An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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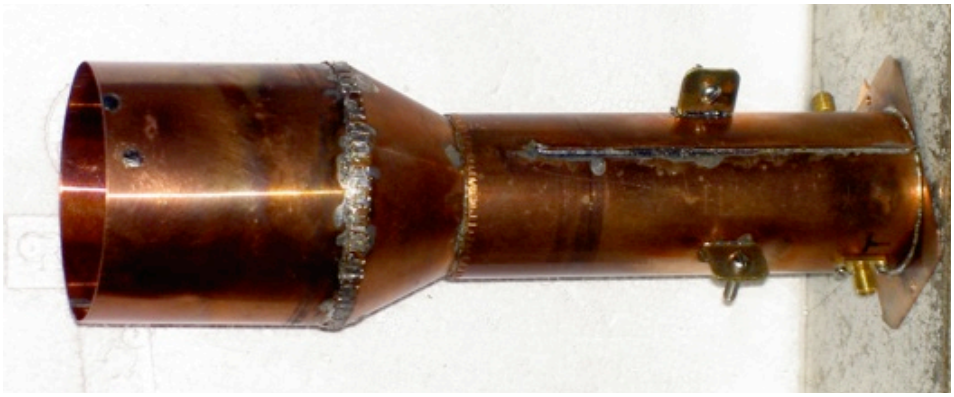
N2UO version of W2IMU horn using a septum polariser scaled to 5760 MHz

By Peter Blair G3LTF



In this Issue

Latest News

- The 135 GHz, 243 GHz and 324 GHz Microwave Bands were activated in Australia (VK) on Friday 21/10/2011. See page 19.

Many thanks to all our contributors this month, without whom there would be no Scatterpoint!

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Editor's bit

Beacons (bright light in the east?), round table, feeding and big dishes – must be the Christmas edition!

We bid farewell to Robin G8APZ/F1VJQ as compiler of Activity News. I am very grateful for his continued support during my first 6 months as Editor.

John G4BAO is now taking on this task. Please use scatterpoint@microwavers.org for your news and articles.

Readers, please let me have your ideas for topics, even if you don't feel able to write an article yourself. I may know someone who knows of an arm to twist.

The 2010 volume of Scatterpoint will become available via the microwavers.org site at the end of December.

Seasons Greetings to all our readers (yes, I know it's still November) and trust Santa will bring interesting additions to your shacks. Please don't forget that I need articles for the January edition...

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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Colour codes

Editorial & Events

Activity & Contests

Technical

Nanowaves (optical)

Commentary

Reproducing articles from Scatterpoint

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N2UO version of W2IMU horn
using a septum polariser scaled to 5760 MHz

Peter Blair G3LTF

Marc, N2UO, described at the 13th EME conference a dish feed-horn based on the dual mode design which originated with W2IMU. His paper (pdf) is here.

I took this design and scaled all the dimensions of Figure 4 by 1296/5760 = 0.225. Note that I did not exactly scale the septum thickness but the results do not seem to have been affected by this (see later).

The septum section internal diameter scaled to 41.3mm which is almost exactly 1.625". This is a copper tube size that can be found in the UK in model-making suppliers although it is quite expensive in small quantities. The wall thickness is 1.6mm. (1/16")

The horn section, flare and septum I made from 0.35mm thickness copper sheet. The horn section is made by cutting a strip of copper sheet with a small joggle or double bend with about a 5mm overlap. It is then formed into a tube by careful flexing on a round mandrel. A similar technique is used for the flare. I used very small screws, about 1.5mm diameter, to hold the overlaps together while soldering them. I made the "fingering" on the narrow end of the flare very small, about 3mm, and fitted them inside the guide, ensuring that they were tight against the wall. At the large diameter end of the flare I fitted the "fingering" on the outside. The detail of how to cut the "fingering" can be seen in Figure 17 of the original article by N2UO.

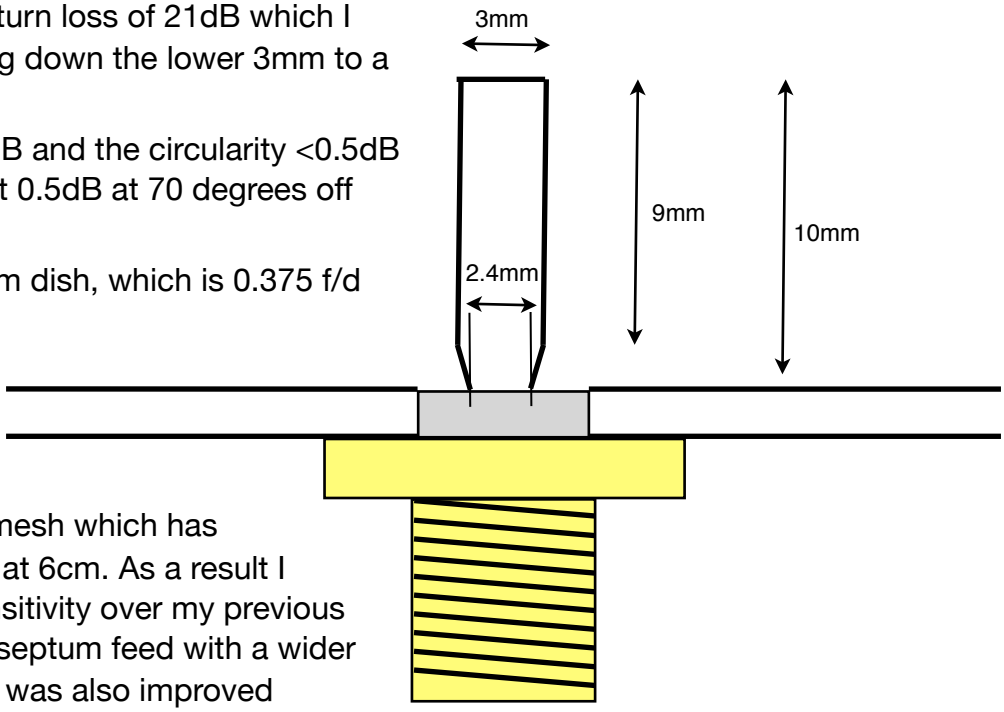
The three pieces, horn, flare and guide were then soldered together.I used a mandrel scheme using wood and metal and a length of threaded rod,very similar to Marc's arrangement, to keep the guide and the horn sections aligned while soldering. Finally the septum was soldered in.

I marked out the septum using a vernier calliper and on the long side of the septum I added 5mm so that the material outside the tube wall would be 5 -1.6 = 3.4mm. I carefully cut along this at each end for a distance of 3mm and then bent this tab at right angles, in opposite directions at each end, to hold the septum at the correct position and depth before soldering. For strength I added 3mm to the short side of the septum

The probe position was scaled by the same 0.225 factor and sited at 13.9mm from the back wall. The probe dimensions that I used with an SMA fitting are shown in the sketch opposite.

This arrangement gave a return loss of 21dB which I improved to 27dB by turning down the lower 3mm to a diameter of 2.4mm.

The isolation measured 36dB and the circularity <0.5dB axial ratio on axis and about 0.5dB at 70 degrees off axis.



I fitted the horn to my HB 6m dish, which is 0.375 f/d ratio, but I only wanted to illuminate the centre 4.4m as that is the part covered by 6mm mesh, effectively 0.51 f/d. The rest of the dish has 12mm mesh which has only about 5dB attenuation at 6cm. As a result I gained 1.5dB in system sensitivity over my previous feed which was an RA3AQ septum feed with a wider pattern. My tx performance was also improved slightly.

The two lugs fixed to the side of the horn are for the connection of stabilisers to the dish feed supports to ensure that the feed points exactly to the dish centre. The back plate is made slightly larger than the guide diameter so that the back support tube, used to adjust position, can be fixed to it without needing screws inside the guide.

Peter Blair G3LTF

Ref: Computer Optimized Dual Mode Circularly Polarized Feedhorn, Marc Franco, N2UO
http://www.ok1dfc.com/EME/technic/septum/N2UO%20opt.pdf

30 years later …… A New Beacon Manager

Kevin Avery, G3AAF

At one of the very early Martlesham Microwave Round Tables Charlie Suckling asked me if I would look at Microwave Beacons in the UK and help co-ordinate getting others on the air (at the time I was beacon-keeper of GB3BPO – now GB3MHL).

Some 30 years later, I thought that the time had come to ask someone else the same question! I was delighted that **Kevin, G3AAF**, agreed to take on the task. At the GM Round Table recently we completed handover and now any beacon enquiries should be directed to Kevin rather than me.

Can I take the opportunity to thank 'the few' who are beacon-keepers – they are rarely acknowledged but very quickly complained about if the beacon goes off the air! I have enjoyed being involved in what is a key activity for the users of the microwave bands – there have been a few challenging moments but these have been far outweighed by the positives.

Once again we are in a period of licences/NoVs taking a long time to be granted but this should not deter people from offering sites or proposing new opportunities.

Over to you Kevin.

Graham Murchie – G4FSG

A 144–146MHz bandpass filter
for use with the SPFAMP

By Sam Jewell G4DDK

Introduction

Whilst the SPFAMP covers from around 50MHz to over 3GHz, many radio enthusiasts may only want to use the SPFAMP to provide a low noise 144MHz amateur band preamplifier for talkback or maybe to use in a 2m transverter or in front of a deaf 144MHz transceiver for satellite or DX working.

It is possible to achieve a noise figure of less than 0.7dB at 144MHz with the SPF5043z and with its exceptionally high dynamic range and good gain it is an ideal front end for a 144MHz transverter. Calculations show it is possible to achieve a transverter noise figure of around 1dB with an input IP3 (IIP3) of around +6dB and as high at 10dB depending on the transverter gain distribution decisions.

Not only that, but the input return loss can be as good as 10dB, making the transverter ideal for use with a mast head preamplifier and coaxial down lead where poor second stage input return loss can lead to unstable operation with some preamplifiers and even a noticeable reduction in system noise figure if the masthead preamplifier has poor reverse isolation (S12).

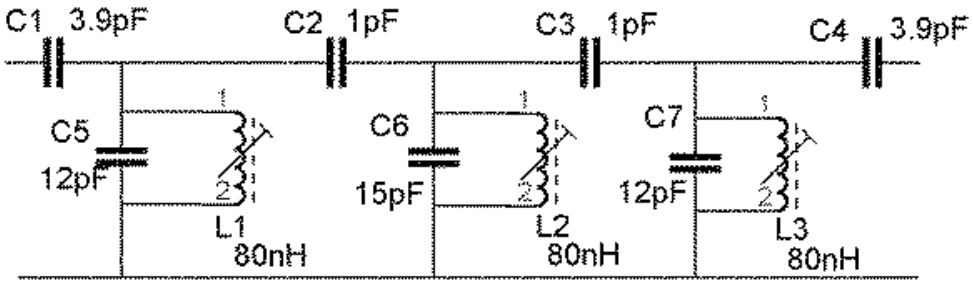
In order to achieve a low noise figure using the SPF5043z, with its gain of approximately 22dB at 144MHz, and a level 10 ring mixer with 7dB conversion loss, the bandpass filter between the SPF5043z stage and the mixer must have relatively low loss. The usual capacitively coupled resonator filter, such as I used in my Suffolk transverter (The VHF/UHF DX Book, RSGB) can be lossy. I was looking for something with no more than 3dB loss.

Using the Ansoft *Designer* filter synthesis programme and putting in some figures for bandwidth, ripple, stop band attenuation etc, it produced a 3 pole design that looked interesting. I wanted to use some nominal 80nH Toko adjustable coils that I had available. *Designer* indicated that the wanted centre frequency and bandwidth could be achieved with standard value fixed capacitors if the inductance was adjusted slightly, within the range of the specified TOKO coils.

On building the filter I found that the expected bandwidth was not quite achieved but, unexpectedly, the stop band attenuation was better than predicted. By increasing the value of the top coupling capacitors I could easily achieve 6MHz bandwidth (in fact the bandwidth eventually ended up at slightly under 10MHz. I felt this was acceptable and went ahead and used this filter in my new transverter front end.

The filter

The filter is a Chebyshev 3 pole filter achieving over 75dB stop band attenuation at 88MHz (144- (2x 28) with 50Ω termination impedance. Figure 1 shows the filter schematic diagram



L1,2,3 = Toko E528 SNAS 100074

Fig 1 – Circuit schematic of the Chebyshev filter.

The three adjustable inductors are Toko E528 series with ferrite core and screening can. The capacitors are all ceramic plate or 0805 size SMD.

The top coupling capacitors have been increased from the Designer value of 0.47pF to 1pF in order to achieve the wanted filter response, shown in figure 2. This shows the gain and frequency response of the filter connected immediately after the SPFAMP. It was found necessary to change the value of the inductor in the drain bias of the SPF5043 from the 100nH provided in the SPFAMP kit to 470nH as it is effectively in parallel with the filter and affects its response.

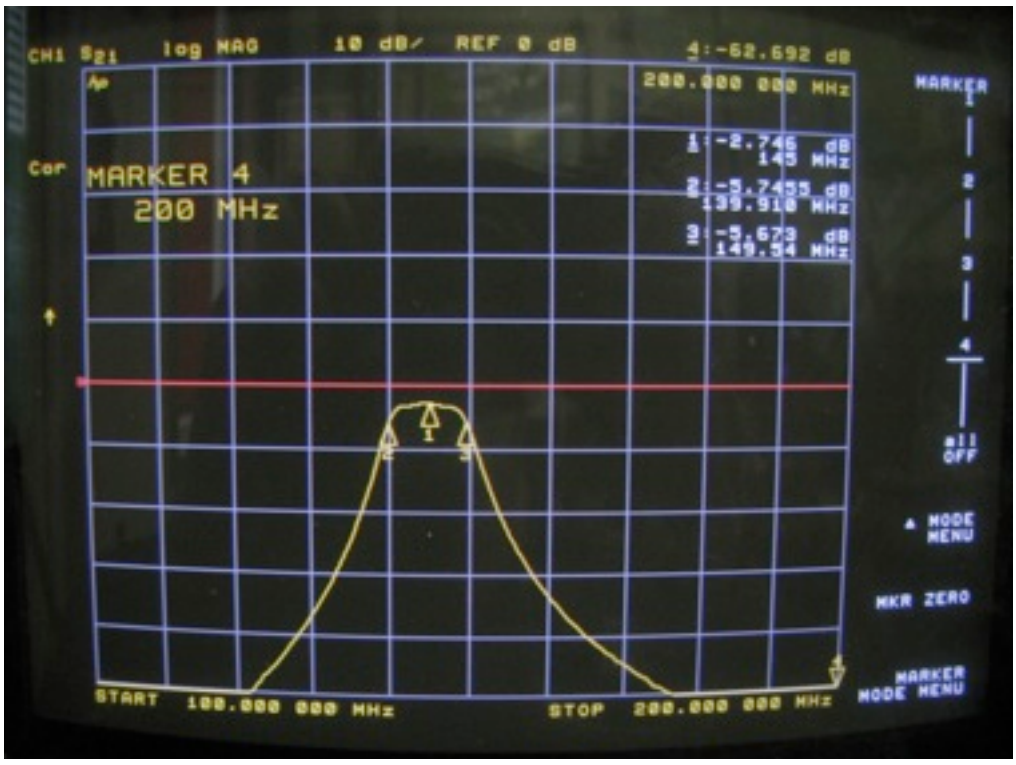


Fig 2 – Frequency response of the Chebyshev filter at a centre frequency of 145MHz

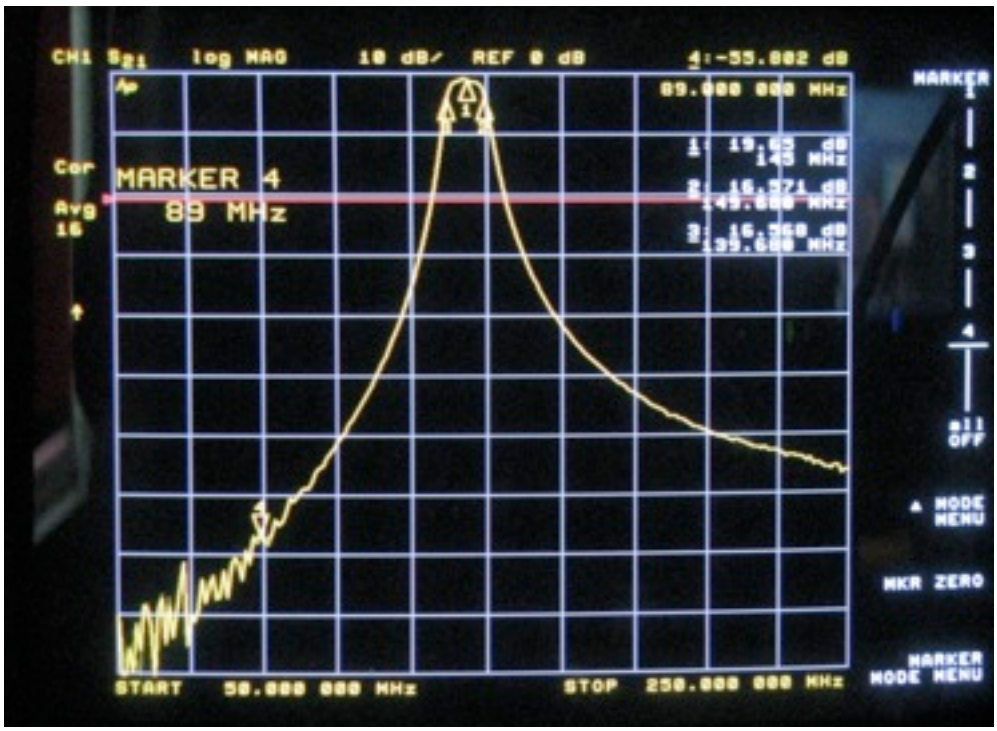


Fig 3 – Frequency response of the filter from 50 to 250MHz.

The frequency response at 89MHz (image of 145MHz signal frequency with 116MHz LO) marker 4 is over 77dB down on the response at 145MHz.

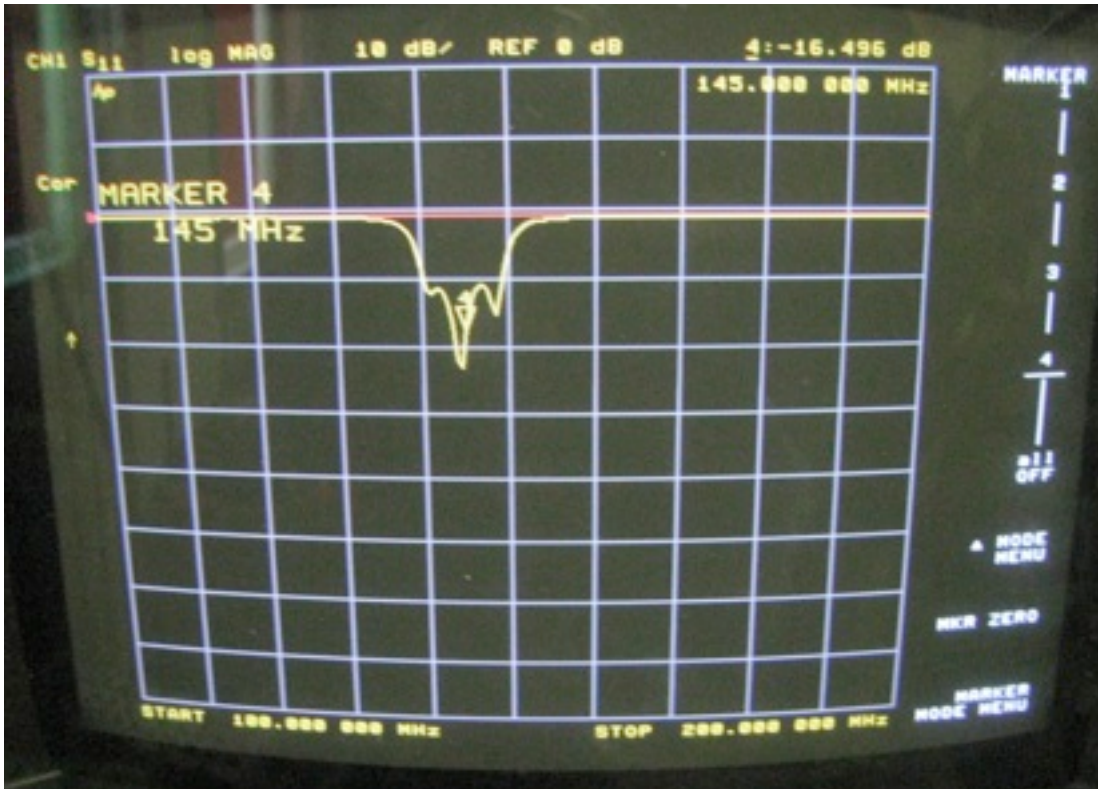


Fig 4 Return loss of the filter, looking back into the filter, with the preamp turned on and its input terminated in 50R.

The RL loss varies slightly across the frequency range, reaching over 20dB at 144MHz with Marker 4 showing the RL as 16.5dB at 145MHz.

Results

Parameter	Measured value	Comments
Insertion loss	2.7dB	Centre band
Bandwidth	10MHz	
Return loss	16.5dB	Looking back into the filter

Conclusions

These results are better than expected and should ensure that the image response of the filtered preamp is such that there should be few problems when using the SPFAMP as the front end of a 144MHz transverter with 28MHz IF. The bandwidth of the filter can be narrowed, if required, by decreasing the value of C2 and C3 to 0.5pF.

In case of difficulty finding the specified TOKO coils, Neosid or Coilcraft equivalents could be used.

Sam Jewell G4DDK

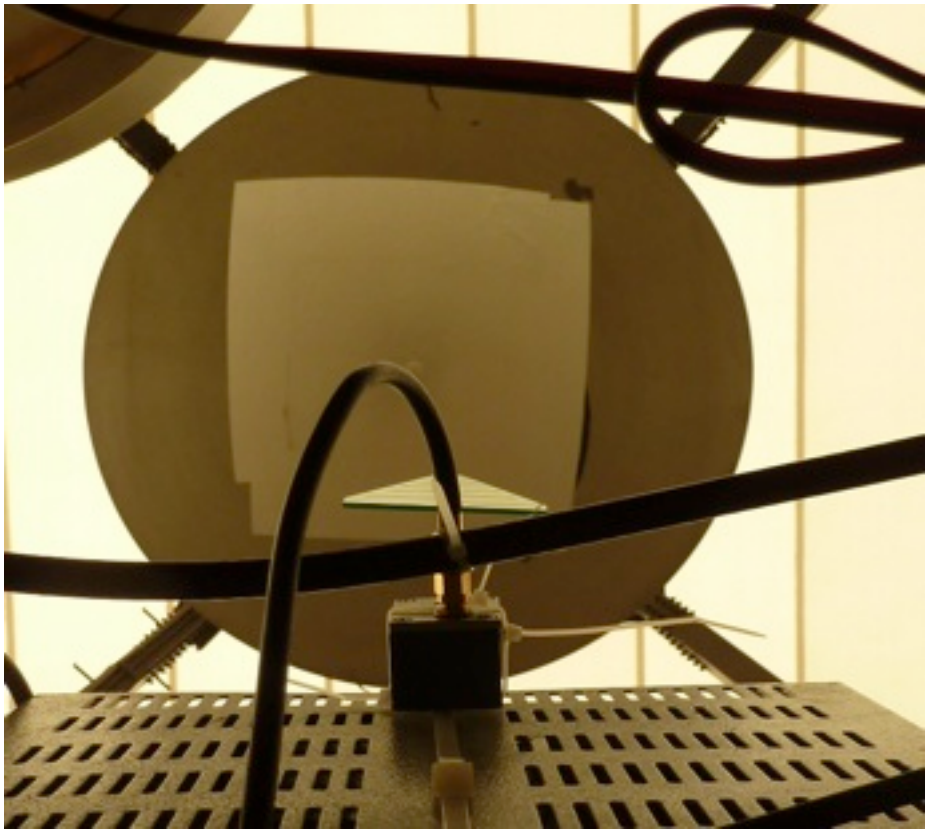
News from the “Big Dish” at Bochum

Reproduced with permission from James Miller G3RUH

Many of you will be aware of the AMSAT activities in Germany with the 20m dish at Bochum. The following is an email from James G3RUH and the Bochum team thanking Sam G4DDK and Kent WA5JVB for the donation of a harmonic multiplier and PCB log periodic antenna and showing the ingenious use they have put it to.

Dear Sam and Kent,

On behalf of the team working at the Bochum 20m Antenna, I would like to thank you for the very generous donation of the Mini-Circuits MK5 harmonic multiplier, and the wide-band log-periodic microwave antenna.



These items are already in use at the antenna, where we need a stable 8.4 GHz carrier to be injected into the front-end non-invasively, in order to investigate the source of a frequency drift problem. Attached is a small photo which shows the unit affixed to a metal box in the focus room.

It is well to the side of the 8.4 GHz horn. The LPY antenna is pointed at the sub-reflector, in order to spray back some RF into the feed horn. 0 dBm drive generates a signal at the receiver at the same strength as we get from NASA spacecraft. The curious square patch on the sub reflector is aluminium foil, kitchen variety. Back in 2004 we were trying to find out whether the sub-reflector was smooth enough at 10.4 GHz, so we put Freddy ON6UG into a cherry picker, armed him with Tesco’s finest and a tin of spray-glue, we set him to work. It made no difference, but remains in place!

The log periodic and multiplier will also be used in future whenever we are commissioning a new front-end system at the focus. One day we might afford a 12 GHz signal generator, but meanwhile, this is just perfect – thank you again!

73 de James G3RUH

Hartmut DL1YDD

Michael DD5ER

How to be a Bad Morse Operator

(With apologies to Simon Barnes, "the bad birdwatcher")

John Worsnop G4BAO

A wise man once said to me

"Don't worry about what people are thinking of you, because they rarely are"

How many times have you heard that very weak Morse Tropo signal on 23cm or the distant hiss of rain scatter Morse on 3cms and wished you could work it?

I know, you trot out the usual excuses in your head.

- Oh he's going too fast….
- I used to be a Class B/I'm a new licensee and I never took the Morse test.
- I've not operated on Morse since I walked out of my local coastal station in 1972.
- My Morse is not good enough

Maybe you just too "frit" to have a go in case you get in a tangle with the dots and dashes and "make a fool of yourself"?

Wake up… no one really cares about how bad your Morse is.

You'll miss out on some of the best Microwave DX if you take this attitude, just look at the Terrestrial DX World records.

1.3GHz	4143km	CW
2.3GHz	3980km	CW
3.4GHz	3980km	CW
5.7GHz	3980km	CW
10GHz	2079km	SSB
24GHz	710km	CW
47GHz	343km	SSB
75/76GHz	175.3km	CW
122GHz	114km	CW
134/136GHz	114.4km	CW

……Need I go on? 8 out of 10 are on Morse.

Unlike the HF bands you don't need to be a "good" Morse operator to work Morse DX on Microwaves. There's no "First Class Operator's Morse" club for Microwavers, in fact I'm thinking of forming a "2nd Class Morse operator's club!

So why not join me and become a bad Morse operator? Don't sit back and "wish you could do Morse properly".

Here are the four pillars of being a Bad Morse operator.

- Everyone else is as bad at Morse as you are.
- Never admit how bad at Morse you are.
- Bad Morse operators still work the DX on Microwaves
- On the radio, no one can see you blushing

And here are the rules of Bad Morse Operating

- If you hear someone calling CQ or posting on KST….. CALL THEM!
- If you don't call them, you won't work them.
- Call the station at your speed, 99% of people will slow down. If they don't, then they are likely to be a

prat and you wouldn't want to work them anyway.

- If you miss something, ask them to repeat it.
- Learn to pick out callsigns, reports and locators. The rest of it's probably boring chatter anyway!
- Don't be afraid to sign off once you've got the above info, blame it on "Deep QSB" ("Heavy QRM" doesn't cut it on Microwaves, but it's great for HF!)
- All the Morse you need to know after you've learned the alphabet is …
  G1XYZ de G2ABC ga (gm/ge) tnx call UR 559(xxx for contests) in <your Locator>
  ?
  RRR tnx QSO es 73
- If you're embarrassed by your poor Morse skills, …LIE!..... and learn...

The "Bad Morse operator's code"

Here it is.

1. QRS = please slow down
2. QSB = I didn't read my report because my Morse skills are so bad
3. QRM = (see QSB)
4. PSE ALL AGN = (see QSB)
5. PSE TRY SSB (only if signal is strong enough)
6. TNX QSO es 73 = (see QSB, only to be used after 2, 3, 4 and 5 have failed)

The chances are the only person who'll know or care that you are a Bad Morse Operator is yourself, the other station has got a new square/country/ initial – that's all he cares about.

What do Bad Morse Operators do better than non-Morse operators?

They have Morse QSOs! …..AND….. their Morse actually improves!

`Dih di dih dah, dih dah  dit dit`

John G4BAO

For those of you with an iPhone, iPod Touch or iPad there's this app **Ham Morse** to help you practice. Costs £2.99.

See aa9pw.com/hammorse/

Or the App Store

All you have to do is find the time to practice, practice, practice….

But I may give the ~~Les Dawson~~ BAO method a try.

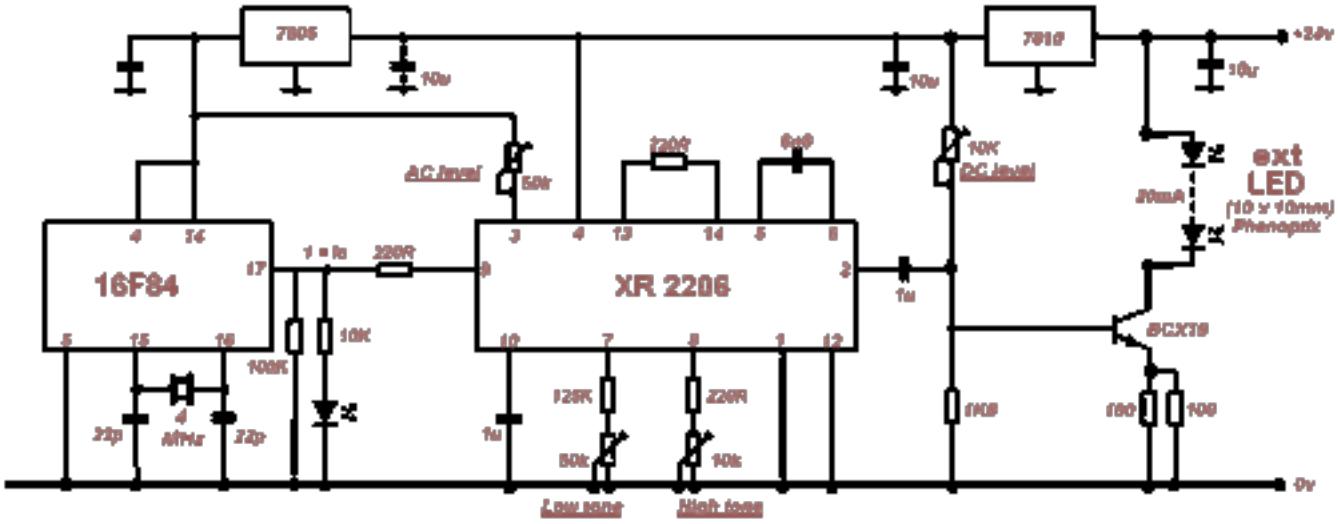
Martin G8BHC

GB3CAM low power red LED beacon

Bernie Wright G4HJW

A 400mW dc input cluster of 10 red LEDs was installed at the Wyton site in late October, mainly to provide a suitable practice source some 30km away in the Cambridge/Newmarket area. It has already proved its worth – my receiver having only displayed very poor waterfall images on what is a readily visible, though weak, signal to the naked eye.

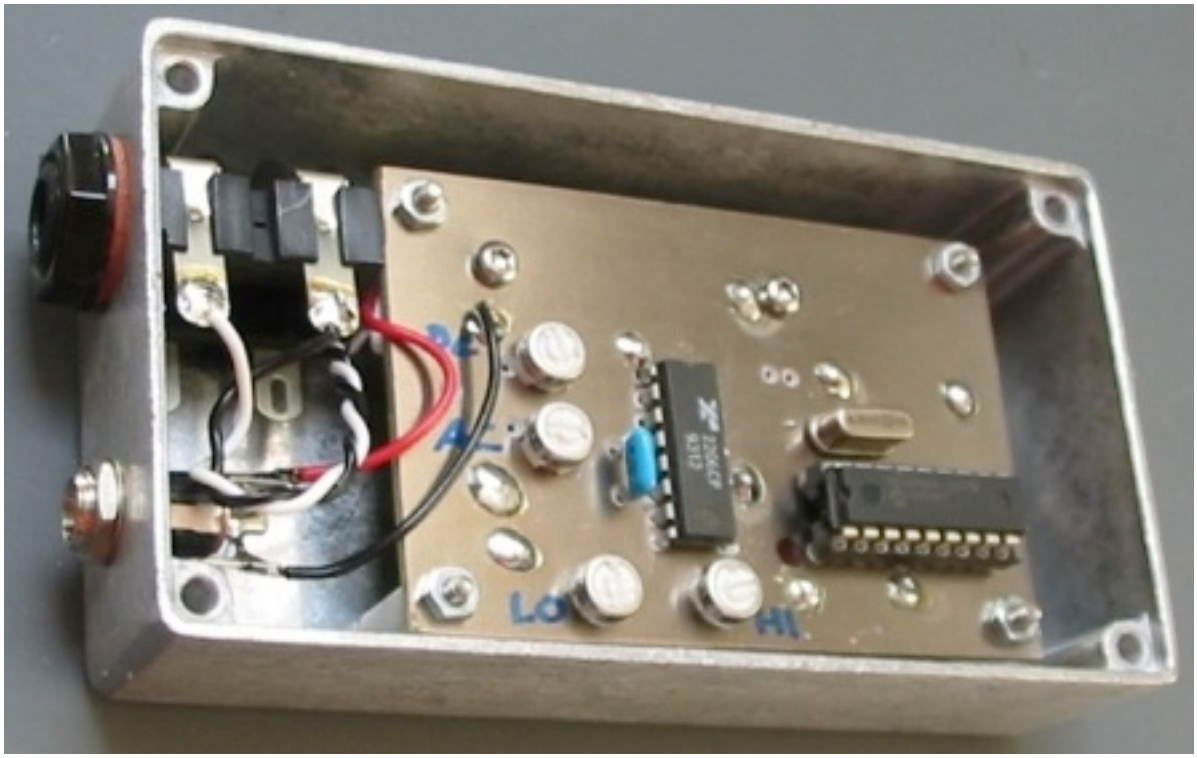
Continuous-level AM modulation of the light beam is used. This avoids unnecessary distraction to the general public were there otherwise to be noticeable amplitude fluctuations in the light output level. FSK keying with tones at 1 and 15kHz is employed, allowing for either direct baseband or heterodyned detection. When listening directly to the 1kHz tone, the GB3CAM Morse code ident is heard correctly formatted. When listening to the heterodyned 15kHz tone, the Morse appears inverted. During periods when the call sign is not being sent, the beacon modulates with a continuous series of 'S' characters in order maintain a near 50% duty cycling of the two tones.



The sine wave FSK tones modulate the reference of a constant current drive source and is set pretty much at 100% modulation depth. Light output shows a fairly linear relationship to the LED drive current, and the harmonic content of the detected tones are all less than -40 dBc.

To keep power consumption to a minimum (John G4BAO and I have to pay the electricity bill, and it soon adds up), a narrow circular beam is used to illuminate the target area. No additional optics are required for this – the 10mm clear LEDs employed producing a 10 degree beam width. The LEDs making up the beacon cluster are connected in series and fed via a single pair to the beacon keying unit located with the rest of site hardware halfway down the tower.

With such a narrow beam, mounted 100ft AGL and pointing towards the top of the Cambridgeshire Alps to the east of Cambridge, the signal strength close to the tower is not that great, resulting in a strangely even value at ground level over the first 25km.



Although weak, the beacon is easy enough to spot amongst the plethora of high-pressure sodium street lighting around Cambridge, the colour difference being quite striking. A good indication of ‘band conditions’ here is the Sandy Heath TV mast. This is some 40km distant, and is very well lit to its full height. It is soon noted that most outdoor light sources have a large AM content, and tower warning lights seem to be no exception, though often they are fed via switched mode PSUs, and can have hefty non 50Hz-related AM modulation components, which make them easy to identify – a useful feature really.

The GB3CAM beacon page contains a link to further information, including this coverage map.

Bernie G4HJW

1296MHz JT65 Experimental Beacon

From Andy Talbot G4JNT

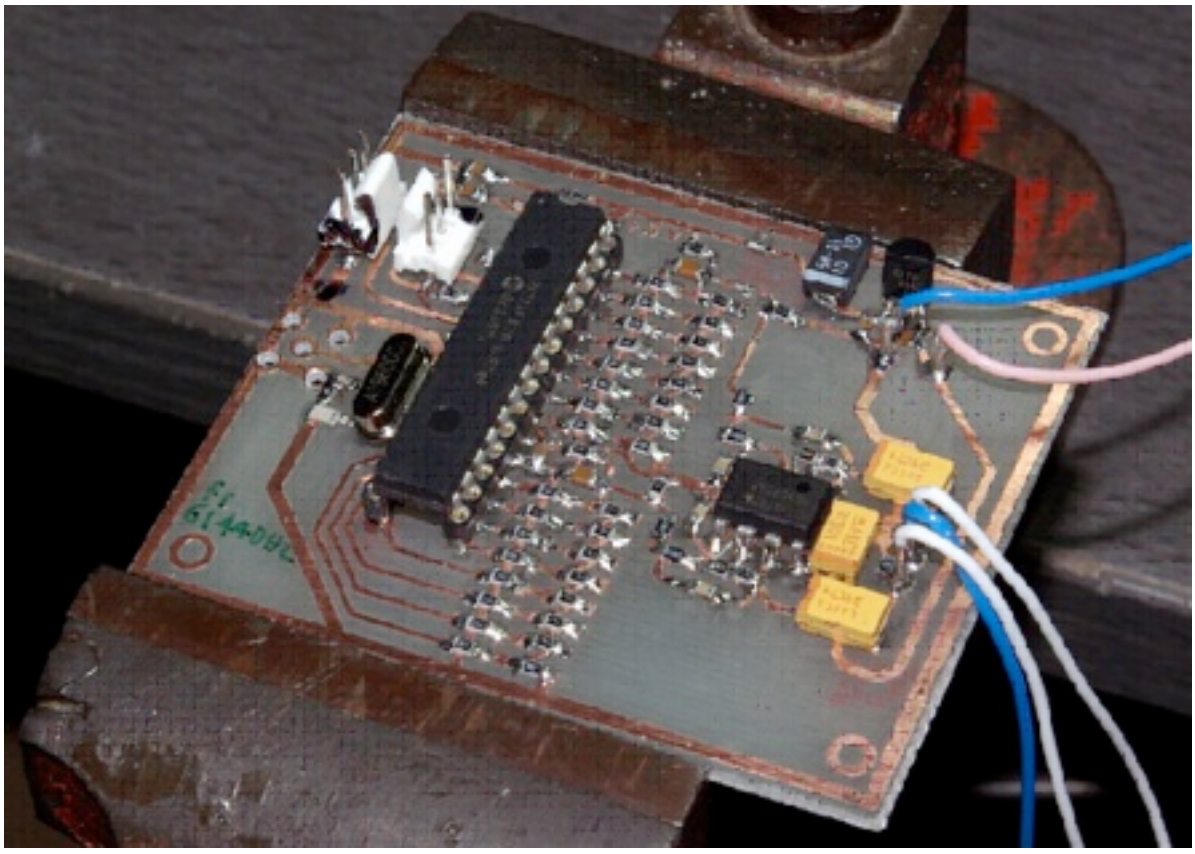
This is a description of the experimental beacon I've been running recently for transmitting WSJT modes, made up from a mixture of surplus bits and modern ICs with some DSP thrown in.

Background

The idea started after I developed a simple low frequency Direct Digital Synthesizer using a PIC and external R-2R ladder. By clocking the PIC with a 20MHz crystal, code for implementing a DDS allowed frequencies up to around 25kHz to be generated. The latest version of this PIC-DDS allows it to be programmed with a frequency word over a custom serial interface. Another PIC was then programmed to generate WSJT modes (code exists for JT4, JT65 and WSPR) so any of these could be generated at carriers frequencies up to 25kHz. All this was done with optical communications using 25kHz subcarriers in mind, and all works well up there. Versions of the PIC code were developed that could operate free running, relying on the PIC crystal alone for maintaining timing, as well as versions taking in NMEA from a GPS receiver. With a crystal set to within 10ppm of its nominal value, adequate timing for WSJT decoding could be maintained for a day or two

Then it occurred to me: I'd previously built a PIC based DDS designed for generating two 90 degree shifted audio tones, so the hardware already existed. A quick modification to the PIC code to add in the serial command protocol I'd developed for the optical comms one, and it was happily generating JT65 / JT4 / WSPR with IQ outputs, all ready for a quadrature upconverter. A photograph appears below. (File LF_IQ_DDS.JPG)

The maximum frequency wasn't as high as the single tone versions, 10kHz maximum is all the dual DDS can really achieve, but as I/Q upconversion is really a baseband process and wouldn't be used for subcarriers, not an issue...



I also realised that by sending it the codes for negative frequencies (sending the twos-complement codes for the frequency to be generated) being an IQ source, it really would generate a negative frequency.

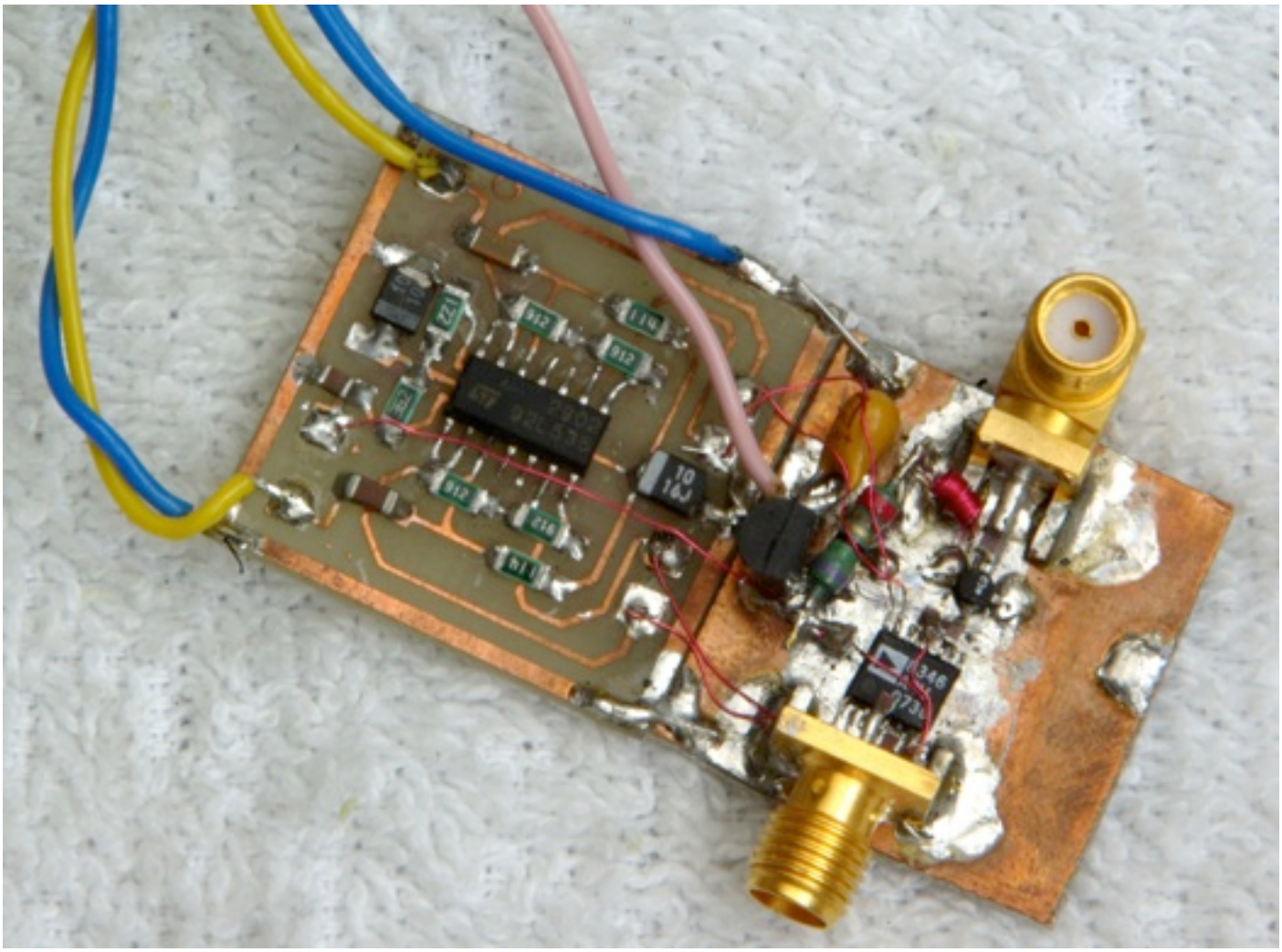
If the concept of negative frequency makes your head spin, it just means the phase of the I/Q outputs is swapped over, so after quadrature upconversion the output is now below the carrier. This ability to generate negative frequencies is an essential part of the IQ baseband to RF direct conversion process.

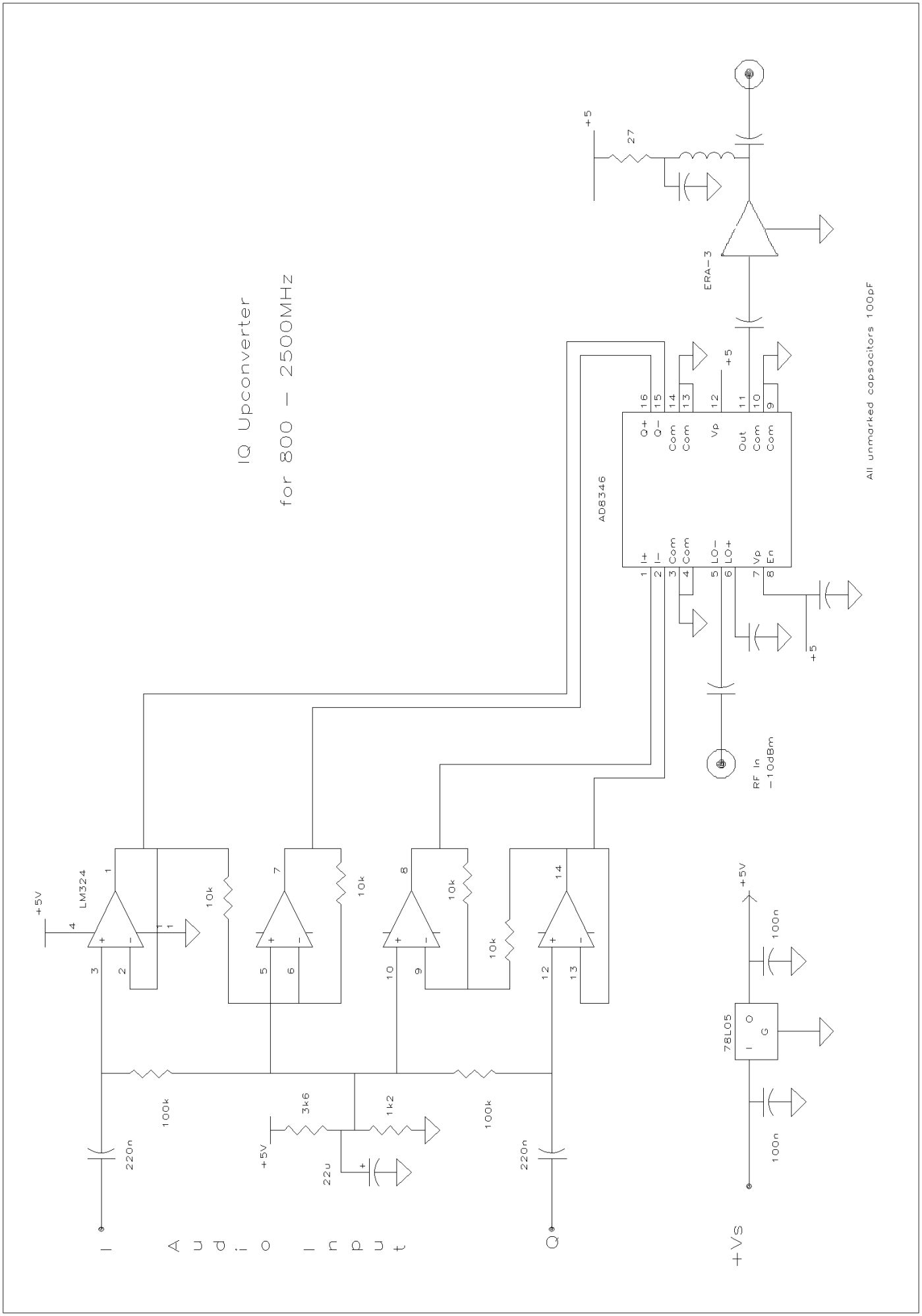
Full details of the low frequency DDS can be found here with the download archive including all PIC code and design utilities here.

There is a bit more in RadCom Design Notes, April 2011.

Microwave Version

The Analog Devices AD8346 is a quadrature upconverter designed for operation over 800MHz to 2400MHz The data sheet can be found here (search for AD8346). An RF input at the wanted carrier is supplied, optimally at a level of -15dBm, and dual differential baseband (audio type) signals have to be supplied at a level not exceeding 1.3V Pk-Pk. I'd made up a breadboard converter previously that was languishing on a shelf, (*RadCom, Short Circuits, Nov 2009*) so put it into a homebrew tinplate box for a bit of screening. A photo of the original before boxing-up is shown below. An ERA-3 raises the output level from the AD8346 to around +10dBm

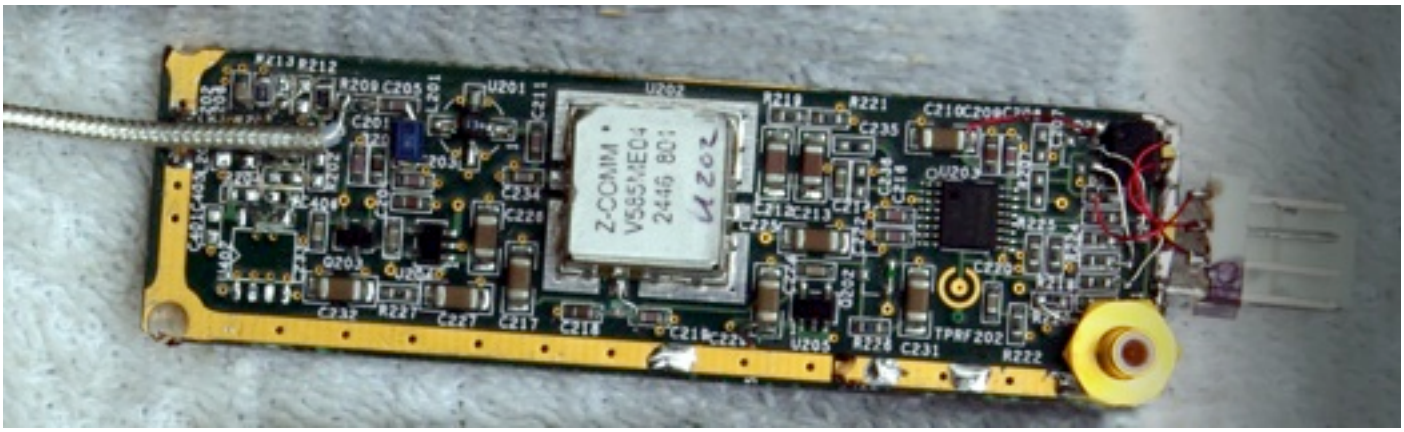



IQ Upconverter
for 800 – 2500MHz
All unmarked capsacitors 100pF
AD8346
ERA-3
LM324
78L05
RF In
-10dBm
I Audio Input
Q
+Vs
+5V
+5
27
10k
100k
3k6
1k2
220n
22u
100n

The differential audio comes from a quad opamp arrangement. The full circuit diagram of the upconverter is shown in Figure 1. As the LF-DDS arrangement delivers 2.8V peak to peak, the I and Q outputs have to be divided down to get to the maximum 1.3V permitted for this chip.

RF Source

In the past I'd dismantled an old cell phone type of module that had had three LMX2346 synthesizers built onto it. I'd (literally) hacksawed off each module, added a small PIC to decode commands sent via an RS232 serial interface, then put them aside after testing. (One of these covered 2.3GHz and was subsequently used for GB3SCS. That conversion is detailed here. Another module covered 1.3GHz, and photo of that is shown below. This module was also put into a tinplate screened housing



The output level from the synth at +15dBm was far too high for the AD8436, so 30dB of attenuation had to be added to bring it down to the drive level needed by that chip.

Frequency Setting

The synthesizer module was configured for comparison frequencies in the 500kHz region, and I didn't want to change loop filter components on this ready-to-go module, so was forced to choose only a limited range of frequencies in the narrowband 1296 segment. With a 10MHz reference input from the 'ZAZ GPS locked source, and after playing with a few numbers, I finally settled on R = 18 and N = 2333 for a generated frequency of 1296.11111MHz with a reference of 555.555kHz.

Now this is where being able to programme negative frequency is useful. It would be nice to have a round number of kHz as the reference tuning point for the signal. I'd intended to use JT65B and C waveforms for transmission (JT4 is old-hat, all uWave beacons run that now) and these are 350 and 700Hz wide respectively. Both are based on a reference sync tone that has to be tuned to come out at 1270Hz at audio. So the nearest ideal tuning points were 1296.110 or 1296.109MHz to keep the tones generated by the DDS as low in frequency as possible. Using 1296.109 as the SSB carrier tuning reference, meant the audio tone needed for the JT65 sync at 1270Hz had to be at a frequency of 1296.109MHz (Wanted carrier) - 1296.1111 (From the synth) + 1270Hz (JT65 sync) which is [minus] -840Hz. JT65C generation inside the PIC increases this to -90Hz maximum. (Had I selected an SSB carrier tuning point of 1296.110MHz, the respective tone frequencies would +159 to +860Hz for JT65C, but I wanted negative frequencies for the challenge!)

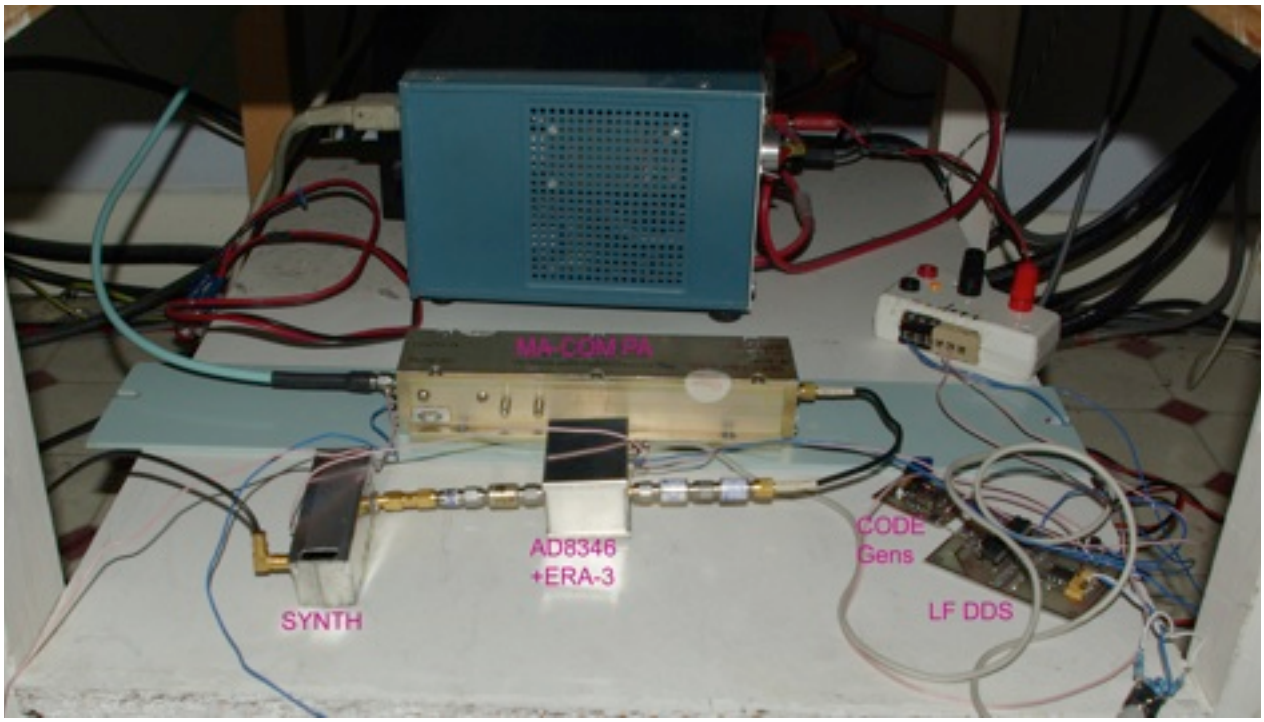
Calculating the values for the frequency codes to be sent from the code generator to the LF DDS, together with all details of programming the JT65 code generator are all covered in the references given.

Amplifier and Antenna

A surplus 900 – 1400MHz MA-Com unit was to hand, an ancient module running in class A that consumed over 1A from a 26V supply, but it did deliver a clean 5 Watts at 1296MHz. Optimum drive level was 0dBm so further attenuation had to be added on the upconverter output.

John G0API had loaned me a 1.3GHz Alford slot in a waterproof housing – it has been originally intended for an ATV repeater in the Bournemouth / Poole area that didn't happen) and this on top of the mast fed with 12m of LDF450 ensures an EIRP in the region of 11dBW.

The photo below shows the breadboard combination connected up and going.



Conclusions

At the time of writing the beacon has been up and running for a couple of days, with reports from as far away as Wakefield (319km) QRM from Doppler shifted Aircraft scattering appears to suggest JT65C has the edge over the B version, and it ought to be possible to get successful decodes from the stronger aircraft reflections, as only 20s of the complete 48 second transmission sequence is needed for decoding, provided the that 20s is of good quality.

Carrier leakage at 1296.5111MHz which looks like a spurious tone at 2111Hz is at a level of -40dBc. With a properly laid out PCB instead of the rats-nest breadboard, an even better isolation should be possible. Other spurious tones in the -50 to -60dB region are also present. These come from a combination of the lkow 8-bit resolution of the LF DDS D/A converter, I/Q sideband cancellation, etc, etc.

Andy Talbot G4JNT

Web References

Low frequency DDS	www.g4jnt.com/OpticalComms/LF_DDS_Beacon_Source.pdf
PIC code and design utilities	www.g4jnt.com/LF_DDS_Beacon.zip
Analog Devices AD8346 data sheet	www.analog.com/en/index.html
GB3SCS	www.scrbg.org/TheNewGB3SCS.htm

New bands in VK

from the world above 100GHz

By Ian VK3XPD and Michael VK3KH

The 135 GHz, 243 GHz and 324 GHz Microwave Bands have been activated in Australia (VK) today, Friday 21/10/2011.

Despite most unfavourable weather conditions, Michael – VK3KH and I went out to test a pair of new Transverters that I had just finished building. Our initial On Site testing over a 10 Metre path was to check the functionality of the gear. We started with 324.48 GHz. Signal Reports for our SSB signals were 5+9 both ways. At this time, I'm unsure if we in VK have any allocations in this Band segment. There have been recorded Amateur QSO's on 322 GHz in the USA and Europe.

The next frequency we activated was 243.36 GHz. Signal Reports were 5+9 +10 both ways.

Our final frequency was 135.20 GHz, again with 5+9 +10 both ways.

Having seen such big signals over our 10 Metre path, we decided to try our luck with an optimistic 400 metre path. We failed to hear anything on 135 GHz.

This was not surprising with all the recent wet overcast weather, water sitting in puddles in the nice green grass and the very high Relative Humidity at the time. Tests over a 200 metre path yielded much the same results. Nothing heard. Clearly we had too much atmospheric attenuation.

A 100 metre path yielded mixed results. We heard our 135 GHz IDENT signals but they were so very weak that SSB was going to be impossible. Despite much effort to optimise our Dish pointing and the gear sensitivity.. the signals finally disappeared as the afternoon passed.

On each series of Tests using non Amateur Band Frequencies, we noticed that conditions (propagation) for these upper Microwave frequencies were changing (degrading) very fast - even over these relatively short paths. As the afternoon progressed towards 1600 hours local, it became somewhat chilly. With time running out, we decided to run our last tests over a 25 Metre path.

Our 135 GHz QSO was 5+9 both ways. The 243 GHz QSO was also 5+9 both ways. Our final QSO on 324 GHz was 5+5 from Michael to my 5+2 report. All in all it was a very successful day despite the poor weather.

Amazingly, the QSO's we achieved on these 3 widely spaced Band segments were achieved by this single pair of Transverters.

At this time, we have not decided whether to claim Australian Distance Records for these 25 Metre QSO's. Clearly with some better weather and accompanying low Humidity, these distances will certainly be improved on.

A full Write-Up on the Equipment used will be published shortly. Suffice to say that the hardware is very similar to the 78/122 GHz Transverters I built previously. This time the "pump" source is 27.04 GHz. So, the 5th harmonic is 135.2 GHz, 9th harmonic is 243.46 GHz etc.

Our VK9NA Website at www.vk9na.com has more information on the techniques used. Related articles will also appear in DUBUS 4/2011.

Cheers,

Alan – VK3XPD and Michael – VK3KH.

The 1st GM Microwave Round Table

5 November 2011

Roger Blackwell GM4PMK

The first–ever Scottish Microwave Round Table took place at the Museum of Communication, Burntisland, Fife (just across the Forth Bridge from Edinburgh). www.mocft.co.uk What a wonderful venue! I'm sure everyone who attended found the displays and the 'stacks' completely absorbing. They are filled with all kinds of equipment from early electrostatic machines and semaphores to modern IT equipment – I've never seen so many communications receivers (or BC221s) in one place! Test facilities and some sales tables were located in the museum display area, while the talks, refreshments and an excellent lunch were all in a separate lecture room.

The programme covered topics from low microwave to optical, including a master-class on Noise Figure Measurement by David, GM4ZNX and the latest VLNA news from G4DDK. Other topics included how to use unmodified satellite LNBs as receive converters for 3cm narrowband by G4HJW, the new Edinburgh 23cm Beacon by GM8BJF, Optical Communications by one of the current UK record holders G8CYW, and something of particular interest to those of us with poor sites and a lack of tropo openings, Aircraft Reflection by Ray GM4CXM. A wide-ranging and fascinating selection indeed! Some excellent test facilities were provided by Dave

Nugent (Agilent) and Brian Flynn GM8BJF. They were kept very busy all day and I know they had a good number of very happy customers. All too soon the programme came to a close – but that wasn't the end of the day. A dinner at the Burntisland Sands Hotel provided the opportunity to meet and chat with many of the participants. An auction of items donated by Sam, G4DDK raised a generous amount, which those present unanimously agreed should go to the Museum, who had put in much hard work for the event.

What particularly struck me was how much everyone enjoyed themselves and the comments, both in person and on the newsgroups, have been deservedly very complimentary. The organisers, Ray GM4CXM, Ian GM3SEK and Colin GM4HWO are to be congratulated on a superb event, as are the volunteer staff of the Museum, who went out of their way to make us all feel most welcome. I'm already looking forward to next year's GMRT!

Caption competition?

More pictures here and on the Museum of Communication's Facebook album here.

The Lothians Radio Society

Contest News

By John Quarmby G3XDY

5.7GHz Cumulatives 2011

Entries were back to the levels of 2009 this year, but activity and conditions seemed down. GP3ZME/P created some interest by operating from Guernsey in August, but this was not their highest scoring session, which came in September. Again a few contacts were made outside mainland UK, with F1DBE/P and PA/ON7BV/P providing the DX in many cases.

Congratulations to Telford & DARS G3ZME/P, operating from Shropshire, who again win the G3KEU Trophy. Leading fixed station and overall runner-up Neil Underwood G4LDR will receive a certificate, as will G0JMI/P who operated with Radio talkback only. G3WFK/P was the only station in the low power category and will also receive a certificate

10 GHz Cumulatives 2011

Following a dip last year, entries were back up again this year, although activity seemed to be lower overall, particularly for the July session (holidays perhaps?). Some stations entered logs for only one or two sessions despite being active in other periods. The online log entry system is not set up to handle submission of all the logs at the end of the overall contest, which created a few challenges. To avoid this next year please submit your logs in the two weeks after each session, rather than waiting until the end.

Several stations lost points through simple logging errors, eg incorrectly transcribed callsigns, missing (or added!) /P suffixes. Please check your log carefully before submitting it. The online logging system allows logs to be resubmitted if you find errors after uploading them.

No-one commented on finding any rainscatter this year, some thought that session four conditions were above normal, but the biggest feature seemed to be strong winds that plagued many on several days, and which certainly did not help activity. Once again PA/ON7BV/P was the best DX for many, and a fair number of French stations appeared in the logs of stations in the South, thanks to coordination with their activity days.

Once again the Restricted Section was won by Steve Cooke, G1MPW/P, operating from Ashdown Forest and Dunkery Beacon. Jim Gale, G4WYJ/P, operating from Ditchling Beacon was runner up. G1MPW/P will receive the G3JMB Memorial Trophy.

5.7GHz Cumulative Results 2011

Pos	Callsign	Overall Score	Total QSOs	Scores					Best DX	km
				Session #1	Session #2	Session #3	Session #4	Session #5		
1	G(P)3ZME/P	5208	34	0	1543	1221	1700	1965	F1GHB/P	439
2	G4LDR	3058	19	421	1519	0	0	1118	PA/ON7BV/P	357
3	G4WYJ/P	2377	20	0	1373	33	448	556	G4ALY	291
4	G0JMI/P	861	12	89	273	0	289	299	GP3ZME/P	202
5	G8AIM	411	3	0	0	411	0	0	G3XDY	190
5	G8CUB/P	387	5	0	304	83	0	0	G3ZME/P	184
6	G3PHO/P	157	3	0	58	0	0	99	G3ZME/P	126
7	G3WFK/P	154	2	0	0	0	0	154	G3ZME/P	118

10GHz Cumulative Results 2011

Open Section

Pos	Callsign	Overall Score	Total QSOs	Scores					Best DX	km
				Session #1	Session #2	Session #3	Session #4	Session #5		
1	G(P)3ZME/P	9338	73	892	2586	2588	4150	2600	PA/ON7BV/P	430
2	G4LDR	5678	34	1855	2114	0	0	1709	F6DKW	378
3	G4ZXO/P	5035	37	0	1877	0	1280	1878	F1GHB/P	346
4	G8CUB/P	3444	32	810	1244	811	1389	0	PA/ON7BV/P	341
5	G3PHO/P	2569	15	0	2267	0	0	302	PA/ON7BV/P	389
6	G8DTF	1479	17	300	662	0	341	476	G8DKK	229
7	GM0USI/P	752	5	0	0	0	752	0	G4CBW	348

Restricted Section

Pos	Callsign	Overall Score	Total QSOs	Scores					Best DX	km
				Session #1	Session #2	Session #3	Session #4	Session #5		
1	G1MPW/P	4860	31	529	2159	1472	0	1229	F1NPX/P	364
2	G4WYJ/P	4624	37	0	1891	209	1388	1345	G4ALY	291
3	G6KIE/P	2145	18	54	959	0	0	1132	G4ALY	303
4	G(W)3TKH/P	1439	10	0	118	0	1321	0	G0OLX/P	234
5	GW4HQX/P	1341	11	263	0	0	0	1078	G4WYJ/P	227
6	G3UYM/P	1244	10	0	1244	0	0	0	G3PHO/P	218
7	G0JMI/P	1078	11	0	0	0	592	486	GP3ZME/P	202
8	GW3CWI/P	947	7	0	947	0	0	0	GM0USI/P	292
9	G8AIM	566	5	0	566	0	0	0	M0DTS/P	230
10	G4BLH/P	195	2	0	195	0	0	0	GW3CWI/P	113
11	G6GVI/P	36	1	36	0	0	0	0	M0UFC/P	36

Checklog gratefully acknowledged from G6MXL/P

24GHz Cumulative Results 2011

Pos	Callsign	Overall Score	Total QSOs	Scores					Best DX	km
				Session #1	Session #2	Session #3	Session #4	Session #5		
1	G(P)3ZME/P	652	8	265	181	0	112	206	G3PHO/P	126
2	G(W)3TKH/P	440	6	210	118	0	112	80	G3ZME/P	118
3	G4ZXO/P	323	7	0	0	0	230	93	G0JMI/P	70
4	G3PHO/P	244	2	118	0	0	0	126	G3ZME/P	126
5	G8CUB/P	242	4	0	130	0	112	0	GW3TKH/P	112
6	G0JMI/P	138	2	0	0	0	71	67	G4ZXO/P	71
7	G4LDR	48	4	16	16	0	0	16	G4NNS	16
8	G6KIE/P	13	1	0	0	0	0	13	G4ZXO/P	13

In the Open section Telford & DARS G3ZME/P were winners by a large margin. Their successful expedition to Guernsey gave them a commanding lead in session 4, and they had consistently high scores in all the other sessions bar the May event. They also took advantage of the rover rule, moving location in several sessions to gain additional points. This year the runner up was Neil Underwood G4LDR, located between Salisbury and Andover, who is also the leading fixed station.

Congratulations Telford ARS, who will receive the G3RPE Memorial Trophy, and to G4LDR who will receive the overall runner-up and leading fixed station certificate.

George Tarver G8AIM is the leading Fixed Station in the Restricted Section . The leading radio talkback entrant was G(W)3TKH/P. Both will receive certificates.

24GHz G0RRJ Cumulatives 2011

Entries held steady again this year. The only contact made outside the UK was between GP3ZME/P and F9ZG/P. G3ZME/P and G3PHO/P recorded the best DX in the contest at 126km. Unfortunately two stations lost a significant number of points due to incorrectly logged callsigns.

Telford & DARS G(P)3ZME/P operated from sites in IO82 and Guernsey (IN89) to swap top spot with G(W)3TKH/P this year, Telford & DARS will receive the G0RRJ Memorial Trophy as winner and a certificate goes to G(W)3TKH/P.

Neil Underwood G4LDR takes the Leading Fixed Station certificate.

24GHz Trophy 2011

Changing this from a 3 stage cumulative event in previous years to a single date resulted in more entries on 24GHz, but still no sign of activity on the 47 and 76GHz bands. All the activity was concentrated in SE England, mostly in Kent and Essex. Chris Whitmarsh, G0FDZ/P was the winner, and will receive the 24GHz Trophy. John Wood G4EAT is runner-up and will receive a certificate.

24/47/76GHz Trophy Results 2011

24GHz

Pos	Callsign	Locator	Total QSOs	Best DX	km	Overall Score
1	G0FDZ/P	JO01JK	4	G3ZEZ	48	110
2	G4EAT	JO01HR	3	G3ZEZ	36	87
3	G8CUB/P	JO01FN	3	G0FDZ/P	27	27
4	G0JMI/P	IO91KA	1	G1JRU	26	26

47GHz No entries

76GHz No entries

73 John G3XDY,

UKUG Contest Adjudicator

Back on the Air

By Tony Collett G4NBS

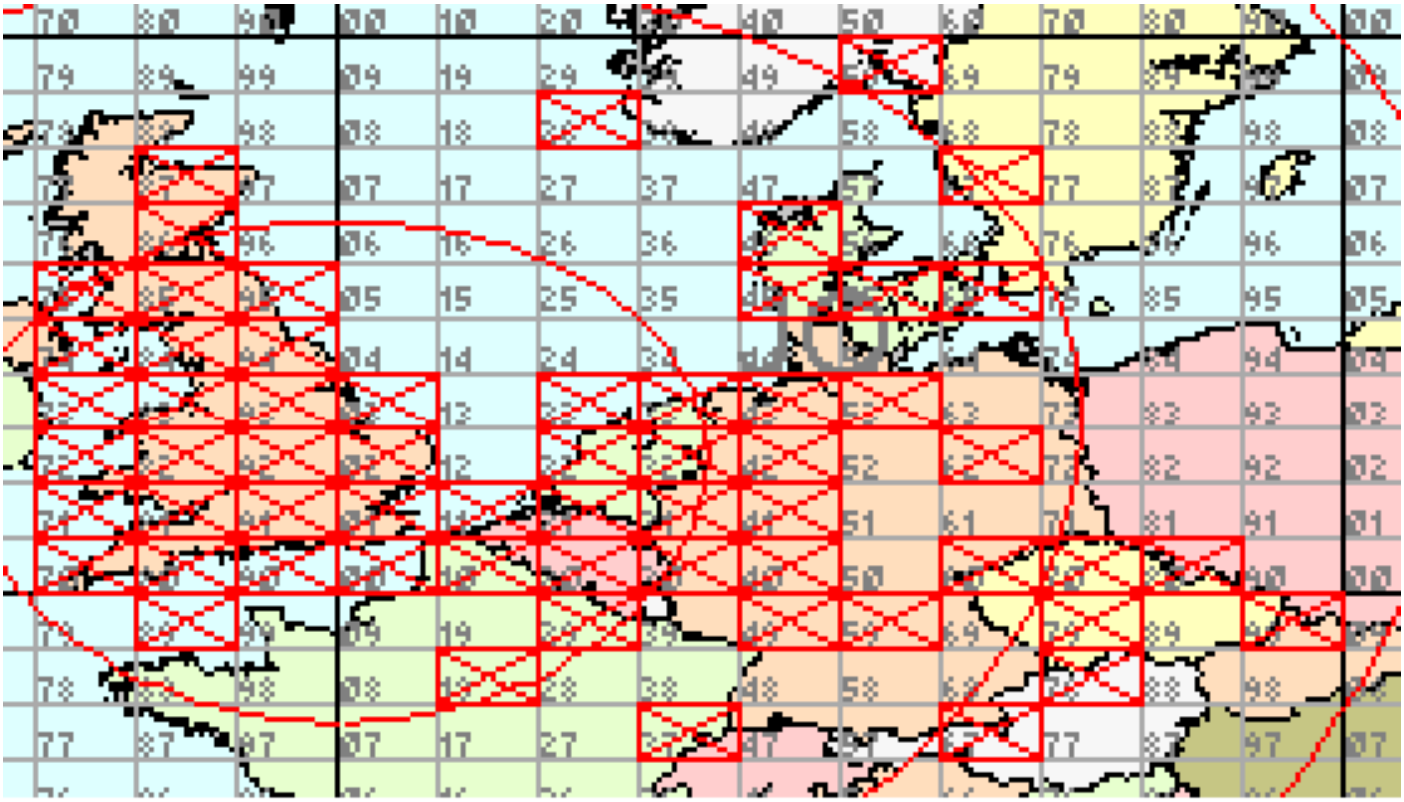
Hi

seeing my name in print back in September Scatterpoint, thought this might possibly be of interest?

As John mentioned “some” of the cards dated back to the 80's – in fact 55 squares are for contacts between 1985 and 1988, then 1 each in 1989, 1990 and 2002.

My total worked squares had sat at 70 since 1988 but I had to wait till this year to confirm 2 "local" scottish squares thanks to GM4JR and GM0USI so I could make the claim!

Attached is the map of the squares confirmed.



Possibly of more note is that my station was initially just a 1Watt MM Transverter feeding 4*23ele F9FT (originally driven by an FT221, then in 1988 by a TS780). The majority of QSOs though were made after the addition of a small 10W PA late in 1985 with about 6W actually at the aerial. Only 3 squares were worked and confirmed with QRO (25W... IO75,85 and JO23)

Like a lot of others family and work meant I have rarely been on from home since early 1990 and apart from a “burst” of sporadic activity at the start of the millennium 2000 – 2003 running a TS790 with 25W from a rather abused pair of 57762 I have largely been QRT. I reappeared on the band in OCT 2010, but had to change the aerial to a single 55 ele as the 4*23 were showing their age somewhat (I purchased them from G3SPJ back in early 80's so they did me well!).

Coming back on after such a long break it is noticeable how power levels have generally increased and how much reliance is on KST rather than calling and tuning. I generally get fewer replies to my CQ's now than when I was running lower power but find that majority of skeds arranged on KST result in a proper QSO, I've just got to learn to type while I talk now..., Oh, and get that PA built!

Regards

Tony G4NBS

Activity News

from the world above 1000MHz

By Robin Lucas G8APZ

This month's Scatterpoint marks the last activity column written by Robin G8APZ after many years as our activity reporter. As you probably know, know Robin spends his summers in France, but never failed to produce a column over the years and was always very particular about the content and layout. Getting in the reports each month requires a lot of research and cajoling of members to send in their activity summaries, and I know of another well-known columnist who actually finds this the hardest part to do each month. I'm sure the group as a whole would like to pass on our heartfelt thanks to Robin for his sterling work, and wish him well in his "retirement".

"With a little help from my friends" I will be taking over from Robin in the January issue so please keep the reports of activity, 23cms to light, coming in to

scatterpoint@microwavers.org

and I'll try and keep up Robin's high standards of reporting. If anyone has any suggestions as to how we can change or improve the column, send them to me at the same address.

73
John G4BAO
Chairman

Once again we reach the final issue of the year. It seems such a short while ago since the calendar of contests and activity periods was published for 2011. The whole process starts again soon!

Remember that winter can be a good time to be active on microwaves. Large areas of still air, and high pressure can produce good DX, and even snow can bring scatter conditions on the higher bands. As I am putting this column together in mid November, northern Europe is experiencing some excellent tropo distances on the high bands, judging from the beacon reports, some of which are approaching 1000km.

Some of my winter projects involve converting more of my transverters to precise frequency by locking them to a 10MHz GPSDO. The higher bands in particular benefit most from this. Twenty years ago, when two stations couldn't be sure of their frequency, contact attempts often failed. These days, it really is a pleasure to agree a frequency, and on moving the dial finding the wanted station there calling!

The IARU 432MHz and up contest at the beginning of October was just a few days before my deadline for the October column, and although I was able to get a few reports in, I have a few more for this issue.

IARU Contest – October

From: Tony G4NBS, Cambridge

Seeing the reports on the IARU contest from the coast, I thought I would provide my input from a little further inland (JO02AF).

Despite the forecast looking good, and hearing John G3XDY working things, the only DX I found on 23cm in the days before the contest were OZ1FF at 59 and SM7GEP at 539 late on 30th Sept. (JO77 being a new square for me). As the weather and radio forecasts were so good I took the opportunity to (literally) hang my 13cm transverter off the back of my 40 ele on the mast unboxed and not waterproofed...

On the Saturday morning of 1st October GB3ANT and GB3MHS were both received at enormous strength, with GB3LES easily audible so hopes were high for my first foray on 13cm from home. By the start of the contest all three beacons had reduced in strength significantly.

With just 1W at the aerial I managed 18 QSOs in 8 squares. My best QSOs were with PI4GN (JO33) at 465km early on Sunday, with F6KPL (IN99), and PA6NL (JO21) both on Saturday afternoon. Several others were heard, but my QRP couldn't be heard, so thanks to those that struggled to hear me.

The transverter is now back in the shack waiting for me to find the time to build it into a proper station...

23cms did not perform as well as hoped though - the conditions on the coast never made it here unfortunately. There were some strong signals from the East but no radar noise. However I did suffer an S7 noise level beaming north west that disappeared at midday on Sunday, coinciding with the majority of continental signals dropping out.

I worked 56 stations in 25 squares and 9 countries. Best QSOs (listed in decreasing order) were DF4IAI at 710km and DR9A both in JN48 (new sq), GM4LBV (IO86), DK1VC (JO31), F6KUP/P (JN29), GM4CXM (IO75), DF0MU (JO32), and DK5EZ (JO31).

It is interesting to note that only four of these were worked without using 'KST first, just to show how much weaker signals were further inland. In fact 20 out of the 56 QSOs were initiated via 'KST which shows how useful it is. I didn't hear anything from Scandinavia or further east than the JO4# line.

73, Tony G4NBS

Roger Ray, G8CUB was out portable on the Sunday from a site near Dover Castle. He made contact on 3cm with M1CRO/p (JO01pu) and a test was arranged to try a QSO on 24GHz.

Unfortunately, Roger had forgotten the correct tripod, and so he used the string and sealing wax approach with a few house bricks for good measure! The 24GHz contact was made on SSB over the 84km path at 58/59.

What to do if you forgot the tripod!
Photo: G8CUB

Super Tropo from EA

There were some superb tropo conditions from Spain during mid October, which brought in lots of QSOs for Manel, EA1BLA with his five band portable setup.

On 15th and 16th October, Manel was QRV from his portable QTH on the north western coast of Spain at Cedeira (IN53xq), on VHF/UHF (2m, 70cm), and the microwave bands too (23cm, 13cm, and 3cm).

Whilst not in the microwave part of the spectrum, it is worthy of note that on 2m he worked four stations over 2,000km into Sweden, and 86 stations over 1000km out of a total of 129 QSOs on 2m. A similar story followed on 70cm, where 32 of the contacts were in excess of 1000km.

Manel's QSOS on 23cm, were all at very long distances for the band. With just 10W with an IC-910 and a 67 element yagi, he made contact with 27 stations. The longest distances were to DB6NT (JO50) at 1658km, DL7QY (JN59) 1514km, and DF0MU (JO32) at 1472km.

Indeed there were 12 stations over 1000km, which must have been very interesting for Manel.

On 15th October, Manel worked some super DX on 10GHz falling just a few kilometres short of the magic 1000km mark. Contacts in the Paris area were made with F6DWG/p (JN19) 997km, F1PYR/p (JN19) 983km, F5HRY (JN18) 974km, and F6DKW (JN18) at 968km. Other contacts with F6FHP (IN94) 646km, and F2CT/p (IN93) 540km brought the total to six stations in four squares. Very impressive for just 4W and a 48cm dish.

On 13cm with 4W and a 45 ele loop yagi, Manel worked all the stations above (apart from F6DKW), with the addition of F1DBE

(JN09) 973km, and G4ALY (IO70) 809km (see First G-EA below).

Manel's 23cm list covers the 15th and 16th October with some superb DX. Using an IC-910 with just 10W into a 67 ele yagi, he worked stations in F, G, PA, DL, and LX. In descending distance, QSOs in excess of 1000km were made with DB6NT (JO50) 1658km, DL7QY (JN59) 1514km, DF0MU (JO32) 1472km, PA5DD (JO22) 1330km, PA2M (JO21) 1325km, DF2VJ (JN39) 1306km, LX2LA (JN39) 1270km, F1CXW (JO20) 1205km, F1EZQ (JN27) 1104km, G0XDI (IO91) and F6DQZ (JN19) both at 1050km.

In all, 220 QSOs across 5 bands, during an incredible weekend of conditions.

First G – EA on 13cm

Ralph, G4ALY (IO70vl) sent in his list of DX worked in October. Amongst the DX, on 15 Oct 2011 was a QSO with Manel, EA1BLA/p (IN53xq) on 13cm ssb at a distance of 809km which is the first G/EA QSO on 13cm.

Congratulations to both stations on making this contact.

From the south west

Ralph, G4ALY's October log contains some very good DX.

On 9th October, F6AJW/p (IN93ek) was worked on 23cm at 807km. On 15th October he worked F6AJW/p again, along with F6FHP (IN94tr) 700km, EA1BLA/p (IN53xq) on ssb at 809km, and also on 13cm ssb for a first G/EA on 13cm.

Conditions were superb on 15th, when Ralph worked F2CT/p on 3cm, 6cm, and 13cm over the 830km path to IN93hg.

On 16th, a 3cm contact with F2CT/p (JN15he) at 778km brought a new square for Ralph.

On 22nd, a 6cm QSO with F2CT/p (IN93GJ) at 815km, and on 24th a 3cm QSO with F6DKW (JN18cs) over 500km.

The 29th brought another new square on 6cm when he worked F2CT/p (JN02ax) 894km, plus contacts on 6cm and 3cm with F6APE (IN97qi) at 438km.

Over 900km on 3cm

On 16th October, F6DWG had a QSO with Rudi, OE5VRL/5 (JN78dk) at 902km on both 6cm and 3cm. Signals were not very strong (519/519), but constant.

The following morning, F5DQK (JN18) worked Rudi at 589, as did F6DKW (JN18) with signal reports of 59 on SSB.

UKAC

From: Tony G4NBS, Cambridge

Having been back on 23cm for a year now, I can safely say that GM4CXM (503km) is audible here 99% of the time when beaming at each other, although my 25W to a 55 ele yagi does not make the return trip when the conditions are rock bottom.

In 10 UKACs we have only failed to make a QSO once but CW is often required – it has certainly improved at my end with all that practice.

GM4JR (IO85) at 394km on the other hand is not so reliably audible yet we have made 9 QSOs out of 9 attempts all on SSB. As both stations are almost on identical beam headings I haven't understood why the difference but I wonder if there are more aircraft reflections on GM4JR?

In the 23cm UKAC on 18th October I had 28 QSOs working all I heard in 14 different squares. Best QSOs were GM4CXM, GM4JR, GD8EXI, G8PNN (IO95), PA0EHG (JO22), PA0S (JO21) and PE1EWR (JO11). Most activity was from IO91 (six) then IO92 and IO83 (with five each) but despite working some new stations several regulars were missing so the final score wasn't as high as in recent months.

73, Tony G4NBS

Beacons on 24GHz

Rudi, OE5VRL/5 (JN78dk) spotted three 24GHz beacons on 18th October during the morning in just ten minutes - the beacons were in three different countries!

OK0EA (JO70up) was 529 at 266km, OE1XGA (JN88eg) was 419, and DB0NCO (JN59jd) was 519 QSB at 268km.

If only there were as many stations as there are beacons QRV on the band!

23cm Beacons at >1000km

On 17th October, OE5VRL heard the F1ZBC beacon (JN06) at a distance of 1044km. Since then, I've noticed a number of other beacons spotted at great distance. Bearing in mind that most beacons are fairly low power, reception at these distances must bode well for lots of QSOs on the bands!

On 10th November, GB3MHL (JO02) on 1296.830MHz was spotted by a number of Swedish stations at strengths up to 599. Spotters included SM7GEP (JO77) 1057km and SM7LCB (JO86) 1096km.

Conditions across Scandinavia held up for several days, with many beacons on 23cm being spotted at distances in excess of 1000km.

On 12th November, SP5XMU (KO02) spotted SK2SHF at 1290km, and SK3UHG at 1195km, whilst OH6SHF was heard at 1017km by SM7ECM (JO65). SR6LHZ at 1057km was heard by SM0DFP in JP90, and on 13th November, ES0SHF was heard at 1032km by DL4DTU (JO60).

...AND FINALLY

After over four years of putting this column together, this really is my last one. Much as I have enjoyed preparing it, it does take up a fair amount of time, both in research, and in writing, and so from now on I will now be able to devote more time to some of my other interests.

Hopefully, my personal 24GHz beacon will take to the air within the next few weeks, and news of it will appear on www.beaconspot.eu when it is QRV.

I would like to thank all of the contributors to this column whilst I've been editing it, and to thank you the reader for reading it!

73, Robin G8APZ/F1VJQ

Please send your activity news to:

scatterpoint@microwavers.org

Chart for the workshop

Source: Anomalous Propagation – the newsletter of The Midwest VHF/UHF Society, Oct 2011

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DECIMAL and MILLIMETER EQUIVALENTS

	DECIMALS	MILLIMETERS
1/64	0.015625	0.397
1/32	.03125	0.794
3/64	.046875	1.191
1/16	.0625	1.588
5/64	.078125	1.984
3/32	.09375	2.381
7/64	.109375	2.778
1/8	.1250	3.175
9/64	.140625	3.572
5/32	.15625	3.969
11/64	.171875	4.366
3/16	.1875	4.762
13/64	.203125	5.159
7/32	.21875	5.556
15/64	.234375	5.953
1/4	.2500	6.350
17/64	.265625	6.747
9/32	.28125	7.144
19/64	.296875	7.541
5/16	.3125	7.938
21/64	.328125	8.334
11/32	.34375	8.731
23/64	.359375	9.128
3/8	.3750	9.525
25/64	.390625	9.922
13/32	.40625	10.319
27/64	.421875	10.716
7/16	.4375	11.112
29/64	.453125	11.509
15/32	.46875	11.906
31/64	.484375	12.303
1/2	.5	12.700

	DECIMALS	MILLIMETERS
33/64	0.515625	13.097
17/32	.53125	13.494
35/64	.546875	13.891
9/16	.5625	14.288
37/64	.578125	14.684
19/32	.59375	15.081
39/64	.609375	15.478
5/8	.625	15.875
41/64	.640625	16.272
21/32	.65625	16.669
43/64	.671875	17.066
11/16	.6875	17.462
45/64	.703125	17.859
23/32	.71875	18.256
47/64	.734375	18.653
3/4	.75	19.050
49/64	.765625	19.447
25/32	.78125	19.844
51/64	.796875	20.241
13/16	.8125	20.638
53/64	.828125	21.034
27/32	.84375	21.431
55/64	.859375	21.828
7/8	.875	22.225
57/64	.890625	22.622
29/32	.90625	23.019
59/64	.921875	23.416
15/16	.9375	23.812
61/64	.953125	24.209
31/32	.96875	24.606
63/64	.984375	25.003
1	1.000	25.400

1 mm = .03937"

.001" = .0254 mm

National Bureau of Standards Miscellaneous Publication 286

Events calendar

2012

Feb 12	GHz-Tagung, Dorste	www.ghz-tagung.de/
Mar 31	CJ-2012, Seigy	cj.ref-union.org/
April 28–29	Martlesham Microwave Round Table and UKμG AGM	(mmrt.homedns.org/)
Jun 22-24	Ham Radio, Friedrichshafen	http://www.hamradio-friedrichshafen.de/
Jul 7-8	Finningley Roundtable	
Aug 16-19	15th International EME Conference, Cambridge, UK	eme2012.com
Sep 14-16	Amsat-UK Colloquium, Holiday Inn, Guildford, Surrey	www.uk.amsat.org/Colloquium/
Sep 14-16	57.UKW Tagung, Weinheim	www.ukw-tagung.de/
Sept 23 ?	Crawley Roundtable	
Sept 28-29	National Hamfest, Newark	www.nationalhamfest.org.uk/
Oct 5-7 ?	RSGB Convention, Horwood House, Milton Keynes	www.rsgb.org/rsgbconvention/
Oct 28 - Nov 2	European Microwave Week, Amsterdam RAI	www.eumweek.com/
Nov 3	Scottish Roundtable	(www.rayjames.biz/microwavert)

NB (unlinked websites) are still showing their 2011 programme.

Contests & Activity Dates

November

22-Nov 2000 – 2200 2.3GHz+ Activity Contest
Arranged by VHFCC (RSGB Contest)

27-Nov 1000 - 1600 Low band 1.3/2.3/3.4GHz

December

20-Dec 2000 – 2230 1.3GHz Activity Contest
Arranged by VHFCC (RSGB Contest)

27-Dec 2000 – 2200 2.3GHz+ Activity Contest
Arranged by VHFCC (RSGB Contest)

EME Activity weekends

19/20 Nov ARRL EME
Arranged by ARRL

Don't forget that

Every Monday evening is Microwave Activity Evening

The RSGB 2011 VHF+ Contest Calendar is available at www.rsgbcc.org