An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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In This Issue

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, 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.

Roger G8CUB

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 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

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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: **Contact John G4BAO for more information**

5.7GHz 10GHz 24GHz 47GHz (coming soon) 76GHz

Fraser-Shepherd Award

Each year the RSGB awards the Fraser-Shepherd award "For research into microwave applications to radio communication in honour of Fraser Shepherd GM3EGW". Although this award is given in the name of the RSGB, it is the UKuG that makes the decision as to who should get the award each year. Previous winners include the ES'Hail-2 web SDR team, G4HUP, G0FDZ and G8CUB, G8ACE and G8KQW.
In the past this decision was made by the UKuG committee but this year we would like nominations from the membership so please let me know if you would like to nominate someone by sending me an email to -
trophies@microwavers.org
The committee can then make the final decision.
Remember that the remit for the Fraser-Shepherd award is "For research into microwave applications to radio communication"
Thanks,
73,
Mike, G8CUL.

a fuller list of past recipients for UKuG awards is at:-
https://www.microwavers.org/?award-history.htm

UKMicrowave Group Hayling SDR project

Following on from discussions at the Martlesham and Crawley Microwave roundtables about the need for an SDR based Microwave transceiver, Noel G8GTZ has written the following project proposal. This sets out the idea of a phased development based on the Rpi to provide an all mode transceivers for microwave bands up to 3.4Ghz and possibly 5.7Ghz, depending upon SDR hardware used.

All we need now is for volunteers to help make it happen! Colin G4EML has volunteered to be the main contact point for the project and Heather M0HMO has offered to contribute to the project which will be hosted on GitHub - but we are still looking for others to contribute towards the code or publish designs in ScatterPoint for the additional system components such as Pas, LNAs and higher band transverters.

The Hayling project

Noel Matthews G8GTZ – October 2019

Introduction
The introduction of advanced SDR hardware such as LimeSDR and Adalm pluto means it is now possible to receive and generate signals on the lower and medium microwave bands from a single "box solution" at very low cost. This, coupled with the development of high powered single board computers such as the Rpi, means it should now be possible to build an advanced mulit-band multi-mode radio using off the shelf components for under £250. However, whilst the various modules to do this are available as standalone items, there does not seem to be a single integrated offering which makes it easy for users to get on the air.
The proposal
This is proposal is for a UKmicrowave group sponsored project to develop a VHF/UHF and microwave transceiver developed around the Raspberry PI and commonly available SDR hardware such as LimeSDR Mini or Adalm Pluto. It would provide a basic transceiver primarily designed to give coverage of the 1.2, 2.3, 2.32, 3.4 and 5.6 GHz microwave bands.
The idea is to develop a receive/transmit system along the lines of the BATC Portsdown system, which uses a number of software modules developed by various people within the ATV community, to provide a standalone, easy to use DATV transmit system. Over 350 people have purchased components to build the Portsdown and it has enabled

significant numbers of stations, including several members of the Microwave group committee, to overcome the significant challenges to get on the air with DATV.
Hayling is suggested as the project name in memory of Mike Walters, G3JVL, who lived on Hayling Island and as well as the development of efficient microwave antennas and the JVL waveguide based transceiver provided help and encouragement to many of today's microwavers to get on air.

Project aims and scope

The project aim is to produce a standalone transceiver with operation from 50 MHz up to 5.7GHz depending on the hardware used. The aim would be to provide a totally self-contained dedicated transceiver, ideal for use out portable. It is envisaged the major focus and work for the project will be the integration of a number of existing software modules and to provide an easy to use user interface.
The project would not be set up to directly provide an SDR education course but should be seen as a community develop project with files hosted on Github or similar and people will be encouraged to contribute and learn by doing so.

Outline specification

The key to the success of a project like this is to agree a very tight spec before development starts and aim to have phased releases for new functionality. Without this level of control, the volunteers doing the work will soon feel overwhelmed by feature demands and complaints from the user community – under promise and over deliver is the key to success!
It is envisaged that the project will be developed on the Rpi4 and an integrated touchscreen. The Element 14 7" screen used on the Portsdown has proved to be very reliable and useable in portable environments. Note there are significant differences with between the Rpi 4 and earlier hardware versions and it is suggested that no backwards compatibility would be offered.
SDR hardware compatibility should be targeted at the LimeSDR mini and Adalm Pluto which are available for under £200 and will give coverage of all bands up to 3.4 GHz (5.6GHz in the case of the Pluto).
An external USB dongle would be used for audio in and outputs.
Exact hardware and case design should be left to the individual constructor.
The basic functionality would be CW, USB and FM modes on both transmit and receive. The aim would not be to produce a complex unit which competes for the number of bells and whistles with a state of the art commercial transceiver but provides a good basic low power transceiver which enables contacts on the microwave bands. The unit will also provide coverage of 50MHz and 144 MHz but RF performance may not be comparable with transceivers designed for those bands.
Additional functionality which may be incorporated at later phases could include:

- SDR waterfall display
- Integration of CW keyers and readers
- Integration of WSJT and similar modes
- KST and Zello screens
- Web interface and remote control

Companion products

The SDR transceiver will provide basic functionality, including PTT steering and RF switching, and can be used as the basis for several DIY construction projects to provide the required filtering, power amplifiers and pre-amps .
This is an ideal opportunity for the microwave community to encourage home construction and use Scatterpoint to publish or re-publish a series of designs under the Hayling project name.
Designs for more advanced compatible low cost transverter solutions for the higher bands could also be published as part of the Hayling project.

The Portsdown project

This proposal is written based on the very positive impact the Portsdown project has had for the ATV community. Given the support of the Microwave group I see no reason why this success could not be replicated for Narrow Band microwaves.

The BATC is happy for the Hayling project to use any code the team thinks appropriate and it is all in the public domain on Github. Note some of the UI code may no longer be directly re-useable due to some libraries becoming obsolete with the release of the RPi4.

There are also some Portsdown PCBs which may be of use for the Hayling project such as Rpi GPIO breakout, 4 and 8 way RF switches and PTT steering boards – these could be made available to non BATC members through the UK Microwave group.

The BATC team are also happy to share their experiences in running such a project.

What resources do we need?

To make this happen, the key thing is to build a small core team who will promote and develop the project and find at least one person who has the capability to understand and integrate the various modules required. They will also need to understand basic UI design and be willing to provide ongoing support to the community of constructors.

A large number of software modules are already available although some run under the desktop and others natively – these are a few I found from a quick web search:

- F5OEO has developed basic SSB and FM transmit functions – already used by stations on Oscar100 and available on Github
- GQrx is an SDR rx package http://gqrx.dk/download/gqrx-sdr-for-the-raspberry-pi
- WSPR https://gerolfziegenhain.wordpress.com/2013/04/13/raspi-as-wspr-transmitter/
- WSJT package for Rpi

The community and online support

The project will need some dedicated on line support and it is suggested the Microwave Wiki would be used to set up the user manual and reference pages.

This would not be used for Q+A which will require a community forum - email reflector is not appropriate for this as people need to be able to read back across the history of a thread in one place. The community forum would also be the place to exchange ideas on hardware design including cases and add on functionality.

A UKmicrowave group github should be used for version control and distribution of the files.

These resources will be significant in helping build the self-help community required for the success of such a project.

Conclusion

Whilst this is a challenging project which will need to be undertaken by the right team, it is a great opportunity to build a product that is the easy way to get on to microwaves.

It will be a great story for the UKMicrowave group to demo and talk about at rallies etc. and is great way to interest new comers to microwavers and build a strong community around the project. The project will also provide a large number of articles for publication in Scatterpoint and content for articles in the GHz column and standalone articles in Radcom.

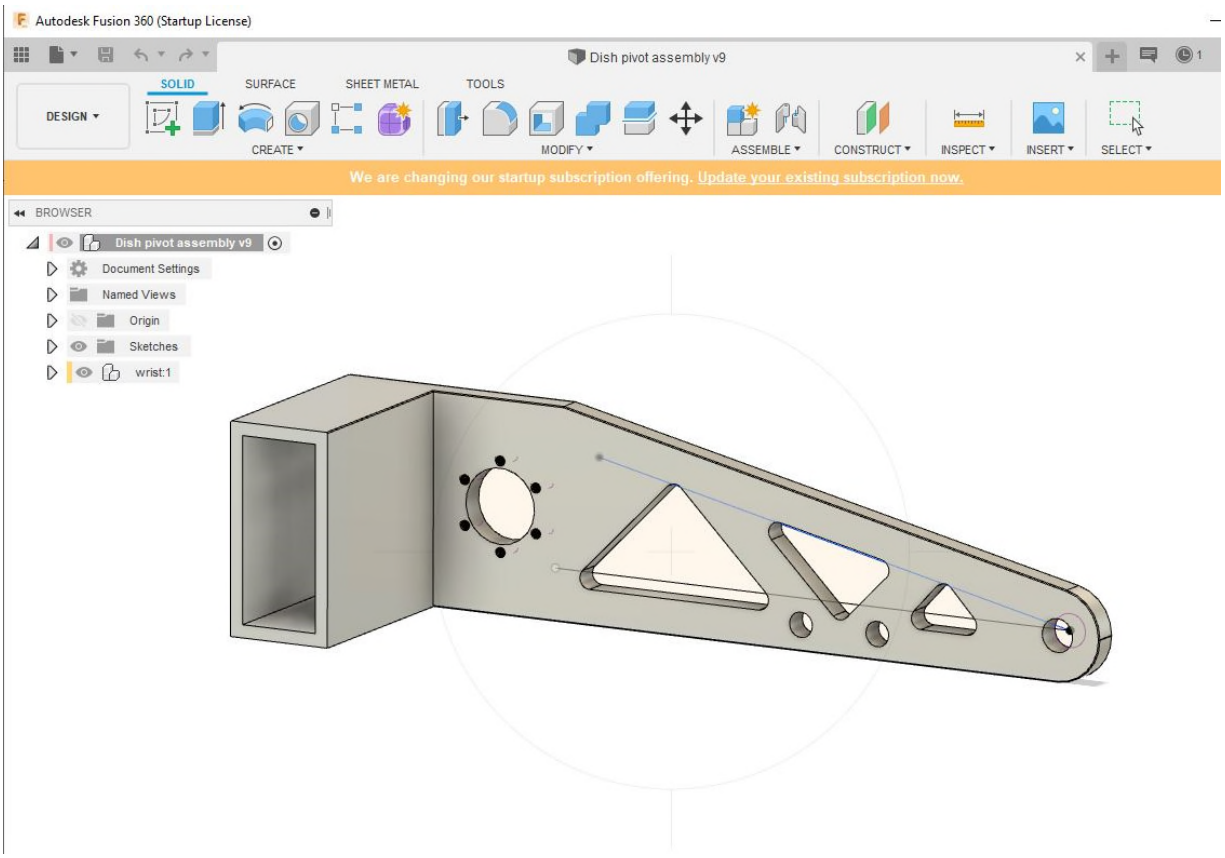
Elevation system and feedpoint support for van-mounted 2.4m mesh dish

Neil G4DBN

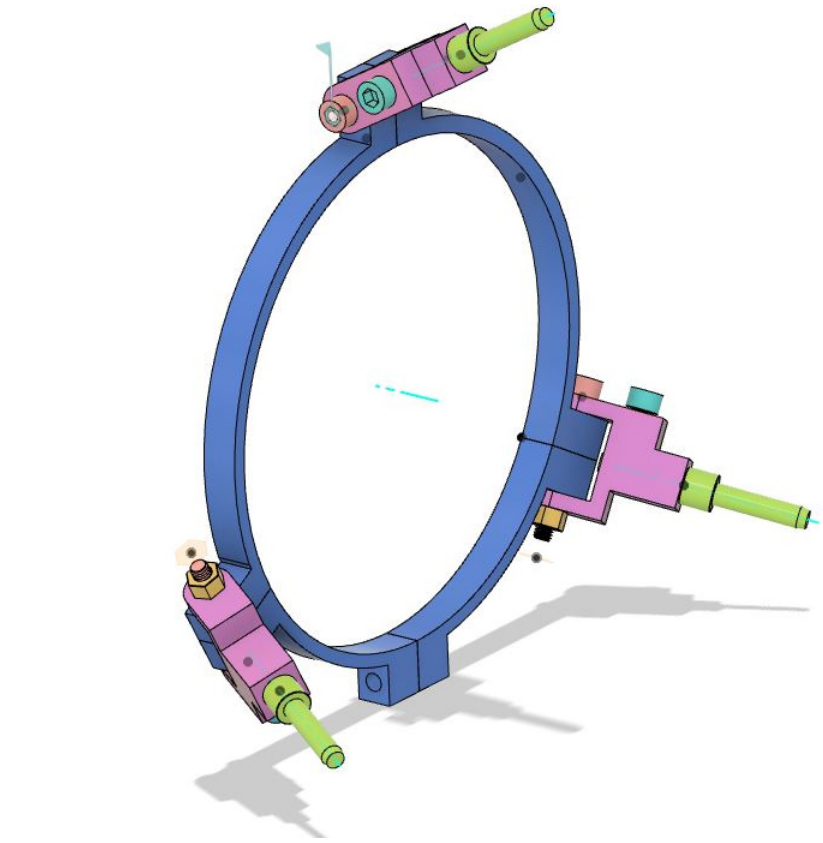
I've been working with Tony G8DMU to design portable antenna solutions for microwave bands which are fast and safe to deploy and operate single-handed while up a hill in North Yorkshire Design brief was that it all had to be put together without help and taken down in the dark on a wet and windy mountain top. This part of the project was to add quick-deployment and elevation accessories to a 2.4m RFHamdesign dish to fit on Tony's big pneumatic mast attached to his van.

"Tony testing the finished system"

I drew up some CAD designs to check the clearances, range of motion and nod angles of the dish for deployment and stowage. I use the Startup licence for Fusion360, which is a superb CAD tool.



"Fusion360 CAD model of the saddle"

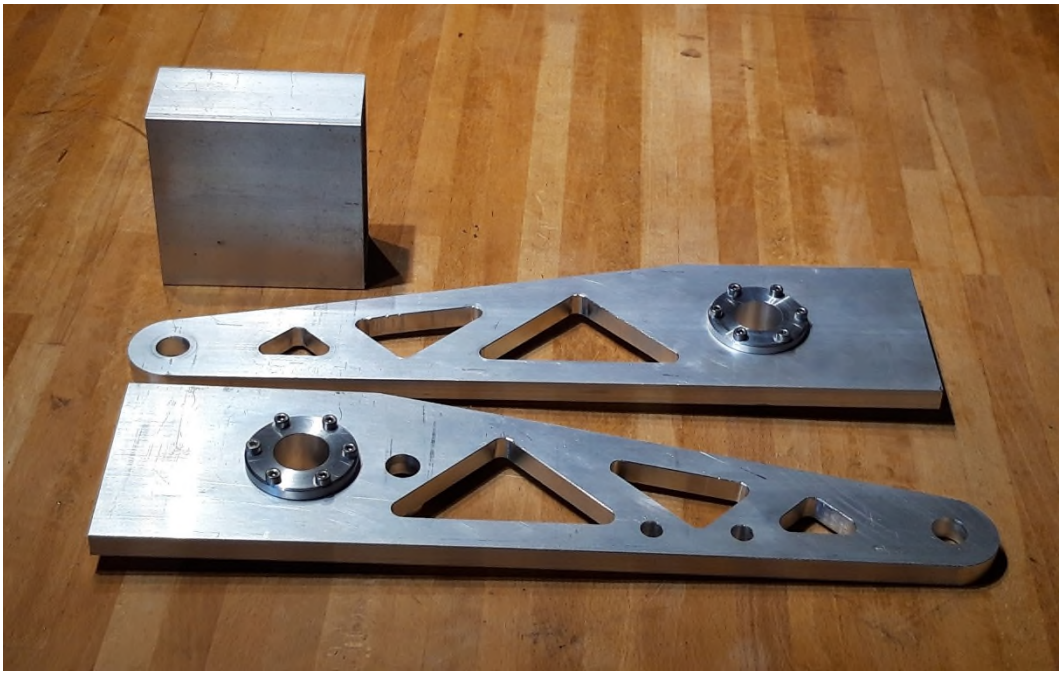


"CAD model of the feedpoint ring"

Once I was happy that the geometry would work, I generated dimensioned drawings in Fusion360 and fabricated a saddle from milled aluminium plate and box section, TIG welded together. The bearing uses UHMWPE bushes in

turned aluminium carriers, with a 20mm stainless steel pivot rod held in a machined fitting pressed into the top of a thick-walled tube. All of this was done on my 1962-vintage Bridgeport mill and 1980s Colchester 1800 lathe as I don't have anything as clever as CNC (yet).

I had to rotate the holes in the dish mount by 15 degrees so the mast and rotator would fit between two of the dish support struts, allowing a down-nod of around 18 degrees for parking the dish ready to lash down to the van roof bars. Tony has fitted extension tubes to the top rails, which the dish can land on as it is luffed over. The mast then retracts, and lays flush with the roof checkerplate walkway. The dish then slides into place above it and the extensions are retracted, then the dish is fixed with straps.



"Side cheeks and dish mounting block before welding"

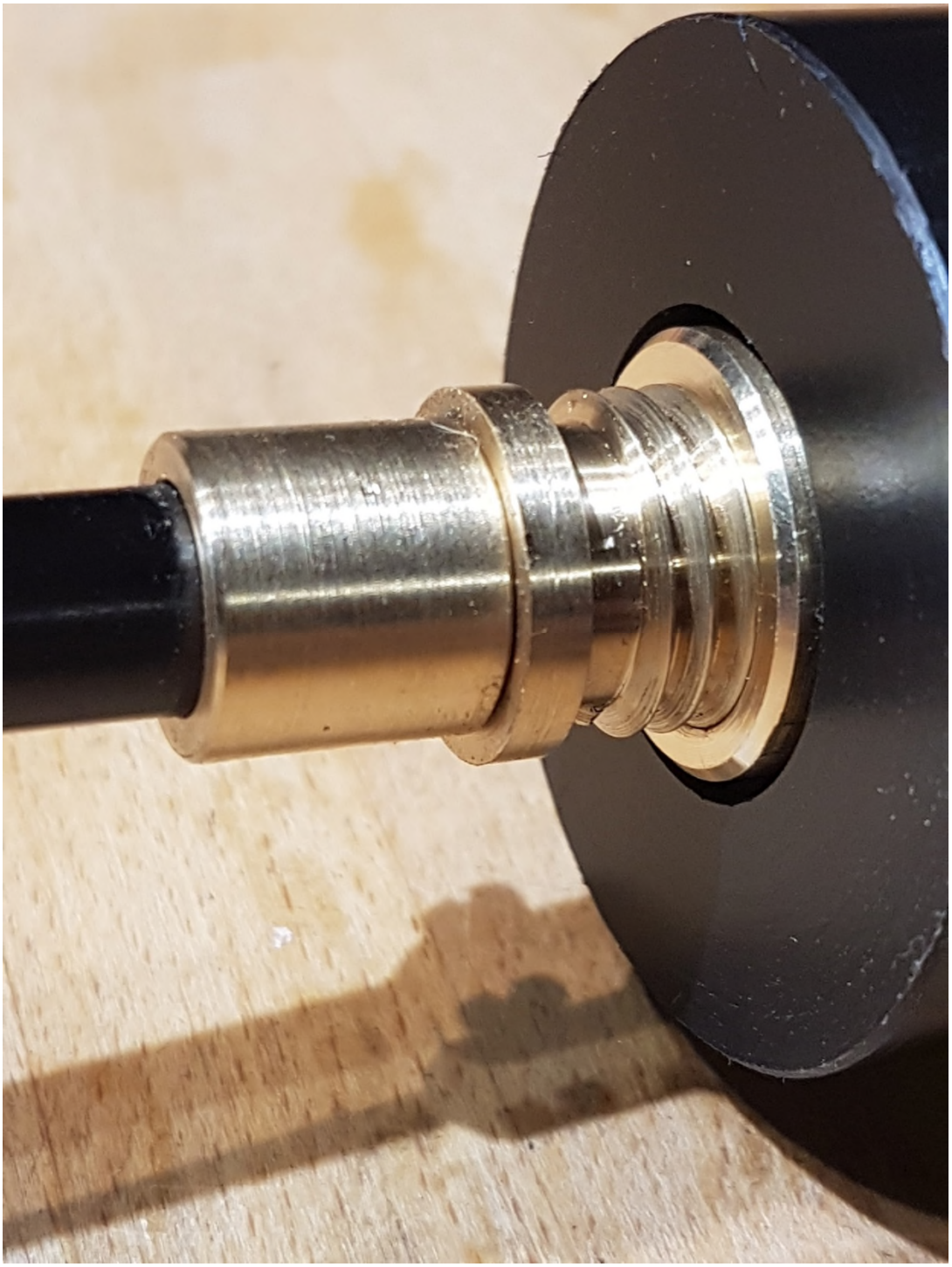
On the rear of the saddle, there is a square spigot which holds a counterweight arm fixed with a pin.
The counterweights are retained by a two-part 20mm stainless steel pin on one side and a two-part Delrin clamp on the other.

"Adjustable clamp and stainless steel end stop for the counterweights"

We used a 150kg rated actuator, but the total force with the counterbalance in place is mainly from the wind.

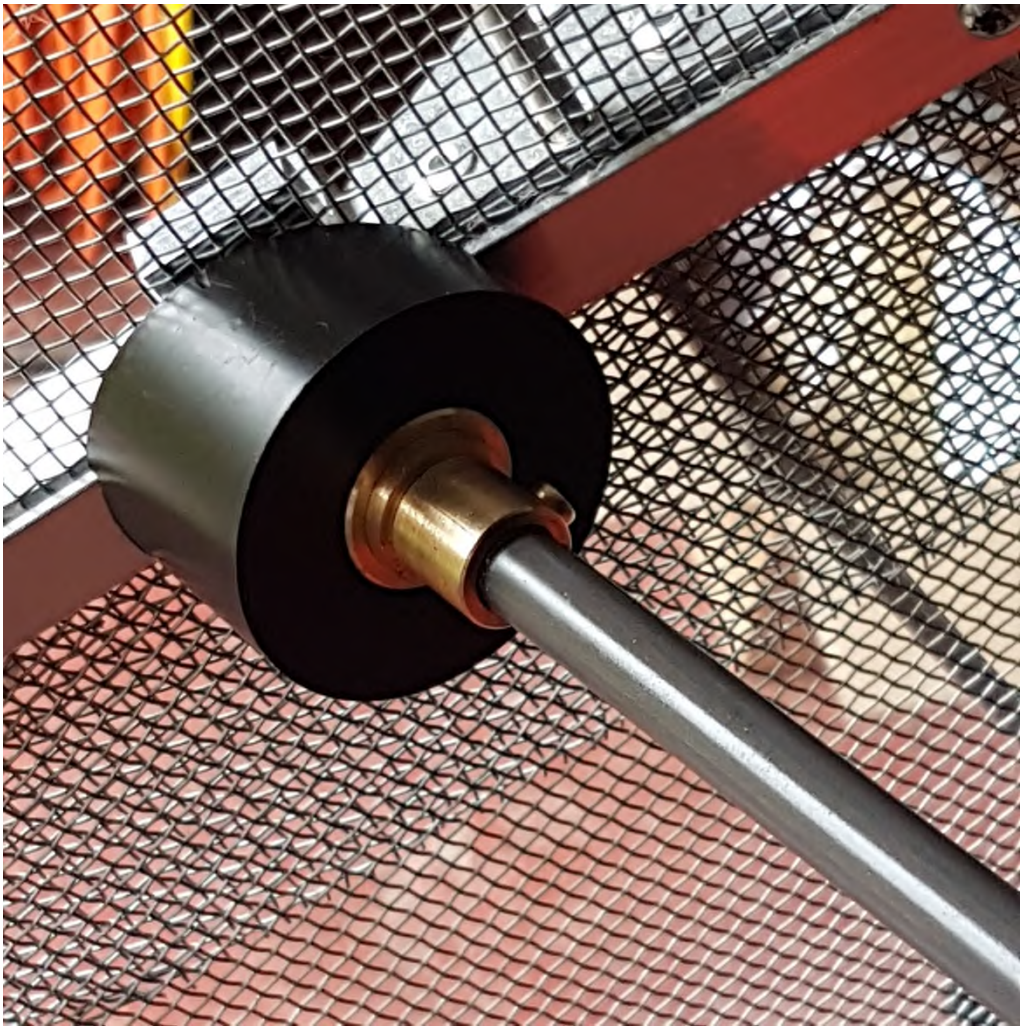
I made three delrin and brass sockets to fix to the dish surface, to take an M16 coarse threaded spigot on the end of the carbon fibre feed support tubes. The base of the sockets was grooved to fit the mesh retention strips and the base angle was milled to about 33 degrees to ensure the rods would hit the ring at the feedpoint. I milled up some U saddles to attach the sockets through the mesh and around one of the dish face members.

"Socket on dish face with carbon fibre rod"



"M16 threaded brass end epoxied to carbon tube"

The other end of the carbon rods has a QD fitting and adjustment slider for fine feedpoint positioning.



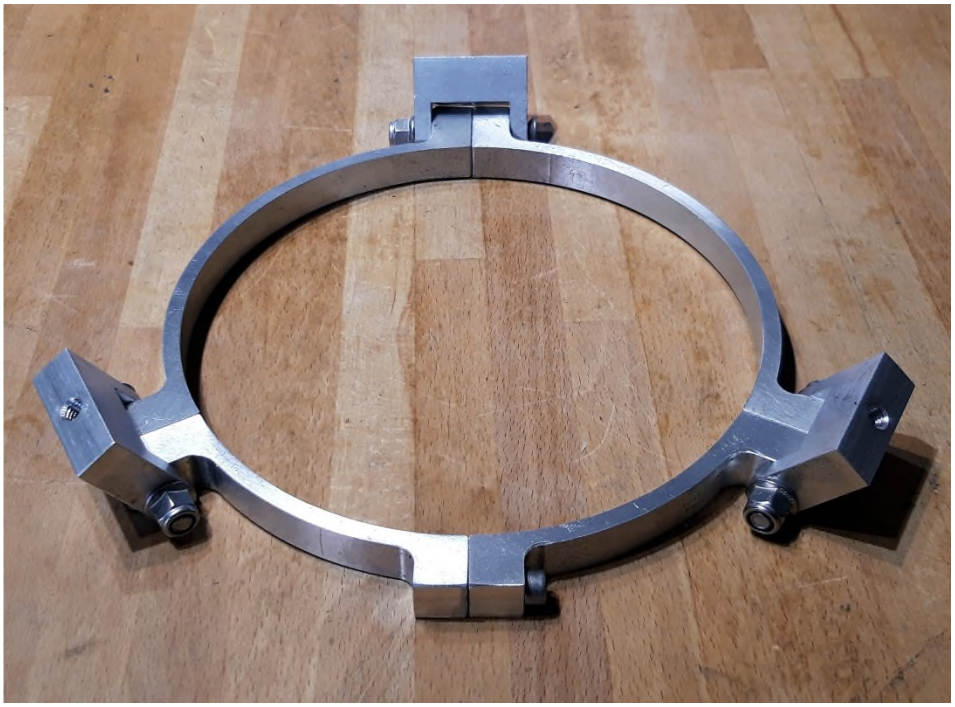
“Delrin and brass threaded socket mounted on the dish face”

The QD plug fits into one of three Delrin sockets mounted on aluminium pivot saddles. There is a knurled brass retaining pin with a short thread in a brass plate to lock the QD fitting when deployed. The coarse knurl allows removal even when wearing gloves. A short chain ensures the pins don't get lost.

"QD plug and sliding collar on carbon tube"

"QD socket with retaining pin in place"

The saddles hold the four-piece milled feed clamp ring. The ring currently only supports the RFHamdesign multiband ring feed, a 23cm horn and a 3cm horn.



"The ring was milled from 12mm aluminium plate"

"RFHamdesign ring feed in place on the dish"

I will be making other fittings to support Tony's other feeds, including the 3.4GHz horn I made using a commercial scalar choke.

"0.71 lambda 3.4GHz feedhorn with N socket and probe"

To get round the problem of running the feeders right round the edge of that big dish, I made up a porthole from HDPE bar so the feeders could go through the dish face near one of the support rod sockets. The ring is made in two parts and has a smooth taper and overlapped collar to prevent fingers and feeders being sliced by the mesh. The seven-bolt retaining ring uses M4 bolts threaded into the HDPE.


"feeder porthole"

Tony can now elevate the dish to around 60 degrees, and when it is pumped up to a scary height, it looks even more terrifying as it elevates. I suspect the Northern Fells contest group might do very well in the SHF UKAC next year with this additional weapon in their armoury.

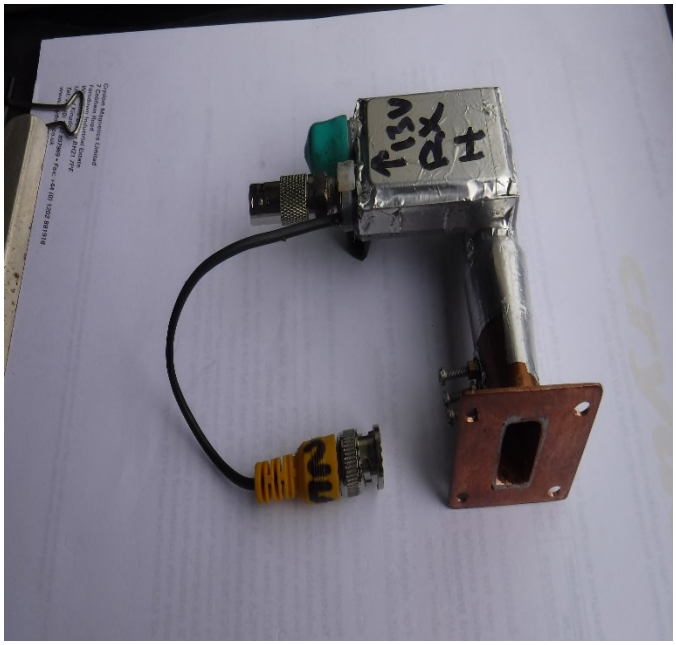
Editors Comments

This edition of Scatterpoint produced in mid-October reflects the culmination of most contests. The Autumn period may produce enhanced propagation, with the following Winter giving low Dew point for Millimetre work. Let's hope so anyway.

Roger G8CUB

10GHZ LNB @ The right Price

John G0API



I recently obtained an alternative to the Octagon Twin Optima LNB that I use for Terrestrial, QO100 and EME work on 10GHZ.

This new device is similar in concept to the Octagon with twin on-board 25MHZ Xtal references for the synth LO 's , supply voltage polarity options and housed in a cast aluminium body with integral Horn suitable for normal 0.7 f/D dishes .Output frequency at 10368MHZ is nominally 618MHZ at a level suitable for any SDR .

What makes this LNB interesting is the price, at £12.99 delivered from UK sources, such as ebay Ref. 352183592481 and the diameter of the cast circular guide between the LNB and the horn.
The guide is longer than that of the Octagon, which allows a copper water-pipe cutter wheel to fit between the ends, making clean square ends.
LNB guide outside diameter is 19.9mm, which will slide into standard 22mm copper pipe bore with the fit adjusted as required by slight crimping or silver loaded epoxy.
The die-cast body guide wall is 1mm thick, so a 25mm countersink can be used to add an internal flare to match the copper guide bore using hand effort.
As you know 22mm Copper pipe can be easily formed with a vice and 11.2mm wide Swan neck pliers to fit into a standard WG16 flange or one cut from copper sheet and soldered up.
My formed transition was 45mm long, which is about the realistic minimum and the overall body was covered in adhesive alum tape.
The removed Horn can also be used as a low gain antenna by adding a section of copper pipe, formed into a transition as above and used as the dish feed when mounted onto a 4 port waveguide switch in a full system.

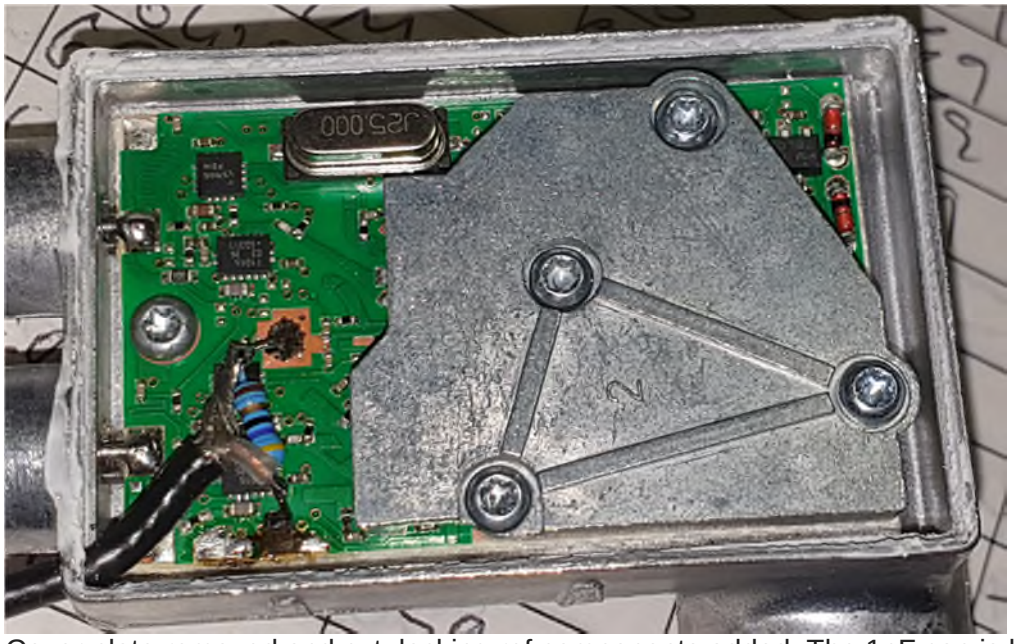
I tested the unmodified LNB using normal Cold Sky /ground method (LNB horn mounted vertically upwards at top of a 4m vertical pole for the Cold measurement) and found with 13V DC applied a noise output change of 5.8dB .At above 15V ,on the other polarity , this reduced to 5.4dB.
After fitting to the WG transition, the 13V figure was 5.5dB which for a £12.99 item is what I consider a bargain!
I added a 3 screw tuning section onto the transition but best result was with them withdrawn - perhaps they would have helped if I could have afforded longer 22mm pipe section.
Naturally the "as delivered" frequency accuracy and stability are determined by the Xtal elements and although these are marked as 25.000MHZ , I found the resulting 10GHZ signal at room temperature to be 600kHZ away from nominal (low) .
Adding external frequency reference is also easier to do than with the Octagon and requires a scalpel to remove the white silicone sealant used to secure the pressed aluminium cover - no screws used.

Carefully prise the cover away and the Xtals end of the PCB is found close to the twin F type sockets .Remove the Xtal with wire leads and fit a 1nF leaded ceramic capacitor from the vacated pad nearest to the WG entry end in series with a 50 Ohm leaded resistor to the earth pad in the centre of the board .Add a short length of miniature coaxial cable across the 50 Ohm R , which will be used to inject an external sourced 25MHZ reference - the Leo Bodnar synth is ideal for this .Re-seal the lid using more "good" quality silicone sealant.(RTV 3145 or equiv.)

To keep things mechanically solid I like to use the unused F type to interface for the reference signal - this limits the LNB to a single polarity and requires the F type to be dissed from its normal board connection. Alternately drill a small hole into the F type end of the body to allow a close fit to the coaxial cable in use and pass the reference out to an inline SMA or BNC socket - ensure this cable is tie wrapped to one of the F type socket mounts as a strain relief and seal around the cable with good quality silicone sealant .Both polarities will still be available but note that if fitting a WG transition , this will need rotation through 90 degrees to avoid the cross polarity loss and the Xtal will not be reference locked ...

With the Xtal removed , phase noise ,frequency stability etc. will be a function of the external source - it would be good to perhaps replace the Xtal with a "good" performance type - the original Xtal was probably 7HZ off frequency at 25MHZ and outside the locking range capability .Alternatively you could keep the original Xtal and offset the external reference so that locking capture could be obtained - with an SDR such as the Airspy , you could then offset the display to compensate for the odd frequency reading .

My Thanks to Paul M0EYT for finding this new LNB and the locking mod details and to Julian G3YGF for confirming performance.



Cover plate removed and ext. locking ref components added .The 1nF cap is between the coax/50R junction and the right hand of the Xtal pads as shown above.

John
G0API

Addendum from G3YGF

A recent batch of GS LNBs were tested and found to have repeatable Xtal LO offsets from the nominal 25MHz frequency, resulting in 10GHz offsets of about +250 kHz for the surface mounted Xtal and -600kHz for the 3mm wire ended Xtal lying on its side. A 6p8 capacitor from either leg of the Xtal to ground pulled it approximately onto normal frequency.

When an external input was taken via 1k/1n in series to the Xtal leg closest to the centre of the LNB, as shown in the main article text, it allowed 25MHz capture from the external reference at a level of around -20dBm. Oscillation was measured at 0.5V p-p at 2v and the two ends were in antiphase.

VK3CV 122GHz Transceiver PCB

This project originally in Dubus (3/2019), has caught the imagination of many microwavers. With nearly 50 built boards being ordered from the UK alone!
Details are now on the Wiki here: https://groups.io/g/The122GProject/wiki/home

A separate IO group can be accessed here: The122GProject@groups.io.

UK orders for built boards can still be added until 23rd October. Email Roger G8CUB : g8cub@yahoo.co.uk

Horns for 122GHz Transceiver

Neil Smith G4DBN

After getting enthused by the 122GHz article in Dubus by VK3CV and the subsequent discussions on groups.io and the group purchase of boards, I decided I couldn't wait for the boards to arrive, so I made up some couplers with a fine adjustment thread, just to see how easy it would be to manufacture various antennas and fittings.

I followed Andrew's design, with an 8mm diameter recess and 4mm cavity above the chip, with a sliding 4mm rod with 2.00mm reamed waveguide down the middle.

I drew up my own CAD drawing to make sure it all would fit together and cut an M8 x 0.5mm thread on the barrel. I made the barrel to the same fit Andrew used (0.02mm clearance) and reamed the body to 4.00mm. The locknuts are just simple rings, knurled and tapped M8 x 0.5. After drilling and tapping the body for the barrel and M2 mounting screws, I checked that the 4mm section of the barrel would not be able to foul the chip when fully retracted.

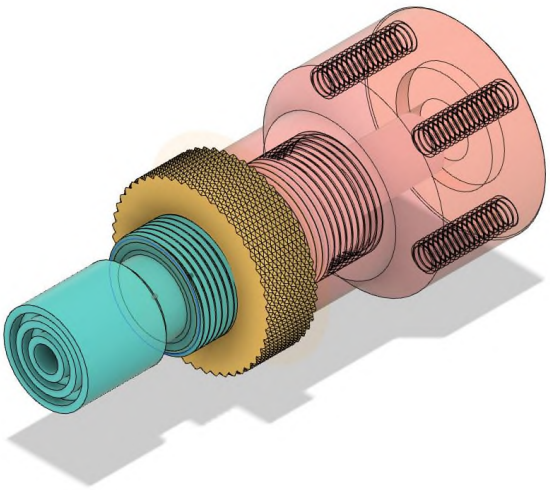
I made a couple of the Chaparral choked ends, but I'm not really happy with the finish, so I am now trying a high-speed spindle on the lathe and using a 0.6mm drilling cutter to see if I can get a better result.

I made up a D-bit boring tool like Andrew used and it does produce a reasonable finish. I made two horns, the one in the picture is a bit short because I was only using a bit of scrap aluminium, but the finish is surprisingly good and the concentricity is better than 0.01mm.

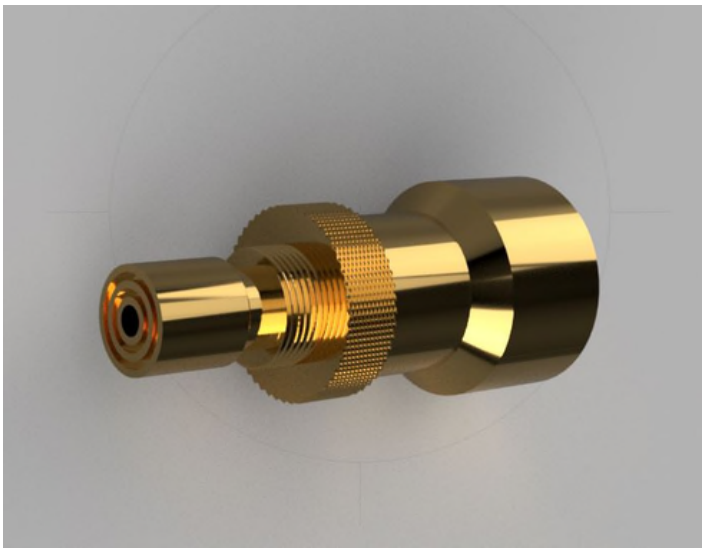
Now we have to wait for the boards to arrive and test the screw adjustment method to see how it compares with the plunger/grubscrew version.

Next step is to make a barrel with an integrated UG-387/U anti-cocking flange to allow connection to existing antennas and testgear. I'm also working on a one-axis CNC drive for making dishes and reflectors to any profile. Exciting times ahead.

Neil G4DBN



More pics at http://www.g4dbn.uk/?p=1301



By John G4BAO

Please send your activity news to: scatterpoint@microwavers.org

Introduction

A report from the activity news editor John G4BAO.

Activity reports received here seem to have dried up this month despite October containing the largest 432 and up contest of the year.
Where is everybody? Or are you just shy? Please send reports to me if you work stuff! I've nevertheless cobbled something together for you from Social media and my own log.
My main highlight was working a new station on 24GHz. Keith G4ODA is now QRV from home in South Lincolnshire IO92WS and we managed to squeeze out a 60km rainscatter CW QSO out during the 432 and up contest.
Welcome to the frustrating world of 24GHz home station operation, Keith!
That added to my usual QSO with M1CRO/P made for my best 24GHz contest for a long time.
Notable that they were both via rainscatter on 24GHz. You know, that band "everyone knows doesn't work in the rain due to water absorption"
We have to overcome this "hilltop to hilltop, line of sight" mind-set on 24GHz and only more home stations will do this. It happened with 10GHz 30 years ago. Over the horizon from a relatively poor site is possible on this band if you're patient and there at the right time. John G8ACE has already shown that rainscatter/ cloud scatter happens on 47GHz as well so let's push up the boundaries for this mode, now we have ever-improving equipment for the band

Here's the rest of my best for October, nothing else really spectacular DX-wise, very much "the usual suspects"

1.3GHz Terrestrial

4/09/2019	DJ5AR	JN49CV	CW	AS	617km
05/10/2019	PI4GN	JO33II	SSB	TR	453km
06/10/2019	DFØMU	JO32PC	CW	TR	483 km
06/10/2019	DKØPU	JO31JN	SSB	TR	458km

3.4GHz terrestrial

06/10/2019	PI4Z	JO11WM	CW	RS	265km

10GHz Terrestrial

06/10/2019	G3UVR	IO83KH	CW	TR	252km
06/10/2019	PI4Z	JO11WM	CW	RS	265km
29/09/2019	G4KUX	IO94BP	CW	RS	298km

24GHz terrestrial

6/10/2019	G4ODA	IO92WS	CW	RS	60km
06/10/2019	M1CRO/P	JOØ1PU	539 002	419 1	CW RS 87

2.3GHz EME

20/09/2019 PAØPLY JO22IH JT65
21/09/2019 UA3PTW KO93 JT65
21/09/2019 OK1CA JO7ØGM CW
21/09/2019 OK1KIR JN79 JT65
21/09/2019 RA3EME KO72 JT65
21/09/2019 PAØHRK JO22 JT65
21/09/2019 G4CCH IO93 CW
21/09/2019 G3LTF IO91GG CW
21/09/2019 PAØBAT JO31FX CW

Reports from Twitter under the hashtag #ghz_bands

G0LBK @g0lbk Reports that his 1296 EME project is progressing well. He has the Dish azimuth and elevation and the control unit, almost ready to go.

Inveterate metal-basher, Neil @g4dbm is busy machining heat spreaders for a pair of 500W 23cm F5JWF PAs each using 4 x MRFE6S9160s as well as “chucking some ideas around” about an alternative solution for a flanged termination of the 122GHz TRA_120_002 chip coupler. He’s investigating a way to allow free rotation but no end-float, then locking like a collet.

Steve @G8GKA reports receiving the GB3PKT 10GHz beacon via rain scatter with his dish pointing 23deg up and out through closed patio-doors!

The Website https://ghz-europe.com/ and a posting on Twitter reports that CT1BYM, @BymCt1, Miguel made his first EME QSO on 10GHz.
On October 10th he worked Peter OZ1LPR. Miguel uses 8.5W to a circular corrugated horn with linear polarisation and a 0.74dB NF, 26.4dB gain LNA in a just a 1.2m prime focus dish. Miguel is now testing a 24GHz system

Contests

August 5.7GHz Contest 2019

This session was again won by Dave G1EHF/P, with runner up G3ZME/P. Just as in July it was largely down to working F8DLS. Conditions were noted as above average in the morning, falling away during the day. There was a noticeable increase in activity for this session.
73
John G3XDY
UKuG Contest Manager

5.7GHz Contest August 2019

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1	G1EHF/P	IO91GI44	11	2006	F8DLS	430
2	G3ZME/P	IO82QL	11	1450	G3XDY	265
3	M0GHZ	IO81VK	10	1243	G3XDY	246
4	G6TRM/P	JO01QD	5	1061	GW4HQX/P	319
5	GW4HQX/P	IO81KR	6	806	G4ODA	235
6	G4LDR	IO91EC	6	787	G4ODA	212
7	G8AIM	IO92FH	2	184	M0GHZ	108
8	G1DFL/P	IO92BN	1	52	G3ZME/P	52

August 10GHz Contest 2019

At the top of the Open section there was a close fought battle between Nick G4KUX and G3ZME/P for top place in this session, with log accuracy playing its part in determining the outcome. In the Restricted section Barry G4SJH/P has already made certain of winning the G3JMB Trophy after coming out on top for the third time so far this year. Conditions were noted as above average in the morning, and many took advantage of the coincident French contest to work stations as far south as Paris. Activity was good with nearly 30 UK stations on the band.
73
John G3XDY
UKuG Contest Manager

10GHz Contest August 2019

Open Section

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1	G4KUX	IO94BP	17	5771	F6DKW	712
2	G3ZME/P	IO82QL	26	5633	F6DKW	535
3	G4ZTR	JO01KW	20	3995	F5HRY	377
4	GW3TKH/P	IO81KR	16	3399	F6DKW	502
5	M0GHZ	IO81VK	18	3365	F6DKW	433
6	G6TRM/P	JO01QD	14	3194	G4KUX	446
7	G4LDR	IO91EC	11	2130	G4KUX	395
8	G4BAO	JO02CG	7	780	G3ZME/P	194

9	G8AIM	IO92FH	1	108	M0GHZ	108

Restricted Section

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1	G4SJH/P	IO91GI	20	3398	F6DKW	389
2	G0HIK/P	IO84JE	6	1348	M0EYT/P	401
3	G4HSK/P	JO01FS	3	382	M0EYT/P	220

September 5.7GHz Contest 2019

David M0GHZ took the leading spot in this session, with a substantial lead over runner up the Luton VHF Group G3SVJ/P. Best DX was the QSO between M0GHZ and G3XDY at 246km, the rain scatter seen on 10GHz had little effect on this band.
John G3XDY
UKuG Contest Manager

5.7GHz Contest September 2019

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1	M0GHZ	IO81VK	4	670	G3XDY	246
2	G3SVJ/P	IO92XA	4	441	M0GHZ	163
3	G8AIM	IO92FH	2	181	G3SVJ/P	108
4	G3ZME/P	IO82QL	1	77	G3VKV	77
5	G4BAO	JO02CG	1	73	G3XDY	73
6	G4LDR	IO91EC	1	55	M0GHZ	55

September 10GHz Contest 2019

Once again there was close tussle for the top places in the Open section. Graham G8HAJ came out on top, with John G4ZTR, G4DBN, and G3ZME/P in a close group not far behind. In the Restricted section Barry G4SJH/P won again to continue a fine record in this year's events.
The weather was not very conducive to portable operation with strong winds and rain showers. This did however mean that some good rain scatter contacts were possible, although not over great distances. Best DX was between G4LDR and F6DKW at 378km, with no other continentals in the logs this time.
John G3XDY
UKuG Contest Manager

10GHz Contest September 2019

Open Section

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1	G8HAJ	JO01JR	18	3216	G4KUX	370
2	G4ZTR	JO01KW	17	2951	G4KUX	353
3	G4DBN	IO93NR	18	2916	GI7UGV/P	330
4	G3ZME/P	IO82QL	19	2891	G3XDY	265

5	G3UVR	IO83KH	12	2275	G3XDY	324
6	G4KUX	IO94BP	8	2227	G8HAJ	370
7	M0GHZ	IO81VK	11	1869	G4DBN	271
8	G1PPA/P	IO93RI	10	1598	M0GHZ	242
9	G4BAO	JO02CG	11	1490	G4KUX	298
10	G4LDR	IO91EC	7	1278	F6DKW	378
11	G3YJR	IO93FJ	7	1092	G8HAJ	244
12	G3SVJ/P	IO92XA	8	946	G4DBN	199
13	G0HIK/P	IO84KD	3	381	G4DBN	155
14	G8AIM	IO92FH	3	269	G4BAO	120

Restricted Section

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1	G4SJH/P	IO91GI	7	951	G3XDY	200

Highband Championships 2019

5.7GHz

The entry level this year has continued at the same rather disappointing level as in 2018. More stations are finding WiFi signals encroaching on the band, making some sites unusable.
The winner this year is Dave G1EHF/P who entered four sessions, won two of them and placed second in one other. Runner up was David M0GHZ who entered all the sessions, winning one. Dave will receive the G3KEQ Memorial Trophy.

10GHz

In the Restricted Section Barry Lewis G4SJH/P entered all the sessions and won the four, taking the runners up slot in the other one. Runner up was Keith GW3TKH/P who won the third session. The leading fixed station was Ken G3YKI as last year. Entries have dropped in this section over the last two years, possibly due to more stations moving up to the open section.
This year the Open Section was won by Telford & DARS G3ZME/P, who won the first session and were runners up in the fourth, with entries in all five sessions. Nick G4KUX takes the runner up slot for the second year running, with two session wins out of four sessions entered.
The G3JMB Trophy goes to Barry Lewis G4SJH/P, and the G3RPE Memorial Trophy goes to Telford&DARS G3ZME/P.
Congratulations to all those mentioned.
73
John G3XDY

5.7/10GHz Championship Tables

Final positions, the best three events count towards the total

5.7GHz

Pos	Callsign	26/05/2019	30/06/2019	28/07/2019	25/08/2019	29/09/2019	TOTAL
1	G1EHF/P	937	932	1000	1000	0	2937
2	M0GHZ	652	892	543	620	1000	2544
3	G3ZME/P	737	964	655	723	115	2424
4	G4LDR	1000	0	0	392	82	1474
5	GW4HQX/P	0	1000	0	402	0	1402

6	G3SVJ/P	0	0	0	0	658	658
7	G6TRM/P	0	0	0	529	0	529
8	G8AIM	0	0	158	92	270	520
9	G3VKV	0	78	67	0	0	145
10	G4BAO	0	0	0	0	109	109
11	G1DFL/P	0	39	0	26	0	65

10GHz Open

Pos	Callsign	26/05/2019	30/06/2019	28/07/2019	25/08/2019	29/09/2019	TOTAL
1	G3ZME/P	1000	547	852	981	899	2880
2	G4KUX	749	0	1000	1000	692	2749
3	G4ZTR	815	358	815	692	918	2548
4	G8HAJ	742	178	0	0	1000	1920
5	M0GHZ	349	728	575	583	581	1892
6	GW3TKH/P	0	1000	0	589	0	1589
7	G3UVR	497	320	351	0	707	1555
8	G4LDR	466	0	0	369	397	1232
9	G6TRM/P	0	459	0	553	0	1012
10	G4DBN	0	0	0	0	907	907
11	G4BAO	0	209	0	135	463	807
12	G3YJR	156	0	225	0	340	721
13	G1PPA/P	0	0	0	0	497	497
14	G8AIM	0	127	152	19	84	363
15	G3VKV	0	87	218	0	0	305
16	G3SVJ/P	0	0	0	0	294	294
17	G4RQI	284	0	0	0	0	284
18	G0HIK/P	0	0	0	0	118	118

10GHz Restricted

Pos	Callsign	26/05/2019	30/06/2019	28/07/2019	25/08/2019	29/09/2019	TOTAL
1	G4SJH/P	1000	1000	807	1000	1000	3000
2	GW3TKH/P	0	0	1000	0	0	1000
3	G3YKI	0	0	566	0	0	566
4	G0HIK/P	0	0	0	397	0	397
5	G4HSK/P	0	0	0	112	0	112

24GHz/47GHz/76GHz Contest September 2019

A little more activity saw the highest winning score of the year so far posted by G8CUB/P, who roved between two sites to good effect on 24GHz. No entries for 47GHz were received on this occasion.
Congratulations to the 24GHz winner Roger G8CUB/P and joint runner up Keith GW3TKH/P and Pete GW4HQX/P, and on 76GHz the honours were shared between Neil G4LDR/P and Roger G8CUB/P.
John G3XDY
UKuG Contest Manager

24GHz Contest September 2019

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1	G8CUB/P	IO91BL16	8	509	G3ZME/P	123
2=	GW3TKH/P	IO81LS19	4	356	G8CUB/P	94
2=	GW4HQX/P	IO81LS19	4	356	G8CUB/P	94
4	G4LDR/P	IO81XG25	6	316	GW3TKH/P	91
5	G3ZME/P	IO82QL83	3	289	G8CUB/P	123
6	G4SJH/P	IO91GI44	6	189	G1DFL/P	44
7	G1DFL/P	IO91LO98	2	80	G4SJH/P	44

76GHz Contest September 2019

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1=	G4LDR/P	IO81XG25	1	30	G8CUB/P	30
1=	G8CUB/P	IO91CL35	1	30	G4LDR/P	30

Tables 2019 24/47/76GHz Championship

Positions after three events, the best three count to the total

24GHz

Pos	Callsign	19/05/2019	23/06/2019	15/09/2019	**TOTAL**
1	G3ZME/P	888	993	568	2449
2	G4LDR/P	1000	786	621	2407
3	G8CUB/P	650	194	1000	1844
4	G4SJH/P	0	1000	371	1371
5	GW3TKH/P	555	0	699	1254
6	GW4HQX/P	555	0	699	1254
7	G1EHF/P	161	385	0	546
8	G8ACE/P	0	177	0	177
9	G1DFL/P	0	0	157	157

47GHz

Pos	Callsign	19/05/2019	23/06/2019	15/09/2019	TOTAL
1	G8CUB/P	1000	1000	0	2000
2	G4LDR/P	555	672	0	1227
3	G8ACE/P	0	914	0	914
4	GW3TKH/P	849	0	0	849
5	GW4HQX/P	431	0	0	431

76GHz

Pos	Callsign	19/05/2019	23/06/2019	15/09/2019	TOTAL
1	G8CUB/P	1000	983	1000	2983
2	G4LDR/P	138	1000	1000	2138
3	G8ACE/P	0	610	0	610
4=	GW3TKH/P	431	0	0	431
4=	GW4HQX/P	431	0	0	431

Crawley Microwave Roundtable

This year's Crawley Round Table was on Sunday 22nd September.

A cracking event put on by Crawley Amateur Radio Club, organised by Alun G4WGE and Denis G0OLX.

Dave G8GKQ Giving his talk on the LimeSDR

Talks were:

A 24 GHz beacon source using IQ upconversion, Andy Talbot, G4JNT

Using the LimeSDR on the Microwave Bands, Dave Crump, G8GKQ

288 GHZ update, Chris Whitmarsh, G0FDZ

RFZero Signal Source, Denis Stanton, G0OLX

Denis's talk on the RFzero device

The construction competition was won by Roger G8CUB, with his 241/288GHz transverter.

Scottish Microwave Round Table

2nd November 2019 Museum of Communication Burntisland KY3 9AA
Speakers include Mark Hughes GM4ISM, Sam Jewell G4DDK, Martin Hall GM8IEM and Heather Lomond M0HMO.

See below for latest information:

www.gmroundtable.org.uk/

UKuG MICROWAVE CONTEST CALENDAR 2019

Dates, 2019	Time UTC	Contest name	Certificates
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

Sept 29-Oct 4	European Microwave Week, Paris	www.eumweek.com/
October 3-5	Microwave Update, Dallas, Texas	www.microwaveupdate.org
October 11-13	RSGB Convention & Amsat-UK Colloquium	http://rsgb.org/convention/
Oct 28-Nov 22	ITU WRC-19, Sharm el-Sheikh	http://rsgb.org/wrc-19
Nov 2	Scottish Round Table	www.gmroundtable.org.uk/
Dec 14-15	Midlands Round Table, Eaton Manor	www.eatonmanor.co.uk

2020

January 11	Heelweg	http://www.pamicrowaves.nl/
February 15	Tagung Dorsten	www.ghz-tagung.de/
April 14	CJ-2020, Seigy	http://cj.r-e-f.org
May 1-17	Hamvention, Dayton	www.hamvention.org/
June 26-28	Ham Radio Friedrichshafen	http://www.hamradio-friedrichshafen.de/
August 20-23	EME 2020 Prague	www.eme2020.cz
September 13-18	European Microwave Week, Utrecht	www.eumweek.com/
October 5-18	Microwave Update, Sterling, Virginia	www.microwaveupdate.org
October 10-16	IARU-R1 General Conference, Novi Sad	www.iaru2020.org

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

73 Martyn Vincent G3UKV