An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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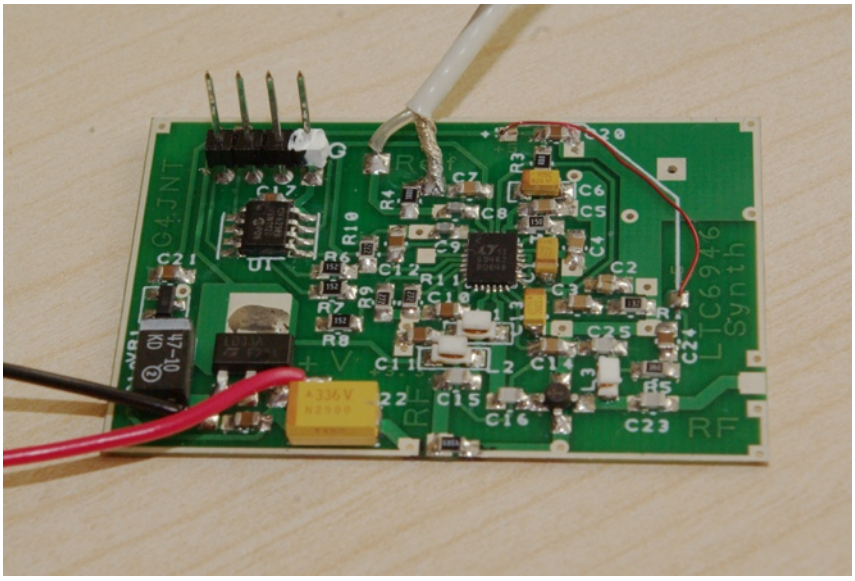
LTC6946 Synthesizer PCB

By Andy Talbot G4JNT



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Editor's corner

Now the darker (and colder) evenings approach, we have a number of technical articles to warm your soldering irons and encourage you to make use of the UKµG Chip Bank.

73 de Martin G8BHC

Articles for Scatterpoint

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

Please send them to

editor@microwavers.org

The CLOSING date is the FIRST day of the month

if you want your material to be published in the next issue.

Please submit your articles in any of the following formats:–

Text: txt, rtf, rtfd, doc, docx, odt, Pages

Spreadsheets: Excel, OpenOffice, Numbers

Images: tiff, png, jpg

Schematics: sch (Eagle preferred)

I can extract text and pictures from pdf files but tables can be a bit of a problem so please send these as separate files in one of the above formats.

Thank you for you co-operation.

Martin G8BHC

UK MICROWAVE GROUP

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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.

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Colour codes

Editorial & Events

Activity & Contests

Technical

Nanowaves (optical)

Commentary

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LMX2541 Fractional-N Synthesizer
Development PCB

By Andy Talbot G4JNT

The LMX2541 Fractional N synthesizer is a convenient tool to use as a building block at microwaves. It has an internal VCO making construction of a complete synthesizer a lot easier than if a separate VCO had to be included. With the addition of a suitable controller and reference frequency input this PCB allows a complete Fractional-N Synthesizer operating within the frequency range of 32MHz to 4000MHz to be built. The PCB has provision for the Synthesizer chip, 3.3 volt regulator, all decoupling components, loop filter and interfacing to 5V SPI control signals for a standard PIC based or other type of controller. A complete description with all supporting files and software can be found at www.g4jnt.com/lmx2541Support.zip

PCBs can be obtained from www.g4jnt.com/The_JNT_Shop.htm

The LMX2541 comes in six variants with the internal VCO covering sub-bands in the overall range 1.99 to 4.00GHz When the output divider is used, the frequencies available from each version after division begin to merge, until around 400MHz where all versions of the chip can be used for any arbitrary frequency. The table below lists the six chip variants identified by type number suffix, with the final frequency ranges possible for output divider settings from 1 to 8, and with the highest possible divider setting of 63. Figures highlighted in red show AM-band coverage for 430MHz and higher, those underlined are for 5.76 and 10GHz with additional RF multiplication.

Version	VCO / 1	2	3	4	5	6	7	8	63
Q2060	1990	995.0	663.3	497.5	398.0	331.7	284.3	248.8	31.6
	2240	1120.0	746.7	560.0	448.0	373.3	320.0	280.0	35.6
Q2380	2200	1100.0	733.3	550.0	440.0	366.7	314.3	275.0	34.9
	2530	1265.0	843.3	632.5	506.0	421.7	361.4	316.3	40.2
Q2690	2490	1245.0	830.0	622.5	498.0	415.0	355.7	311.3	39.5
	2865	1432.5	955.0	716.3	573.0	477.5	409.3	358.1	45.5
Q3030	2810	1405.0	936.7	702.5	562.0	468.3	401.4	351.3	44.6
	3230	1615.0	1076.7	807.5	646.0	538.3	461.4	403.8	51.3
Q3320	3130	1565.0	1043.3	782.5	626.0	521.7	447.1	391.3	49.7
	3600	1800.0	1200.0	900.0	720.0	600.0	514.3	450.0	57.1
Q3740	3480	1740.0	1160.0	870.0	696.0	580.0	497.1	435.0	55.2
	4000	2000.0	1333.3	1000.0	800.0	666.7	571.4	500.0	63.5

Power Supplies

The Synthesizer chip needs 3.3 VDD supplied by the on-board regulator; current consumption is approximately 100mA. Input voltage, VIN, can range from 4.5 to 20V. A heatsink is not necessary on the regulator for input voltages in the lower range.

Resistors allow the chip to be controlled with 5V logic levels. This allows a PIC to be used with a VDD suitable for allowing in-circuit programming. Vin to the regulator can be conveniently made equal to this 5V, which is then supplied as one from a second external regulator.

Programming and Getting it Going

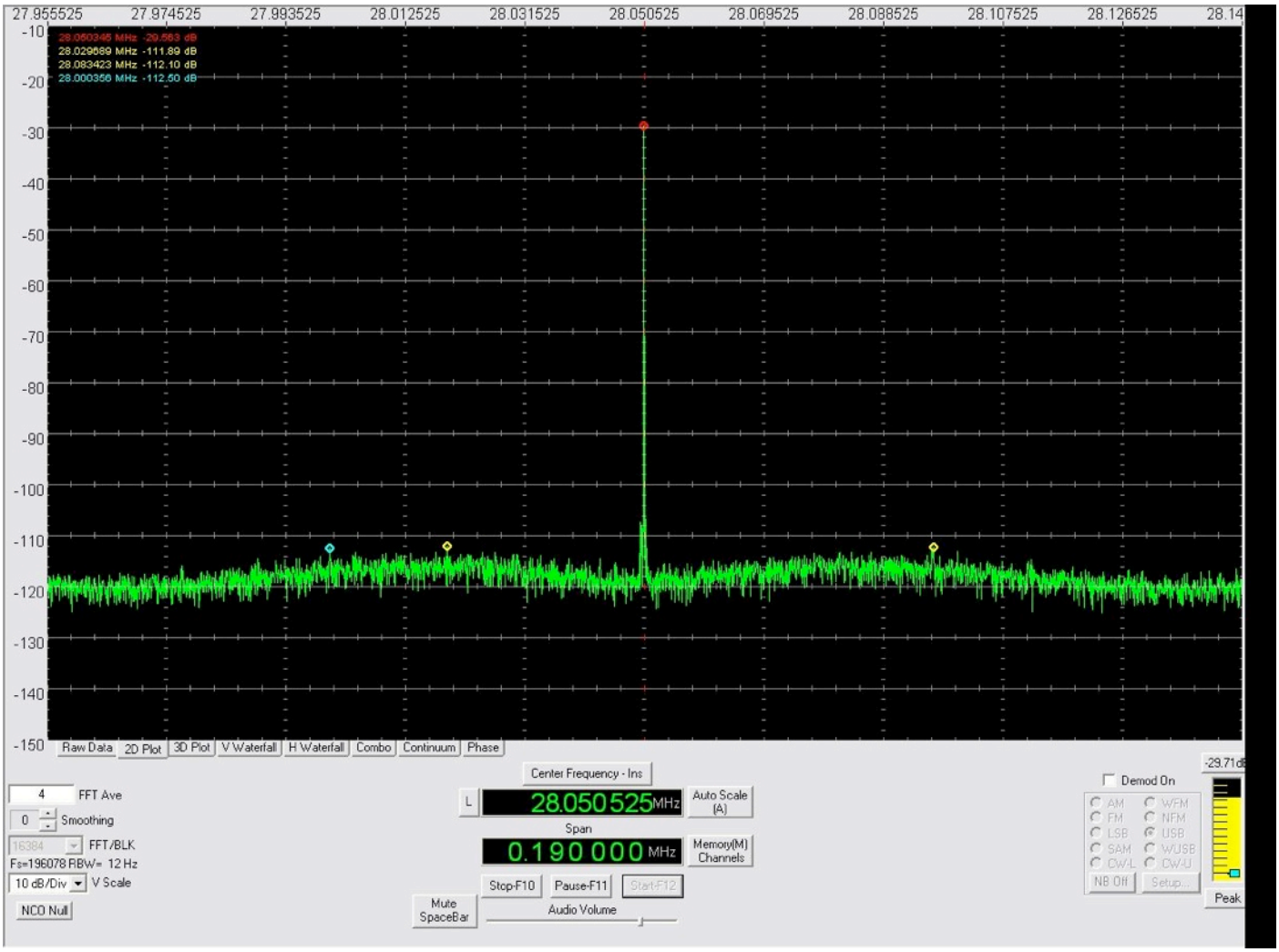
The chip's internal registers have to be programmed to the correct values for your desired frequency and fractional grid, and the loop gain set, and etc. The data sheet and an understanding of Fractional-N synthesizers is essential here, but the easiest way to start off is to use National's CodeLoader software to work out the values for you. This

can be downloaded from www.ti.com/product/lmx2541 The TI website also has loop filter design utilities www.ti.com/tool/clockdesigntool

CodeLoader shows a graphical representation of the RF PLL where you can interactively set frequencies and division ratios, as well as all the other PLL settings.

The LMX2541_PROG.EXE programme included in LMX2541Support.zip allows quick calculation of the registers for specified values of Fosc, Fout and frequency tuning grid. It can be used in conjunction with a PIC containing the LMX2541CTL operating system.

T*he plot below shown the phase noise spectrum at 432MHz (using the Q2690 version)*

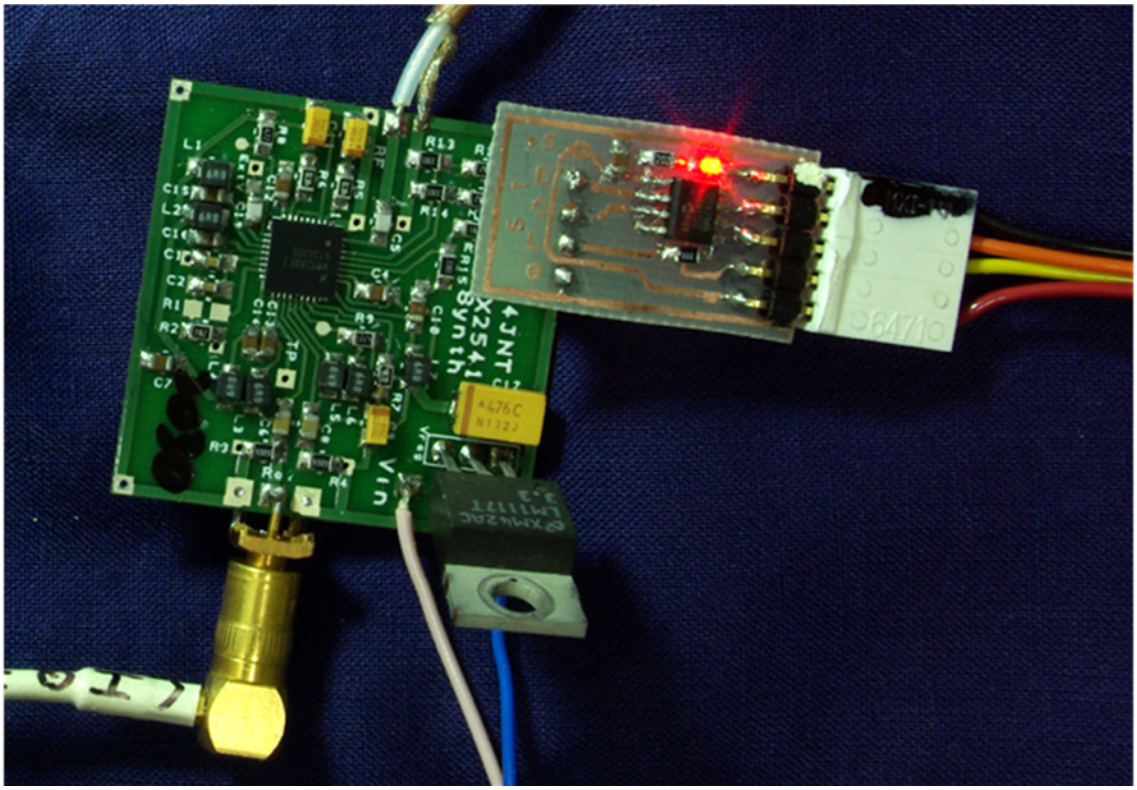


More phase noise plots at different frequencies and PLL settings can be see in the slides from my talk given at MMRT 2013 www.g4jnt.com/Synths_MMRT_2013_G4JNT.pdf

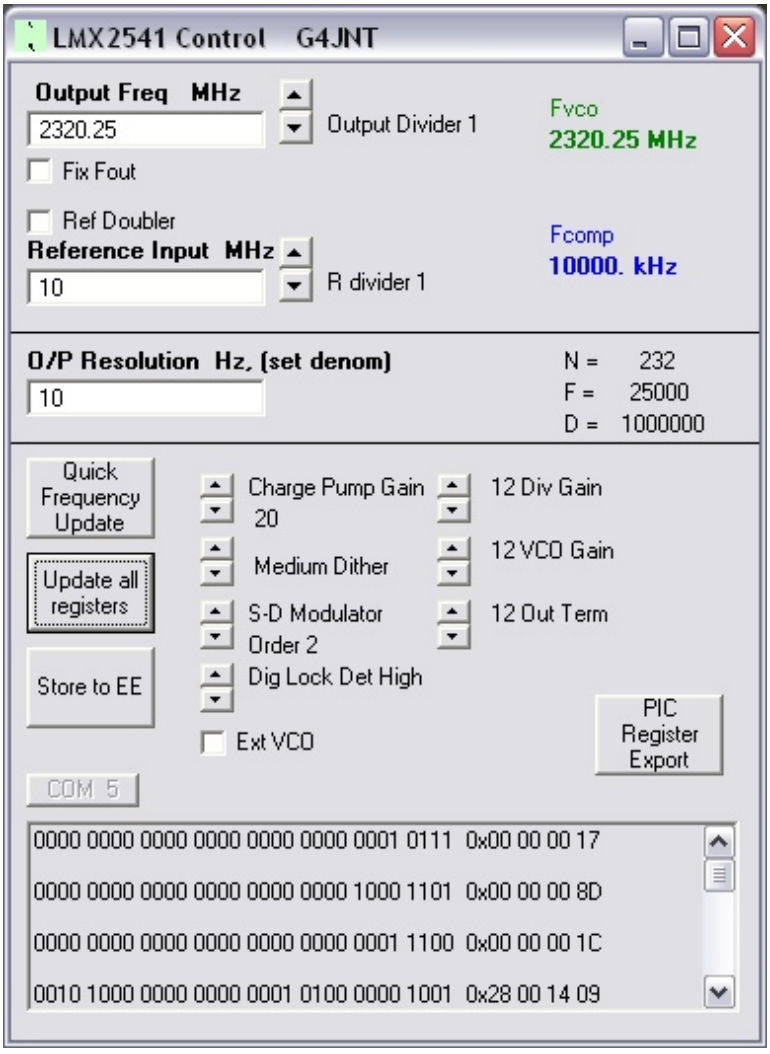
LMX2541CTL PIC Operating System

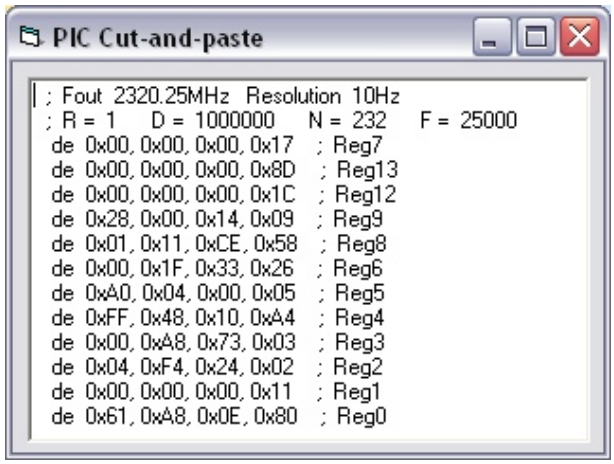
A 12F629 PIC containing the LMX2541CTL code generates SPI data to allow the registers in the synthesizer chip to be set directly to the wanted values using a serial RS232, or COM Port interface with simple ASCII text commands from any terminal emulator programme such as Hyperterm. The register values can be programmed into non-volatile EEPROM memory in the PIC. At turn on, these stored values are recalled and sent to the synthesizer for immediate start up.

The PIC sits on a small postage stap sized daughter board that plugs directly onto the LMX2541 chip programming header pins.



The *LMX2541_Prog* Software shown here can send the ASCII text automatically to the controller,





LMX2541_Prog **User Screen**

Control using a rotary encoder and LCD

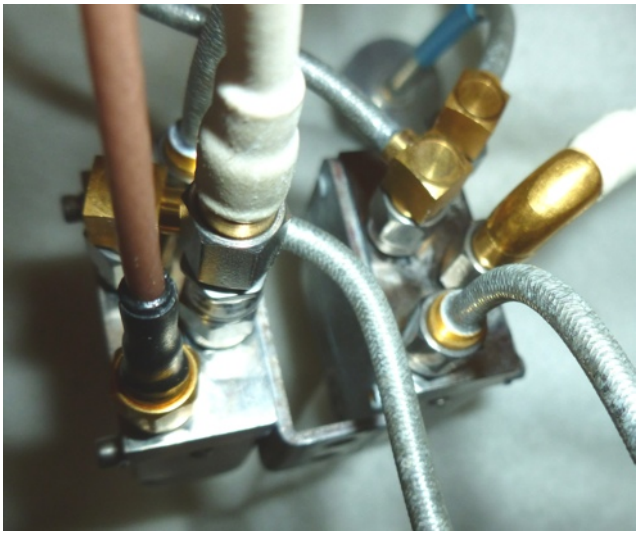
www.g4jnt.com/LMX2470_2541-Controller.zip contains full details of a PIC based controller for use with an IQ rotary encoder and LCD. The PCB sits directly on the back of the LCD and communicates with the synthesizer via a 4-way ribbon cable. The output frequency can be set in decimal steps from 10Hz to 1MHz

Andy G4JNT

SMA Wrenches

Kent Britain WA5VJB/G8EMY

We have all had the fun of scraping out an assembly that looks like this, or even more fun, building one up for that multi-band transverter. And getting at 5/16ths wrench in there to tight up that SMA is a @#$%!



Bench grinders work fine, a belt sander will do as well, but greatly grind down the sides of that wrench. Manufacturers seem to vary a bit, but an SMA is usually torqued to about 8 inch lbs of torque. It doesn't take a very strong wrench for 8 in-lbs, or about 1 N-m, and if you did tighten the SMA enough to break that wrench, it's probably distorted internally anyway. Also a good way to recycle those cheap wrenches you would never use on a serious bolt.

Kent WA5VJB

LTC6946 Synthesizer PCB

By Andy Talbot G4JNT

This 34 x 53mm PCB allows a complete Integer-N Synthesizer operating within the frequency range of approximately 370MHz to 5800MHz to be built The PCB has provision for an LTC6946 Synthesizer chip, voltage regulators, all decoupling components, loop filter and a PIC microcontroller for loading the frequency information start up. This can be changed using an RS232 interface with simple ASCI text based commands. A design utility for Windows simplifies this task.

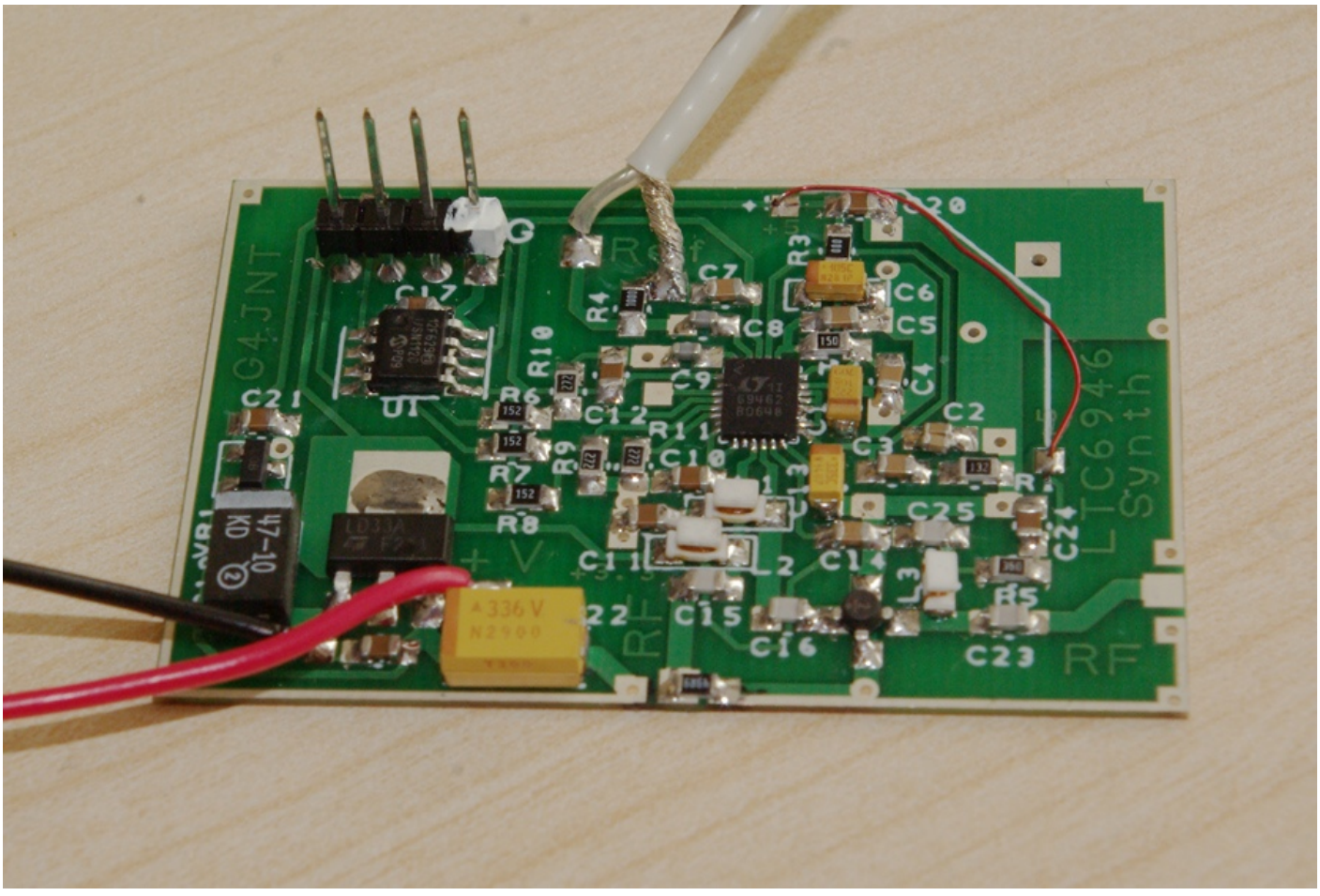
Alternative PIC firmware allows up to four pre-stored frequencies to be recalled based on link, or switch, settings. This could be useful, for example, for selecting the segment of 2.4GHz band to be used for EME.

An external reference input needs to be supplied, This could be from a TCXO or ovenned oscillator, possibly part of a GPS or Rubidium locked source.

The LTC6946 comes in three variants with the internal VCO covering different sub-bands in the overall range 2.2 to 5.8GHz. An output divider programmable from 1 to 6 allows lower output frequencies to be obtained. The table below lists the three chip variants identified by type number suffix, with the final frequency ranges possible with the output divider.

A test on the higher frequency –3 version, showed that full operation could be maintained over the range 3650 to 6300MHz, although operation much beyond the manufacturer's quoted limits should not be assumed and performance is not guaranteed.

The performance is more than adequate as an LO for 10GHz with frequency doubling (it is used by GW4DGU in his transverter module) and should be adequate for driving frequency multipliers for 24GHz or higher.

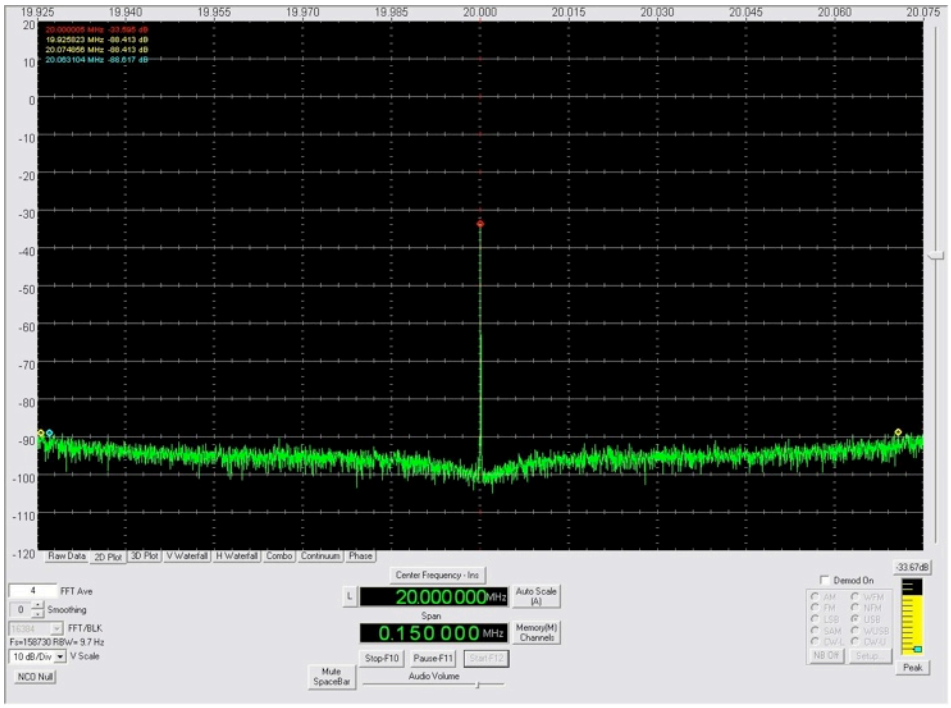


More details can be found at	www.g4jnt.com/LTC6946_Synth_Module.pdf
Full constructional Archive	www.g4jnt.com/LTC6946Support.zip
PCBs from	www.g4jnt.com/The_JNT_Shop.htm
Full data on the chip can be found at	cds.linear.com/docs/en/datasheet/6946fa.pdf

The LTC6946 is obtainable from Digikey or Farnell (US Stock, so an extra fixed delivery charge applies) or direct from the manufacturer.

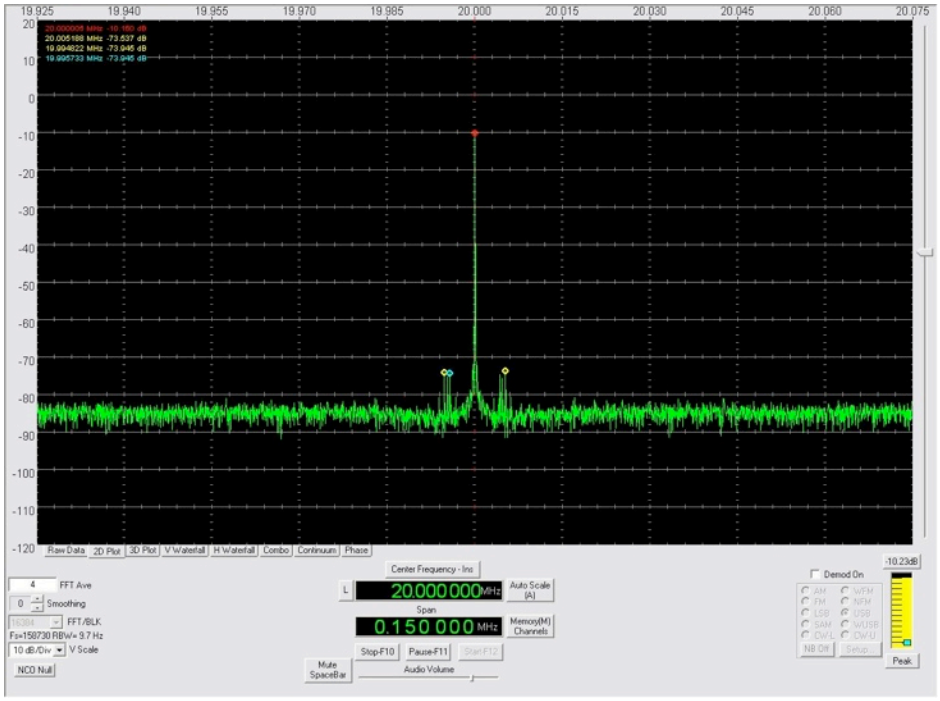
Performance

By mixing the outputs from two identical LTC6946–3 modules set to 5000 and 5020MHz respectively, the combined phase noise from both synthesizers can be seen by viewing 20MHz mixer product. As the phase noise from each of the two similar modules is the same, the spectrum plot will show the cumulative power-added value which is 3dB higher than the phase noise for one synthesizer alone. . Both modules were fed from the same 10MHz reference oscillator. The comparison frequency FCOMP was set at 5MHz for each. All other settings were identical between the two modules.



The resolution bandwidth is 9.7Hz, so the individual phase noise in dBc/Hz of each individual module is 13dB lower than the value read off from the plot. At 20kHz spacing, the value is in the region of 75dBc/Hz.

The second plot shows the result from two –2 variants generating 3390 and 3410MHz respectively. FCOMP is the maximum possible for the reference used, 10MHz, with charge pump current set to 8mA on each.



The phase noise is in the region of –88dBc/Hz, the lower value being achieved by using the highest possible comparison frequency and optimising the charge pump current. (The discrete spurii at around +/-5kHz spacing are an artefact of the SDR-IQ measuring receiver)

EME notes: Effect of feed blockage on a small EME system

By Gordon Fiander G0EWN

Background

Sometime around 2008 I first began to take a serious interest in the prospect of becoming active on EME. After some questions, which dashed any prospect of getting away with a small 1.2m dish I finally settled on a 2.4m dish —previously the system of Dave G4HUP (1)

Since collecting the dish from Dave I have had to build and construct many items including a ground stand, transverters, power amplifiers and renew the dish power supply and tracking arrangements. It is surprising just how much time this consumes.

In April 2012 I was finally ready to 'test' the basic system. I tentatively requested a large station put a signal on 13cm on the moon for me to listen for – F2TU kindly offered and within a few minutes there was a CW signal clearly audible in the speaker. What followed was a bit of a shock as I worked 6 stations in short succession on CW all with signals around 549—both ways. (PA my end adjusted to 80w output).

Excellent---a very promising start.

However after that session I realised I was still somewhat short of being in a position to work EME regularly. Plus according to the VK3UM software (2) my system was far from working optimally.

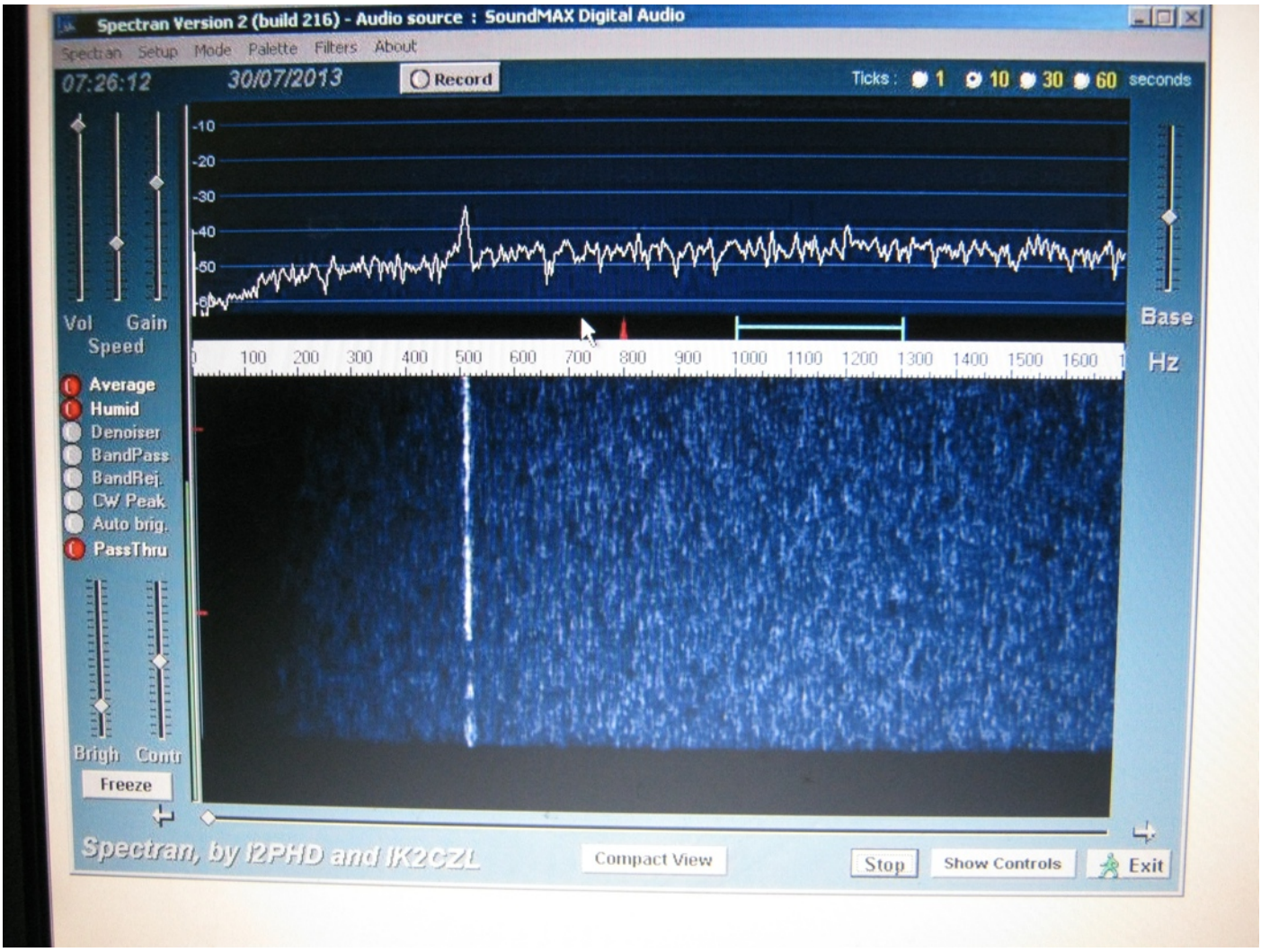
As can be seen from my noise measuring, I was achieving just 4dB cold sky to ground and sun to cold sky of around 7dB---well short of the predicted values for my system at 13cm.

G0EWN EME system noise measurement

	G / CS	Sun / CS
13cms		
Before	4dB	7dB
After	5dB	9.25dB
Predicted	5.2dB	10.7dB
23cms		
Before	4dB	6.4dB
After	5.2dB	9.2dB
Predicted	5.2dB	9.6dB

Whilst constructing and refining more aspects of the system over the autumn of 2012, I came to the conclusion that there was too much feed blockage from the original 'focus box' arrangement. Finally, almost a year after my successful 13cms test, I found time to resize the focus box. Compare the photograph of the new arrangement with the original on Dave's EME web page.

The new arrangement is now largely hidden behind the feed choke rings on both 13cms and 23cms.



My latest system noise measuring sessions have showed that the reduction in feed blockage has yielded significant improvements on both bands. Interestingly it seems my system is currently working better on 23cm than at 13cm – so more work required on 13cm – probably the choke ring.

Having confirmed the improvement I decided to take a listen for the ON0EME 23cm EME beacon. It was also a chance to test another LNA---this one by G8FEK,(3 Martyn has an audio clip of my reception of ON0EME via a link on his website---take a listen) which includes high and low pass filtering to give band pass filter characteristics. (I often have strong interfering signals from radar and nearby telecoms towers on 23cms). As soon as the system tracking indicated it was following the moon I was hearing ON0EME. (4) Spectran plot below.

At last it seems as if things are starting to come together and I'm now hopeful that in the coming years I will be able to work many stations on both 13 and 23cms with this modest system.

G0EWN EME system.

Dish	Andrews 4 section dish. 2.4m F/d 0.375 (not 0.4—original info).
Feeds	13/23cms square septum OK1DFC design with choke rings.
13cms LNA's	G4DDK VLNA1 0.5dB, VLNA 2 0,3dB, power max 125w modified Lucient (Noise measurements with 0.5db LNA)
23cms LNA's	G4DDK VLNA 1 0.5dB, G8FEK SBA 0.5db (internal filtering), power max 160w 2 x XRF286 (Noise measurements with G8FEK 0.5db SBA LNA).
Moon tracking	VK5JD (5)

Many articles have been written about converting surplus amplifiers to 13cms operation. As far as I remember few if any mention cooling. A simple way of cooling can be arranged by adding fans to blow air through the cooling fins – they are easy to attach using self tapping screws into the milled slots. The pitch of milled slots is usually compatible with the spacing of fixing holes of the fans. Power can be taken from inside the amplifier and the final result looks quite neat. Works for Lucient and Andrews amplifiers.(Remember that with typical efficiencies of just 25% when

running 100W the amp will need to dissipate some 300W – a lot of heat). Photograph of simple cooling fan arrangement of a 'tropo' amplifier below.

References

1. G4HUP www.qsl.net/dl4mup/eme/eme.html
2. VK3UM vk3um.com/
3. G8FEK rfdesignuk.com/
4. ON0EME users.skynet.be/on0eme/ON0EME/Welcome.html
5. VK5JD www.vk5dj.com/index.html

Gordon G0EWN

Microwave Update

Oct 18–19 Morehead, Kentucky

Greetings All:

Just a quick reminder that the date for Microwave Update is coming up fast.

www.microwaveupdate.org/

But at the moment we are looking for items for the Proceedings.

One page mods are very welcome, as well as more in depth papers.

A good opportunity to share your latest project with the microwave community.

Personally I like the short 'Hints & Kinks'.

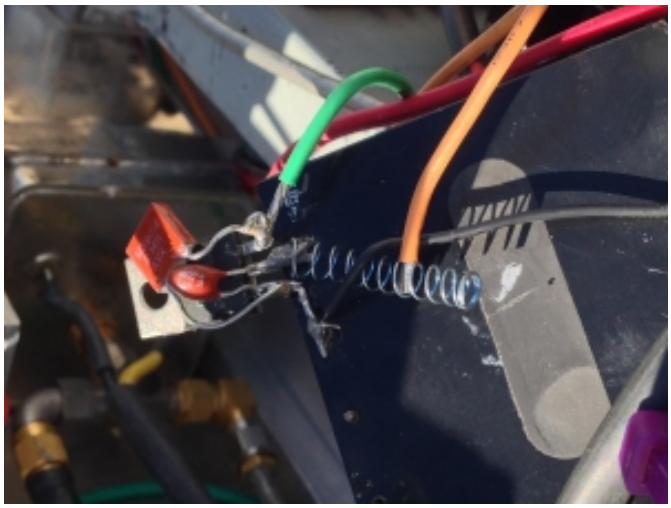
Kent WA5VJB/G8EMY

Snippets from the San Bernadino Microwave Society newsletter

From Kent WA5VJB/G8EMY

Ball Point Pen Saves the Day

This is Pat Coker's power supply for his 10 GHz amplifier, repaired with no solder, no wire strippers, out in the middle of nowhere.

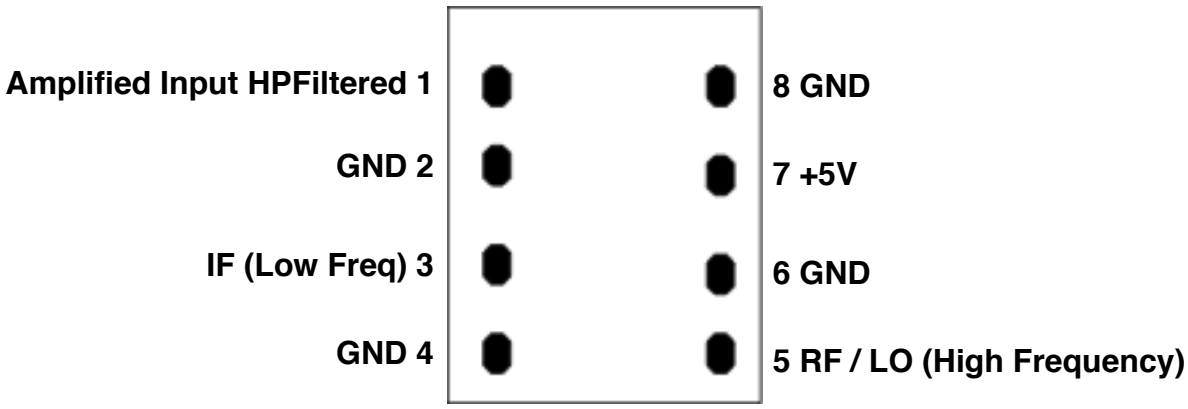


"Could one of you guys pass me my beer?"

ACMY-1228H Mixers

Available though UKµG Chip Bank

By Andy Talbot G4JNT



Pin 1 RF input (or low level LO). Goes through a high pass filter, cutoff in the low VHF region into an internal amplifier then a mixer port.

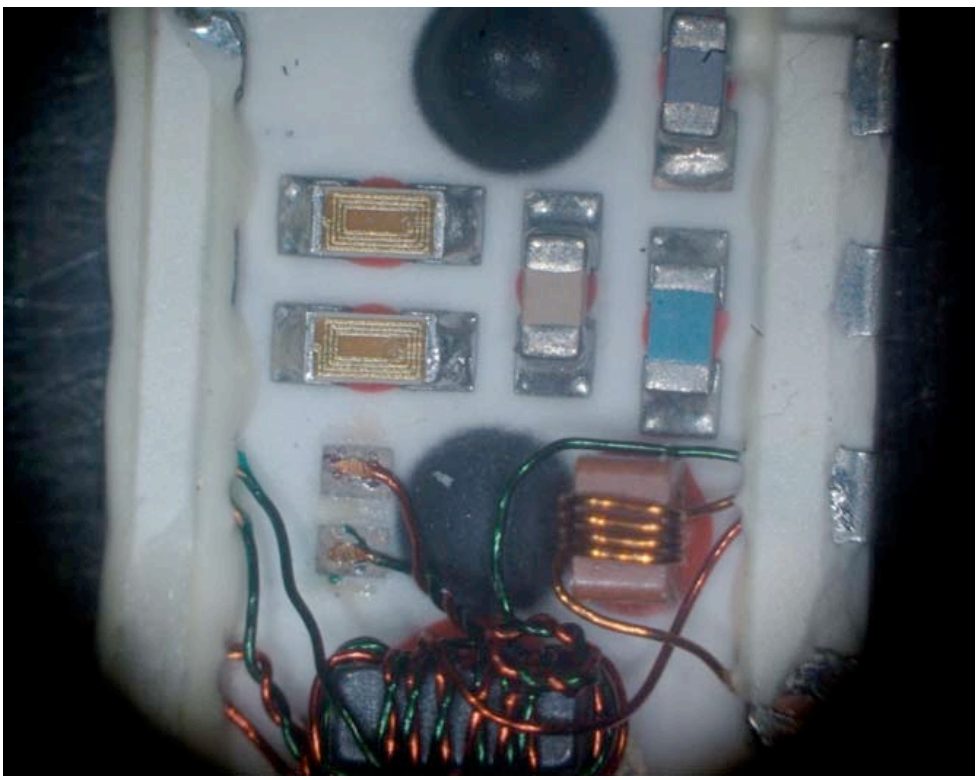
Pin 3 Mixer input, through low frequency transformer. Freq response extends down low.

Pin 5 Mixer input via higher frequency winding. Appears to fall off below 300MHz

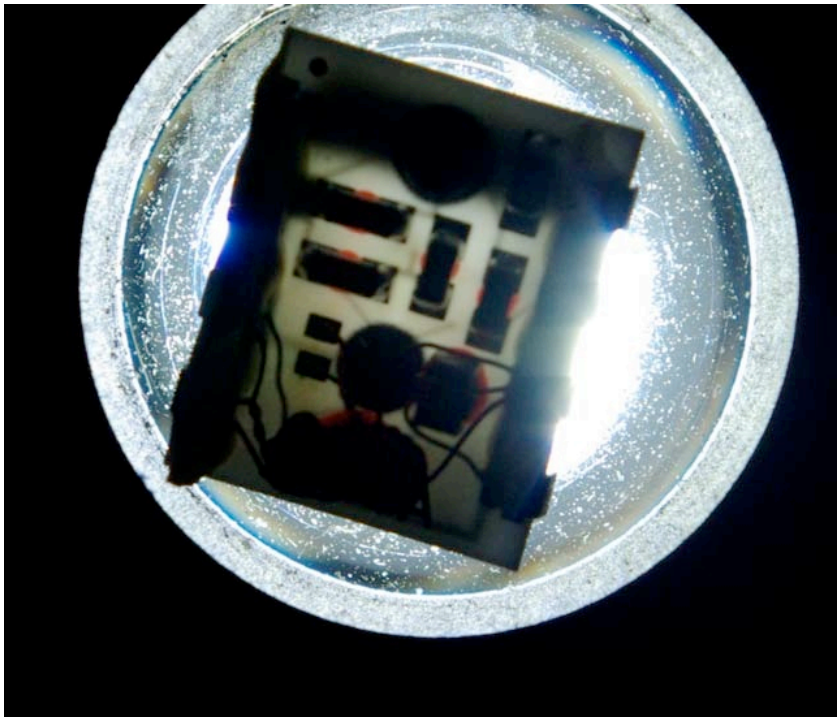
It is difficult to say which is LO and which is RF. Assume the lower freqeuncy port, pin 3 is IF.

Using the mixer as a downconverter, applying 1300MHz to Pin 1 at a level of -26dBm, LO at 1150MHz to pin 5 gives +12dB overall gain with 150MHz IF out from pin 3

View of its insides (pin 1 top left). Spot the two spiral inductors forming the high pass filter on the amplified input Pin 1. The multiturn transformer at the bottom is on the IF port, Pin 4 . Bottom right, the smaller transformer with single turn secondary going to pin 5 RF Port



Second photo is an attempt to do an optical X-Ray view of the substrate to see the tracks. (It did reveal the High Pass Filter on the amplified input))



Frequency Response

RF ports function above 300MHz, and after just a quick test, appear to have little degradation up to at least 1500MHz

Feeding with an LO of +7dBm at 2176MHz to pin 5, mixer gain as a converter from 2320 to 144MHz was measured as +10dB. The layout of the breadboard is not ideal for higher frequency tests, but it does look as if performance at a gradually reducing gain ought to be possible at frequencies above 2.4GHz.

The IF response, output from pin 3, extends from below 1MHz to above 500MHz.

UKµG Chip Bank

A free service for members

The catalogue is now on the UKµG web site See www.microwavers.org/?chipbank.htm

Non members can join the UKuG by following the non-members link on the same page and members will be able to email Mike with requests for components. All will be subject to availability, and a listing of a component on the site will not be a guarantee of availability of that component.

The service is run as a free benefit to all members and the UK Microwave Group will pick up the cost of packaging and postage, that is, Jiffy bags, small plastic bags for individual component values, and Large letter 2nd class postage, currently 69p.

Minimum quantity of small components supplied is 10. Some people have ordered a single smd resistor!

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

There is an order form on the website with an address label which will slightly reduce what I have to do in dealing with orders so please could you use it.

Also, as many of the components are from unknown sources, if you have the facility to check the value, particularly unmarked items such as capacitors, do so, and let me know if any items have been miss labelled. G4HUP's Inductance/capacitance meter with SM probes is ideal for this (Unsolicited testimonial!!)

Following the Finningley RT, I came home with a large box of reels of chip components kindly donated by Kevin Avery.

I have now sorted through these and added them to the chipbank catalogue on the UKµG's website. This donation has considerably expanded the stock of both 0805 and 1206 resistors as well as capacitors, inductors, diodes and transistors.

I plan to bring the stock to the Crawley RT next month, but in the meantime, I am happy to accept e-mail requests as usual.

Don't forget it is completely free, you don't even have to pay postage!

73, Mike, G3LYP

Tests on a DIGITAL TV LNB
for 10GHz narrowband

By Andy Talbot G4JNT

Paul M0EYT mentioned that he was playing with a new low cost Satellite TV Low Noise Block that used a PLL synthesised Local Oscillator. He said that it appeared to receive GB3SCX very well, and the JT4G decoded perfectly. As soon as the Ebay link
www.ebay.co.uk/itm/170940689242
appeared on the Email chat page, I ordered one which arrived two days later. The LNB is described as:

"Octagon Optima Narrow Feed Twin 0.1dB HD 3D Ready LNB With 3 Year Warranty Model DTL50".

It cost £19.


Figure 1

See Figure 1.

Paul had already looked at its innards and produced the photograph in Figure 2.

Figure 2

The PLL/Mixer chip is RDA3560; a short data sheet can be obtained from
www.uhf-satcom.com/misc/datasheet/RDA3560m.pdf
The photo shows the RF inputs (right hand side) and the RF path going leftwards through to the chip with a 27MHz reference crystal. What is not visible on the photo is that there is a duplicate crystal and mixer chip on the other side of the PCB, giving a dual channel output. There are two RF inputs for vertical / horizontal polarity, selectable via the usual +12/+18V voltage switching. The unit is marked as being dual LO 9.75 and 10.6GHz. For normal operation, a 22kHz tone superimposed on the feed up to the LNB selects the higher LO frequency. A plain DC supply selects 9.75GHz

Narrow Band Performance

Using a bias tee to supply +12V up the feed coax to either of the two F connectors selects 9.75GHz LO and the polarisation is in line with the connectors and an arrowhead marked on the front casing at the top. For narrowband reception at 10368MHz the resulting IF is 618MHz. If the higher 10.6GHz LO were to be used, the sideband sense would be inverted, the IF output at 232MHz is rolling off, and there is the hassle of providing a 22kHz switching tone.

I was mainly interested in the phase noise performance and stability of the LNB, so had to use suitable test signals with low inherent phase noise – this meant my otherwise very nice Gigatronics microwave synthesizer couldn't be used. The test signal at 10368 came from my transverter (WDG modules with RDDS locked LO) and IC202 drive. The 618MHz IF output was mixed down in a MiniCircuits ZLW-11 DBM. with a 85MHz LO generated from a DDS source, with known good phase noise performance. The DBM operated as a harmonic mixer (7 * 85 = 585MHz) for a resulting output at 23MHz which was fed to the SDR-IQ receiver for display. For phase noise measurements it was not necessary to include any image filtering, but remembering the added image response does then increase the output noise level by 3dB

Saturated output power of the LNB was in the region of +5dBm at 618MHz, and the harmonic mixer loss was 33dB, so it was important to keep the output from the mixer at 35dBm or lower to avoid saturating the mixer. Transverter output, at a few milliwatts, was fed to a PCB log-periodic antenna and the spacing and orientation of the two antennas arranged to give the required output level from the mixer.

Figures 3 , 4 and 5 show respectively the plot of the received signal in spans of 100kHz, 10kHz and 1kHz. Figures 3 and 4 use a resolution bandwidth of 12Hz, so phase noise in dBc/Hz is 10.log(12) = 10.8 dB lower than the curve, plus another 3dB for image noise. Say 14dB correction factor. For Fig 5 the value is near-enough 5dB

At 20kHz spacing the phase noise has pretty well fallen to a flat level of 82dBc/Hz that is maintained out to around

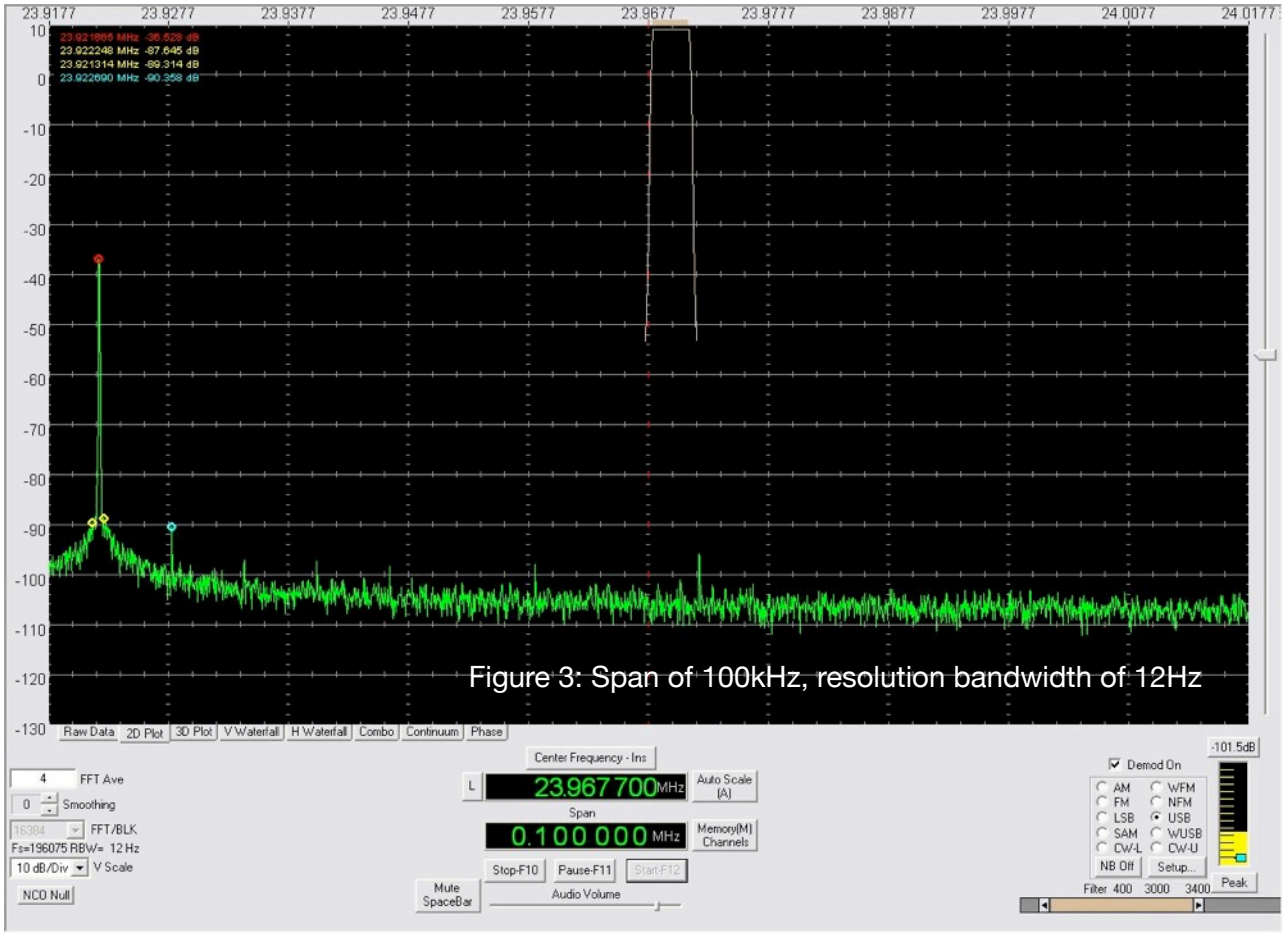


Figure 3: Span of 100kHz, resolution bandwidth of 12Hz

1MHz spacing. At 2kHz spacing it lies around –72dBc/Hz, and very close in at 200Hz spacing from the carrier is a remarkable –61dBc/Hz. This close in it is not entirely possible to guarantee all the phase noise is even entirely due to the LNB. The two distinct spikes at 90Hz spacing are unknowns – they could be the computer fan vibration getting though my 10GHz transverter all part of the same bench assembly, or the central heating pump the other side of the partition wall, or anything. The ones at 100Hz spacing are self explanatory.

To put the figures into perspective, take the far out 20kHz spacing value of –82dBc/Hz. In a 2.5kHz SSB filter, the resulting noise from a pure carrier will be –82 + 10.log(2500) = -48dBc. So any 59++ carrier anywhere in the passband, or a combination of many signals adding to this sort of level will make itself heard as a rise in background noise, 48dB down.

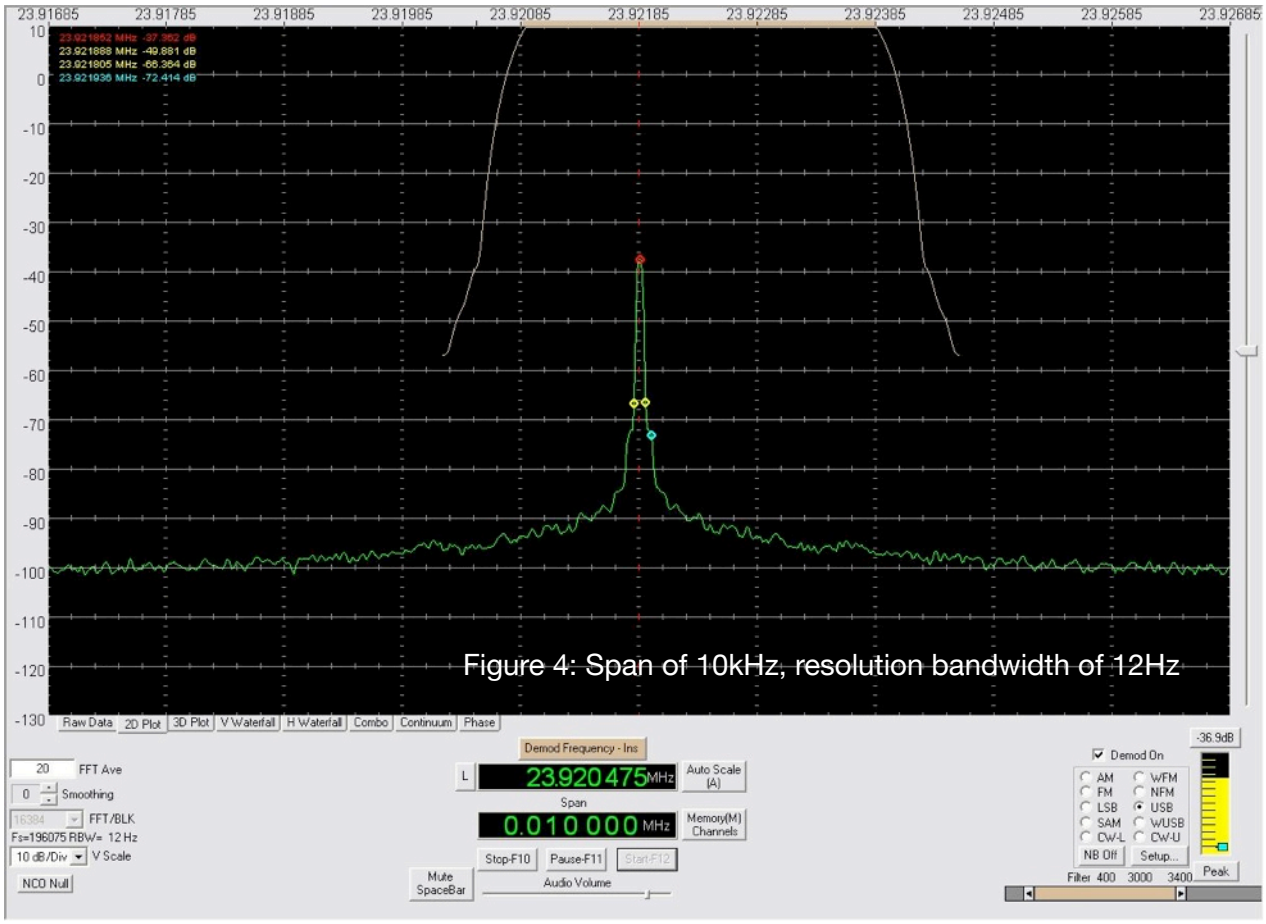


Figure 4: Span of 10kHz, resolution bandwidth of 12Hz

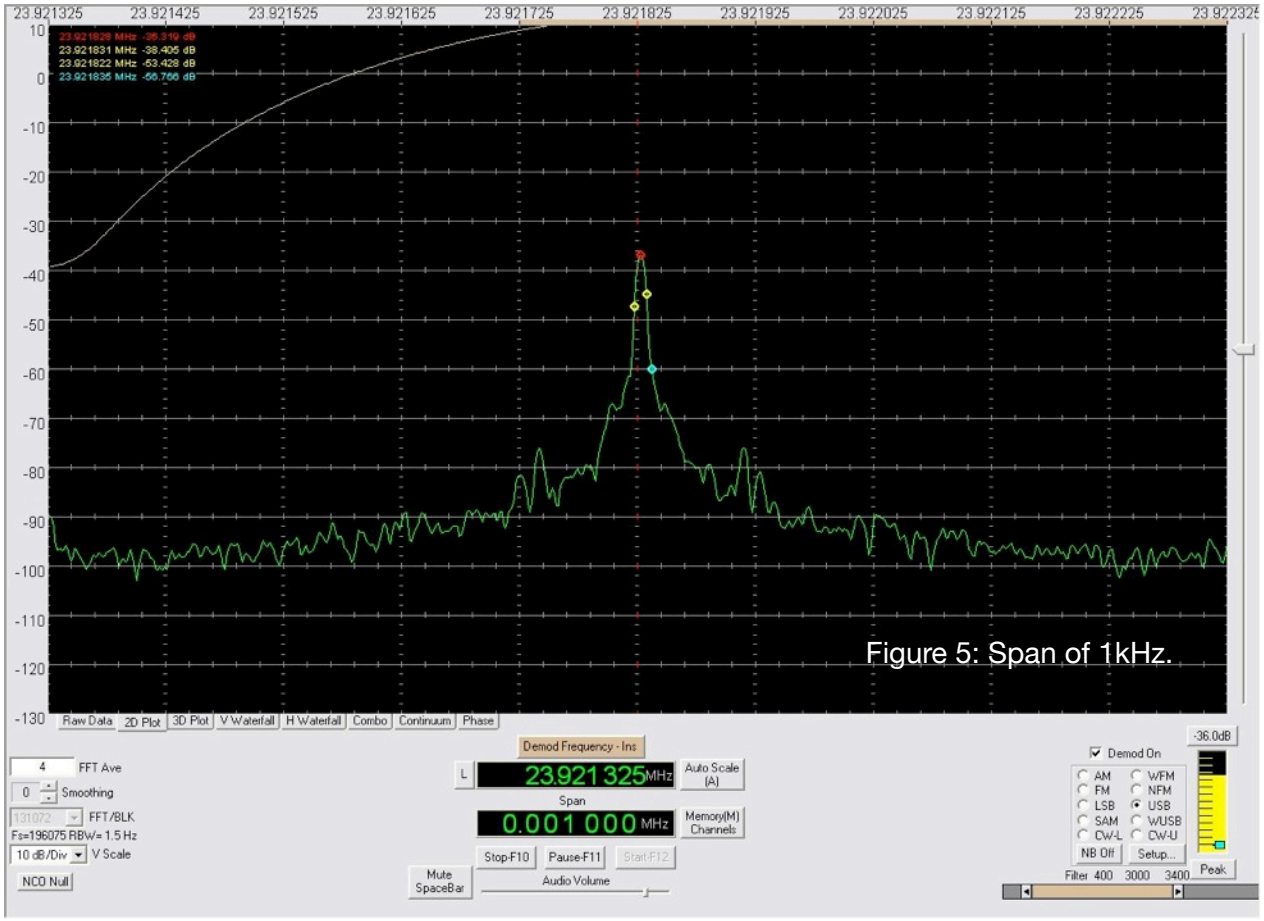


Figure 5: Span of 1kHz.

But the close in performance is very impressive; it “sounds perfect”. Although that phrase is meaningless in the face of absolute measurements. That the phase noise is more-or less flat out to 1MHz suggests a high loop bandwidth is used, so the stability is just that of the crystal, multiplied up.

Stability is also pretty good considering it comes from an unovenned fundamental mode 27MHz crystal. From turn on at room temperature it drifted a couple of kHz at the most (I didn’t measure it thoroughly) and after being on for a hour or more, no more than a few tens of Hz were detected over several minutes. Certainly it appears stable enough in a domestic environment for JTxx decoding. How much worse this would be outside with sun and wind is still to be determined.

Changing the LO, and using an External Reference

The internal 27MHz crystal (there are two of them, for two independent conversions via the two output connectors) is effectively multiplied by 361.111 inside the RD3560 chip. Paul removed one of his crystals and supplied 27MHz from a GPS locked signal generator – it worked perfectly, as before, and now with a rock steady output. In fact Paul, who can receive GB3SCX very strongly, could see the Simple-GPSDO induced wobble of a few Hz on the beacon using this LO in locked mode, something he hadn’t observed before.

He then tried changing the injection frequency to 27.515076MHz, which after multiplication yields an LO of 9936MHz and means 10368 is converted to 432MHz. He reported GB3SCX reception as being just the same as it was at 618MHz – so that works. (It would not really be fair to ask it to generate a 10224MHz LO as the IF circuitry has rolled off considerably at 144MHz, so that wasn’t tried).

Special high resolution frequencies can easily be generated from a DDS, but be careful not to add in unwanted close in spurious signals as these will get passed straight through the PLL and be effectively multiplied in amplitude by 3612 = 51dB. The reference must be very clean!

Paul has linked across the external input to one of the IF ports so this forms an injection connector, with the IF taken from the other. [So far] I’ve left mine well alone.

Ideas for a Bottom End Box

618MHz is quite a benign IF to work with. A scanner (with SSB facility) is useable directly, but my AR8200 has a vastly worse phase noise than this LNB and ruins its performance as a narrowband monitor receiver. Amongst all the synthesizer modules I’ve made over the last year, one using an LMX2326 and MiniCircuits JTOS-535 will run at 474MHz (but only just, with this VCO) thus allowing a 144MHz IF from 618MHz. An alternative would be a 94.8MHz crystal oscillator and 5th harmonic mixer. Or perhaps an old surplus 96MHz crystal giving a 138MHz 2nd IF – within the tuning range of many modern 2m receivers. With the huge gain available in the LNB, the losses of harmonic mixing are perfectly acceptable.

The image response at 330MHz will be a straightforward task to filter out using high pass or bandpass LC elements. It is only necessary to reduce it by 20dB or so to kill the added noise – its not as if there are likely to be many image-frequency signals present. For direct feed to an SDR, an I/Q conversion using one of the chips described in RadCom Design Notes last year would do

The bottom end box will also have a DC injection bias-tee, and input attenuation to overcome the huge gain in the LNB.

Conclusions

This LNB offers an extraordinarily good performance as a low cost, low noise narrowband 10GHz monitoring receiver. If placed at the focus of a suitable dish, it will make for a very potent 10GHz receiving system. The Noise Figure is quoted as being 0.1dB, but in light of the Noise Figure measurement presentations at recent Microwave Roundtables, we’ll take that with a pinch of salt! But, it is still very good. With snow on the ground as I write, I don’t feel inclined to set up outside and do cold sky/[not very] hot ground tests.

Time will tell just how stable the internal crystal really is, but use with an externally generated reference, a high stability converter can result.

Andy Talbot G4JNT

Contest Results

By John Quarmby G3XDY

Microwave Field Day 2013 Results

Activity and entry levels plumbed new depths for this year's event, unfortunately. Despite opening the event to fixed stations, no fixed entries were received. The future of the event has to be in question for 2014, your suggestions for improving participation would be very welcome.

1.3GHz

Only two entries, one in each section, made this a non-contest. No portable stations appeared in the logs of either station.

10GHz

Activity was slightly better on 10GHz, with GM0USI/P amassing a respectable tally of contacts from his site on the Mull of Galloway. GM8OTI/P operated from three sites as a Rover station.

Overall

The overall winner of the Restricted section was the North East Surrey Contest Group G4WGE/P & G3WIM/P who won both bands. GM8OTI/P gains the runner-up spot.

In the Open section Cheltenham Amateur Radio Association G5BK/P was the winner, with GM0USI/P taking the runners-up spot.

Congratulations to the winners and runners-up, who will all receive certificates.

August 2013 MICROWAVE FIELD DAY RESULTS

Restricted Section

Overall

Pos	Callsign	1.3GHz	10GHz	Total	
1	G3WIM/P & G4WGE/P	1000	1000	2000	
2	GM8OTI/P	0	274	274	

1.3GHz

Pos	Callsign	Locator	QSOs	Best DX	Points
1	G4WGE/P	JO01BB	7	G4ALY 312km	1622

10GHz

Pos	Callsign	Locator	QSOs	Best DX	Points
1	G3WIM/P	JO01BB	6	G4ODA 338km	3168
2	GM8OTI/P	IO74RR/UV/IO84AT	4	G4CBW 237km	867

Open Section

Overall

Pos	Callsign	1.3GHz	10GHz	Total	
1	G5BK/P	1000	460	1460	
2	GM0USI/P	0	1000	1000	
3	GM4BYF/P	0	95	95	

1.3GHz

Pos	Callsign	Locator	QSOs	Best DX	Points
1	G5BK/P	IO81WU	6	GM4CXM 478km	2216

10GHz

Pos	Callsign	Locator	QSOs	Best DX	Points
1	GM0USI/P	IO74NP	13	G5BK/ P 361km	5794
2	G5BK/P	IO81WU	8	GM0USI/P 361km	2667
3	GM4BYF/P	IO76XA	2	GM0USI/P 162km	552

5.7GHz Contest July 2013

Once again activity was poor for this event.

Congratulations to G3ZME/P as the winner, and G4LDR as runner up in this event. The overall table for the championship to date has been updated with the scores from this event.

10GHz Contest July 2013

There was some rainscatter enhancement noted by a few entrants, and the expedition to GJ added extra interest.

Congratulations go to G4EML/P who won the Radio Talkback section, with GJ3TKH/p and GJ4HQX/P as runners up, and G4RGK as the leading fixed station. In the Unlimited section G4LDR was the winner, with G3ZME/P second and leading portable station. The leading Restricted section entrant was GJ4HQX/P.

The championship table shows the positions for the Open and Restricted sections after three events.

24GHz Contest July 2013

GJ3TKH/P and G0API/P share the top spot this month, with a one way contact. Please ensure that one way contacts are clearly identified in your logs, or they may be incorrectly scored in the adjudication process.

GW/J3TKH/P is in the leading position for the G0RRJ Trophy at present.

5.7GHz Contest July 2013

Unlimited Talkback

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1	G3ZME/P	IO82QL	5	802	G4ALY	248
2	G4LDR	IO91EC	4	658	G3LRP	279

10GHz Contest July 2013

Radio Talkback

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1	G4EML/P	IO90SV	11	1311	G3ZME/P	231
2=	GJ3TKH/P	IN89WG	6	1254	F6DKW	321
2=	GJ4HQX/P	IN89WG	6	1254	F6DKW	321
4	G4GSB/P	IO82WM	6	599	G4LDR	162
5	G4RGK	IO91ON	5	489	G3ZME/P	162
6	G8AIM	IO92FH	1	58	G3VKV	58

Unlimited Talkback

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1	G4LDR	IO91EC	14	2733	F6APE	424
2	G3ZME/P	IO82QL	11	1495	G4ALY	248
3	G3PHO	IO93GG	7	998	G4ALY	364
4	G4WLC/P	IO81WU	8	987	G4ALY	211
5	G8CUB/P	IO92XA	8	964	G3ZME/P	184
6	G0API/P	IO80XO	2	149	GJ3TKH/P	149

24GHz Contest July 2013

Radio Talkback

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX Kms
1=	GJ3TKH/P	IN89WG	1	75		149
1=	G0API/P	IO80XO	1	75		149
3	G4LDR	IO91EC	1	16	G4NNS	16

24/47 Trophies and 76-248GHz Contest 2013

For the first time that I can remember this contest attracted entries on four bands from 24GHz to 134GHz, with 11 stations active on 24GHz, 5 on 47 and 76GHz, and two on 134GHz.

A new overland UK record contact on 76GHz was made by G8KQW/P and G8ACE/P at 92km.

Several stations took advantage of the rover rules on 24GHz to increase their scores, but they did not dislodge the winner, Ian Lamb G8KQW/P, who operated from Butser Hill on the South Downs. Runner up was Peter Day G3PHO/P operating from two locations in the Peak District, who also made the best DX contact with GW3TKH/P at 148km.

G8KQW/P also won the 47GHz Trophy, working G8ACE/P and G8BKE/P at Povington (IO80WP), with G8ACE/P as runner up.

76GHz saw a closer finish with G8KQW/P again winning with a contact with G8ACE/P, with G4EAT as runner-up.

G8CUB/P and G0FDZ/P share the honours on 134GHz with a short range contact in Kent.

The normalised tables for 76GHz – 268GHz show G0FDZ/P and G8CUB/P in the winning position overall for these bands.

Logging errors led to quite a few points being lost, despite the small number of contacts involved. Spending an extra minute on confirming the reports and ensuring they are transcribed accurately is time well spent. Comments were relatively few but some felt this was not a good time to have a mm-wave contest (due to high humidity), and there was one against the rover concept.

The 24GHz and 47GHz Trophies go to G8KQW/P. The winners certificates for 76-248GHz go jointly to G8CUB/P and G0FDZ/P. The runners-up will also receive certificates.

Overall 76GHz - 248GHz

Pos	Callsign	76GHz Score	134GHz Score	Total
1=	G8CUB/P	283	1000	1283
1=	G0FDZ/P	283	1000	1283
3	G8KQW/P	1000	0	1000
4	G4EAT	848	0	848
5	G8ACE/P	500	0	500

24/47GHz Trophies & 76-248GHz Results 2013

24GHz

Pos	Callsign	Locator	Total QSOs	Best DX	km	Overall Score
1	G8KQW/P	IO90MX	7	G0FDZ/P	95	470
2	G3PHO/P	IO93FB/AD	4	GW3TKH/P	148	391
3	G3UKV/P	IO82QL/RQ/RP	4	G3PHO/P	98	325
4	GW3TKH/P	IO81LS/IO82KA	2	G3PHO/P	148	231
5	G8ACE/P	IO80WP/IO90EV	3	G8KQW/P	92	202
6	G0FDZ/P	JO01DH	2	G8KQW/P	95	143
7	G4EAT	JO01HR	3	G8CUB/P	52	140
8	G4LDR	IO91EC	3	G8ACE/P	62	127
9	G8CUB/P	JO01DH	2	G8KQW/P	95	72

47GHz

Pos	Callsign	Locator	Total QSOs	Best DX	km	Overall Score
1	G8KQW/P	IO90MX	2	G8ACE/P	92	184
2	G8ACE/P	IO80WP	1	G8KQW/P	92	92
3=	G0FDZ/P	JO01EP	1	G8CUB/P	1.5	2
3=	G8CUB/P	JO01EP	1	G0FDZ/P	1.5	2

76GHz

Pos	Callsign	Locator	Total QSOs	Best DX	km	Overall Score
1	G8KQW/P	IO90MX	1	G8ACE/P	92	92
2	G4EAT	JO01HR	1.5	G8CUB/P	52	78
3	G8ACE/P	IO80WP	1	G8KQW/P	92	46
4=	G8CUB/P	JO01DH	1	G4EAT	52	26
4=	G0FDZ/P	JO01DH	0.5	G4EAT	52	26

134GHz

Pos	Callsign	Locator	Total QSOs	Best DX	km	Overall Score
1=	G8CUB/P	JO01EP	1	G0FDZ/P	0.2	1
1=	G0FDZ/P	JO01EP	1	G8CUB/P	0.2	1

5.7/10/24GHz Championship Tables

After 3 events

5.7GHz

Pos	Callsign	5/26/13	6/30/13	7/28/13	TOTAL
1	G4LDR	568	801	820	2189
2=	G3ZME/P	1000	0	1000	2000
2=	G1EHF/P	0	1000	0	1000
4	GW3TKH/P	502	0	0	502
5	G4SJH/P	317	0	0	317
6	G4WYJ/P	0	288	0	288
7	G4WGE/P	0	38	0	38

10GHz Open

Pos	Callsign	5/26/13	6/30/13	7/28/13	TOTAL
1	G4LDR	948	882	1000	2830
2	G3ZME/P	1000	0	547	1547
3	GW/J3TKH/P	0	1000	459	1459
4	G8DTF	527	404	0	931
5	G8CUB/P	0	457	353	810
6	G4EML/P	0	298	480	778
7	M0DTS/P	342	386	0	728
8	G1MPW/P	0	704	0	704
9	G3PHO	0	0	365	365
10	G8KMH/P	304	0	0	304
11	GW4NOS/P	96	0	0	96
12	G8AIM	0	0	21	21

10GHz Restricted

Pos	Callsign	5/26/13	6/30/13	7/28/13	TOTAL
1	G4WLC/P	1000	943	787	2730
2	GW/J4HQX/P	781	563	1000	2344
3	G4GSB/P	164	483	478	1125
4	G1EHF/P	0	1000	0	1000
5	G4SJH/P	960	0	0	960
6	G4WYJ/P	0	694	0	694
7	GM8OTI/P	518	0	0	518
8	G0EHV/P	322	141	0	463
9	G4RGK	0	0	390	390
10	G0API/P	0	0	119	119
11	G4WGE/P	0	85	0	85

24GHz

Pos	Callsign	5/26/13	6/30/13	7/28/13	TOTAL
1	GW/J3TKH/P	920	1000	1000	2920
2	G4LDR	718	1000	213	1931
3	G0API/P	0	0	1000	1000
4	G8KQW	1000	0	0	1000

UKµG Technical support

Another free service for members!

While many of you will have taken advantage of the "test equipment rooms" that we run at the Round Tables, sometimes that project just cannot wait for the few occasions per year when we hold them. 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, more importantly, 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

Region	TechSupp. volunteer	Facilities
NW England, N Wales Wales	David Wrigley G6GXK 07811776432 Chris Bartram GW4DGU	Spectrum Analysis to 24GHz Power measurement to 76GHz Freq Measurement to 26GHz Freq sources to 47GHz NF Measurement to 10GHz Antenna Test range to 24GHz
NE England Yorks and Humberside	Peter Day G3PHO microwaves@blueyonder.co.uk	Available from Spring 2013 Spec Analyser to 24GHz Power measurement to 24GHz (up to 5W on 24GHz), RF sources to 24GHz, direct freq measurement to 3GHz. Setting up/tuning up transverters, etc + general advice.
S and SW England	Brian Coleman G4NNS Paul Marsh M0EYT pjmarsh@uhf-satcom.com	Spectrum analyser to 24GHz Power measurement to 26 GHz Scalar Network analyser and sweeper 2 to 15GHz Antenna test range 2.3, 3.4, 5.7, 10 and 24GHz Wavegide directional couplers for 10GHz and 24GHz Coax couplers 1.3 – 26GHz. Power measurement to 12GHz High power dummy load @ 10GHz (500W) Frequency measurement to 22GHz Spectrum analysers to 6 and 18GHz Frequency generation to 18GHz.
SE England and London	Allan Wyatt G8LSD allan@virtual-museums.org	not known
East Anglia, Essex & Suffolk Herts.	Sam Jewell G4DDK sam@g4ddk.com Bryan Harber G8DKK Letchworth, Herts	Spectrum analysis to 24GHz Power measurement to 24GHz Direct frequency measurement up to 3GHz VNA to 3GHz RF sources to 24GHz
West Anglia East Midlands	John Worsnop G4BAO john@g4bao.com	Spectrum analysis to 24GHz Power measurement to 24GHz Direct frequency measurement up to 18GHz VNA to 1.3GHz RF sources to 24GHz High current PSUs at 12, 28 and 48V
W Midlands	Richard Bown G8JVM richard@g8jvm.com	power measurement to 18 GHz Sig gen to 1.3 GHz but can mix up to 3cms SA to 1.3 GHz but can down convert from 3 cms and probably other lower bands , check NF to 3 cms with IFs of 144 and others , check Freq measurement to 18 GHz, Rb standard
Scotland	Ray James GM4CXM	Lot of mutual assistance in GM via GM microwave reflector
N Ireland	Gordon Curry GI6ATZ	

Activity News : August

By Bob Price G8DTF

Please send your activity news to:

scatterpoint@microwavers.org

Introduction

This month we have some reports of nanowave activity as well as the activity in UKAC and Microwave Group contests. Conditions over the month have been very mixed with some good conditions. During most of the contest periods except the 23cm UKAC, the conditions have been poor certainly with me.

Nanowaves

From Barry G8AGN

On Wednesday G0RPH/P and G8AGN/P extended the 54.9km daylight record set in Dec 2011 by G0EWN/P and G8AGN/P to 59.4km.

Yesterday, Thursday, G0RPH/P and G8AGN/P extended this to 65.8km and today we just managed 83.4km.

Last night (28 Aug 2013) Richard G0RPH/P and Barry G8AGN/P had a 2 way Hellschreiber contact over a 66km path (Harpswell, Lincs to High Bradfield, Sheffield) using red light.

From Peter G3PHO

On Tuesday 20th August, I kept Bernie, G4HJW, company at a /P site next to the Cattle and Fiddle Pub on the high moors west of Buxton in Derbyshire. He was doing some red lightwave tests (nanowaves) with a group on the Wrekin in Shropshire and another /P operator in North East Wales. Things didn't work out exactly to plan but it was a very interesting evening nevertheless. I am at this very moment uploading a short video of the proceedings onto my You Tube page at:

youtu.be/3VabPzvHsXw

Yes, there are periods of complete darkness in this video, but listen to the audio in the background or read the scrolling text and you'll soon feel the "atmosphere" of trying to communicate at 470 odd THz!

Bernie went on later in the week to make some excellent contacts over a few days which witnessed what was possibly the largest gathering of portable nanowavers the UK has ever seen!

Beacons

From John G4BAO JO02

30th August.

Just got back from site, nothing obvious like failed PSUs or fuses. There is DC and Drive up to ODU, the GPSDO was still in lock.

I've removed the whole thing and brought it back to here to look at. The radome on the antenna is looking a bit weather beaten after 5 years and the box needs a coat of paint so I'll give it a good refurbishment! Hope to get back next up there Thursday with it fixed.

The 10GHz beacon is still of course operating.

4th September

The beacon is repaired and has had a major overhaul. Replaced the 12GHz driver and separate doubler with my DB6NT 24GHz LO unit and replaced a suspect PA. Re weatherproofed it. Amazing what happens to self-amalgamating tape after 5years of sunlight!

5th September

The beacon is back up and running.
It's now sitting at some 30dB above the noise on my SDR here, that is more than 20dB stronger than it was before it failed completely during August and back to the level it was at initial installation in September 2008.

I now realise that it has been running just a few hundred uW or so for the last four years! If you've never heard it before take a listen now.

Reports please to beaconspot.eu

Fingers crossed it remains in this state for the foreseeable future, as I'm not keen on climbing to the top of a 30m water tower too often, spiral staircase or not!

GB3CAM IO92WI53

24048.870MHz GPS locked to a G3RUH GPSDO

100mW to a 10dBi slotted waveguide without wings. Main lobes SE/NW

FSK CW ident plus JT4G on even minutes

Microwave Field Day

From John GM8OTI

The addition of an old 1W PA module to my 10GHz transverter has made it a bit heavy, but also at present impossible to take hill-topping in a rucksack since I do not (yet) have suitable batteries. A small car battery is a bit heavy for a rucksack! Since the rules allow it I decided to try going out "roving", moving to different locations in the car in the south west of Scotland, using my 40cm dish on top of the car.

After some study of the maps I found three different locations that would be worth trying. The first was at sea level, just 21km across the water from Alan GM0USI/P who was setting up at the Mull of Galloway. This made for a quick test of the gear, and also an attempt with Tony G4CBW which didn't succeed (though as Tony commented later, we should probably have persisted as the path ought to have worked).

The second location was selected to be suitable for contacts up to the area near Edinburgh as I knew Brian GM8BJF/P and Pete GM4BYF/P were due to be out with newly assembled 10W (or thereabouts) systems. Again I started with Alan GM0USI/P (46km now), then discovered that Brian and Pete had gone to Alan's usual high perch in the Kilsyth hills - not at all suitable for the site I'd chosen! However we had some fun testing, and I was able to hear carriers and some audio from both of them over a very obstructed 125km path; Pete GM4BYF/P was just able to hear a carrier from me.

The third location was chosen as one where knew I ought to be able to work Tony G4CBW, since when I first assembled the transverter (October 2012 with just 0.7mW output!) I had heard his signal from there. Again Alan GM0USI/P was the first contact (now 63km and much more obstructed), and it was an easy contact with Tony G4CBW over 221km, a mostly sea path. An test was made with G5BK/P (500km, 1W at both ends, over part of the Lake District!) but unexpectedly this did not work.

So that was it - only 4 completed contacts but a lot of fun, and more experience gained. The problem I really need to solve is reliable ON4KST access from remote locations where often there is a poor mobile phone signal so that I can attract more attention from the south. I'm not that enamoured with using the mobile phone infrastructure to set up microwave contacts, but it seems that's how most people do it. I've not found that 2m talkback is much used.

In spite of the difficulties I'm intending to do more roving in future for the UKuG events. It's a lot of fun - please can we have roving added to the rules for RSGB microwave contests?

August 23cm UKAC

From Eddie G0EHV/P IO94ET

This month's UKAC produced my all time best session on 23cm. Conditions were up a bit but still suffered from sudden QSB at times. A total of 44 QSO's with 15 mults, best DX being G3TCU @ 409 Km. Lots of new calls to me on the band plus a new square /P – thanks to G4DHF/P in JO03.

At the usual IO94 portable site with 100 Watts to a 55 element Tonna antenna. No equipment problems other than a seized N plug at close down, the cold nights are coming back!

From Ray GM4CXM IO75TW

Above average conditions and great activity levels.

GM4JR	IO85FB	111km
G8CYW	IO94CX	195km
G6CQC	IO94DT	210km
G0MJW	IO91IO	523km
G8CUL	IO91JO	525km
G3VKV	IO81XV	475km
G8ATB	IO83SA	348km
GM4FZH	IO74SS	130km
G8DTF	IO83SM	296km
G4MVU	IO83SM	296km
G4JLG	IO83TM	298km
G0EHV/P	IO94ET	215km
G4KCT	IO93LW	308km
OZ1FF	JO45BO	784km
G4ODA	IO92WS	447km
G3PYE/P	JO02CE	514km
G4EAT	JO01HR	572km
G4AGE	IO93IF	361km
G4NBS	JO02AF	504km
GI6ATZ	IO74AJ	199km
G8OHM	IO92AJ	425km
G4BRK	IO91HP	517km
G3UVR	IO83KH	303km
GW8ASD	IO83LB	331km
G4RGK	IO91ON	541km
GM3WIL	IO75QL	54km
G3TCU	IO91QE	584km
G6UW	JO02AF	504km
G4KIY	IO92WN	467km
G8DKK	IO91VX	519km
GM0USI	IO75UV	7km
G3NEO	IO93II	350km
G3XDY	JO02OB	566km
G3VCA	IO93RF	390km
M0SDA	IO83QK	300km

From Bob G8DTF IO83SM

I managed to get on my shed roof this month to swap the antennas. I worked the following stations.

G4MVU, G8HXE/P, G3UVR, G4JLG, G8REQ, G4NTY, GW8ASD, M0SDA, G6GVI, M1DDD/A, M0ICK/P and G4WIM all in IO83.

GW4BVE/P and G3SMT in IO82.

G3VKV and M0GHZ in IO81

G4BRK, G0MJW and G8CUL in IO91

G8OHM and G4KIY in IO92

G4KCT in IO93

G0EHV/P in IO94

GM4CXM in IO75

GI6ATZ in IO74

G6UW, G4NBS and G3PYE/P in JO02

And finally G7RAU/P in IO90 who was my best DX at 336km.

Not bad with just 3.5W and a 44 ele WIMO.

August 5.7/10/24GHz Microwave Group Cumulative Contest

From John G(M)8OTI IO83PM

For this event I had limited time and equipment as I was in transit between Edinburgh and Southampton. However, I was on for an hour or so and had a few interesting tests using my 40cm offset dish, 1W PA and LNB based Rx. I went to a local hilltop near Wigan (my original home) where the road crosses the M6 which is in a deep cutting, so there was lots of audio QRM! This was still not an ideal site to the North, as another somewhat higher hill was obstructing the horizon about 10km away.

Being used to the hilly regions of Scotland I was astonished by the enormous signal from GB3XGH which I could detect in most directions! Much of the time was spent testing with Alan GM0USI at his usual site in IO76XA. At nearly 300km he was also behind much of the Lake District and lots of the Scottish southern uplands, so I didn't expect much. However, Alan's CW dashes turned out to be audible once we had the dishes aligned, and given a better site at my end we would probably have made a QSO.

Following that I had a couple of easy contacts. Tony G4CBW (59km) was very loud as expected, since I have worked him easily from over 200km. I could even just hear his signal when we were both beaming north towards Alan! I tried to use the ON4KST chat to contact Bob G8DTF, which may have worked since he called me very soon after! Unexpectedly at 17km that was also a very easy contact.

I'm sorry I wasn't around for longer to have had a chance to try some more difficult paths. I find the Opera browser on my phone not very compatible with the KST chat and must find a better solution.

From Bob G8DTF

I was experimenting with different dish feeds during the contest. In the end I managed just 5 QSOs with G4CBW (IO83), G3VKV (IO81), G8OTI/P (IO83), G4WLC/P (IO81) and G4LDR (IO91). There is still more work to do to improve my system. I need to get the transverter and preamp closer to the feed-point as I suspect there is still a fair bit of loss in the foot or so of semi-rigid cable.

August SHF UKAC

From Ray GM4CXM IO75TW

G0EHV/P	IO94ET	214km
G8PNN	IO95EF	190km
G8CUL	IO91JO	525km
G0MJW	IO91IO	523km
G4BRK	IO91HP	516km
G4ODA	IO92WS	447km
G1SWH	IO83QO	283km

G8OHM	IO92AJ	424km
G3VKV	IO81XV	475km
G8NVI	IO91JO	525km

Got-aways OZ1FF and G4EAT

Heard Kjeld OZ1FF briefly, but aircraft was always heading away from our midpoint. John G4EAT could hear me most of the time, but just heard him briefly, but very readable with his 10w and 25el.

1-100km	0
100-200km	1
200-300km	2
300-400km	0
400-500km	3
500-600km	4

From Eddie G0EHV/P IO94ET

I was /P from the usual IO94 site and found conditions below par with QSB being particularly harsh at times.

Best of my 13 QSOs was John G3XDY at 359Km. I did hear PE9GHZ, but no QSO resulted. One new one for me was Bob G8DTF.

Early in the contest I had a report of "drift" from Neil G4BRK, this seemed to settle later in the contest.

On investigation on the bench, I find my Kronotek transverter drifts considerably until warmed up.

It takes about an hour to settle down to within 1KHz (at 2320 MHz). It also doesn't like the supply voltage variation when /P. On TX my 12V supply battery voltage does swing about the nominal 12V.

I've now dug out my stabilized +12V supply, which I used to use on 3cm when I had the same issue and it seems to work well, powering just the transverter, a better test next time out /P.

From John G3XDY JO02OB

There was some good activity in the NAC/UKACs this month, along with enhanced conditions on occasion, plus some good QSOs into France. Here are the details:

F8TD Contest 18th August

There was some slightly enhanced tropo for this 23cm upwards contest. Contacts included:

1.3GHz: F2CT/P JN17, F5FLN/P IN94, F1BZG JN07, F6APE IN97

2.3GHz: F2CT/P JN17, F5KMB/P JN19, F1BZG JN07

5.7GHz F2CT/P JN17 (New square on 6cm), F5KMB/P JN19

10GHz F2CT/P JN17, F5KMB/P JN19

1.3GHz NAC/UKAC 20th August

Some tropo combined with great activity made this a memorable event, with 60 QSOs made in 2.5 hrs in a total of 29 locator squares.

Highlights were:

SK7MW JO65 by aircraft reflection,

Eight DLs, best DL0VV JO64

Four OZs, best OZ9ZZ JO46QK

GM4CXM IO75 and GM4JR IO85

Two stations in JO03: M0CGL and G4DHF/P.

GI6ATZ IO74,

GI4SNA (IO64) was a got-away, briefly heard by aircraft reflection.

UKuG 5.7/10GHz contest 25th August

I was on for a short period early on then again later in the afternoon. Conditions were flat with no tropo or rain scatter.

3 QSOs on 5.7GHz with G3ZME/P (IO82) the best DX

9 QSOs on 10GHz with F6DKW (JN18) the best DX

SHF NAC/UKAC 27th August

Some tropo over the North Sea for this one, but it did not extend much inland, but good activity on four bands made it a busy evening.

2.3GHz: 16 QSOs in 10 squares included:

OZ1FF (JO45) Tropo

SK7MW (JO65) by aircraft reflection

DK2MN & DF0MU in JO32

DF9IC in JN48

G0EHV/P IO94

G8PNN IO95

3.4GHz 6 QSOs in 5 squares:

DF9IC (JN48)

DK2MN, DF0MU JO32

DK6JL JO31

G0MJW IO91

M0GHZ IO81

5.7GHz:

OZ1FF JO45

DK6JL JO31

M0GHZ IO81

10GHz

OZ1FF JO45

DF0MU JO32

M0GHZ, G4WLC/P IO81

G4ODA IO92

From Bob G8DTF IO83SM

The SHF UKAC proved to be a very busy evening trying to juggle 3 bands.

13cm

G1SWH, G4MVU, G3UVR, G6GVI/P, GW8ASD, G4JLG and M0UFC/P in IO83

G4BRK, G8CUL, G0MJW and G8NVI in IO91

G8OHM and G4ODA in IO92

G3VKV in IO81

G0EHV/P in IO94

9cm

I found a fault in my transverter which had been resulting in poor RX performance. It is now fixed and things much better. I am still to work anything much over 100km though.

G4JLG, G6GVI/P and G4MVU all in IO83.

3cm

This was the best score ever from here.

G4MVU in IO83

G3VKV and G4WLC/P in IO81

G4ODA in IO92

G4LDR in IO91

Other Activity

From Jim GM3UAG IO87XJ

When Alan, GM0USI, announced on the µwave reflector that he had access to 6cm gear and he was looking for contacts I responded immediately. Over the years we have tried unsuccessfully on 23cm - there's an awful lot of Grampian granite between Aberdeen and Glasgow!

He very kindly offered to go portable to IO86PB, North Berwick, which is a much better direction for me. We had worked on 3cm before on one of his portable forays so it seemed logical to try that band as well. Then he suggested he could have 9cm capability.

Today, by arrangement, we hooked up first on 3cm at S9 both ways; then on 6cm, S9 again; then on 9cm, S9 again. So within an hour I enjoyed more contacts on more bands than I get in a year.

At 152km, on a largely sea path, it's not outstanding DX, but it's fine to get confirmation that the gear does work!

...and finally

I want to encourage you all to report your activity to clearly document use of the amateur microwave bands. This means not just DX, but also local activity with low power or WB equipment.

Please send your reports to Scatterpoint@ukmicrowaves.org

Remember the deadline is the 1st of the month.

Don't forget that

Every Monday evening is Microwave Activity Evening

Activity Across The Pond

from Kent WA5VJB/G8EMY

From SBMS Newsletter: Courtney Duncan's Photographic Record of the 10 GHz and Up Contest

RSGB & UKµG Contests 2013

Month	Contest name	Certificates	Date 2013	Time GMT	Notes
Mar	Low band 1.3/2.3/3.4GHz	F, P,U,R,L	3-Mar	1000 - 1600	First 4 hours coincide with IARU event
Mar	1.3GHz Activity Contest	*Arranged by RSGB*	19-Mar	2000 - 2230	RSGB Contest
Mar	2.3GHz+ Activity Contest	*Arranged by RSGB*	26-Mar	2000 - 2230	RSGB Contest
Apr	10GHz & Up EME	*Arranged by DUBUS*	*13–14-Apr*	0000-2359	DUBUS EME Contest
Apr	1.3GHz Activity Contest	*Arranged by RSGB*	16-Apr	1900 - 2130	RSGB Contest
Apr	Low band 1.3/2.3/3.4GHz 2	F, P,U,R,L	21-Apr	1000 - 1600	
Apr	2.3GHz+ Activity Contest	*Arranged by RSGB*	23-Apr	1900 - 2100	RSGB Contest
May	*10GHz Trophy*	*Arranged by RSGB*	*4-May*	*1400 - 2200*	Saturday, to coincide with IARU
May	*432MHz & up*	*Arranged by RSGB*	*4–5-May*	*1400 -1400*	RSGB Contest
May	1.3GHz EME	*Arranged by DUBUS*	*11–12-May*	0000-2359	DUBUS EME Contest
May	5.7GHz EME	*Arranged by DUBUS*	*18–19-May*	0000-2359	DUBUS EME Contest
May	1.3GHz Activity Contest	*Arranged by RSGB*	21-May	1900 - 2130	RSGB Contest
May	5.7GHz/10GHz/24GHz	F, P,U,R,L	26-May	0600-1800	
May	2.3GHz+ Activity Contest	*Arranged by RSGB*	28-May	1900 - 2130	RSGB Contest
Jun	Low band 1.3/2.3/3.4GHz 3	F, P,U,R,L	2-Jun	1000 - 1600	Aligned with some Eu events
Jun	2.3GHz EME	*Arranged by DUBUS*	*15–16-Jun*	0000-2359	DUBUS EME Contest
Jun	1.3GHz Activity Contest	*Arranged by RSGB*	18-Jun	1900 - 2130	RSGB Contest
Jun	2.3GHz+ Activity Contest	*Arranged by RSGB*	25-Jun	1900 - 2130	RSGB Contest
Jun	3.4GHz EME	*Arranged by DUBUS*	*29–30-Jun*	0000-2359	DUBUS EME Contest
Jun	5.7GHz/10GHz/24GHz	F, P,U,R,L	30-Jun	0600-1800	
Jul	VHF NFD (1.3GHz)	*Arranged by RSGB*	6– 7-Jul	1400 - 1400	RSGB Contest
Jul	1.3GHz Activity Contest	*Arranged by RSGB*	16-Jul	1900 - 2130	RSGB Contest
Jul	24GHz - 1THz Contest	O	21-Jul	0900 - 1700	New Format
Jul	2.3GHz+ Activity Contest	*Arranged by RSGB*	23-Jul	1900 - 2130	RSGB Contest
Jul	5.7GHz/10GHz/24GHz	F, P,U,R,L	28-Jul	0600-1800	
Aug	Microwave Field Day	O,L	4-Aug	0900 - 1700	
Aug	1.3GHz Activity Contest	*Arranged by RSGB*	20-Aug	1900 - 2130	RSGB Contest
Aug	5.7GHz/10GHz/24GHz	F, P,U,R,L	25-Aug	0600-1800	
Aug	2.3GHz+ Activity Contest	*Arranged by RSGB*	27-Aug	1900 - 2130	RSGB Contest
Sep	1.3GHz Activity Contest	*Arranged by RSGB*	17-Sep	1900 - 2130	RSGB Contest
Sep	2.3GHz+ Activity Contest	*Arranged by RSGB*	24-Sep	1900 - 2130	RSGB Contest
Sep	ARRL Microwave EME	*Arranged by ARRL*	28–29-Sep	0000 - 2359	
Sep	5.7GHz/10GHz/24GHz	F, P,U,R,L	29-Sep	0600-1800	
Oct	*1.3 & 2.3GHz Trophies*	*Arranged by RSGB*	*5-Oct*	*1400 - 2200*	RSGB Contest
Oct	*432MHz & up*	*Arranged by RSGB*	*5–6-Oct*	*1400 - 1400*	IARU/RSGB Contest
Oct	1.3GHz Activity Contest	*Arranged by RSGB*	15-Oct	1900 - 2130	RSGB Contest
Oct	2.3GHz+ Activity Contest	*Arranged by RSGB*	22-Oct	1900 - 2130	RSGB Contest
Oct	ARRL EME 50-1296MHz	*Arranged by ARRL*	26–27-Oct	0000 - 2359	
Nov	ARRL EME 50-1296MHz	*Arranged by ARRL*	16–17-Nov	0000 - 2359	
Nov	1.3GHz Activity Contest	*Arranged by RSGB*	19-Nov	2000 - 2230	RSGB Contest
Nov	Low band 1.3/2.3/3.4GHz 4	F, P,U,R,L	24-Nov	1000 - 1400	
Nov	2.3GHz+ Activity Contest	*Arranged by RSGB*	26-Nov	2000 - 2230	RSGB Contest
Dec	1.3GHz Activity Contest	*Arranged by RSGB*	17-Dec	2000 - 2230	RSGB Contest

Sections		
	F	Fixed / home station
	P	Portable
	L	Low-power <10W 1.3/2.3/3.4GHz, <1W 5.7/10GHz)
	R	Radio talkback
	U	Unlimited Talkback

Main changes from 2012 calendar	
1	ARRL/DUBUS EME updated
2	Lightwave event deleted
3	5.7/10/24GHz Cumulatives replaced with individual events

73 John G3XDY, UKUG Contest Adjudicator

UKµG Contest Portal

Journées d'Activité Dates in 2013

From Robin Lucas G8APZ

JA September: W/E 28 and 29 (UKMG contest)

October JA: W/E 26 and 27.

F6BSJ memorial JA: QSOs by reflection via Mt Blanc will take place on Sunday morning July 14.

Duration of JAs: Saturday 5:00 p.m. Sunday 5:00 p.m.

The latest EME calendar is available from DL7APV's website

Events calendar 2013/14

2013

Sept 8	**Crawley Roundtable**	
Sep 13–15	58.UKW Tagung Weinheim	www.ukw-tagung.de/
Sept 27–28	National Hamfest	www.nationalhamfest.org.uk/
Oct 8–10	European Microwave Week, Nuremberg	www.eumweek.com/
Oct 11–13	**RSGB Convention**	www.rsgb.org/rsgbconvention/
Oct 18–19	Microwave Update, Morehead, Kentucky	www.microwaveupdate.org/
Oct 26-27	BATC Convention, Finningley	www.g0ghk.co.uk/calendar/viewevent/90-batc-convention
Nov 2	**Scottish Roundtable**	www.rayjames.biz/microwavert/

2014

Jan 18	Heelweg	www.pamicrowaves.nl/
Apr 12	CJ-2014, Seigy	cj.ref-union.org/
April 26-27	Martlesham Round Table	
May 16-18	Hamvention, Dayton	www.hamvention.org/
Jun 27-29	Ham Radio, Friedrichshafen	www.hamradio-friedrichshafen.de/
July 1	Scatterpoint 10th Anniversary	www.scatterpoint.org/
August	EME2014, Pleumeur-Bodou near Lannion	
Oct 6-9	European Microwave Week, Rome	www.eumweek.com/
Oct 10-12	RSGB Convention	www.rsgb.org/rsgbconvention/
Oct ??-??	Microwave Update, Rochester, New York	www.microwaveupdate.org/