June.
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 millimetre wave event in June.
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 June

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 RSGB 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 RSGB 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 1930 – 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 2019

Dates, 2019	Time UTC	Contest name	Certificates
3-Mar	1000 - 1600	1st Low band 1.3/2.3/3.4GHz	F, P,L
7-Apr	1000 - 1600	2nd Low band 1.3/2.3/3.4GHz	F, P,L
5-May	0800 - 1400	3rd Low band 1.3/2.3/3.4GHz	F, P,L
19-May	0900 – 1700	1st 24GHz Contest	
19-May	0900 – 1700	1st 47GHz Contest	
19-May	0900 – 1700	1st 76GHz Contest	
26-May	0600 - 1800	1st 5.7GHz Contest	F, P,L
26-May	0600 - 1800	1st 10GHz Contest	F, P,L
2-Jun	1000 - 1600	4th Low band 1.3/2.3/3.4GHz	F, P,L
16-Jun	0900 - 1700	24/47GHz Trophy / 76/122-248 GHz	
30-Jun	0600 - 1800	2nd 5.7GHz Contest	F, P,L
30-Jun	0600 - 1800	2nd 10GHz Contest	F, P,L
28 -Jul	0600 - 1800	3rd 5.7GHz Contest	F, P,L
28 -Jul	0600 - 1800	3rd 10GHz Contest	F, P,L
25-Aug	0600 - 1800	4th 5.7GHz Contest	F, P,L
25-Aug	0600 - 1800	4th 10GHz Contest	F, P,L
15- Sep	0900 - 1700	3rd 24GHz Contest	
15- Sep	0900 - 1700	3rd 47GHz Contest	
15- Sep	0900 – 1700	3rd 76GHz Contest	
29 -Sep	0600 - 1800	5th 5.7GHz Contest	F, P,L
29 -Sep	0600 - 1800	5th 10GHz Contest	F, P,L
20 -Oct	0900 - 1700	4th 24GHz Contest	
20 -Oct	0900 - 1700	4th 47GHz Contest	
20 -Oct	0900 – 1700	4th 76GHz Contest	
17 -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)	

Events calendar

2019

Mar 15	IET Colloquium on Millimetre-wave and Teraherz Engineering & Technology 2019	www.theiet.org/events/2019/248017.cfm
Mar 16	Cardiff Roundtable	www.cardiffars.org.uk/roundtable/
April 13	CJ-2018, Seigy	http://cj.r-e-f.org/
April 13-14	MartelshamRoundtable / AGM	www.mmrt.homedns.org/
April 20	Deep Space Tech-Talk Presentation. Ypres, Belgium	ronald@rts.be
April 27	RSGB AGM, Birmingham	www.rsgb.org/agm
May 17–18	Hamvention, Dayton	www.hamvention.org/
June 16	RAL Round Table Chilton Village Hall	rally@g3pia.net
June 21-23	Ham Radio, Friedrichshafen	www.hamradio-friedrichshafen.de/
July tbc	Finningley Round Table	www.g0ghk.com/
Sept 6-7	63.UKW Tagung Weinheim	www.ukw-tagung.de/
Sept tbc	Crawley Roundtable	
Sept 29-Oct 4	European Microwave Week, Paris	www.eumweek.com/
October tbc	Microwave Update, Dallas, Texas	www.microwaveupdate.org
Oct 28-Nov 22	ITU WRC-19, Sharm el-Sheikh	http://rsgb.org/wrc-19
Nov 2	Scottish Round Table	www.gmroundtable.org.uk/

2020

Aug tbc	EME 2020 Prague	
Sept 13–18	European Microwave Week, Utrecht	www.eumweek.com/
Oct 10-16	IARU-R1 General Conference, Novi Sad	

80m UK Microwavers net

Tuesdays 08:30 local on 3626 kHz (+/- QRM)

73 Martyn Vincent G3UKV