An Amateur Radio publication for the Microwave Enthusiast

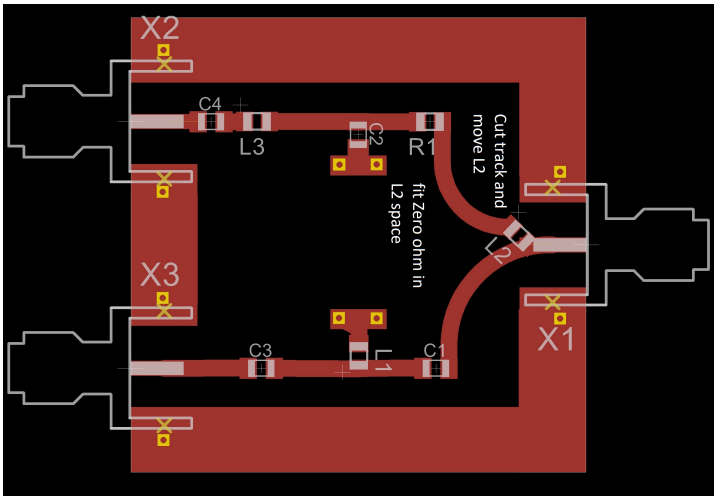
scatterpoint

January 2019

Published by the UK Microwave Group

The G4BAO Diplexer Revisited for an Es'hailSat2 LNB

John Worsnop G4BAO



In this Issue

UK Microwave Group Contact Information

Chairman: G4DDK
Sam Jewell
Email: chairman @microwavers.org
Located: Suffolk JO02pa
Address: Blenheim Cottage
Falkenham
IPSWICH
IP10 0QU
Home Tel: 01394 448495

General Secretary: G3XDY
John Quarmby
Email: secretary @microwavers.org
Located: Suffolk JO02ob
Address:
12 Chestnut Close,
Rushmere St Andrew
IPSWICH IP5 1ED
Home Tel: 01473 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: 01223 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 Neil and myself.

Scatterpoint
Activity News: G4LDR
Neil Underwood
Email: scatterpoint @microwavers.org

NB editor & scatterpoint email addresses go to both Martin and myself.

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: 01473 717830

Beacon Coordinator:
Denis Stanton G0OLX
Email: beacons @microwavers. org
Located:
Address: 122 Foxon Lane
Caterham CR3 5SD
Home Tel:

UK Regional Reps

Martin Hall	Scotland	GM8IEM	martinhall@gorrell.co.uk
Gordon Curry	Northern Ireland	GI6ATZ	gi6atz@qsl. net
Peter Harston	Wales	GW4JQP	pharston@theiet.org

Assistants

Murray Niman	Webmaster	G6JYB	g6jyb@microwavers. org
Kent Britain	USA	WA5VJB/G8EMY	wa5vjb@flash. net
Mike & Ann Stevens	Trophies	G8CUL & G8NVI	trophies@microwavers.org
Noel Matthews	ATV	G8GTZ	noel@noelandsally. net
Robin Lucas	https://www.beaconspot.uk	G8APZ	admin@beaconspot.uk
Barry Chambers	24GHz and up	G8AGN	b. chambers@sheffield. ac. uk
Mike Scott	Chip Bank	G3LYP	g3lyp@btinternet. com
Denis Stanton	Beacon Coordinator	G0OLX	beacons@microwavers. org
Roger Ray	Deputy Scatterpoint Editor	G8CUB	

UKµG WIKI https://wiki.microwavers.org.uk/

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/files 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, 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

Reproducing articles from Scatterpoint

If you plan to reproduce an article exactly as in Scatterpoint then please contact the Editor – otherwise you need to seek permission from the original source/author.

You may not reproduce articles for profit or other commercial purpose.

You may not publish Scatterpoint on a website or other document server.

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 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, that is, Jiffy bags, small plastic bags for individual component values, and Large letter 2nd class postage, currently 76p.

Minimum quantity of small components is 10.

The service may be withdrawn at the discretion of the committee if abuse, such as reselling of components is suspected. We have asked Mike to check with the Chairman (or designated officer) if anyone is making excessive requests, and we will ensure that the service is only available to members.

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 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.

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

The main addition is some Bluetooth modules donated by Kevin, G3AAF.Those who attended the Finningley R/T last July will have heard Kevin’s talk on adapting these units as signal sources etc. A Datasheet and some notes on modification of these units are available from myself or Kevin.

Chairman's Thoughts – Welcome to 2019!

Sam Jewell G4DDK

Things have moved ahead with Es'Hail-2 since the last Scatterpoint and it seems appropriate to follow-up on this progress.

The ground station equipment has been sent to Doha for the Amsat-DL-organised ground station facility that will be used to control and monitor the amateur satellite transponder. Meanwhile the BATC team have been busy installing the Goonhilly WEB SDR downlink facility to enable anyone (?) to monitor what is being received from the satellite on both the narrowband (voice and digital) and the wideband TV transponders.

Peter Guelzow, DB2OS, writing in CQ-TV, the house magazine of BATC (highly recommended that you join BATC and receive this excellent magazine), describes how the Es'Hail-2 amateur transponder facility came about and how the Qatari owners persuaded Amsat-DL to let Mitsubishi build the transponder instead of Amsat-DL.

No doubt this will lead to some changes as to how we would normally use our 'home built' satellite transponders, but then again I would expect excellent Japanese reliability.

As a bent pipe transponder, the usual beacon and Leila (signal monitor system) will be ground based and uplinked.

Since the New Year we have seen some activity on the narrowband transponder as MELCO (Mitsubishi) test the transponders. If, as assumed, it was the actual transponder including 2.4GHz uplink and not a cross patch from one of the Ku band uplink receivers, as has been suggested, then the transponder noise floor was really noticeable on my 90cm dish and Octagon LNB.

Our concerns about poor LNB noise figure at 10489MHz may not be so important after all. We will have to wait and see. For the time being we are able to monitor the satellite broadcast beacon at 10.706GHz, adjust and optimise our receive systems.

Attention now seems to have shifted to the best way to frequency stabilise the Octagon LNB that many of us use.

Although these use an internal 25 or 27MHz crystal reference (another story for another time), in a PLL system inside the LNB, there is a slow frequency drift even if it has been in for many hours. I find it annoying.

My own initial attempt at injection locking an Octagaon LNB internal crystal, by injecting an external 25MHz reference signal, met with a stubborn spurious set of sidebands on the received broadcast beacon signal. Removing the crystal completely and injecting the reference externally seems to have reduced, if not eliminated thee spurious signals. More work is required, and I am now trying an OCXO based solution.

Why should we be interested in this satellite? I think (hope) that we will see some voice, and maybe TV?) nets being set up. Chat, with text input, is great for communicating but so much more can be conveyed by voice. WEB SDR receive and if it happens, WEB remote transmit, would enable those beyond the E'Hail-2 satellite coverage to join in. This may be dreaming, but a possibility.

Can I remind everyone that the UKuG AGM will be held at the Martlesham Microwave Round Table on the 13th and 14th April (we think this is the 40th anniversary of this particular Round Table) and we will be hoping to recruit some new members to the Group Committee. Details of the AGM are elsewhere in this Scatterpoint. Maybe you feel you would like to hand something back to this wonderful group and this part of our hobby, and stand for one of the Committee posts?

Sam, G4DDK

UKuG Chairman

AGM Notice

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:

Scatterpoint Editor to take over from Martin G8BHC

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 Round Table & UKµG AGM 2019

The event will open at lunch time on Saturday 13th April and close at 16:00 on Sunday 14th April.

Talks to include:

"Microwaves: from Death Rays to Dinner" – William Eustace M0WJE

Kit for accessing the Es'Hail satellite

SDR

No visit this year.

Accommodation

Accommodation has been arranged at the Ipswich Hotel London Road, Ipswich IP2 0UA, room rates are awaited. 20 rooms have been held for guests. Bookings can be made quoting "Microwave Group".

Location

The talks will take place at the BT Adastral Park site at Martlesham, Ipswich IP5 3RF, 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.

Test Gear

A range of test gear will be available including:

- Noise figure to 24GHz
- Network Analysis (scalar) to 6GHz Power measurement to 18GHz Spectrum analysis to 22GHz

Further capability may be added later – watch the website.

Chip Bank

Mike will be there with his stock.

Dinner

Dinner - at the Ipswich Hotel, 3 courses plus tea/coffee at £25 per person.

Please book and select your menu choices on the booking page.

Book here – open by end January.

http://mmrt.homedns.org/index.php/book-here/

Contact

Please contact John Quarmby G3XDY for all queries.
Email: g3xdy@btinternet.com Phone: +44 (0)1473 717830.

Cardiff Round Table

https://www.cardiffars.org.uk/roundtable

Saturday March 16 10:30 - 17:30

Cardiff University, Queen's Buildings, Cardiff CF24 3AA

I'm very happy to share that there will be a one day roundtable in March (yes! Just two and a half months away!) this year. The Cardiff University Amateur Radio Society is organizing the event which will be hosted at the university with a dinner nearby in the city center.

Please mark your calendars! We hope to see you there!

There are a number of talks during the day for which we are looking for speakers. If you are interested in presenting a project or topic please get in touch with myself or officers@cardiffars.org.uk. The spaces are 30 minutes long by default but we're very willing to move that around as best fits your presentation.

There will be space for displaying projects and a test equipment station for measuring components and systems. Please let us know if you'd like to display something or have equipment you would be willing to bring.

Best regards,

Derek Kozel & the Cardiff University ARS

MW0LNA & GC0CDF

Update

Quick but large update on the Roundtable on March 16th here in Cardiff. Three talks are now listed on the program page, three more to come as soon as I get titles and abstracts!

https://www.cardiffars.org.uk/events/2019/roundtable/program/

We've put up much more info about the venue including maps and photos of the rooms. I've confirmed that we will have ~15 reserved parking spots at the venue and another 50+ that are first-come-first-served with other university members. Additional parking is available on nearby streets, both paid and free.

https://www.cardiffars.org.uk/events/2019/roundtable/venue/

Additionally, several people have reached out about having trading tables so that's confirmed as happening. One kit and product seller has also asked if we'll have space and I've just let them know that we do so hopefully they'll be in attendance as well. If you'd like to bring items to sell or trade please let me know so we have enough tables.

As a reminder, please please register as soon as you know you'll be coming. I'm working on the catering and dinner plans and need tentative numbers to give them.

It looks like we'll have a good BATC presence as well which is exciting given the obvious crossover and the excitement with Es'hail 2.

Proceedings of Microwave Update 2018

Freely downloadable here: http://www.microwaveupdate.org/ and click on MUD2018_Proceedings

73 de I2NDT Claudio

Scatterpoint back issues

In addition to the 2017 Scatterpoints...

Our online archive of Scatterpoints now has the 2017 editions freely available.

In addition, courtesy of Peter G3PHO we have just made available a free copy of the 2004/5 UKuG Proceedings as a mere 5MB pdf to freely download.

An updated contents index for Scatterpoint will also be available soon – all on www.scatterpoint.org

BATC Mini-conventions

Shaun O'Sullivan G8VPG

At their AGM in September, the British Amateur Television Club (BATC) decided to hold a number of "mini-conventions" in various regions of the country during 2019. I am pleased to announce the first of these in Bristol on 31st March. These are not rallies with traders, but a technical meeting for ATV enthusiasts and those thinking of making a start in this aspect of the hobby, very much modelled on the microwave roundtable pattern. There will be a full day of talks and demonstrations and the opportunity to meet some of the most active ATV enthusiasts. There will also be test equipment on hand to test and align visitors projects.

There is considerable overlap in interests and membership between ATVers and Microwavers.

Sunday 31st March 2019, 10.00am to 4.00pm,

BATC Regional Convention at the premises of the North Bristol ARC,

SHE7 building, Braemar Crescent, Filton, Bristol BS7 0TD.

A full day of talks & demonstrations with a test bench available for visitors projects.

Full details of the programme will be published on the BATC Forum before the event;

https://forum.batc.org.uk

Further information from Shaun G8VPG, tel.01225 873 098, g8vpg@aol.com

Shaun O'Sullivan G8VPG,

15, Witney Close, Saltford, Bristol BS31 3DX.

Tel. 01225 873 098.

The RAL roundtable

...will be on 16th June this year, again at the Chilton village hall. Booking emails please to -

rally@g3pia.net

73, Mike Stevens,

G8CUL/M0CUL/F4VRB.

Eaton Manor DATV Workshop

Jen Easdown G4HIZ

The second Portsdown DATV workshop was held at Eaton Manor, near Church Stretton, Shropshire on the 8th December. The event was organised by Heather Lomond M0MHO, Paul Nickalls G8AQA and John Cariss G7ACD, who provided the hall. There were about 20 attendees who were able to bring along their Portsdown DATV systems in various states of completion for sorting out. As well as the team, there was a large array of test equipment to support equipment testing, including power supplies, spectrum analysers and signal generators. The event kicked off with a live Skype connection to Dave G8GKQ, the BATC project leader for the BATC Portsdown Project, who described how to debug some of the common issues and also provided an update on the latest project developments. It was interesting to hear that the LimeSDR is going to be integrated into the system and will be capable of DVB-S2, which has lower operating thresholds when compared with DVB-S and improved spectral efficiency and will be particularly useful for operating through the Es'hail-2 satellite.

As you will probably know by now, the Es'hail-2 satellite was successfully launched on November 15th and Heather gave a brief overview of the satellite operating parameters. This satellite is the world's first commercial geostationary satellite to host an Amateur Radio payload and is currently undergoing commissioning and to be hopefully available in early 2019.

Winston 2E0EOP working on his Portsdown system at the Workshop on 8th December.

Photo by John Cariss G7ACD

On Sunday 9th, Heather, Paul and John were kind enough to take myself and my XYL Joan (2E0HIZ), up to the nearby Brown Clee Hill to see the operating point there. It turned-out to be very windy at the top, but the view was fantastic all round, potentially providing a brilliant microwave operating point (altitude 540m).

Heather MOMHO, Paul G8AQA, Jen G4HIZ and Joan 2E0HIZ on top of a very windy Brown Clee Hill. The G4HIZ 24GHz system came out just long enough to hear the Telford beacon.

Photo by John Cariss G7ACD.

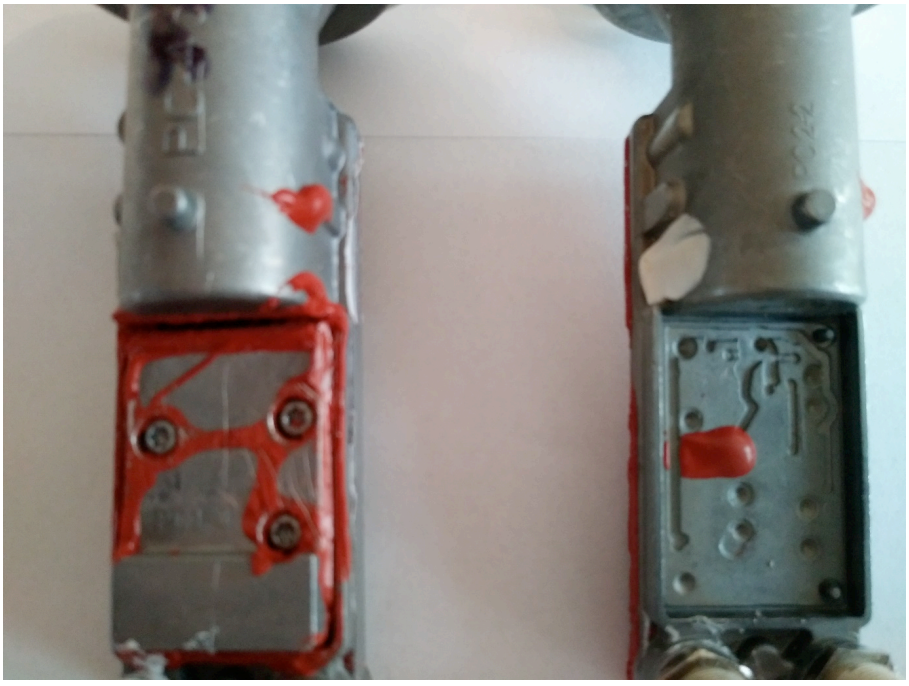
The old and new models of the Octagon Twin LNB – spot the difference !

One of the questions raised at the DATV workshop was how to identify the difference between the two versions of twin output Octagon LNB (OTLSO version), which seems to be a popular choice for Es'hail-2 reception. There has been a fair amount of discussion around this, but from my experience with several units, there are a couple of pointers. First, just to recall that the original unit had a 27MHz PLL crystal reference, whereas later units had a 25MHz crystal. It is felt by some that if you should wish to 'injection lock' one of these units then the 25MHz type may be easier. Although personally, I prefer the 27MHz type, as with a new 26MHz crystal this will give an LO of 9389MHz. How do you tell if you have a 27MHz or 25MHz type, given that the packaging gives no real clues and even the bar code looks the same ? Without removing the plastic shell of the LNB there is a clue, at least on the units I have. If you look at the graduations around the neck which are used to adjust the skew, you will see that the earlier type (27MHz) has 3 marks either side of an arrow, whereas the later type (25MHz) has 25 marks, see photo below.

Octagon twin output LNB OTLSO types, 27MHz left, 25MHz right. Notice the skew graduations.

Photo G4HIZ

If you really wish to be sure though, remove the plastic case. I did this using a small flat bladed screwdriver near the output end. You will inevitably break the plastic clips slightly, but there were usually sufficient to hold the plastic parts together afterwards. Now turn the LNB over so that the underside is visible and the connectors uppermost. You will notice that with a 27MHz type there is a set of 3 screws with a housing cover for a second PCB. For a 25MHz type this housing does not exist, see photo below.



Octagon twin output LNB OTLSO types with covers removed, 27MHz left, 25MHz right. Notice the lack of the 3 screws on the 25MHz unit. Photo G4HIZ

I would be more than pleased to hear from anyone who found things to be different !

Es’hail-2 Launch We Were There !

I very pleased to say that I was able to view the launch live at Cape Canaveral, having met up there with Noel Matthews G8GTZ (BATC General Secretary), Peter Guelzow DB2OS (President of AMSAT-DL and Phase-4A Project Leader) together with Achim Vollhardt DH2VA and Per Malmbak DC3ZB also of AMSAT-DL. The launch really was an event to remember with great international Amateur Radio camaraderie, capped-off by an invite to the EshailSat/Space-X celebration meal afterwards. Below is a photo taken the day before the launch on a visit to Kennedy Space Centre to checkout the viewing locations. Let us look forward to utilising this great facility when it becomes officially available in 2019!

The group visiting KSC on the day before the launch of Es’hail-2 at Cape Canaveral, Noel G8GTZ, Peter DB2OS, Per DC3ZB and Jen G4HIZ. Achim DH2VA is behind the camera.

Photo by Achim DH2VA

The G4BAO Diplexer Revisited for an Es'hailSat2 LNB

John Worsnop G4BAO

A few years back in Scatterpoint I described a simple diplexer that I used for the GB3CAM 24GHz beacon (1) to minimise the cabling by running the DC supply for the beacon, providing the 5V for the GPS antenna, the 124MHz drive and the GPS signal all via the common LDF4-50 feeder. This required diplexers and Bias tees for the top and bottom of the cable run. I designed a simple circuit that combined both functions and Figure 1 shows the PCB layout that was eventually used. A pair of these are connected "back to back" via the coaxial feed.

New Diplexer, new use

When I started looking at locking an LNB to a 25MHz source to use with my receive system for Es'hailSat2 I realised that the requirement is very similar, requiring a DC feed to the LNB's IF port a 25MHz feed to a separate SMA socket fitted on the LNB and an IF from the LNB. The only differences seemed to be the frequencies in use. In this case 25MHz at +5dBm for the Lock signal and between about 700 and 2300MHz for the IF. This corresponds to RF range of (700 to 2300 plus the 9750 LO of the LNB) or 10450 to 12050 MHz. This will cover the Es'hailSat transponders around 741MHz plus the Arabic TV channels around 12050MHz on the BADR4 Satellite in the same 26-degree orbital slot. BADR4 is a very useful line up signal to find the Amateur transponders. I planned to use the same PCB with re calculated values. The original PCB layout is shown Figure 1 and the circuit with original values is in Fig 2.

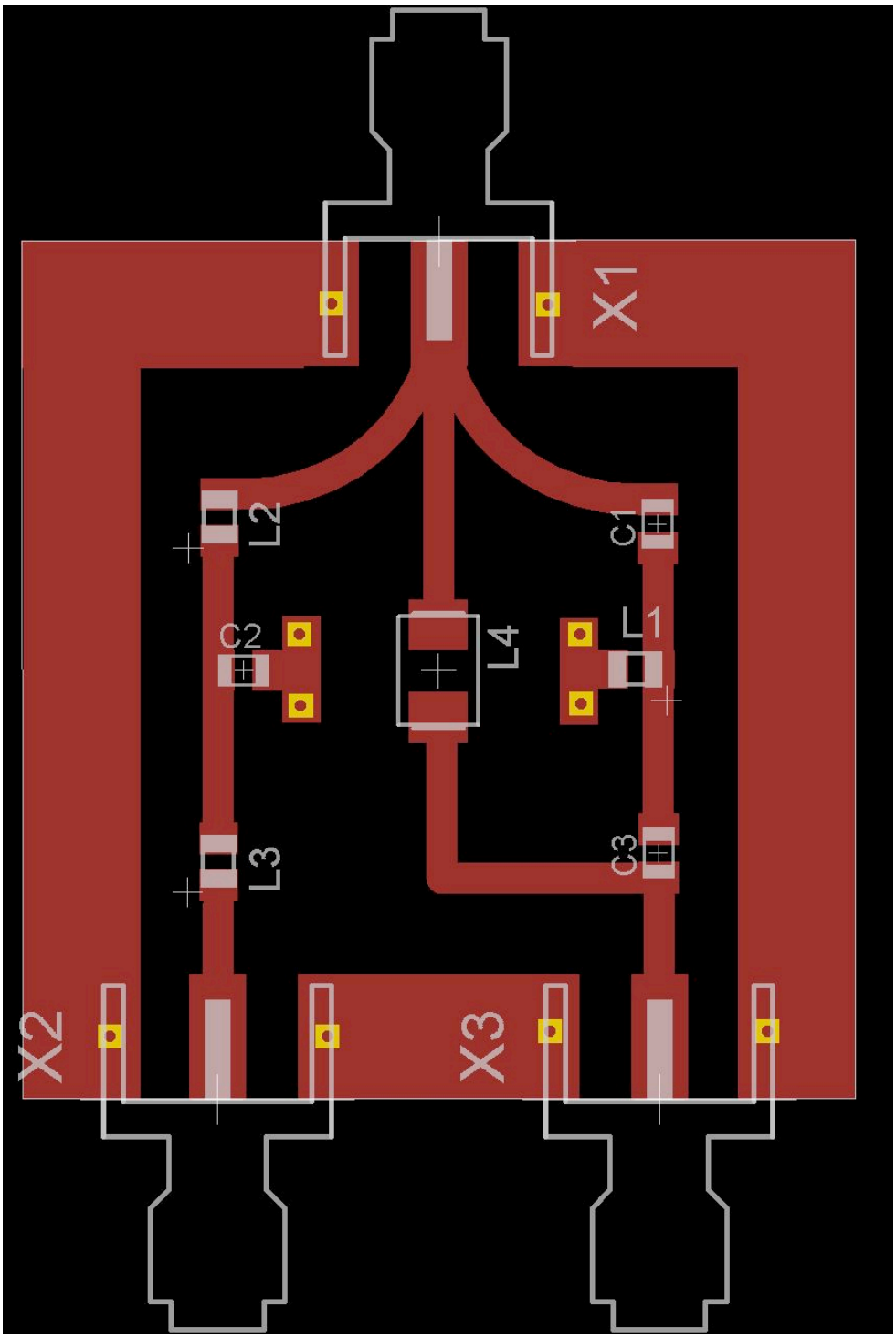


Figure 1:
Original Diplexer layout for GB3CAMt

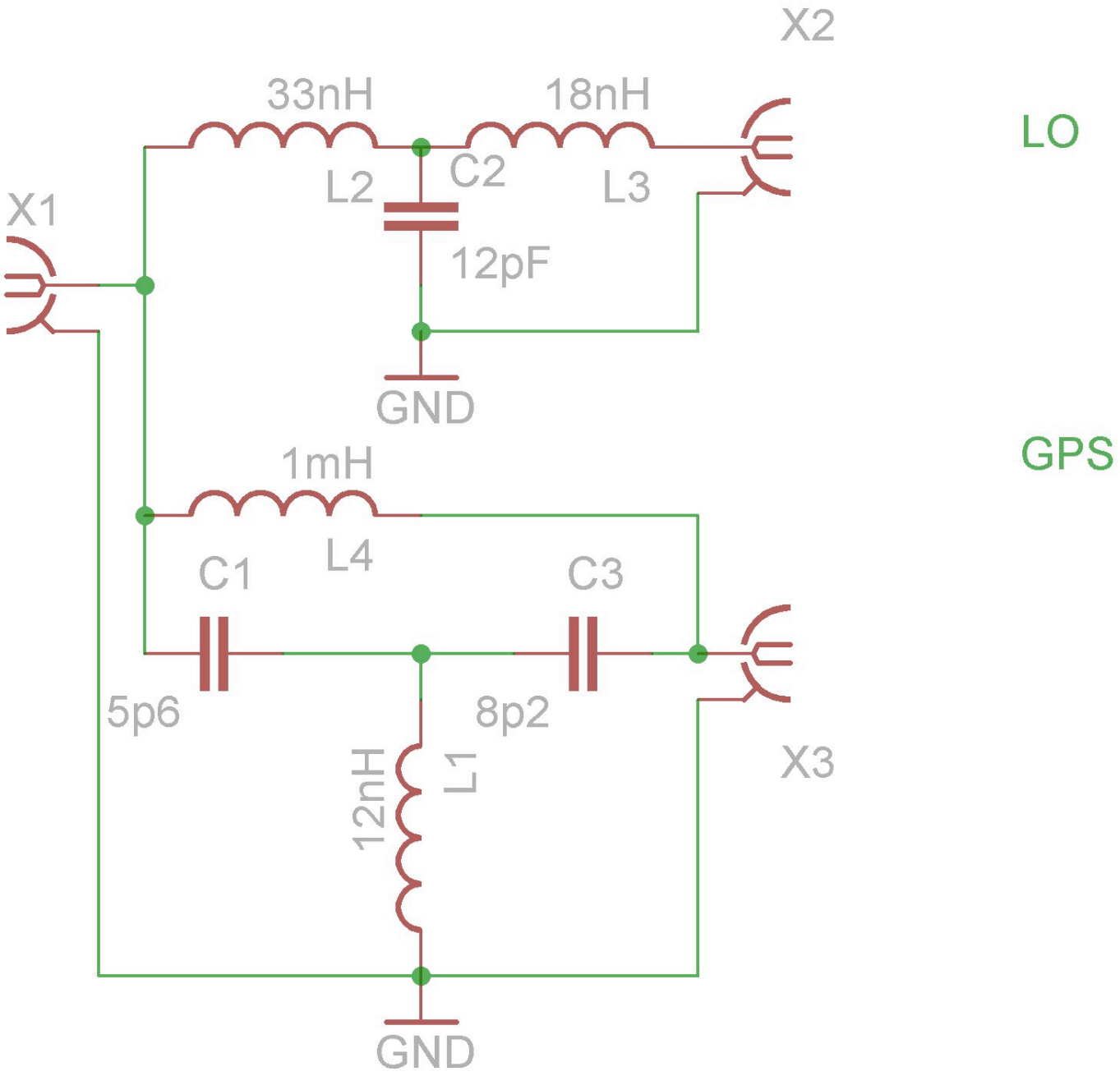


Figure 2: Original circuit and values

New Diplexer – new problems

I used the Tonne diplexer design app (2) to work out new values and built a pair of units on the same PCB layout (Figure 1) Note that there is now a 1nF DC block in series with the Low pass section (Figure 3).

The results were really odd. The losses of the IF path were high at 741MHz but huge, reaching over 25dB at 2300 MHz! Also, I noticed that there was leakage of about 6 dB from the input LO port to the IF feed to the receiver. While the diplexers worked with the huge loss as soon as I connected the lock signal the Minitouner "fell over" losing lock, while the narrowband receiver connected to the same port via a splitter was still fine. On investigating the circuit using QUCS (3) I realised that the DC feed inductor (L4, 680nH in the new design) was causing the isolation to drop below 50MHz. Only by increasing it to a number of mH in simulation was the effect removed. Unfortunately, with real world surface mount inductors the resistance was such that the LNB supply dropped to below its operating value.

I decided to remove L4 and inject the DC right at the output of the first diplexer via a 1uH wire ended choke. At the LNB end I again removed L4 and used a wire-ended 1mH choke with low resistance. Now I had good isolation (>20dB) between the LO input and the IF output.

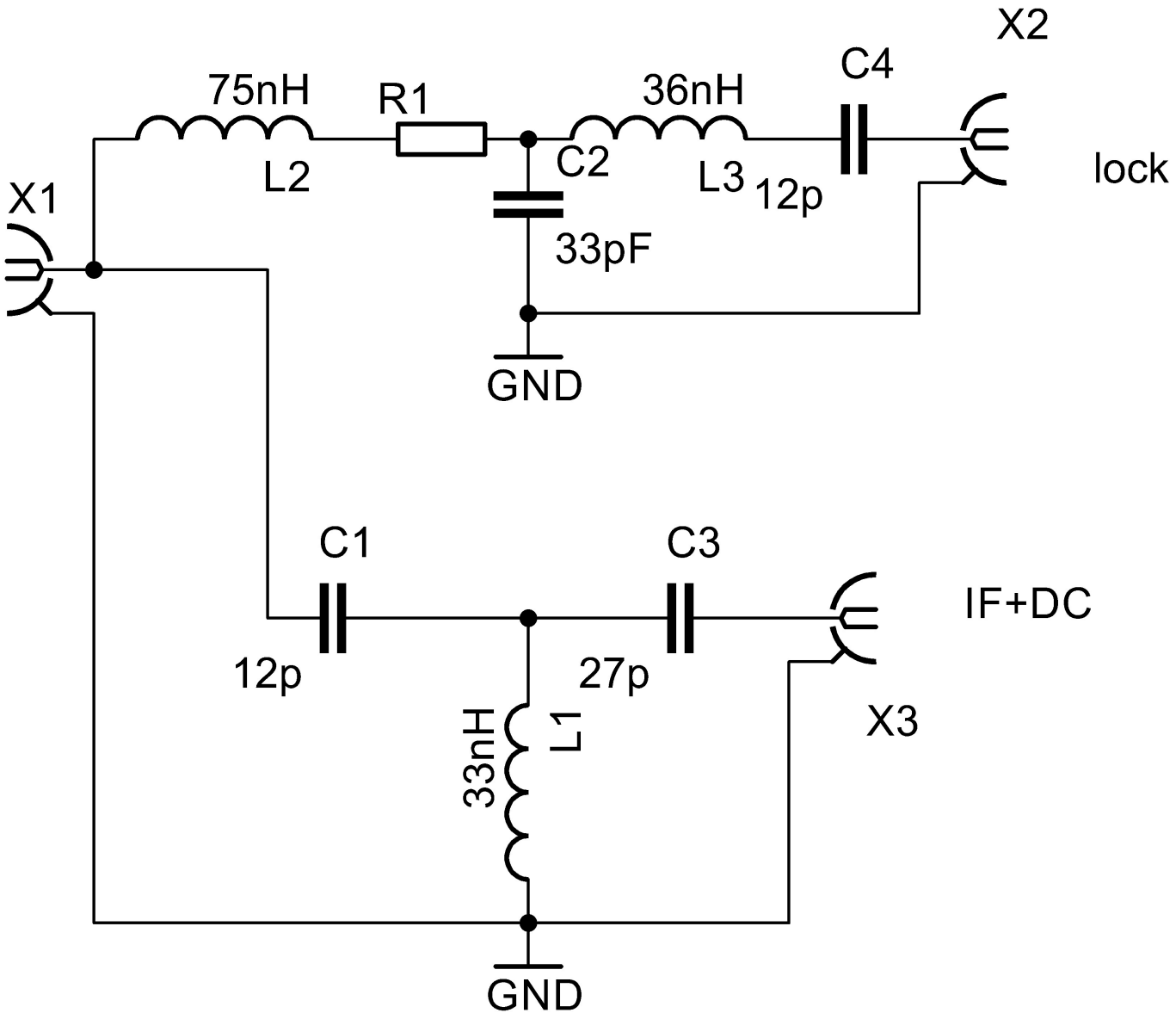


Figure 3: New circuit and values

Losses, losses and more losses!

After all this I still had huge losses in the IF path especially at 2300MHz. Something was seriously wrong, and it had to be a layout issue. I looked carefully at Figure 1 and suddenly realised that the tracks to L4 were acting as open circuit quarter wave (ish) stubs at 2300MHz on the high pass side. Lifting and removing the tracks reduced the losses, but I still had an end to end loss of 10dB over the pair of diplexers at 2300MHz. Still something wrong! Then I looked at the PCB again and realised that the track from L1 to the common port was also acting as an open circuit stub for the high pass side. L2 being effectively an open circuit at 2300MHz.

So, the final change was to do a track cut and move L2 up close to the common port and fit a zero ohm resistor in L2 position.

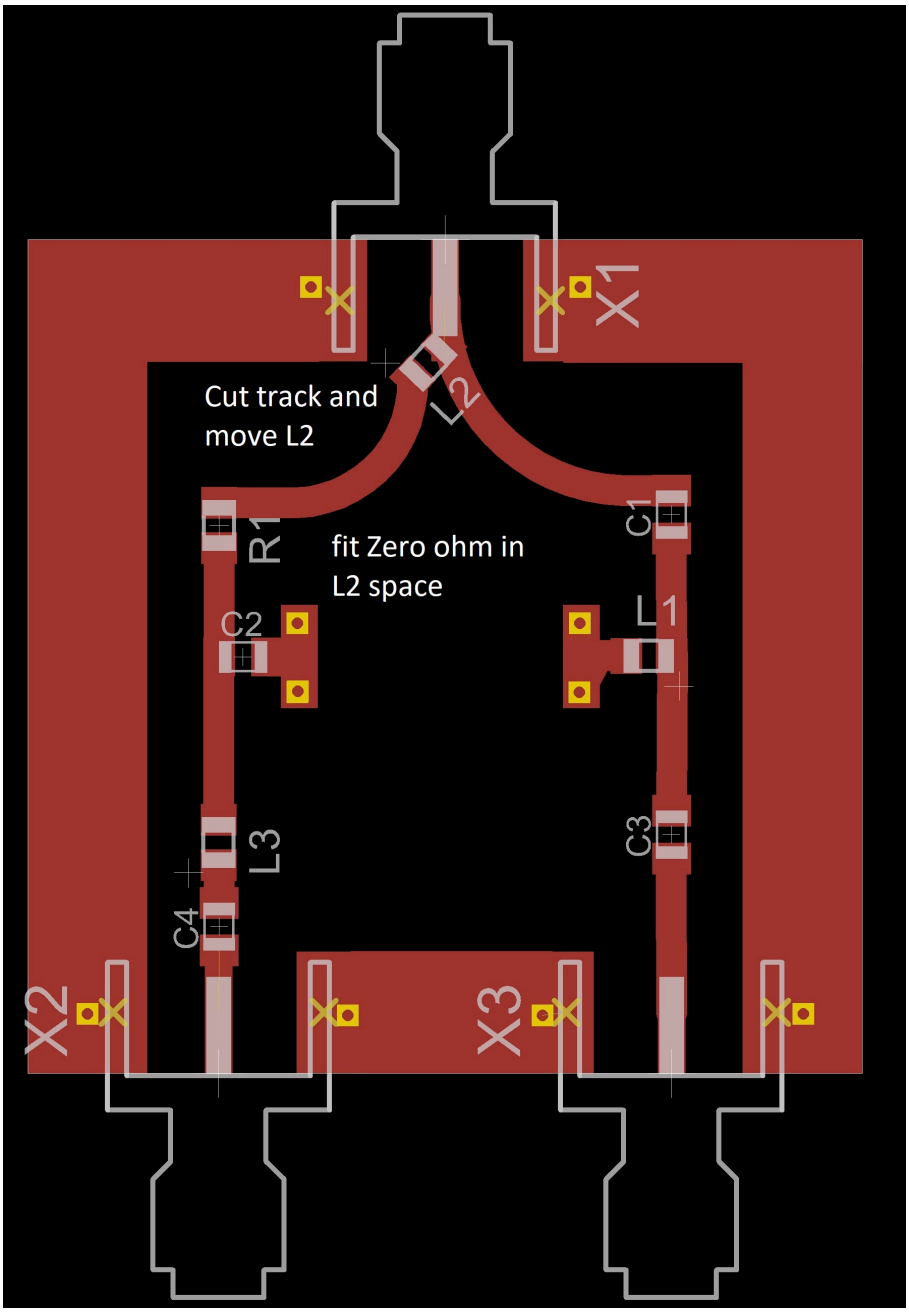


Figure 4: The final PCB layout

Now the back to back losses of the pair of diplexers were MUCH lower only around 4dB at 2300MHz and under 1 dB everywhere else.

Table 1 shows the results for the final layout and design of the diplexer pair.

Table 1

Frequency (MHz)	Loss IF-IF port	IF- LO in	LO- LO
25	>60	>60	0.24
740	0.39	>60	>60
2300	4.3	>60	>60

References

1. GB3CAM. - http://www.earf.co.uk/GB3CAM.htm
2. Diplexer design software. - http://www.tonnesoftware.com/diplexer.html
3. QUCS Quite universal circuit simulator http:-//www.qucs.sourceforge.net

Contest results

John Quarmby G3XDY, UKuG Contest Manager

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.

Final results after five sessions, the best three events count towards the total

Overall

Pos	Callsign	4-Mar-18	8-Apr-18	6-May-18	3-Jun-18	18-Nov-18	TOTAL
1	M0HNA/P	3592	3676	1360	0	3940	11208
2	G4LDR	1940	0	1332	0	696	3968
3	G3UKV	0	1676	0	0	1347	3023
4	PA5Y	947	1000	1000	0	0	2947
5	G4BRK	2233	0	708	0	0	2941
6	G4ZTR	856	693	0	1000	1000	2856
7	G3UVR	499	846	0	0	447	1792
8	G8EOP	124	590	473	0	229	1292
9	G4BAO	0	266	189	0	805	1260
10	G4KIY	426	382	220	0	505	1028
11	M0GHZ	0	823	0	0	0	823
12	G8DOH	0	58	0	0	729	787
13	G3PHO	0	306	0	0	273	579
14	G3YJR	47	134	380	0	0	561
15	G3TCT	362	0	140	0	0	502
16	G3SQQ	182	0	0	0	307	489
17	G4RQI	0	472	0	0	0	472

Pos	Callsign	4-Mar-18	8-Apr-18	6-May-18	3-Jun-18	18-Nov-18	TOTAL
18	GU6EFB	324	0	144	0	0	468
19	GM4BYF	290	0	0	149	0	439
20	GW3TKH/P	0	0	0	0	382	382
21	GM4DIJ/A	0	0	0	0	354	354
22	G8AIM	0	337	0	0	0	337
23	G3YKI	138	138	0	0	0	276
24	F4VRB	0	0	0	0	250	250
25	GM8IEM	69	97	56	0	0	222
26	G4NZV	0	172	0	0	0	172
27	G0HIK/P	0	0	0	0	161	161
28	M0OMB/P	0	151	0	0	0	151
29	G8GTZ/P	129	0	0	0	0	129
30	G4VFL/P	0	0	0	0	92	92
31	G4GSB	57	0	14	0	0	71
32	G1DFL	36	0	0	0	27	36
33	G7ENA	0	0	0	0	18	18
34	G0LGS	0	2	0	0	0	2
35	M0GDX/P	0	1	0	0	0	1
36	G8OHM	0	0	1172	0	0	0

1296MHz

Pos	Callsign	4-Mar-18	8-Apr-18	6-May-18	3-Jun-18	18-Nov-18	TOTAL
1	PA5Y	947	1000	1000	0	0	2947
2	G4ZTR	856	693	0	1000	1000	2856
3	M0HNA/P	1000	676	360	0	940	2616
4	G4KIY	426	382	220	0	505	1313
5	G4BRK	853	0	74	0	0	927
6	G8DOH	0	58	0	0	729	787
7	G4BAO	0	266	189	0	309	764
8	G4LDR	449	0	100	0	167	716
9	G3UVR	96	315	0	0	242	653
10	G3PHO	0	306	0	0	273	579
11	G3TCT	362	0	140	0	0	502
12	G4RQI	0	472	0	0	0	472
13	GU6EFB	324	0	144	0	0	468
14	G3UKV	0	275	0	0	176	451
15	GM4BYF	290	0	0	149	0	439
16	GW3TKH/P	0	0	0	0	382	382
17	G8EOP	25	155	43	0	104	302
18	G3YKI	138	138	0	0	0	276
19	F4VRB	0	0	0	0	250	250
20	GM8IEM	69	97	56	0	0	222
21	G8OHM	0	0	193	0	0	193
22	G3SQQ	182	0	0	0	0	182
23	G4NZV	0	172	0	0	0	172

Pos	Callsign	4-Mar-18	8-Apr-18	6-May-18	3-Jun-18	18-Nov-18	TOTAL
24	G0HIK/P	0	0	0	0	161	161
25	M0OMB/P	0	151	0	0	0	151
26	M0GHZ	0	132	0	0	0	132
27	GM4DIJ/A	0	0	0	0	115	115
28	G8AIM	0	84	0	0	0	84
29	G4GSB	57	0	14	0	0	71
30	G1DFL	36	0	0	0	0	36
31	G4VFL/P	0	0	0	0	24	24
32	G7ENA	0	0	0	0	18	18
33	G0LGS	0	2	0	0	0	2
34	M0GDX/P	0	1	0	0	0	1

2300MHz

Pos	Callsign	4-Mar-18	8-Apr-18	6-May-18	3-Jun-18	18-Nov-18	TOTAL
1	M0HNA/P	1000	1000	0	0	1000	3000

2320MHz

Pos	Callsign	4-Mar-18	8-Apr-18	6-May-18	3-Jun-18	18-Nov-18	TOTAL
1	M0HNA/P	1000	1000	0	0	1000	3000
2	G4LDR	491	0	1000	0	474	1965
3	G3UKV	0	618	0	0	827	1445
4	G3UVR	403	531	0	0	205	1139
5	G4BRK	685	0	323	0	0	1008
6	G8EOP	99	435	430	0	125	990
7	G8OHM	0	0	979	0	0	979
8	G4KCT	0	0	0	0	949	949
9	G3YJR	47	134	304	0	0	485
10	G3SQQ	0	0	0	0	307	307
11	M0GHZ	0	252	0	0	0	252
12	GM4DIJ/A	0	0	0	0	239	239
13	G8AIM	0	69	0	0	0	69
14	G4VFL/P	0	0	0	0	68	68

3400MHz

Pos	Callsign	4-Mar-18	8-Apr-18	6-May-18	3-Jun-18	18-Nov-18	TOTAL
1	M0HNA/P	592	1000	1000	0	1000	3000
2	G4LDR	1000	0	232	0	55	1287
3	G3UKV	0	783	0	0	344	1127
4	G4BRK	695	0	311	0	0	1006
5	G4BAO	0	0	0	0	496	496
6	M0GHZ	0	439	0	0	0	439
7	G8AIM	0	184	0	0	0	184
8	G8GTZ/P	129	0	0	0	0	129
9	G1DFL	0	0	0	0	27	27

mm-Wave Championship 2018

Entry levels for the 2018 Championship stayed broadly at the same level as in 2017. The October session saw the best conditions with lower humidity helping reduce path losses. This year saw probably the first instance of fixed station operation on 76GHz from G4LDR.

The winner on 24GHz and recipient of the G0RRJ Memorial Trophy is Roger G8CUB/P, repeating his success of 2017. Runner up is Neil G4LDR who operated both from home and out portable. Several stations made good use of the rover rules to boost their scores.

On 47GHz Neil G4LDR leads the field, again with a mix of home station and portable operation, with Keith GW3TKH/P in the runner up spot. G4LDR therefore wins the 47GHz Trophy.

This year's winner on 76GHz is Keith GW3TKH/P with some fine contacts. Roger G8CUB/P is the runner up on this band.

It is expected that next year's contest programme will broadly follow the same format, but that the contest exchange will be 8 character locators to permit more accurate determination of distances.

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 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 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 continue 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:

1. 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.
2. 5.7GHz (5 contest days with 3 to count for the championship), on the same days as the 10GHz contests.
3. 10GHz (5 contest days with 3 to count for the championship), on the same days as the 5.7GHz contests.
4. 24GHz G0RRJ Memorial Trophy Contests (4 contest days with 3 to count for the championship).
5. 24GHz Trophy awarded to the leading station on 24GHz in the 24GHz -248GHz event in June.
6. 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 millimeter 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 millimeter 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.

UKµG 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)	

80m UK Microwavers net

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

73 Martyn Vincent G3UKV

UKµG Contest Overview

Month	Contest name	Certificates	Date 2019	Time GMT	Notes
Jan	1.3GHz Activity Contest	*Arranged by RSGB*	15-Jan	2000 - 2230	RSGB Contest
Jan	2.3GHz+ Activity Contest	*Arranged by RSGB*	22-Jan	1930 - 2230*	RSGB Contest
Feb	1.3GHz Activity Contest	*Arranged by RSGB*	19-Feb	2000 - 2230	RSGB Contest
Feb	2.3GHz+ Activity Contest	*Arranged by RSGB*	26-Feb	1930 - 2230*	RSGB Contest
Mar	Low band 1.3/2.3/3.4GHz	F, P,L	3-Mar	1000 - 1600	First 4 hours coincide with IARU event
Mar	REF/DUBUS EME 2.3GHz	*Arranged by REF/DUBUS*	16-Mar to 17-Mar	0000 - 2400	REF/DUBUS EME 2.3GHz
Mar	1.3GHz Activity Contest	*Arranged by RSGB*	19-Mar	2000 - 2230	RSGB Contest
Mar	2.3GHz+ Activity Contest	*Arranged by RSGB*	26-Mar	1830 - 2130*	RSGB Contest
Apr	Low band 1.3/2.3/3.4GHz 2	F, P,L	7-Apr	1000 - 1600	
Apr	REF/DUBUS EME 1.2GHz	*Arranged by REF/DUBUS*	13-Apr to 14-Apr	0000 - 2400	REF/DUBUS EME 1.2GHz
Apr	1.3GHz Activity Contest	*Arranged by RSGB*	16-Apr	1900 - 2130	RSGB Contest
Apr	2.3GHz+ Activity Contest	*Arranged by RSGB*	23-Apr	1830 - 2130*	RSGB Contest
May	*10GHz Trophy*	*Arranged by RSGB*	*4-May*	*1400 - 2200*	Saturday, to coincide with IARU
May	*432MHz & up*	*Arranged by RSGB*	*4-May to 5-May*	*1400 -1400*	RSGB Contest
May	Low band 1.3/2.3/3.4GHz 3	F, P,L	5-May	0800 - 1400	Aligned with RSGB/IARU event
May	REF/DUBUS EME 10GHz & up	*Arranged by REF/DUBUS*	11-May to 12-May	0000 - 2400	REF/DUBUS EME 10GHz & up
May	24GHz/47GHz/ 76GHz		19-May	0900-1700	
May	1.3GHz Activity Contest	*Arranged by RSGB*	21-May	1900 - 2130	RSGB Contest
May	5.7GHz/10GHz	F, P,L	26-May	0600-1800	
May	2.3GHz+ Activity Contest	*Arranged by RSGB*	28-May	1830 - 2130*	RSGB Contest

Month	Contest name	Certificates	Date 2019	Time GMT	Notes
Jun	Low band 1.3/2.3/3.4GHz 4	F, P,L	2-Jun	1000 - 1600	Aligned with some Eu events
Jun	REF/DUBUS EME 5.7GHz	*Arranged by REF/DUBUS*	8-Jun to 9-Jun	0000 - 2400	REF/DUBUS EME 5.7GHz
Jun	24GHz-248GHz Contest		16-Jun	0900-1700	
Jun	1.3GHz Activity Contest	*Arranged by RSGB*	18-Jun	1900 - 2130	RSGB Contest
Jun	2.3GHz+ Activity Contest	*Arranged by RSGB*	25-Jun	1830 - 2130*	RSGB Contest
Jun	REF/DUBUS EME 3.4GHz	*Arranged by REF/DUBUS*	29-Jun to 30-Jun	0000 - 2400	REF/DUBUS EME 3.4GHz
Jun	5.7GHz/10GHz	F, P,L	30-Jun	0600-1800	
Jul	VHF NFD (1.3GHz)	*Arranged by RSGB*	6-Jul to 7-Jul	1400 - 1400	RSGB Contest
Jul	1.3GHz Activity Contest	*Arranged by RSGB*	16-Jul	1900 - 2130	RSGB Contest
Jul	2.3GHz+ Activity Contest	*Arranged by RSGB*	23-Jul	1830 - 2130*	RSGB Contest
Jul	5.7GHz/10GHz	F, P,L	28-Jul	0600-1800	
Aug	1.3GHz Activity Contest	*Arranged by RSGB*	20-Aug	1900 - 2130	RSGB Contest
Aug	5.7GHz/10GHz	F, P,L	25-Aug	0600-1800	
Aug	2.3GHz+ Activity Contest	*Arranged by RSGB*	27-Aug	1830 - 2130*	RSGB Contest
Sep	24GHz/47GHz/ 76GHz		15-Sep	0900-1700	
Sep	1.3GHz Activity Contest	*Arranged by RSGB*	17-Sep	1900 - 2130	RSGB Contest
Sep	ARRL Microwave EME	*Arranged by ARRL*	21-Sep to 22-Sep	0000 - 2359	ARRL EME 2.3GHz & Up
Sep	2.3GHz+ Activity Contest	*Arranged by RSGB*	24-Sep	1830 - 2130*	RSGB Contest
Sep	5.7GHz/10GHz	F, P,L	29-Sep	0600-1800	
Oct	*1.3 & 2.3GHz Trophies*	*Arranged by RSGB*	*5-Oct*	*1400 - 2200*	RSGB Contest
Oct	*432MHz & up*	*Arranged by RSGB*	*5-Oct to 6-Oct*	*1400 - 1400*	IARU/RSGB Contest
Oct	1.3GHz Activity Contest	*Arranged by RSGB*	15-Oct	1900 - 2130	RSGB Contest
Oct	ARRL EME 50-1296MHz	*Arranged by ARRL*	19-Oct to 20-Oct	0000 - 2359	ARRL EME Contest
Oct	24GHz/47GHz/ 76GHz		20-Oct	0900-1700	

Month	Contest name	Certificates	Date 2019	Time GMT	Notes
Oct	2.3GHz+ Activity Contest	*Arranged by RSGB*	22-Oct	1830 - 2130*	RSGB Contest
Nov	ARRL EME 50-1296MHz	*Arranged by ARRL*	16-Nov to 17-Nov	0000 - 2359	ARRL EME Contest
Nov	Low band 1.3/2.3/3.4GHz 5	F, P,L	17-Nov	1000 - 1400	
Nov	1.3GHz Activity Contest	*Arranged by RSGB*	19-Nov	2000 - 2230	RSGB Contest
Nov	2.3GHz+ Activity Contest	*Arranged by RSGB*	26-Nov	1930 - 2230*	RSGB Contest
Dec	1.3GHz Activity Contest	*Arranged by RSGB*	17-Dec	2000 - 2230	RSGB Contest
Dec	1.3GHz Activity Contest	*Arranged by RSGB*	17-Dec	2000 - 2230	RSGB Contest

Activity News : Dec 2018 & Jan 2019

By Neil Underwood G4LDR

Please send your activity news to:

scatterpoint@microwavers. org

Introduction

As has become usual at this time of year and particularly with no scheduled UKuW contests or activity periods and no RSGB UKAC 2.3 to 10GHz contest in December there is less to report. The exception is on the mm-wave bands where the reduced absolute humidity on colder dryer days leads to less atmospheric attenuation, thus giving the potential for increasing distances worked.

mm-Wave Band Report

From Neil, G4LDR, IO91

On Sunday 13th January I was persuaded by Noel G8GTZ to try some more contacts on 76GHz including trying to extend the range using DATV. As our attempts using DATV for a couple of paths in the range of 15 to 35km last September had failed we decided to try a path of about 12km between Hannington north west of Basingstoke and Farley Wallop south west of Basingstoke which we had previously worked. On this occasion visibility was good and we could see each other's sites. On narrow band signals were 59+ (i.e. end stop) and we had no problem in exchanging reduced band width TV pictures (333ksymbloms/sec). We discussed trying a longer path of 28km from Hannington (IO91JH) to Cheesefoot Head near Winchester (IO91JB), which I was not convinced would work based on the estimated signal strength and picture quality margin we had. Noel was able to show me via the 76GHz link the gap in a hedge he would need to aim through and by zooming in, Cheesefoot Head on the horizon.

I therefore drove to Winchester and joined Dave G8GKQ and John G4JTT in the Cheese Foot car park and set up the 76GHz gear. Narrow band signals (59+) were quickly acquired which allowed accurate dish alignment. When I switched to DATV Noel immediately saw my pictures. We exchanged pictures again using reduced bandwidth TV at 333ksymbols/sec. Interestingly signal strength and quality were about the same as they had been over the shorter line of sight path at Basingstoke. We decided to try High Definition TV at 2000ksymbols/sec and much to everyone's surprise it worked. A photograph of Noel's lap top screen is shown in Figure 1. Noel was using the UKuW 76GHz loan equipment.

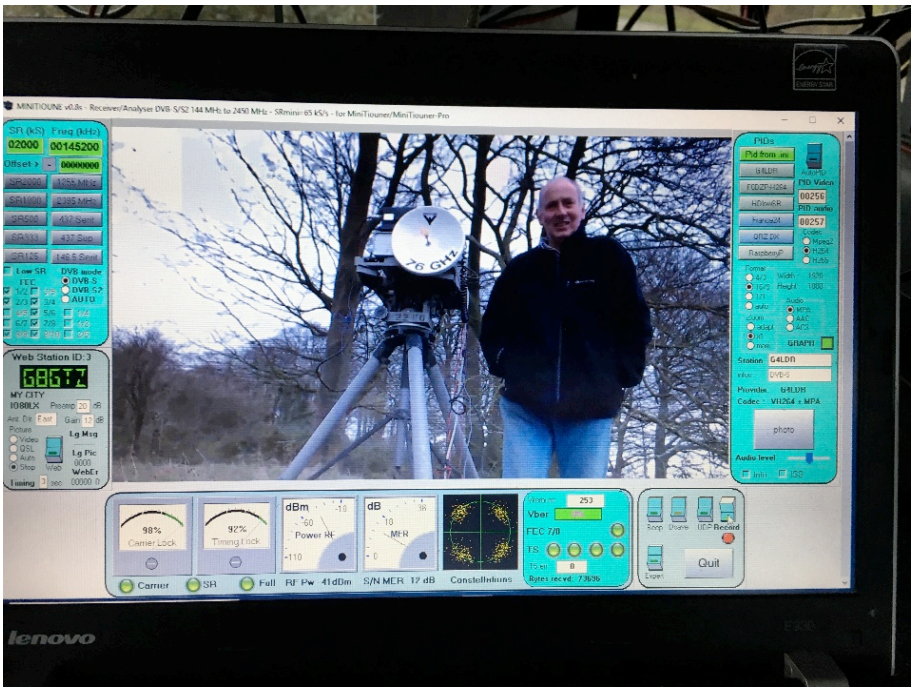


Fig 1. G4LDR/P as received by G8GTZ/P in HD DATV over a 28km path on 76GHz

At the time we worked the Hannington to Chessefoot Head path (between 1330 and 1400), it was no longer possible to mutually see the other site due to a low level band of cloud/drizzle/rain sitting across the middle

part of the path. Could this have enhanced signals in anyway (on a line of sight path)? The data from the Chilbolton 94GHz cloud radar (which is only a few km west of the path) does show reflections from small water droplets up to a height of 1km as is shown in Figure 2. The 34GHz cloud radar was not showing any significant reflections at the time. The temperature was 10deg C and humidity 80% r/h with very strong winds from the west (resulting in significant wind chill as experienced by us all on the two hill tops).

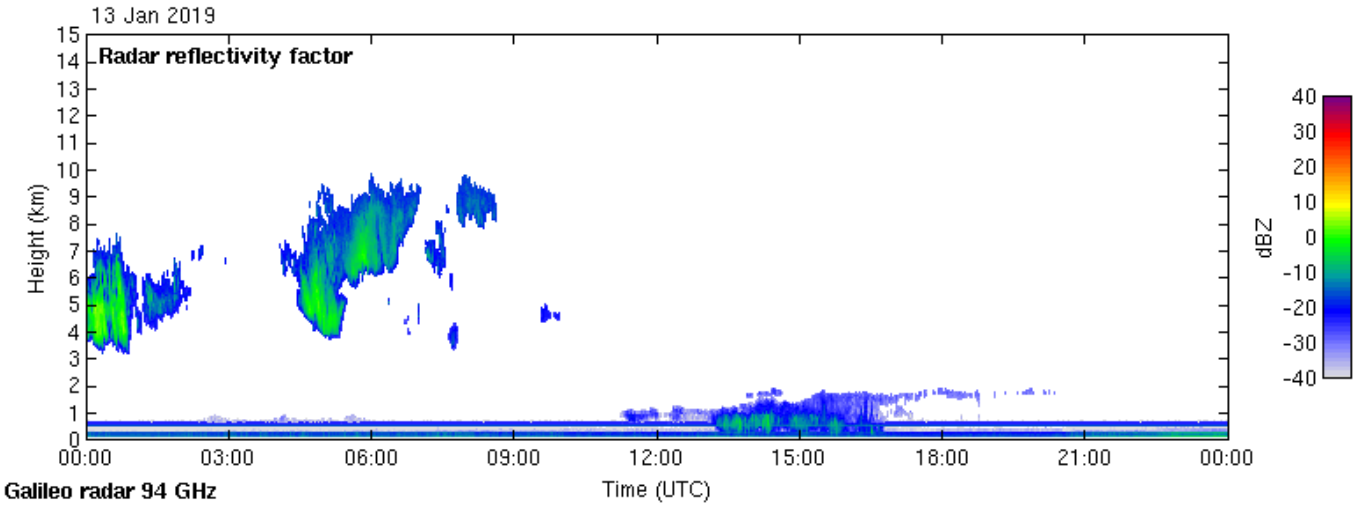


Fig 2. Chilbolton 94GHz Cloud radar, 76GHz DATV contact took place between 13:30 and 14:00

From Roger Ray G8CUB

Chris G0FDZ & I went to Higham, Kent on 11th January.

Operating on 241GHz using sub-harmonic mixers at each end. We completed an SSB contact at a distance of 1.25km. Reports were 58 each way. Having an actual speech qso was novel at this frequency! With most millimetre contacts being on CW.

At one end the LO was just over 120GHz giving an IF of 432MHz. At the other end the IF was 24GHz with LO around 108GHz.

Chris using the 24G IF system first found my separate beacon on 241.02G. I then turned the beacon off, and we had a qso on the same frequency. I was using LSB as I had a high side LO (which kept the image in band). The audio sounded somewhat FM. Though this is thought to be slight wobble of the references and possible phase changes in the tx mixer.

Beacon News

A new 13cm beacon became operational on December from Farnham in Hampshire thanks to the hard work of Barry, G4SJH. GB3FNH is on 2320.920MHz and has so far been heard across the south of the UK and in the Netherlands.

.....and finally

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

Events calendar

2019

January 19	Heelweg, Westendorp.	
February 16	Tagung Dorsten	www.ghz-tagung.de/
March 15	IET Colloquium on Millimetre-wave and Terahertz Engineering & Technology 2019	www.theiet.org/events/2019/248017.cfm
March 16	Cardiff Roundtable	www.cardiffars.org.uk/roundtable/
April 13	CJ-2019, Seigy	cj.r-e-f.org/
April 13/14	Martlesham Roundtable / AGM	mmrt.homedns.org/
April 26–28	IARU Region-1 Interim Meeting, Vienna	
April 27	RSGB AGM, Birmingham	rsgb.org/agm
May 17–19	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/
Sept tbc	Crawley Roundtable	
Sept 6-8	64.UKW Tagung Weinheim	www.ukw-tagung.de/
Sept 27–28	National Hamfest	www.nationalhamfest.org.uk/
Sept 29–Oct 4	European Microwave Week, Paris	www.eumweek.com/
Oct 11–13	RSGB Convention	rsgb.org/convention/
Oct 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 Roundtable	www.gmroundtable.org.uk/

2020

August	EME 2020 in Prague	domain www.eme2020.cz registered but currently not in use [*Googling EME2020 comes up with some unusual items! Ed.*]
Sept 13–18	European Microwave Week, Utrecht	www.eumweek.com/
Oct 10–16	IARU-R1 General Conference, Novi Sad	