An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

December 2022

Published by the UK Microwave Group

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G8CUB/P Coombe Gibbet 122/134G working G8ACE/P

Dave G8GKQ's test equipment talk at Midlands RT

UK Microwave Group

Subscription Information

The following subscription rates apply

UK £6.00 US $9.00 Europe €9.00

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 DropboxAlso, **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

payukug@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@microwaversorg

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)

Please send pictures and tables separately, as they can be a bit of a problem.

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.

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 (e.g. 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 contact the committee.

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 Neil G4DBN for more information**

5.7GHz 10GHz 24GHz 76GHz 122GHz(future)

Chipbank Update

Thanks go to Andy Wade, G4AJW for a very generous donation of a large collection of surface mount components which I brought home from the RSGB Convention last month.

Thanks also to John Wilson, G3UUT, who stored the ten boxes for several weeks, and then delivered them to me at Kents Hill.

I have now been through all the boxes and the updated Chipbank catalogue is now on the UKuG website.

In summary:

RESISTORS: We now have good stocks of almost all E12 values in both 1206 and 0805, as well as many of the intermediate values which make up the E24 series. The 0603 list is unchanged from the last update.

CAPACITORS: Good stocks of all the common values of ceramic chip capacitors again in 1206 and 0805.

Also Murata TXBX4 series trimmers, 1-3pF (Brown) and 3-10pF (White) and a few 4-25pF (Black).

DIODES: A good range of Schottky and PIN diodes in singles and multiple packages. Several sm versions of 1N4148 general purpose general purpose diodes, and rectifier diodes (sm versions of 1N4001/2/3/4) in various packages.

In addition, a full range of Zener diodes from 2v4 up to 15v plus a few higher voltage.

TRANSISTORS: A good selection of general purpose and RF transistors including a selection of BFR90/91/92/93/96 in stripline packs suitable for building/repairing legacy designs.

MMICS: A good selection of MAR, ERA, GALI and MSA devices either in sm or stripline packs.

Most of the other files in the catalogue are unchanged since the July update. One exception is the addition of a selection of standard LEDs in 3mm and 5mm sizes.

Virtually all of the semiconductors are in amateur friendly packs such as SOT23 etc.

Quantities available vary from a full reel to half a dozen or so, so it is first come first served!

Please take a look at the catalogue, and submit orders on the form on the website.

73, Mike, G3LYP.

Useful Tripod fittings

Robert Atkinson G8RPI

A simpler starting point for the “Tilt-O-Matic”. Having read Gareth Evans G4XAT’s article in the October 2022 issue, I realised that there may be a lack of knowledge of the fittings available for surveyor’s tripods that could make an easier starting point. The flat top and hollow threaded “bolt” on the tripod is normally mated to a device called a Tribrach. The Theodolite, target, level etc then fitted on top of the Tribrach using three pins that are locked by cams. The base part of the Tribrach usually has 3 fine levelling screws. If a target or reflector mount is fitted this usually has a rotary bearing with lock and a socket for the target. Photos show a high-end target mount Tribrach.

This one has the additional feature of an optical plummet, the two coaxial knobs sticking out the side, a sort of 90 degree telescope that allows it to be centred over a feature on the ground.
So how much does all this cost? The unit pictured above cost £40 including shipping and a corner cube retroreflector target (to work with my total station) on ebay.
A new Tribrach base from China is around £25, a rotating adaptor £20 and fixed adaptor £15 based on ebay UK prices. Just search for Tribrach. Alibaba etc are even cheaper.

Fixed adaptor is the yellow one. Obviously the base board of the Tilt-O-Matic can be attached to the 5/8 UNC (11TPI) threaded boss. If you have different set-ups each can have their own adaptor and can be quickly swapped out without losing the settings.
A bit dearer than a wheel bearing but a lot more functionality and less time building.

New UK Records on 122 & 134GHz. Four Records in One Day!

Thursday 15th December.
Temperature 2 deg.C
Dew Point -3.5 deg.C

A new UK record was made between Roger G8CUB/P and Noel G8GTZ/P on 122GHz using Opera, a digital CW mode.
Distance IO91GI25 to IO91IB50 was 37.4km.
Following on from that a QSO was made on 134GHz using FM/Opera, setting a UK record for that band.

But…….

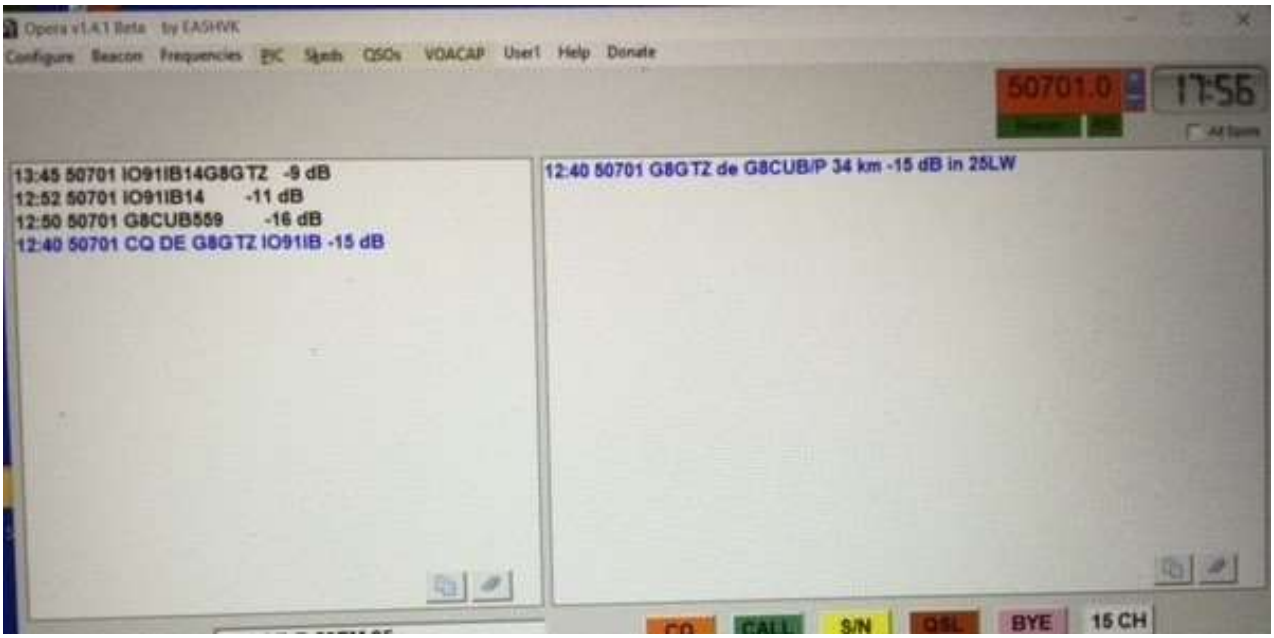
Just two hours later, the record was beaten by G8CUB/P working G8ACE/P at 40.5km
John was at Lane End IO91JA48
The first QSO was on 134GHz where John's FM was received 59++ by Roger. Opera was used in the other direction.
After that an FM QSO was completed on 122GHz.

G8GTZ/P Morestead Road IO91IB50

Receiving Beacon from G8CUB/P on 122GHz
122GHz Equipment:
Standard VK3CV with external TCXO in to a 74GHz 30cm sub reflector dish and IC705 IF radio.
Report sent via Opera 559. Report received via Opera 539.
Distance 37.45km

On 134GHz the TX produced around 3mW, to a 150mm 80GHz horn. It uses a ZL14G synthesiser on 7.466GHz, an amplifier and x9 Impatt multiplier to 67.2GHz. That is then doubled to 134GHz. Keying is FSK.

The receiver uses a fundamental mixer, with LO around 110GHz, from a x6 multiplier. IF is 24.051GHz, which is converter to 435MHz.
Report received 599 from Opera, report sent 59 on FM received.



Received Opera at G8CUB/P. Top Line is 134GHz. Other lines 122GHz. Line on the right is from Opera putting together the 122 reports as a QSO, and calculating distance based on 6 figure references.

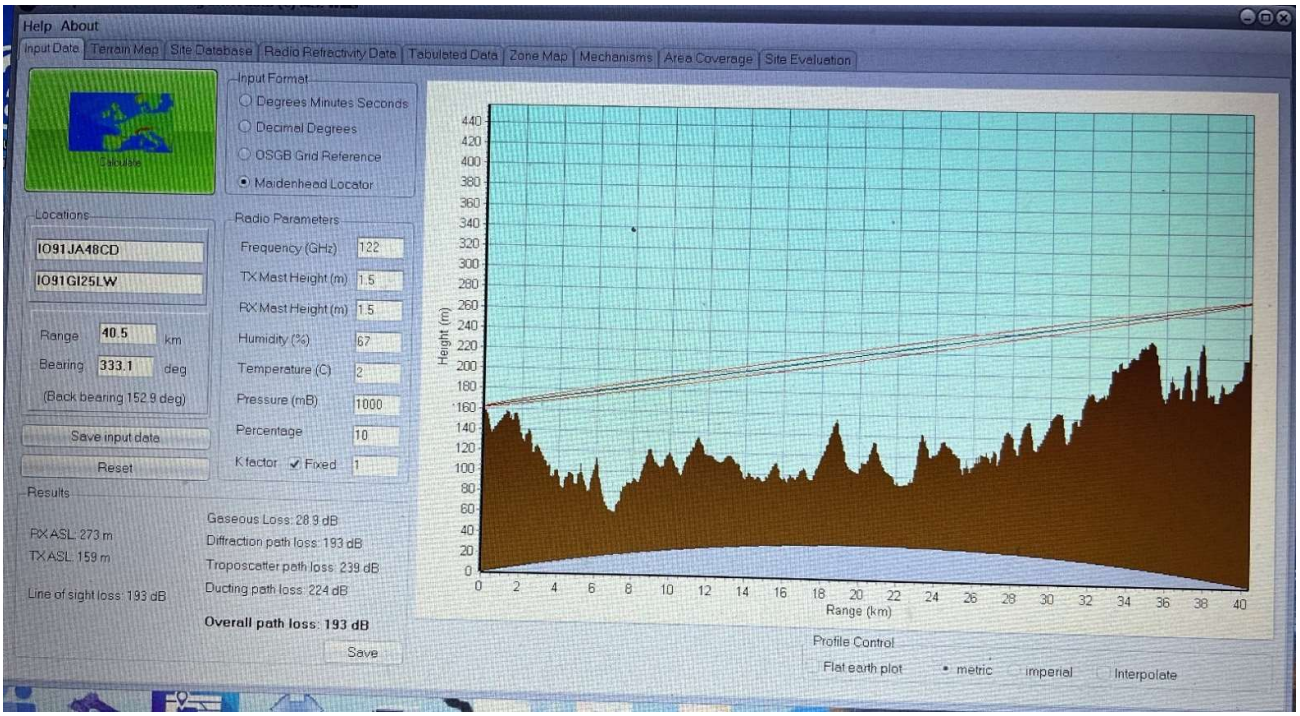
G8ACE/P Lane End IO91JA48 (CD)


134GHz receiver in operation

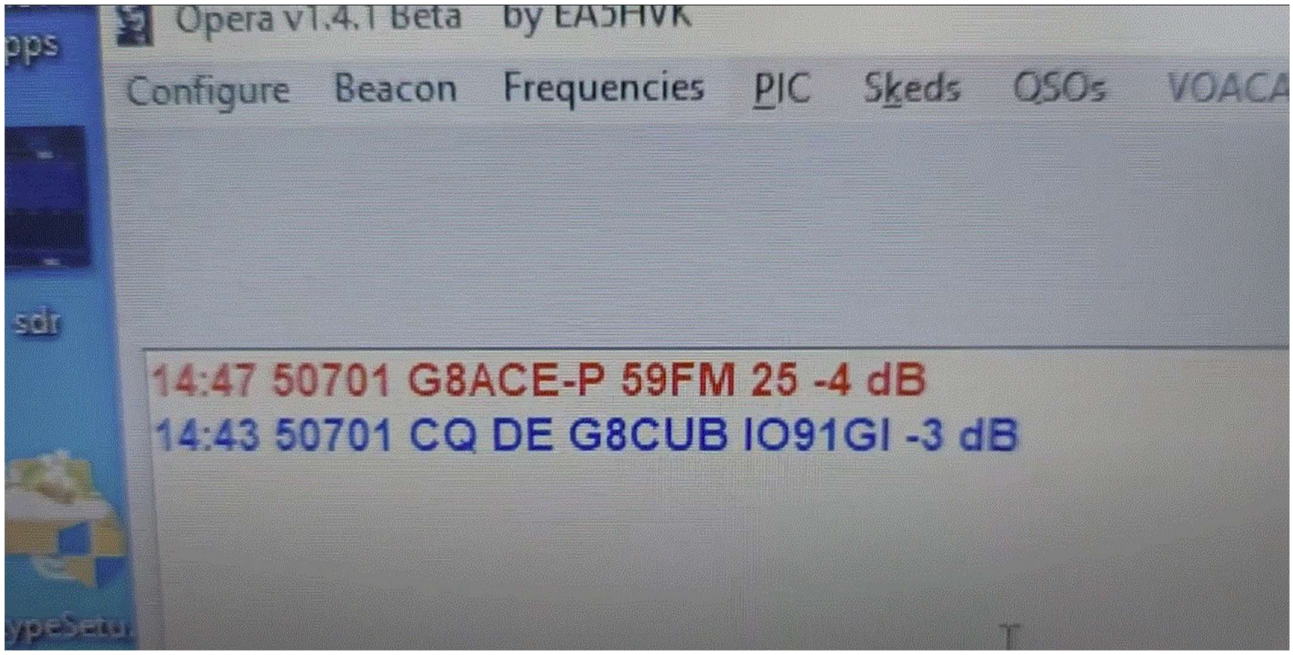
134GHz Receiver towards Coombe Gibbet

122GHz transmitter

Enough room for one car at Lane End



The path profile Coombe Gibbet to Lane End, with estimated path loss

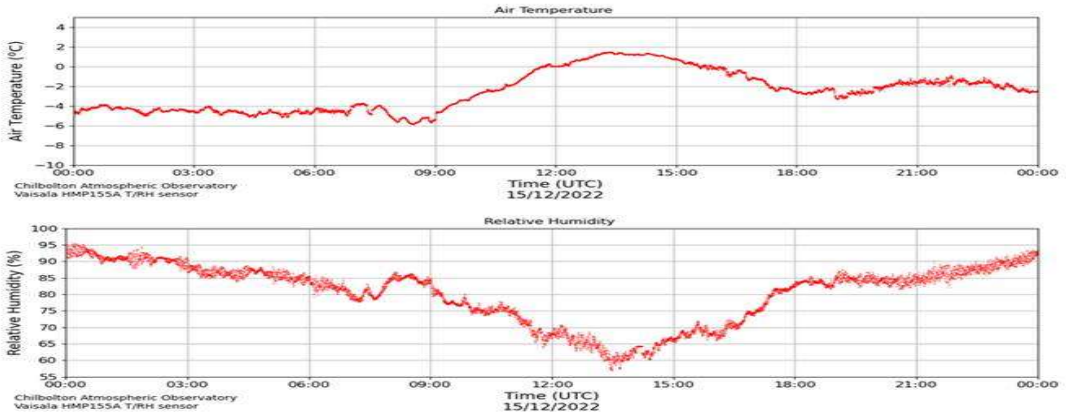


Report on 134GHz from G8CUB/P. Top line is a report on my FM with the last 2 digits of the locator IO91GI25 (Opera only allows 6 digits in the locator field, also the 50701 has no relevance for 122/134G)

The reception equipment used for the 122GHz 40.5 km contact with Roger G8CUB was the VK unit equipped with a 40cm dish.
The transmitter, a home build produces about 5mW. It consists of an ADF5455 eBay synth running at 6.8GHz. FM modulation audio is applied to the synth VCO control loop. The output of the synth is doubled and fed to an ex equipment link tripler amplifier with output at 40.8GHz.
A further tripler using a Microwave Associates varicap diode mounted on a DB6NT pcb provides the 122400 MHz signal output via 1/16" diameter waveguide to the dish feed horn. The dish a 30cm cassegrain slides onto the feed horn for focussing and is removable for transportation. Digital modes are sent by keying the supply voltage to the 40.8 GHz amplifier. Multiplier diode drive bias is monitored by the Arduino Nano which also loads the synth registers with Hex for the 6.8 GHz base frequency.

134 GHz transmitter is similar to the 122 transmitter but using an ex link 33.6 GHz tripler amplifier. This is fed to a multiplier x4 diode again on a DB6NT pcb feeding 1/16" diameter waveguide to an identical horn and dish to the 122 GHz. Multiplying 33.6 by four provides 134400 MHz, the current preferred UK channel for historic reasons.
The receiver is very similar to the transmitter with the final diode acting as a X4 harmonic mixer. The noise figure is consequently high from a harmonic mixer and so is a fairly insensitive system. IF is 144MHz.

John's YouTube channel is UKG8ACE. Partial videos of the latest contacts can be seen.



G8CUB/P Coombe Gibbet IO91GI25 (LW)

G8ACE/P being received on 134GHz FM, at 40.5km. A big signal!

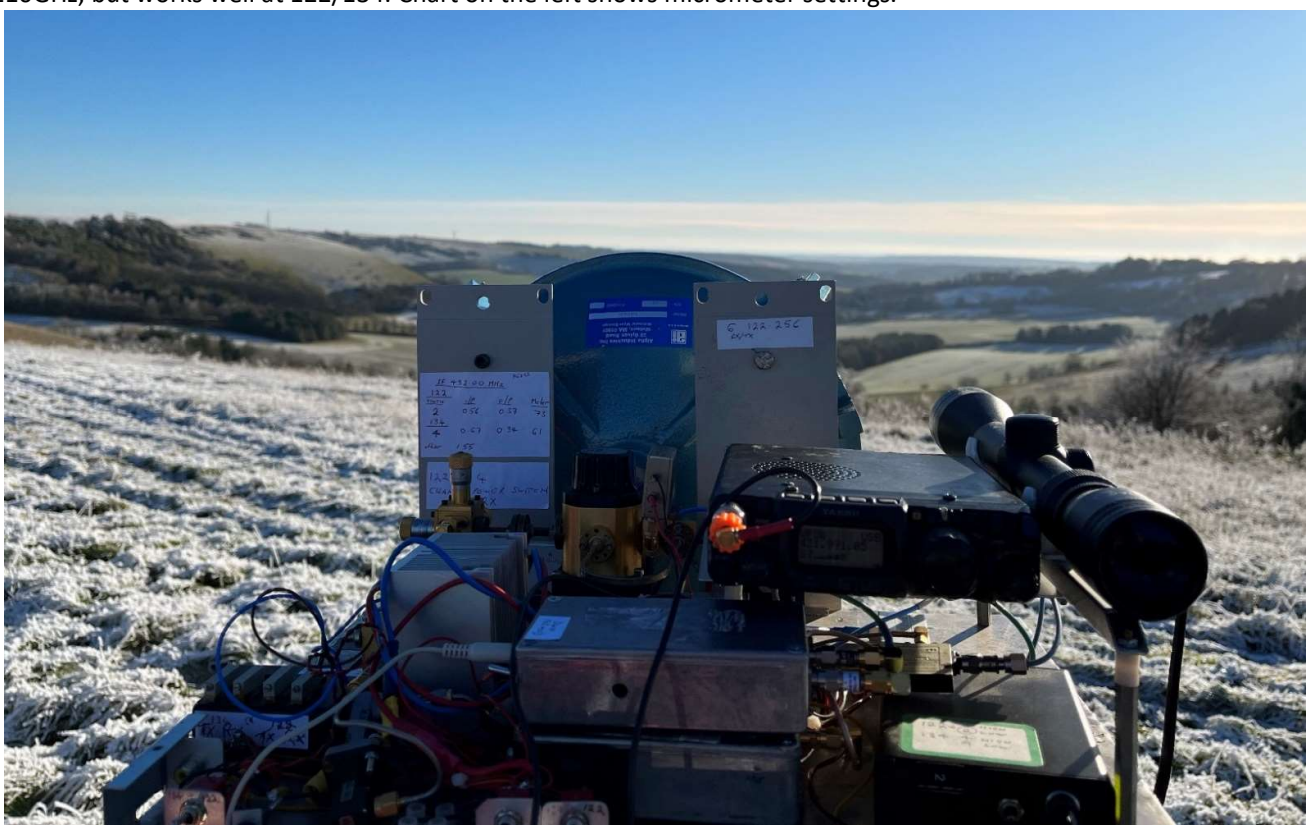
122/134GHz Equipment:

The G8CUB system is a dual band one for 122/134GHz, on a 30cm Cassegrain dish.

It uses a ZL14G synthesiser, using a Wenzel 10MHz reference and inline phase modulator.

The synth output is doubled, then fed into a x4 multiplier to 61/67GHz at +17dBm.

A tuneable doubler provides LO, or TX output of 5mW. Receive mixer is a biased fundamental one, specified for 75-110GHz, but works well at 122/134. Chart on the left shows micrometer settings.



Tuneable doubler on the left and waveguide switch centre

From right to left. 122/134 tx/rx 30cm dish, 25mW 122 beacon 150mm horn, second 122 system 100m lens horns

Arriving at the point where a long distance QSO can be made is far from an easy one.
On the Friday before a test from Coombe to Morestead road nearly worked. Dave G1EHF at Coombe copied and decoded the Opera signal from Noel G8GTZ. Both Barry G4SJH and Noel copied my CW/Opera from my beacon transmitter. No 2 way QSO's resulted. Noel had forgotten the lead between radio and computer, and had to try and use the computer mic.
I could hear nothing from either Barry or Noel. The reference in my tx/rx had apparently failed, as my own beacon signal was moving +/- 60kHz. This was sorted the day after, when I realised there was not enough heating of the OCXO when at 2 deg.C. I had run it on a 10V regulator, rather than the full 12V – another lesson learnt!
I would especially like to thank Chris G0FDZ for all the tests across the Thames on 122 – 241GHz. We had a QSO on 134 at 15km with just 100uW using a 4" centre fed dish, some 10 years ago!
Roger G8CUB

Editors Comments

The Midlands Round table was a great event at the start of December. I am sure all those that attended appreciated the hospitality and quality of the talks.
This is really the November/December edition of Scatterpoint. To keep things simple I have made it the December issue, so I start cleanly in 2023.
With the spell of cold clear weather, it was the perfect time for millimetre operation. Hence the next part of 'Getting started with Waveguide on the Millimetre bands' will be held over to next month.
I would like to wish all readers a Happy Christmas, and New Year. Roger G8CUB

Midlands Round Table – 3rd December 2022 Report

The Midlands Round Table organised by Paul G8AQA and John G7ACD was again held at Eaton Manor Shropshire. This year well over fifty people attended. It proved to be a first class event for anyone interested in Microwaves or Amateur Television.

The BATC had a test and fix area, including noise figure measurement, and the BATC shop. Also new for this year , Noel G8ATZ organised an indoor antenna test range in the old chicken shed and tested a range of antennas from satellite dishes to horns on 3.4 to 24GHz.

Paul and John organised a general microwave test equipment bench, a live QO100 uplink and four talks.

The first was by , Dave Crump G8GKQ who talked about the Portsdown test equipment facilities.

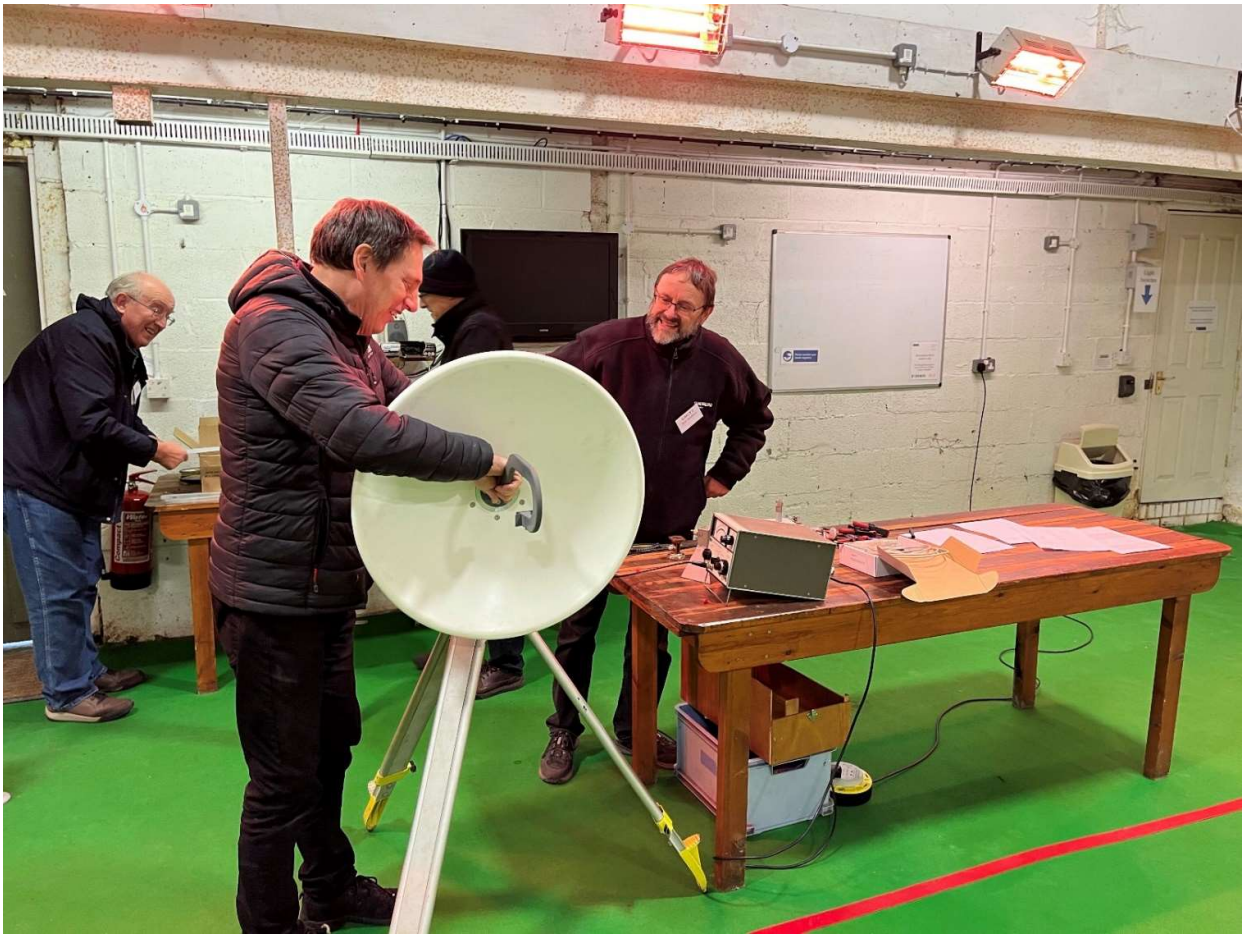
Then a Neil G4DNB describing ‘How I planted a Russian Spy Bug at the BBC’, expanding on his BBC2 appearance. talk on 3D Printed Microwave GRIN Lenses’ and his visit to Rogers in the USA,

Dave G4ASR tried to convince us that the age of the tripod when operating portable is dead! By showing how the whole shack for two operators, rotator and antennas could be vehicle mounted.
Noel G8GTZ described his adventures on 122GHz, and showed just how well ‘Opera’ worked on the Millimetre bands.

There was of course a ‘bring and buy’ area, where free stuff and bargains could be found. An excellent hot two course lunch was served by John’s XYL Nicky. The meal was included in the day ticket price.
Thanks again to John, Paul & Nicky for organising such a great event.

It really was that big!

Paul with power measurement up to 24GHz



Results from the Indoor Antenna Range- With thanks to Noel G8GTZ for setting it up.

Name / Callsign	Description	Size	Ref gain dB	Ref level	Measured level	Gain above reference	Estimated gain dB
24GHz							
G8GKQ	Penny feed dish	46cms	20	-53	-40	13	33
M0GHZ	Sky dish + I0JXX feed	50cms	20	-51	-35	16	36
G7MHF	New Andrew (HB feed)	40cms	20	-63	-49	14	34
G7MHF	New Andrew (HB feed)	60cms	20	-63	-44	19	39
10GHz							
G4HWA	Rfhams (feed not aligned)	1mt	11.7	-60	-45	15	26.7
G1YFG	CML with crook feed	60cms	11.7	-62.5	-42	20.5	32.2
G7MHF	Cambium penny feed	40cms?	11.7	-63	-46	17	28.7
GW0MDQ	Flann Horn with h/b transition		11.7	-63	-57	6	17.7
GW0MDQ	Radar horn		11.7	-63	-56	7	18.7
5.7GHz							
G4HWA	Rfhams (quoted gain 26dB)	1mt	10	-44	-30	14	24
G4XAT	Sat dish (HB feed)	90cms	10	-45	-30	15	25
G4ASR	Sat dish	60cms	10	-46	-31	15	25
3.4GHz							
G4HWA	Rfhams (Quoted gain 25dB)	1mt	11.6	-64	-52	12	23.6
G4XAT	Sat dish (HB feed)	90cms	11.6	-64	-58	6	17.6

Activity News December 2022

By John G4BAO

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

From John G3XDY

A quick summary of some nice tropo DX worked on 13th November.
I spent most time on 23cm on FT8 in this opening the best stations worked were:
DJ4TC JO63, OV3T JO46, SM7FWZ JO77, SM7GEP JO77, SM7GVF JO77, SM0DJW JO88, SP2FRY JO83, LY2WR KO24 (at 1562km) OV5W JO65, OZ7MHZ JO44, OZ2TG JO65.
On CW I worked a new one: SA6BUN JO78CP for square no 160, all on
tropo/aircraft scatter.
On 2.3GHz I worked DL1SUZ JO53 CW, DB8WK JO33 SSB

From David G0LBK

Over summer I decided to streamline operations and concentrate on 2m and 23cm eme as I was dabbling on lots of bands and losing direction.

After a week of intense activity I finally became QRV on 23cms eme with my fully homebrew 4m 0.38 f/d dish antenna from JO03BD. I started building this dish several years ago at my old QTH and brought it to my new QTH almost as a kit of parts. It's my own design with information gleaned from photographs of other peoples antennas. I later added a Kumar choke to the feed which is a square septum. I estimate 200 hours plus has gone into making this dish and it is the biggest homebrew project (both in size and time invested) I have ever undertaken.

Since getting QRV on the 15th October for the second moon window of the ARRL contest I've managed 142 initials in 33 countries using CW and Q65. Echo's are consistently audible and can be seen down to 10 watts or so. Several single yagi stations have been worked on Q65.

It's been an intensely satisfying project with a steep learning curve in many areas.

I'd like to thank all those who have offered information, advice and encouragement in the project.

73 de G0LBK Near Spilsby Lincolnshire

From John G4BAO

My 24GHz WebSDR, still running from my home QTH JO02cg on my 60cm dish. We await the spring to get it installed on the East Coast. The "OpenWebRX" software is currently running on just a Raspberry Pi Zero 2W with an RTL-SDR and is working well, Since the temporary demise of GB3CAM (see later) it points either at GB3MHZ or GB3PKT depending on conditions. Its URL is 24ghzwebsdr.ddns.net:8073.

The cold snowy weather in early December brought some interesting signals in. On the night of the 11th an intense snowstorm over the North London and the Southeast of the UK brought snow scatter signals from GB3PKT/24 over a very obstructed 72km path over the Suffolk hills.

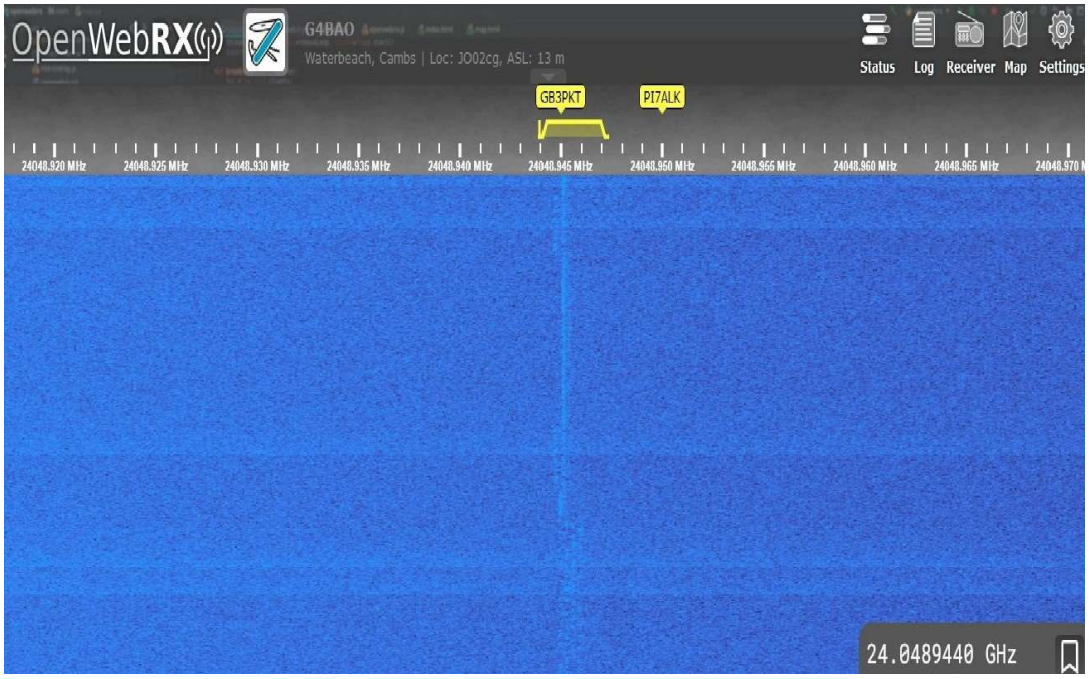


Photo shows how it looked on the WebSDR screen.

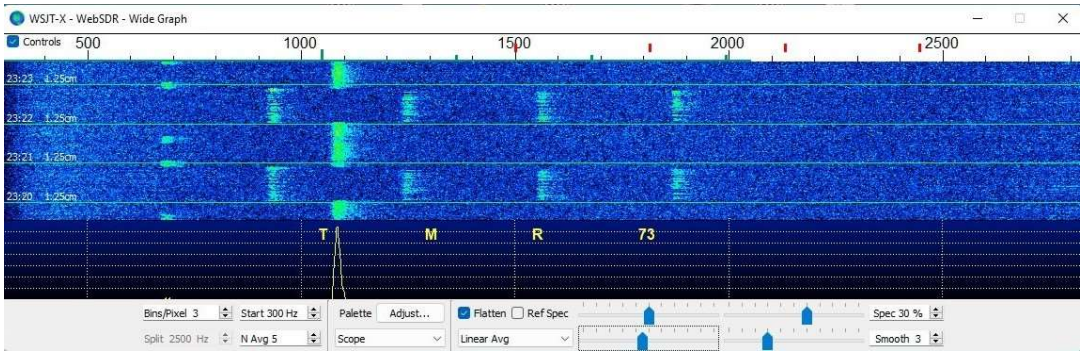
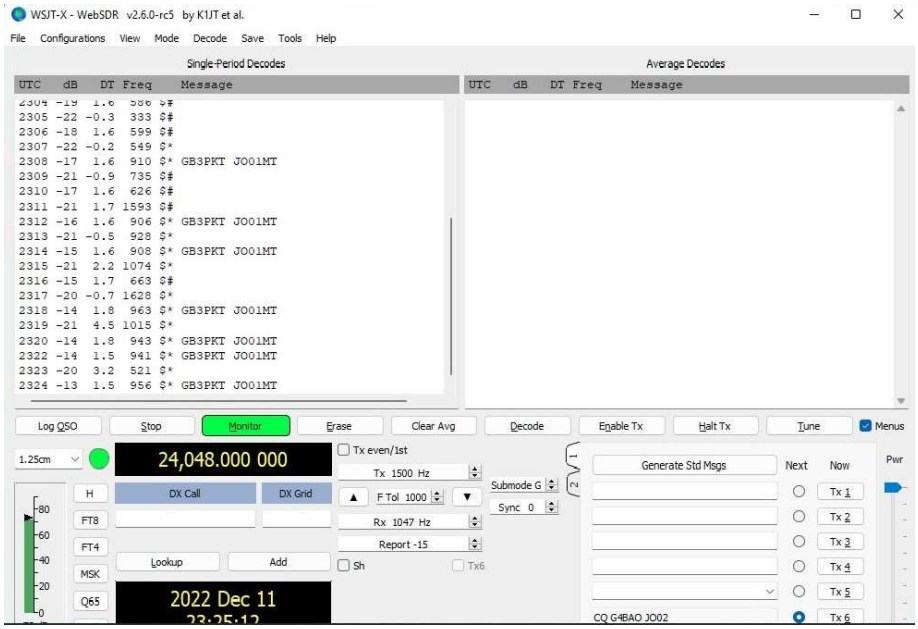


Photo of the waterfall from the beacon



Above photo shows the decodes of the JT4G digimode of the beacon and it can be seen that the signals were strong!

Oh! for the days when there were Home station microwavers in their shacks in the evenings looking for propagation events like this and ready to make QSOs! Most of these fascinating events go unseen, like a tree falling in the forest when there's no one there, but it's great to see the UK's 122GHz pioneers going out in the Winter cold as reported below!
Finally, as noted above, the GB3CAM 24GHz beacon outdoor unit has failed so it will be off the air until we can arrange to get on the roof of the Water Tower, hopefully in the better weather in the Spring.

Winter GHz Bands!

From Hugh VA3TO

Peter and I continue our 47GHz rainscatter tests over short range mentioned last month, and both of us have 7 grids on 47 GHz and have also used the described technique on 24 GHz where I have 11 grids. After a few previous failed attempts to get him FN04 on 47 GHz we did quite a bit of planning to eventually achieve it, based on what we've learned. We're making these 47 GHz contacts using low level scattered rain to work adjacent grids that are otherwise unworkable due to blocked paths. Of course, moisture is a buzzkill on the higher mm wave bands, so this technique is limited in range due to the very high path loss and also the low altitude of the scattered rain showers. But as we've proved, it works well enough to achieve the VUCC 5 squares award.
In our neck of the woods, we get this kind of rain in the spring and fall. We got 47GHz VUCC/5 early this past spring (in ~ 1 week!) , then the summer humidity kicked in. Now here we are in the fall with cooler temps and more low-level rain to try and increase our grid counts! The Oak Ridges Moraine that Peter mentioned is a geological ridge that runs east-west (like our infamous Niagara escarpment that spans north to south), and most of FN04 is on the other (north) side of it relative to Peter's chosen 47 GHz VUCC location at the shoreline of Lake Ontario in Mississauga. Not only is he on the other side of the Moraine but he's downhill all the way from there. So, despite being the next grid to the north, there are absolutely no workable LOS paths between FN04 and both my and Peter's VUCC sites in FN03. A couple of our previous attempts were made from FN04 locations where the Moraine rises sharply so I needed to have a fair bit of elevation on my dish to light up the rain.
Unfortunately, the path loss between Peter and the rain that I was lighting up was too great, so we were never able to complete. Other times the denser rain was closer to him, but I might have been overshooting it with the elevation I needed to clear the Moraine. So, the density of the rain and location of it between the two stations are quite critical. It's also important to note that we're doing this through the rain on the direct path.
Another characteristic of low-level scattered rain is that it's fast moving. We've had some near misses where we find each other on 24 GHz, switch over to 47 GHz and hear each other but spend too much time fussing with Az and EL adjustments in attempt to peak for a better signal. In the meantime, the density of the rain dissipates and we lose the opportunity. The lesson here is... if you hear each other well enough to complete then just make the contact!
Last week I was looking at the weekend forecast and saw that it was calling for cool temps and sunny skies on Saturday and scattered rain on Sunday. I proposed to Peter that we could either try to extend our tropo DX record on Saturday morning or attempt to get him FN04 on Sunday. He was busy on Saturday, so we decided on the latter. I spent some time using a surface elevation tool to scout out an accessible location in FN04 that has the least amount of blockage by the Moraine to allow my signal to reach further between us in the rain. FN04FA was the best I could find so I took a drive up there and lo and behold, it worked!
The next couple of grids are farther away (FN13 & 14) so they will be a challenge. We've done 125km using snow scatter so that may be the next ace up our sleeves. Or wait until next summer for some convection enhanced inversions.

Winter came to the UK too!

From Barry G4SJH

(via Twitter @G4SJH_Barry)

Only the hardiest operators out on December 9th today for 122GHz fun at 2deg C with G8GTZ. G8CUB's 25mW beacon was 30dB above noise and G1EHF was 5dB above noise floor at 36.5km. Both stations using VK3CV units.

The new 60cm offset Sky dish

All seemed to be working well…. Then the Laptop battery failed!

From Dave G1EHF

(via Twitter @G1EHF)

During the tests on December 9th, I managed a -15dB decode from Noel G8GTZ/P using Opera digital mode. I reckon the distance was 37.3km, between IO91GI25NV and IO91IB50IP, which increases the current UK record by nearly 1km. Very good for VK3CV rigs (ignore 50701, no 122GHz in Opera software!)

From Noel G8GTZ

(Via Twitter @G8GTZ)

More reports from the December 9th tests. Although it was cold (2 degrees) and I wore 4 layers and a woolly hat, the dewpoint was too high at only around 0 degrees (needs to be -3 for good condx on 122GHz band). G1EHF was a consistent but weak signal. Good fun was had by all, and plans are afoot for further Winter trips out on 122GHz.

UKuG MICROWAVE CONTESTS – 2022

Millimetre Contest and Championship results will be published in the New Year

If you would like to request any changes to the Microwave Contest Rules for 2023. Please send your comments to John G3XDY by 3rd January. g3xdy@btinternet.com

UKuG MICROWAVE CONTEST CALENDAR 2023

To be published early 2023

Wanted

To improve the accuracy of my power measurements.
Attenuator rated to 26GHz. 20dB preferred but 10dB would be good.
The connectors need to be APC 3.5 (which will mate with SMA)
An HP Part number is 33340C.

Also

HP 415x SWR Meter with good scale.

Paul Nickalls G8AQA
paulnick@btinternet.com
01694 771 441

Available

"Back in the day, AH Supplies of Sheffield listed some noise factor test-sets based on the CV 2341 thermionic noise diode. I bought one, played with it for a while and then sold it on (I can't remember to whom).

There are several web-sites with information about the CV 2341, e.g. its specification, https://frank.pocnet.net/sheets/126/c/CV2341.pdf , including the recommended assembly. This specification claims operation up to 1 GHz but another web-site claims 2 GHz. The diode is a section of 75Ω coaxial line with its filament as the inner conductor; the assembly has a 75Ω N-type output connector.

AH Supplies had also broken some of those test-sets for spares and I bought two of the assemblies shown in the specification (each containing a diode) and a single diode. I came across these spare items recently and I would like to move them on to someone who will find a constructive application for them. I also have a copy of the circuit diagram of the noise factor test-set.

The CV 2341 was/is a 'lifed item' and the test set had a clockwork time switch on the front panel that limited the duration for which the diode was energised at each use. I have no way to determine the accumulated operating hours of the three diodes offered here.

I offer the two assembles and the single diode plus the circuit diagram, for just the cost of shipping, to the first email responder. Alternatively, completely free to the first email responder if they can collect from my Petersfield, East Hampshire, location. My email address is pete.weedon@ntlworld.com ."

Pete W.
(G8ZKZ, QRT)

EVENTS 2023

January 14	Heelweg Microwave Meeting	info@pamicrowaves.nl
February tba	Tagung Dorsten	www.ghz-tagung.de
April 1	CJ-2023, Seigy	cj.r-e-f.org
April 14-15	Microwave Update, Windsor CT, USA	microwaveupdate.org
May 19-21	Hamvention, Dayton	www.hamvention.org
June 23-25	Ham Radio, Friedrichshafen	www.hamradio-friedrichshafen.de

80m UK Microwavers net

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

73 Martyn Vincent G3UKV