An Amateur Radio publication for the Microwave Enthusiast

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In This Issue

Driver Interface for the Elad FDM-Duo-Andy G4JNT

Dave G1EHF on 122GHz at Walbury

UK Microwave Group

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News, views and articles for this newsletter are always welcome.

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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

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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

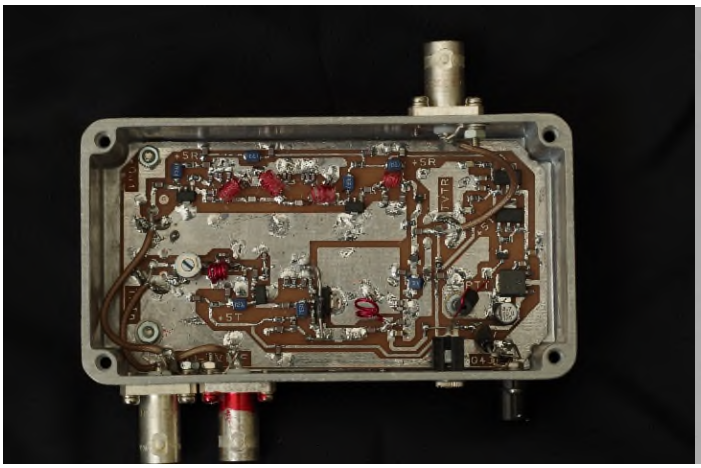
Don't forget, UKuG has loan kit in the form of portable transceivers available to members for use on the following bands:

Contact John G4BAO for more information

5.7GHz 10GHz 24GHz 47GHz 76GHz

144MHz Transverter-Driver Interface for the Elad FDM-Duo

Andy Talbot G4JNT



Introduction

The Elad FDM-Duo is a small fully-SDR based transceiver that can operate either in completely standalone mode or in conjunction with a PC. In normal use it operates over the frequency range from [near] zero to 54MHz where it can deliver 5 Watts on transmit. The sampling frequency is 122.88MHz on receive with the dial frequency adjustable up to 165MHz in 1Hz steps. Above 54MHz, with the input anti-alias filter switched out via menu selection item No. 2 the receiver runs with different alias products of the sampling clock. The internal software automatically compensates for the alias product in use.

On transmit a low power output can be selected via menu item No. 33 so that instead of generating the normal 5 Watts, 1mW appears direct from the SDR transmitter source from the rear-mounted SMA socket. The sampling rate on transmit is 368.64MHz, three time higher than for receive, so this low power port can output frequencies up to 165MHz without making use of alias products.

Ref [1] shows designs for add-on modules for running the FDM-Duo on-air at 144 and 70MHz. The 144MHz design, as it incorporates a 7 watt power amplifier is not suited for driving a transverter, so it was decided to build another module specifically for this task.

FT817 Lookalike

Many people use either an FT817 or the older FT290 (or occasionally the even-older-still IC202) transceiver to drive microwave transverters. These radios are usually adjusted to deliver something like 500mW on transmit, with an internal modification added to supply a few volts of DC on the antenna port for transverter Tx/Rx switching. These transmitters can deliver more than 500mW in normal operation, so any transverter must be 'safe' if accidentally overdriven with a few watts of RF.

The interface for the FDM-Duo needs to replicate this and supply a comfortable 500mW. On receive, although many transverters have plenty of gain, especially at IF, not all do so. Therefore the sensitivity of the interface on Rx needs to be about the same as these older rigs, offering a noise figure of no more than 5dB.

Module Design

The circuit diagram of the complete interface is shown in **Figure 1**. Tx / Rx changeover is controlled by switching 5V transmit and receive power rails using P-channel Mosfets. Tx input is 'ground to transmit' as provided from the 3.5mm jack on the rear of the FDM-Duo

The receive side, and specifically the anti-alias filtering requirements, are dealt with in detail in *[1]* and the same design is adopted here. Good attenuation of the first alias product which occurs at around 100MHz is essential, otherwise Classic FM will be appear all over the band! A three element top-coupled bandpass filter with nominal 10MHz bandwidth works well. The top coupling gives an asymmetric response which enhances low-end attenuation, exactly as needed here. **Figure 2** shows the measured filter response using a noise source to drive the receive chain. Although not visible on the plot due to dynamic range limitations of using noise as a test source, attenuation at 100MHz is around 73dB. Ensure there are no spurious routes for 100MHz signals picked up on connecting leads from appearing on the board. Ferrite beads should be placed on the DC input and Tx control lines and the module built into in a screened box.

As there is so much gain present in the Rx chain, there is no need to make this a particularly low loss filter so small air-wound inductors can be used. Using low-Q inductors does not significantly degrade the stopband response, but does tend to smooth out the passband and make simple "tuning for best passband response" easier. Note that the values of L and C for the filters shown on the circuit diagram are taken direct from the filter simulation package. Use a parallel combination of capacitors to get within a few percent. Tuning is performed by squeezing or stretching the coils for the wanted response. If rejection of 100MHz is still insufficient, an additional bandpass filter can be inserted in the path to the Rx output. This will need to be in its own screened box.

At 144MHz, using the second alias product, the effective receiver noise figure of the FDM-Duo is around 30dB, made up from a combination of SIN(X)/X loss and the summation of noise in all the other alias bands. The interface therefore has to provide something like 40dB of gain to completely overcome this and dominate the overall noise figure. This was the route taken in *[1]* using a pair of PGA-103 devices operating at around 3.5V bias. The bandpass filter sits between the two gain stages. An identical line-up is used here except that an additional 6dB attenuator pad is inserted at the output of the bandpass filter.

The first PGA-103 needs to have a stabilising network added – this is the 150Ω and 1nF combination. Without this network, when presented with a certain range of input impedances, (observed when certain lengths of coax were used to connect to the transverter) the first stage could break into oscillation. A three-section lowpass filter on the input serves to attenuate strong signals from local mobile phone base stations.

On transmit a notch filter removes the 223MHz first alias product and feeds the drive signal into the first gain stage, a single PGA-103. As suggested in the data sheet, a series combination of 150Ω and 2.2pF capacitor is included on the PGA-103 input to stabilise it at GHz frequencies.

The second gain stage is a BFG591 7GHz F_T medium power bipolar device. Presenting the collector with a direct 50Ω load while running from a 12V supply rail allows a theoretical maximum P_{OUT} of 1.4 Watts. It is biased into class AB operation for decent linearity, with the device operating at a standing current of around 100mA. A breadboard of the design showed there was more than enough overall gain with this cascade, requiring just -17dBm of drive for 500mW output; saturation occurs at a little over 1 Watt. An input attenuator is included to drop the 0dBm output from the FDM-Duo to an optimum drive level. A PI network for a 17dB attenuator pad has a top-resistor value of 174Ω, so by making this a 500Ω preset, allows for drive level variation while still maintaining a good match on the input.

The BFG591 is soldered to a 300 mm^2 pad on the PCB, with heat being conducted from this, through the 0.8mm PCB substrate to the ground plane. The PCB needs to be installed without using mounting pillars, directly onto the surface of the enclosure so heat can be conducted directly away from the board. Capacitance of this pad is around 15pF and is in parallel with a 33pF output capacitor. The total C is resonated with the output inductor which should be adjusted by squeezing turns to optimise output at 144MHz. The resulting low Q tank then serves to attenuate harmonics; at 500mW output, the second harmonic was measured at -28dBC. Most transverters designed for 144MHz drive should have filters that are narrow enough to reject mixer products resulting from any harmonics in the drive, so no additional lowpass filter was deemed necessary.

PIN diodes route the Tx or Rx path as appropriate. The diagram shows BAP51 diodes, these are dual devices in a SOT23 package with both diodes operating in parallel.

Inductors and Tuning-Up

For the three bandpass filter inductors of 70nH, a good starting point is six turns of 0.5mm wire wound on a 3.5mm mandrel, then spaced out to give the right value. The transmit notch filter inductor of 32nH requires 3 - 4 turns and the 56nH Rx input filter 5 turns. The Tx output inductor of 25nH is typically 2 turns of 0.8mm wire wound on a 4.5mm mandrel.

The three inductors in the bandpass filter need to be adjusted – by squeezing or stretching turns – to give a reasonable bandpass response using either a network analyser or, as shown in **Figure 2**, by driving the receive input from a noise source and viewing the output on a spectrum analyser. Nothing is critical, the nominal bandwidth is 10MHz so provided a reasonable degree of flatness is obtained over the normal 144 – 145MHz narrowband segment it will work.

The inductor on the transmit input filter should be adjusted to give a notch at 223MHz. Adjust the output inductor for a peak in response at 145MHz. This is a low Q network so adjustment range will be very broad. With the FDM-Duo on CW and generating a carrier adjust the input preset to get 500mW output, or whatever level the transverter drive requires, but do not aim for much more than 500mW as linearity will rapidly degrade.

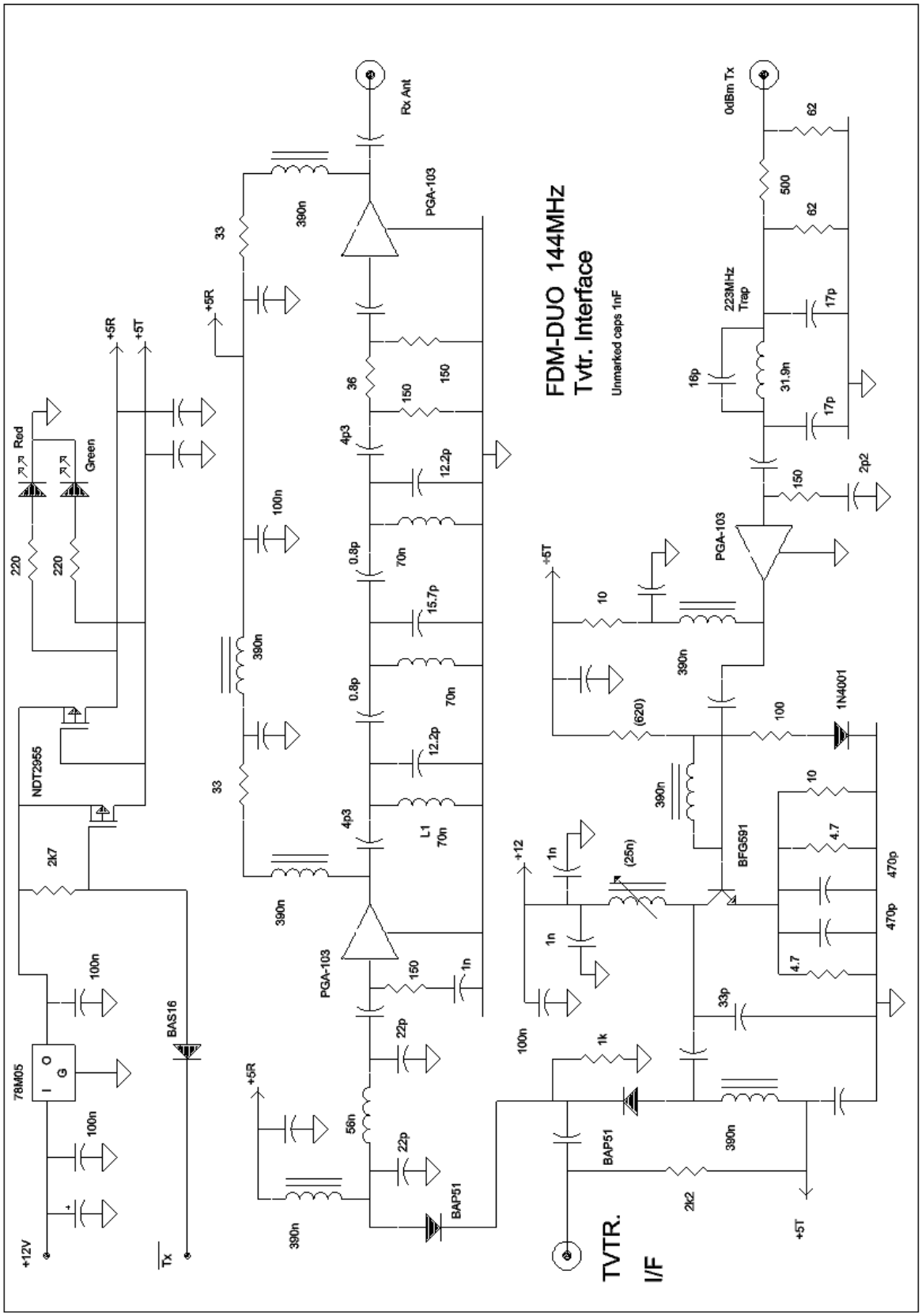


Figure 1. Full Circuit diagram of FDM-Duo 144MHz interface for driving transverters.

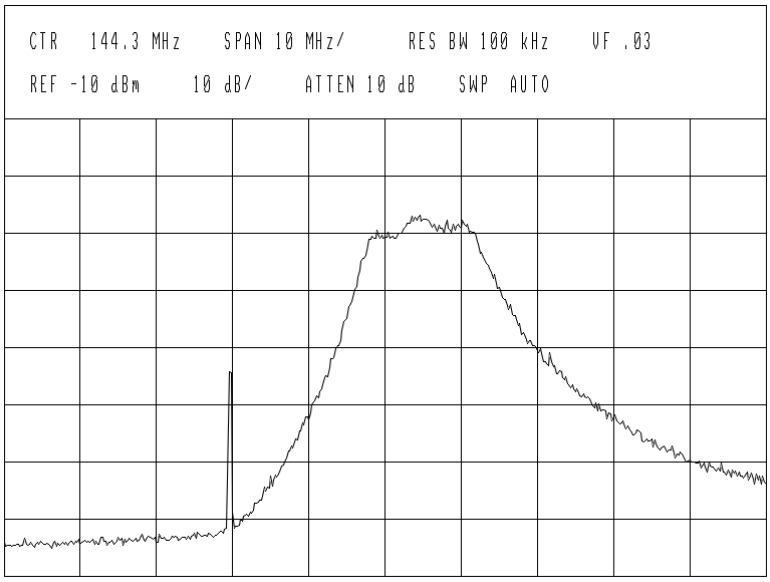


Figure 2. Measured receive chain response using a noise source on the Rx input. The spike at 125MHz is the noise generator clock. Gain at 145MHz is 33dB. Attenuation of the first alias product at 100MHz is around 73dB

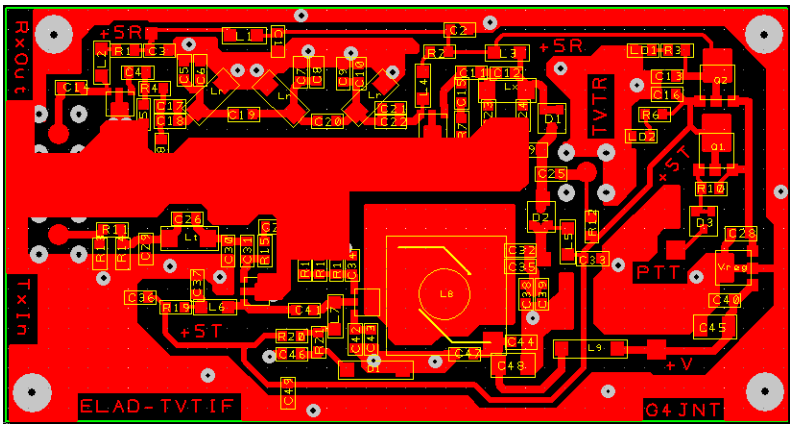
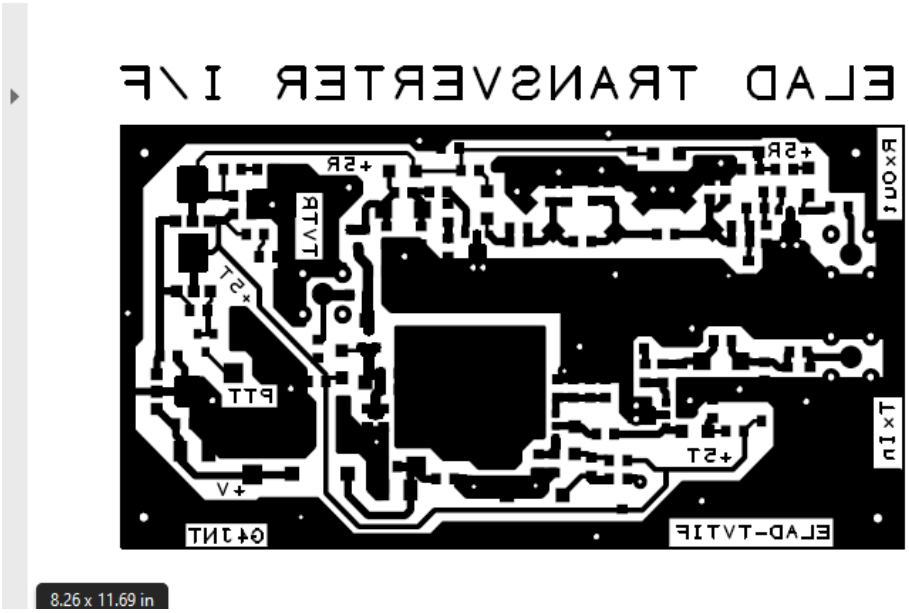


Figure 3 PCB Layout (approx. full size)



References

[1] http://g4jnt.com/FDM-DUO_at_VHF.pdf

Using Feld-Hell with the VK3CV 122GHz transceiver board

Barry Chambers, G8AGN

Introduction

A number of amateurs world-wide are now experimenting on 122GHz using the crowd-funded VK3CV transceiver board. Because the RF portion of the board is based on a Silicon Radar TRA_120_002 chip which was originally developed for short range radar applications, this means that the transmitter is always switched on, even on receive, when it then acts as the receiver local oscillator. Hence as originally conceived, the VK3CV board can only operate using duplex FM (similar to the early days of wideband 10GHz operation) or using frequency shift keyed CW. For weak-signal DX working, FM suffers from the so-called threshold effect which requires a fairly large received C/N before it can start to trade FM's wide transmission bandwidth for a larger recovered S/N. Hence the FSK-CW mode would appear to be the only available candidate for weak-signal working since the PLL chip used on the VK3CV board is not capable of generating the very small frequency shifts required for the usual weak-signal digital modes. There are, however, two other modes which might be exploited since these are variations of CW. The first of these is QRSS and the second is Feld-Hell [1]. Both of these modes make use of a visual display on receive and hence can exploit the eye-brain combination to enhance the received S/N.

Hardware for Feld-Hell

In this article, I will describe how to implement Feld-Hell with the VK3CV board using simple hardware based on an Arduino Nano. Two versions of the system will be described. The first of these, whose circuit schematic is shown in Figure 1, converts the VK3CV board into a Feld-Hell beacon which transmits a pre-programmed message repeatedly. The second version, shown in Figure 2, extends the functionality of the first by including a standard PS-2 keyboard so that messages can be composed and transmitted "on the fly".

Because the first version of the hardware is so simple, it needs no further comment, except to say that it may also be implemented using an Arduino Pro-Mini.

The second version of the hardware is small enough to fit inside the PS-2 keyboard enclosure as shown in Figure 3. It includes a red-green LED whose function is to indicate when the system is transmitting (red) and when it is idle or a message is being typed into the message buffer prior to transmission (green). It should be noted that only upper case letters, together with figures and some punctuation, may be transmitted in Feld-Hell.

Software

The Arduino sketches for both hardware versions are based on software written by K6HX [2] and control the voltage fed into the VK3CV board via the standard key jack, i.e. they replicate the action of a normal Morse key such that on key-down the VK3CV board is radiating on the transmit frequency, whereas on key-up, the board is radiating on the receiver LO frequency. Both frequencies are set by the board's in-built channel switch as usual.

The sketch which is used in conjunction with the PS-2 keyboard is very simplistic and does not check for errors such as message buffer overflow. As some insurance against this happening the buffer size is presently set at 80 characters and this can be changed to suit the user. Once a message has been entered using the keyboard, transmission is initiated using the keyboard "Enter" key and the message will then be transmitted five times although this can be altered by the user.

On receive, use is made of IZ8BLY's Hellschreiber software [3] and the 144MHz receiver acting as the VK3CV board I.F. is tuned to give an appropriate audio frequency output.

Typical received output for both versions of the hardware is shown in Figures 4(a) and 4(b).

Both Arduino sketches are available by e-mailing me at b.chambers@sheffield.ac.uk

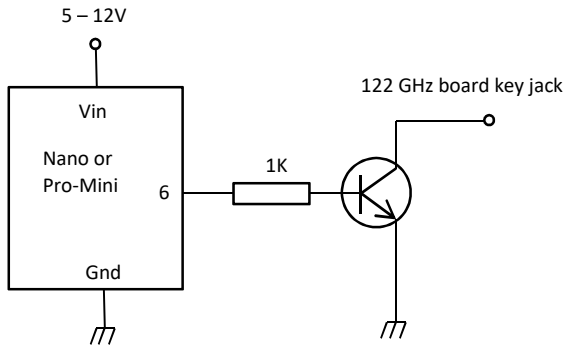


Fig.1

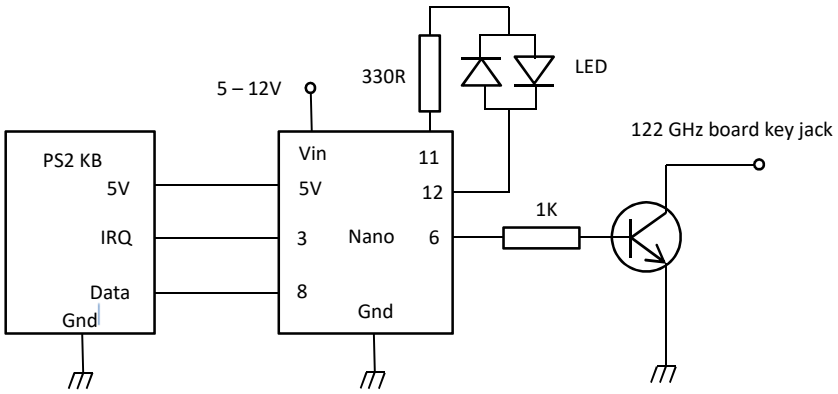


Fig.2

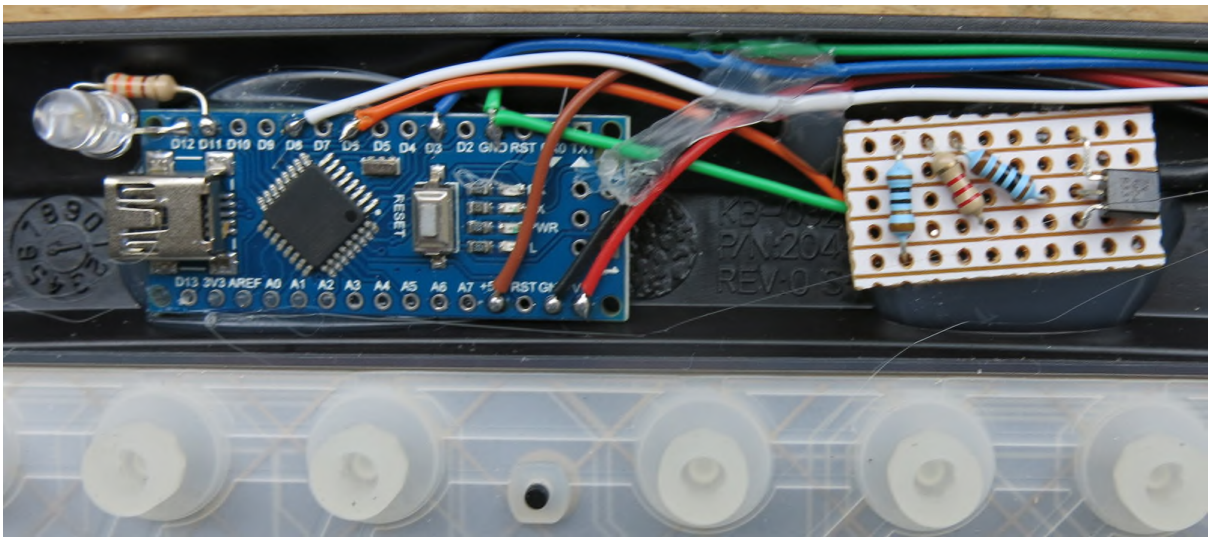


Figure 3 Feld-Hell source, version 2, installed inside PS-2 keyboard

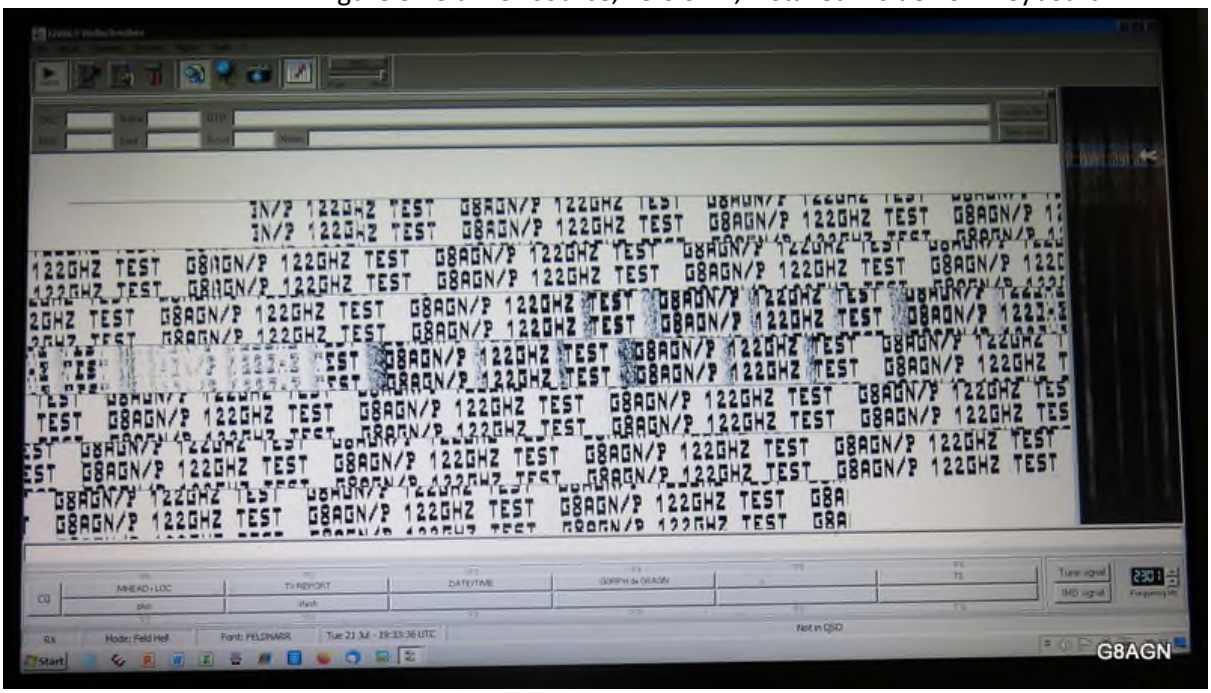


Figure 4(a) Signal received from Feld-Hell beacon at 122GHz

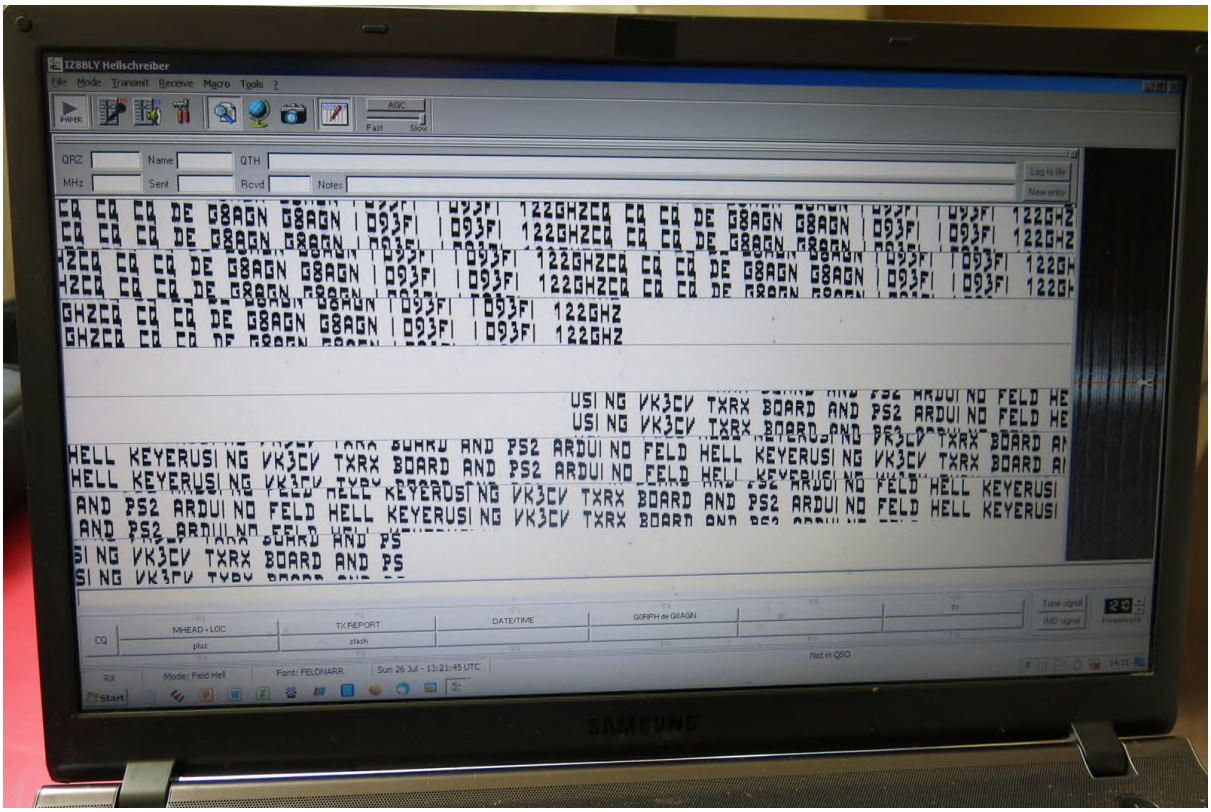


Figure 4(b) Signal received from Feld-Hell PS-2 keyboard at 122GHz

References
1. https://en.wikipedia.org/wiki/Hellschreiber
2. https://brainwagon.org/2012/01/11/hellduino-sending-hellschreiber-from-an-arduino/
3. http://antoninoporcino.xoom.it/Hell/index.htm

This Month I have been…….

Having handed back my lease estate car at the beginning of lockdown. With only my xyl's Toyota Yaris available, there was a necessity to reduce the amount of kit carried for the millimetre contests.
The idea was to add a 24GHz Eyal Gal transverter to the 47GHz system. The aim while doing it, was to keep the weight the same, improve frequency accuracy, and keep operation simple.
The Elcom synth was replaced by a 14G synth board, followed by a 11GHz band pass filter, with 10MHz reference. The 24G transverter was bolted on the base, with coax c/o relay. A WR-34 horn from Ebay was fixed beneath the 47G feed with tape.
This should just mean a small elevation change between the two bands. This proved correct in the July contest. With the setup used for all 24/47G contacts.
I had saved a transverter/dish, tripod, battery, FT817 and check sources.
Roger G8CUB
Picture – transverter in operation at Hackpen

Scatterpoint activity report

Activity News: June / July 2020

By John G4BAO

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

From John G4BAO

I now have my 10GHz EME 20W PA up and running. It uses a pair of 15W 9GHz GaAs FETS and I've been looking at the vagaries of QRA64D decoding off the Moon on that band.

I managed digimode QSOs with (sent report first) W3SZ -14, -20 QRA64D, OK2AQ -18, -21 JT4F, OK1DFC -14 -14 QRA64D. (I came close to a CW QSO with Zdenek, as well but didn't quite make it! HB9DUK -14, -22 QRA64, OK1KIR -15, -17.

On 10GHz terrestrial, running 7W to a 60cm dish, in the June and July 10GHz UKuG contests I worked the "usual suspects." Mainly on CW. ODX being G4KUX at 298km despite Nick having an extremely sick transmitter!

Also, I was pleased to get a rare new station, Paul, G8AQA/P, in the log at 198km for the first time giving me my all-mode initial #140 on 10GHz.

After 16 years on the band, that starkly sums up the levels of activity, fewer than 10 new ones a year. We can all do better!

(Another) observation on GHz Bands digimodes

Like it or loathe it we are in a digital mode revolution at the moment. For home stations on 3.4 GHz and up, they are really worth making the effort to connect up your computer.

I constantly get frustrated when I hear weak unworkable CW signals that clearly show up as a waterfall trace, but when I ask, "can you do digimodes" I just get excuses!

I'm not suggesting we join the "Too lazy to talk" FT8 brigade on HF here, where most could easily work stations on CW or SSB if they could just be bothered.

I'm talking about pushing the boundaries of the GHz bands and our equipment where we could make a marginal QSO using JT4F or QRA64 when no other mode would do it.

Think about it,….. then…… go do it!

From Dave G1EHF

<u>122GHz</u>

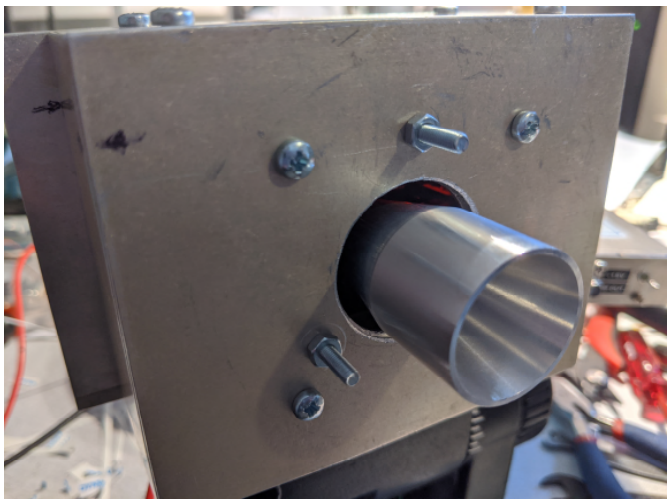
In preparation for the Sunday mmWave activity on Sunday, I quickly assembled my recently received 122GHz board from VK3CV, together with a 1PPS GPS RX and the 20dBi horn into the smallest box I could find (see pictures 1 and 2). I plan to try a number of antenna options but the quickest solution was to add the assembled box with horn to the rear of a 30cm Cassegrain dish from a 50GHz Pasolink (picture 3) and mount on a pan/tilt on a tripod. This was all completed in quick time, leaving just enough to do some simple DC and IF checks before the session on Sunday.

Having performed no real RF tests, Noel G8GTZ who had also just assembled his 122GHz system joined me on Walbury Hill and we did some tests over a very short 3m range. Pleasingly, after having grappled with the options provided by the various switches on the boxes, we achieved a full duplex NBFM contact, proving everything was working OK. Noel

then moved to Combe Gibbet, 1.1km away and we repeated the exercise with fully quieting signals and logged this as our first real contact. We did try again after Noel roved to a new site but failed. We think this was due to the chosen site being almost too close to Walbury, causing summit blockage and errors in the beam headings (~15 degrees it turns out!).

I did listen out later for John G8ACE/P from Lane End but we couldn't work that 39km path on this occasion. However, later in the day Roger G8CUB/P arrived at Combe Gibbet and I also had a simplex NBFM contact with him, so S/N 002 was needed! Again, very large signals from Roger with his QRO TX.

Dave has shared some nice photos of his equipment here



Lessons learnt:
- The VK3CV boards are surprisingly frequency-accurate even with 1PPS disabled, although there is some short-term wobble
- Dish antennas (even small ones) become very sharp at 122GHz and you really need to know exactly where the other station is located, ideally with visible LOS paths
- Range improvements are going to take concerted effort but I'm sure we're up for the challenge

24GHz

Whilst not being distracted by 122 GHz, there were plenty of 24GHz contacts to be had. I managed 10 contacts with ODX of Keith GW3TKH/P and Pete GW4HQX/P at 122km. Yet again, G3UKV/P (at 148km) just got away. We could both just detect each other but S/N and QSB made even CW too difficult (next time Martyn!).

From César, EA8CXN.

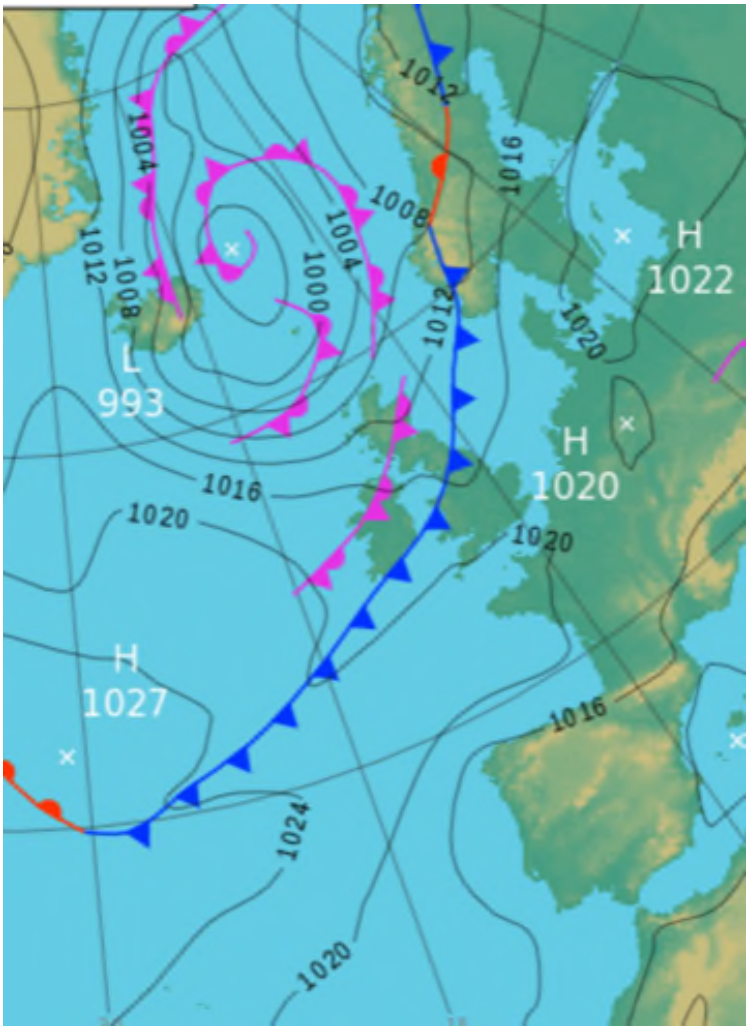
I write you to inform of a claimed Region 1 Tropo record on the 17th of July 2020. From IL18SK, on 1296.200 SSB I worked EI2FG IO61AX. A distance of 2714 km. There is a small description of the QSO, which involved other stations. It is on Spanish, but you can use a web translator to read it. https://ea8cxn.es/?p=242

Spain worked on 10GHz.

David Newman (G4GLT)

I had been watching the path to EA since the EA1URG beacon appeared last year and first heard it on 23rd August 2019 at 0712Z at 559. I had been puzzled by this beacon being heard by various people for a couple of months then nothing at all reported.
On 23rd June 2020 from 0920-1046Z I heard a very weak beacon slightly higher on 10368.980 and eventually pieced together a new callsign of ED1ZBE with a locator of IN73DL.
My site is a portable one at Haytor, Devon, at IO80DO10KU at a height of 363metres ASL. There is a 41km land path over the South Hams to the sea on the bearing towards this beacon.
On looking at F5LEN predictions, I was very interested in the high pressure area over the bay of Biscay predicted for Sat 18th July. I listened briefly at 0530Z and ED1ZBE was audible at 429 as well as the two near French beacons at good strength. I had to rush off to get the weeks groceries and when I got back at 0800Z the area was shrouded in low cloud and it was chilly and the French beacons were inaudible and no ED1ZBE beacon. I carried on listening and the low cloud gradually cleared and ED1ZBE reappeared at 0947Z. I reported the beacon on Beaconspot and via KST2Me chat was able to contact Domi EA1W. By this time the beacon had started to build in strength and was maximal at 579 at 1123Z
I had SSB QSO's with EA1W and Angel EA1NV at around 1055Z. Both their locators were IN73EN.
Reports were of 57 both ways and the QSB was minimal.
Sylvain F6DBI in IN88IJ on 10Ghz said that he also had worked Domi EA1W and that Domi was running only 200mW!!
It is certainly encouragement for anyone who has not got round to adding an amplifier yet.

On the isobar map for 1200UTC for 18/7/2020 there is a large area of high pressure over the Bay of Biscay up to the Devon coast at 1020 millibars. It is of interest that the propagation went across the isobars.



Isobar pressure map courtesy of the Met Office.

Looking at the F5LEN prediction maps for 18/7/2020 for 0900z and 1200Z it is clear that the conditions present are exceptional as we don't normally see much green/yellow on the map connecting us with anything, and have to make do with the two shades of purple much of the time. I was sure that there was nothing much wrong with the path across the Bay of Biscay, but that there is a small land crossing near Brest, which could be part of the problem. In the end I concluded that it was the local conditions here on Dartmoor and the South Hams that was preventing the path to open up earlier.
Generally, I would say that the F5LEN charts are very useful indeed and note that the predictions can and do change, so that something that looked promising can change later into something more ordinary.

VK 122GHz Project – update

The first UK contact using the VK boards over 1km is claimed by Colin G4EML

G4EML end

G1OSO end UK 4.4Km CW Contact

First medium distance test carried out today between Colin G4EML/P and Andrew G1OSO/P.
Distance was 4.4 Km using horn antennas at both ends. Using internal reference oscillators.
Locations TQ062505 (North Downs) to TQ042544 (A3 Junction near Clandon).
Weak CW signals were exchanged. Not strong enough to detect anything on FM.
Recording and pictures of the two sites attached. Distant sites marked with small red dot.

One thing that was confirmed was that it is useful to be able to turn off the GPS locking at both ends once the signals have been acquired.
Without this the signals constantly hunts +/- 1khz every few seconds as the GPS tries to discipline the oscillators. This constant changing tone makes it difficult to read weak CW.
Having the GPS on makes initial acquisition easier as it removes the frequency uncertainty. The signals will be found within about 1kHz of nominal but constantly varying like a siren.
Turning off the GPS then results in better short term stability, making the CW much easier to read.

Based on the signals received any greater distance is probably going to need more antenna gain. I am now working on fitting one unit to an old BSB offset dish which is small and fairly well built

Colin G4EML

Many contacts have now been made using the VK boards

The first GM/GM & G/GM

Pete GM4BYF and Brian GM8BJF have recently built up VK3CV boards into portable systems and have been doing some tests with them. Reports Brian - Thursday 23rd July we had what we believe is the first GM to GM contact across a distance of 0.69 km between two hills in Edinburgh. On 26th we went down to the English border and had what we believe to be the first GM to G contact on the band. Details are on my website at https://gm8bjf.joomla.com/2-uncategorised/23-122-ghz-activities
They used the system in its most basic form with 25 mm circular horns.

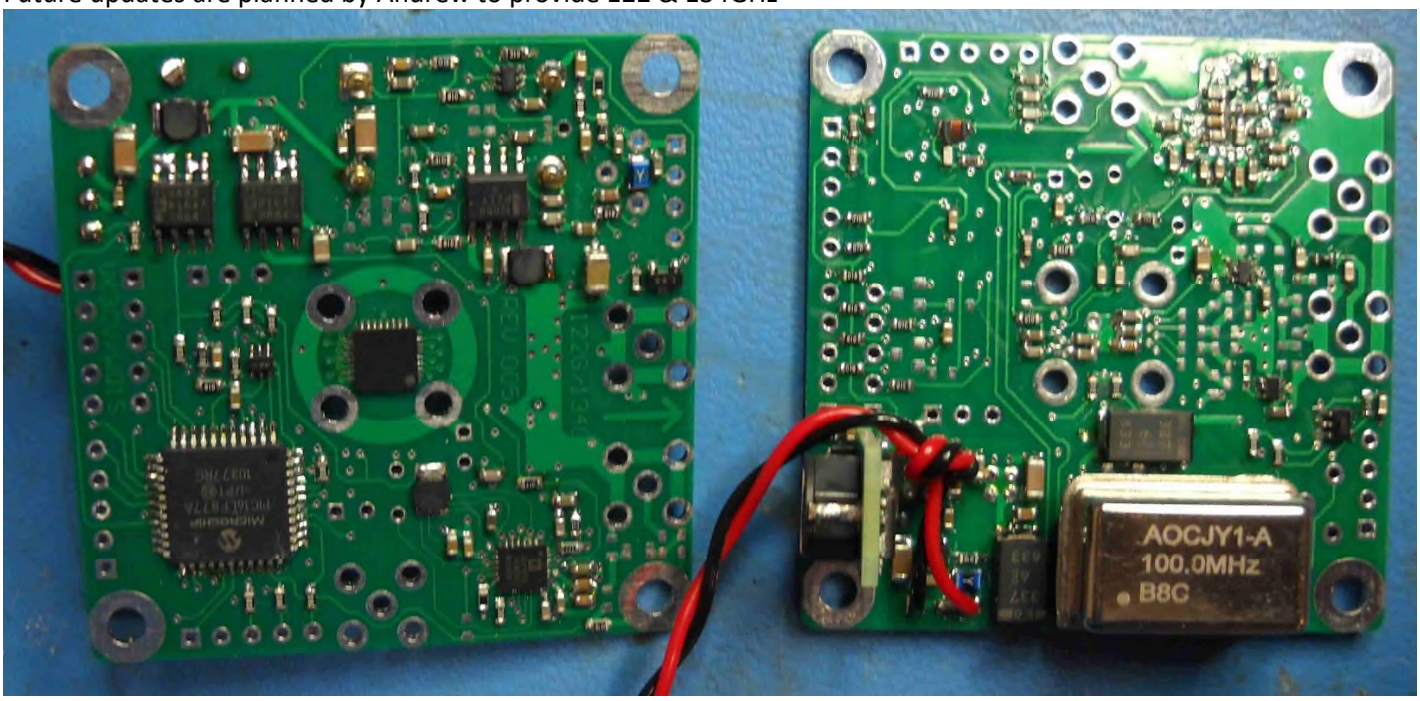
Following on from their contacts in the 24/47/76GHz contest. Noel G8GTZ and Dave G1EHF, now both with dishes, had a 8.5km FM qso. Signals were 5/9 fully quieting FM. Interestingly both stations used the 24dBi horns as dish feeds. This looks very neat with the Pasolink dish.

Path was from IO91KH10cd to IO91KF42wk

On 17th July Chris G0FDZ and Roger G8CUB had a one way CW contact over 14.7km, using the VK boards with 150cm Flann horns. Signals were heard in both directions across the Thames, with noticeable QSB.
Then during the Contest on 19th July John, G8ACE and Roger had a 26km CW contact, between Stockbridge and Coombe Gibbet. Although the VK boards were used for receive. Both stations used higher power transmitters. Neil G4LDR received the CW from G8CUB alongside John, using just the 24dBi horn, on his VK system

The current UK record was set in 2017 by GJ/DB6NT and F/DG8EB at 35.8km.

Future updates are planned by Andrew to provide 122 & 134GHz



122/134GHz 005 Revision PCB Used for the recent VK 134GHz record. Note that production of the IC from Silicon Radar is probably 12 months away, and that they are considering revising the specification.

Roger G8CUB

Beacon News

New Beacon, GB3OSW, is operational on 10368.780 MHz from IO82KV80 and is GPS referenced.

Its a 2min sequence. From the start of the even minute "T=0"

T=0	JT4g (centered on Mark, Call & Locator)
T+50	CWID +GPS Status (L for Locked)
T+60	30 seconds plain carrier (Mark freq)
T+90	20 seconds of 0.5Hz alternating tones
T+110	CWID + GPS status (L for Locked)

There may be a few interruptions whilst commissioning and finalising installation.

from John G0API

Contests

June 2020 Lowband Contest Results

The lockdown made this a rather different event from previous years, with no portable entries (although one or two were on giving points away), and a lack of activity from the continental stations that usually feature in the concurrent European microwave contests. Entrant's comments indicated that conditions were flat at best.

John G4ZTR led the pack on 1296MHz, and also worked the best DX of the contest with DL3IAS at 600km. Anthony G7LRQ was runner up with the highest QSO tally. John G3SQQ was the leading low power entrant.

Just one entry was received for 2300MHz, but two check logs! Unfortunately the one QSO logged failed to get through adjudication, so no points were awarded on this band.

On 2320MHz John G4ZTR again led the way from Anthony G7LRQ, and also recorded the best DX with G4KCT at 257km, which is well down on the same event last year. John G3SQQ was leading low power entrant.

David M0GHZ came out on top on 3400MHz, with Martyn G3UKV as runner-up. Best DX was recorded between G4JNT and G4ODA at 224km.

In the Overall Table, a three band entry by David M0GHZ was the winner by a small margin over John G4ZTR who won both the bands he entered.

The overall Low Band Championship remains open to change in November when the last event takes place. Currently M0GHZ heads the table, with G4ZTR second.

Congratulations to all the winners and runners up listed above.

John G3XDY
UKuG Contest Manager

June 2020 Low Band Contest Results

Overall

Pos	Callsign	1296MHz	2300MHz	2320MHz	3400MHz	Overall
1	M0GHZ	512	0	515	1000	2027
2	G4ZTR	1000	0	1000	0	2000
3	G7LRQ	886	0	745	0	1631
4	G3UKV	205	0	502	820	1527
5	G4LDR	265	0	449	638	1352
6	G3SQQ	541	0	672	0	1213
7	G4BXD	285	0	0	646	931
8	G4JNT	0	0	0	772	772
9	G3TCU	758	0	0	0	758
10	G8AIM	215	0	286	219	720
11	G3VKV	165	0	178	286	629
12	G4KIY	388	0	0	0	388
13	F4VRB	354	0	0	0	354
14	G3TCT	315	0	0	0	315
15	GM4BYF	278	0	0	9	287
16	G8DOH	209	0	0	0	209
17	G4KZY	153	0	0	29	182

18	G4RQI	132	0	0	0	132
19	GW4MBS	113	0	0	0	113
20	G0LGS	94	0	0	0	94
21	GM4DIJ	1	0	37	40	78
22	M0WGF	76	0	0	0	76
23	G6GVI	70	0	0	0	70
24	G1YFG	65	0	0	0	65
25	G1PPA	32	0	0	0	32
26	GW4JQP	15	0	0	0	15

Low Band Championship 2020

Results after four sessions, the best three events count towards the total

Overall

Pos	Callsign	08/03/2020	05/04/2020	03/05/2020	07/06/2020	TOTAL
1	M0GHZ	2003	2218	2280	2027	6525
2	G4ZTR	1902	1762	0	2000	5664
3	M0HNA(/P)	4000	1481	0	0	5481
4	G7LRQ	0	1408	1523	1631	4562
5	G4LDR	0	1745	885	1352	3982
6	G3UVR	1429	2289	0	0	3718
7	G3UKV	1085	223	309	1527	2921
8	G4BRK	0	1455	801	0	2256
9	G3YJR	791	452	965	0	2208
10	G4JNT	0	922	438	772	2132
11	G3SQQ	478	0	275	1213	1966
12	G8AIM	486	701	325	720	1907
13	G3TCU	0	598	355	758	1711
14	G4FRE	0	778	617	0	1395
15	G3VKV	303	329	186	629	1261
16	G1EHF	0	0	1133	0	1133
17	G4BXD	26	123	33	931	1087
18	G8DMU	0	1078	0	0	1078
19	G3TCT	0	522	240	315	1077
20	F4VRB	0	415	297	354	1066
21	GD8EXI	0	1000	0	0	1000
22	PA5Y	0	0	1000	0	1000
23	G6KWA	467	259	134	0	860
24	G4KIY	0	0	319	388	707
25	GI6ATZ	0	0	519	0	519
26	G8EOP	306	146	0	0	452
27	G0EAK	0	0	441	0	441
28	G4RQI	0	279	0	132	411
29	G4KZY	0	187	42	182	411
30	GM4BYF	0	0	51	287	338

31	GM4DIJ(/P)	222	12	35	78	335
32	G8AQA	0	258	0	0	258
33	GW4MBS	43	72	0	113	228
34	G8DOH	0	0	0	209	209
35	G4BAO	0	190	0	0	190
36	GM8IEM	51	64	40	0	155
37	G6GVI	0	40	12	70	122
38	G0LGS	0	0	0	94	94
39	M0WGF	0	0	0	76	76
40	G1YFG	0	0	0	65	65
41	GD1MIP	17	0	32	0	49
42	G0HIK	0	41	0	0	41
43	G1PPA(/P)	140	0	0	32	172
44	GW4JQP	0	0	0	15	15
45	G4GUG	0	0	0	0	0

1296MHz

Pos	Callsign	08/03/2020	05/04/2020	03/05/2020	07/06/2020	TOTAL
1	G4ZTR	905	762	0	1000	2667
2	G7LRQ	0	840	523	886	2249
3	G3TCU	0	598	355	758	1711
4	M0GHZ	367	549	370	512	1431
5	M0HNA(/P)	1000	276	0	0	1276
6	G4BRK	0	866	247	0	1113
7	G3TCT	0	522	240	315	1077
8	F4VRB	0	415	297	354	1066
9	G3SQQ	218	0	275	541	1034
10	GD8EXI	0	1000	0	0	1000
11	PA5Y	0	0	1000	0	1000
12	G3UVR	355	639	0	0	994
13	G6KWA	467	259	134	0	860
14	G4KIY	0	0	319	388	707
15	G8DMU	0	614	0	0	614
16	G3UKV	209	126	83	205	540
17	G4LDR	0	159	110	265	534
18	GI6ATZ	0	0	519	0	519
19	G8AIM	87	151	65	215	453
20	G4RQI	0	279	0	132	411
21	G4BXD	26	90	33	285	408
22	G4KZY	0	187	42	153	382
23	G3YJR	59	229	74	0	362
24	G3VKV	64	97	26	165	326
25	GM4BYF	0	0	41	278	319
26	G8AQA	0	258	0	0	258
27	GM4DIJ(/P)	222	12	22	1	256
28	GW4MBS	43	72	0	113	228
29	G8DOH	0	0	0	209	209

30	G4BAO	0	190	0	0	190
31	G1PPA(/P)	140	0	0	32	172
32	GM8IEM	51	64	40	0	155
33	G0LGS	0	0	0	94	94
34	G6GVI	0	0	9	70	79
35	M0WGF	0	0	0	76	76
36	G4FRE	0	67	0	0	67
37	G1YFG	0	0	0	65	65
38	GD1MIP	17	0	32	0	49
39	G0HIK	0	41	0	0	41
40	GW4JQP	0	0	0	15	15
41	G4GUG	0	0	0	0	0

2300MHz

Pos	Callsign	08/03/2020	05/04/2020	03/05/2020	07/06/2020	TOTAL
1	M0HNA(/P)	1000	1000	0	0	2000
2	G3YJR	648	0	678	0	1326
3	G1EHF	0	0	1000	0	1000
4	G4LDR	0	121	0	0	121

2320MHz

Pos	Callsign	08/03/2020	05/04/2020	03/05/2020	07/06/2020	TOTAL
1	G4ZTR	997	1000	0	1000	2997
2	G7LRQ	0	569	1000	745	2314
3	M0GHZ	645	736	910	515	2291
4	G3UVR	657	921	0	0	1578
5	G4LDR	0	465	374	449	1288
6	M0HNA(/P)	1000	205	0	0	1205
7	G4BRK	0	589	554	0	1143
8	G3UKV	268	0	226	502	996
9	G3SQQ	259	0	0	672	931
10	G8AIM	173	243	186	286	715
11	G3YJR	84	223	213	0	520
12	G8DMU	0	464	0	0	464
13	G8EOP	306	146	0	0	452
14	G0EAK	0	0	441	0	441
15	G3VKV	157	97	38	178	432
16	G4FRE	0	0	178	0	178
17	G1EHF	0	0	133	0	133
18	GM4DIJ	0	0	13	37	50
19	G6GVI	0	40	3	0	43
20	G4BXD	0	33	0	0	33
21	GM4BYF	0	0	10	0	10

3400MHz

Pos	Callsign	08/03/2020	05/04/2020	03/05/2020	07/06/2020	TOTAL
1	M0GHZ	991	933	1000	1000	2991
2	G4JNT	0	922	438	772	2132
3	G4LDR	0	1000	401	638	2039
4	G3UKV	608	0	0	820	1428
5	G4FRE	0	711	439	0	1150
6	G3UVR	417	729	0	0	1146
7	M0HNA/P	1000	0	0	0	1000
8	G8AIM	226	307	74	219	752
9	G3VKV	190	232	148	286	708
10	G1PPA/P	650	0	0	0	650
11	G4BXD	0	0	0	646	646
12	GM4DIJ	0	0	0	40	40
13	G4KZY	0	0	0	29	29

June 5.7GHz Contest 2020

Pete G4CLA won this contest with a good lead over runner up David M0GHZ. M0GHZ also had the best DX at 246km. Thanks go to G1EHF/P, G4EML/P and G4ODA for check logs. Assuming the lockdown relaxation continues I expect to see several portable entries for the July event.

73

John G3XDY

UKuG Contest Manager

5.7GHz Contest June 2020

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1	G4CLA	IO92JL	9	1249	G4JNT	177
2	M0GHZ	IO81VK	8	874	G3XDY	246
3	G4JNT	IO90IV	6	603	G4ODA	224
4	G8DMU	IO93FX	2	333	G4CLA	169
5	G3VKV	IO81XV	1	53	M0GHZ	53
6	G1DFL	IO91NL	1	43	G1EHF/P	43

June 10GHz Contest 2020

The coronavirus restrictions once again limited participation in this event. Hopefully this will ease from July onwards. Conditions were unremarkable for this event.

John G4ZTR won the Open section again this month, with Pete G4CLA as runner up. John worked the best DX of the day with G8DMU. Ben G4BXD wins the Restricted section as the only entrant.

Thanks go to G4ODA, G4EML/P, G1PPA/P, and G4SJH/P who submitted checklogs.

73

John G3XDY

UKuG Contest Manager

10GHz Contest June 2020
Open Section

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1	G4ZTR	JO01KW	16	2437	G8DMU	279
2	G4CLA	IO92JL	16	1850	G3XDY	171
3	M0GHZ	IO81VK	11	1455	G3XDY	246
4	G8DMU	IO93FX	6	957	G4LDR	320
5	G4BAO	JO02CG	9	943	G4RQI	191
6	G4RQI	IO93IR	6	867	G3XDY	250
7	G3YJR	IO93FJ	5	585	G4ZTR	230
8	G3VKV	IO81XV	5	303	G4CLA	87

Restricted Section

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1	G4BXD	IO82UJ	4	417	G4ODA	153

5.7/10GHz Championship Tables

Positions after two sessions, best three count to the total

5.7GHz

Pos	Callsign	31/05/2020	28/06/2020	TOTAL
1	M0GHZ	1000	700	1700
2	G7LRQ	424	0	424
3	G1EHF	225	0	225
4	G8AIM	52	0	52
5	G4CLA	0	1000	1000
6	G8DMU	0	267	267
7	G4JNT	0	483	483
8	G3VKV	0	42	42
9	G1DFL	0	34	34

10GHz
Open

Pos	Callsign	31/05/2020	28/06/2020	TOTAL
1	G4ZTR	1000	1000	2000
2	M0GHZ	888	597	1485
3	G4BAO	309	387	696
4	G3YJR	101	240	341
5	G8AIM	73	0	73
6	G4CLA	0	759	759
7	G8DMU	0	393	393
8	G4RQI	0	356	356
9	G3VKV	0	124	124

10GHz Restricted

Pos	Callsign	31/05/2020	28/06/2020	TOTAL
1	G4BXD	0	1000	1000

UKuG MICROWAVE CONTEST / ACTIVITY WEEKEND CALENDAR 2020

Dates, 2020	Time UTC	Contest name	Certificates
26 -Jul	0600 - 1800	3rd 5.7GHz Contest	F, P,L
26 -Jul	0600 - 1800	3rd 10GHz Contest	F, P,L
29-30 Aug		Activity Weekend	
30-Aug	0600 - 1800	4th 5.7GHz Contest	F, P,L
30-Aug	0600 - 1800	4th 10GHz Contest	F, P,L
13-Sep	0900 - 1700	2nd 24GHz Contest	
13-Sep	0900 - 1700	2nd 47GHz Contest	
13-Sep	0900 – 1700	2nd 76GHz Contest	
13-Sep	0900 – 1700	122GHz up Contest	
26- 27 Sep		Activity Weekend	
27 -Sep	0600 - 1800	5th 5.7GHz Contest	F, P,L
27 -Sep	0600 - 1800	5th 10GHz Contest	F, P,L
18 -Oct	0900 - 1700	3rd 24GHz Contest	
18 -Oct	0900 - 1700	3rd 47GHz Contest	
18 -Oct	0900 – 1700	3rd 76GHz Contest	
18 -Oct	0900 - 1700	122GHz Activity Day	
24-25 Oct		Activity Weekend	
15 -Nov	1000 - 1400	5th Low band 1.3/2.3/3.4GHz	F, P,L
28-29 Nov		Activity Weekend	
26-27 Dec		Activity Weekend	

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

EVENTS 2020

Events may be subject to cancellation due to the Coronavirus
For latest information consult https://microwavers.org

2020

August 20-23	EME 2020 Prague *postponed to Aug 2021*	www.eme2020.cz
September 11-13	65.UKW Tagung Weinheim *cancelled*	http://www.ukw-tagung.de/
September 13-18	European Microwave Week, Utrecht *postponed to Jan 2021*	www.eumweek.com/
September 20	Crawley Roundtable *cancelled*	
September 25-26	National Hamfest	http://www.nationalhamfest.org.uk/
October 9-11	RSGB Convention & Amsat-UK Colloquium *now virtual*	**http://rsgb.org/convention/**
October15-18	Microwave Update, Sterling, Virginia *postponed to 2021*	www.microwaveupdate.org
October 10-16	IARU-R1 General Conference, Novi Sad	www.iaru2020.org
October 24-25	BATC Convention, Online	https://batc.org.uk/events/
November 7	Scottish Round Table	www.gmroundtable.org.uk/

2021

January ?	Heelweg	www.pamicrowaves.nl/
January 10-15	European Microwave Week, Utrecht	www.eumweek.com/

80m UK Microwavers net

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

73 Martyn Vincent G3UKV