An Amateur Radio publication for the Microwave Enthusiast

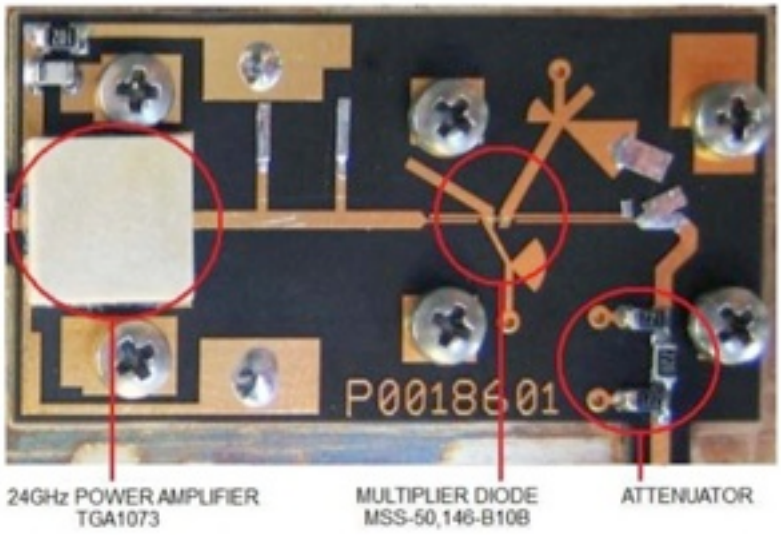
scatterpoint

January 2012

Published by the UK Microwave Group

100mW 24GHz Band x2 Multipliers

By Franco Rota I2FHW



In this Issue

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

Martlesham Microwave Round Table

(including UKµG AGM)

28-29 April 2012

Adastral Park

- Talks
- Dinner
- Stalls
- Testing

Web site for registration should be live by the end of January.

Hotel

Once again the hotel is the Cameo Hotel (Formerly the Hotel Elizabeth, Copdock) Ipswich. A block of rooms has been reserved for the round table, and can be booked by phoning the hotel on 01473 209988 and quoting booking reference BK48672.

Single occupancy rooms are £55.00 bed and breakfast, double/twin rooms are available at £61.00 (the same prices as 2011).

John Quarmby G3XDY

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Editor's corner

Another year of microwaving begins.

Contest calendar & rules, EME2012 registration open, a new Activity News editor, the 2010 issues of Scatterpoint now available at microwavers.org and another collection of technical stuff to exercise the brain and soldering iron.

Apologies for the lateness of this issue due to involvement with EME2012 and Martlesham Microwave Round Table.

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 SUBSCRIPTION INFORMATION

The following subscription rates now apply.

UK £6.00 US $12.00 Europe €10.00

This basic sum is for **UKuG membership.** For this you receive Scatterpoint for **FREE** by electronic means (now internet only) via the Yahoo group.

Please make sure that you pay the stated amounts when you renew your subs next time. If the amount is not correct your subs will be allocated on a pro-rata basis and you could miss out on a newsletter or two!

You will have to make a quick check with the membership secretary if you have forgotten the renewal date. Please try to renew in good time so that continuity of newsletter issues is maintained. Put a **renewal date reminder** somewhere prominent in your shack.

Please also note the payment methods and be meticulous with PayPal and cheque details.

QUOTE YOUR CALLSIGN PLEASE!

Payment can be made by: PayPal to

ukug@microwavers.org

or

* a cheque (drawn on a UK bank) payable to 'UK Microwave Group' and sent to the membership secretary (or, as a last resort, by cash sent to the Treasurer!)

Colour codes

Editorial & Events

Activity & Contests

Technical

Nanowaves (optical)

Commentary

Reproducing articles from Scatterpoint

If you plan to reproduce an article exactly as per Scatterpoint then please contact the Editor – otherwise you need to seek permission from the original source/author.

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UKuG Capital Projects

By John C Worsnop G4BAO Chairman, UKµG

There has been recent and ongoing discussion within your Committee about how we should spend some of the UKMicrowave Group's surplus funds for the benefit of the members. Currently two proposals are on the table, and we are looking for support to make these projects happen.

1. A "loan" portable 10GHz system for individuals, groups and contesters to use for short periods of time. This will consist of a transverter, PA dish, and feed, batteries, and possible a driver but this is still to be discussed. This project has been costed and your Chairman has agreed to co-ordinate the purchase and build of the system. It is aimed to make it initially available to the Camb-hams DXpedition to Mull in April 2012.
2. A network of Microwave Web SDRs, over the UK accessible by all, with just a browser and centred on the activity and beacon parts of our microwave bands.

These projects are not "Committee" projects in that they will not happen if only the Committee get involved, so we are looking for volunteers to make them happen.

Project 1 is relatively straightforward, costed and already has a "champion" and we have had offers of a dish and feed, and batteries but we are still looking for any further offers of suitable hardware to keep the costs at a minimum.

Project 2 is of a much larger scale and specifically we need someone with project management skills to oversee it. I estimate such a commitment could last for a number of years. We also need someone with networking and software skills to help propose, design and implement it. As a first stage we are looking for a plan to formalise what this network would consist of, where the sites should be, and a plan on how to make it happen and how much it would cost.

Please send your proposals, feedback and offers of help to Chairman@microwavers.org

Finally, please do not forget that the UKµG also have an existing 'Project Support' scheme on offer for quite a while for funds for anything else at www.microwavers.org/?support.htm

– with not many takers to date.

73 John G4BAO Chairman, UK Microwave Group

Nominations for Awards

By Dave Powis G4HUP

Nominations for the G3EEZ, G3BNL and Fraser Shepherd Award, please, to Dave Powis G4HUP.

Fraser Shepherd Award:	For research into microwave applications to radio communication. In honour of Fraser Shepherd GM3EGW
G3EEZ Award:	For Contributions to Microwave Communications, in honour of Alan Wakeman G3EEZ
G3BNL Award:	For innovation or technical development of microwave equipment or techniques, in honour of Les Sharrock G3BNL

Details of the trophies are to be found here. www.microwavers.org/trophies.htm

10 MHz Filter for GPS Frequency Reference

Paul Wade W1GHZ ©2011

Many EME and microwave stations are improving their frequency accuracy and stability by linking to GPS. Surplus units like the HP Z3801 and Trimble Thunderbolt use high-quality disciplined oscillators, while simple portable units have a simple disciplined VCXO. The oscillator output frequency is usually 10 MHz.

Then the RF equipment frequency, for instance, a transverter local oscillator, is locked to the 10 MHz oscillator. One of the concerns is added phase noise generated by the frequency locking mechanisms, particularly PLLs. It has been observed that the cleanliness of the 10 MHz source can affect the phase noise of the final output signal.

Many of the 10 MHz sources, particularly the simple ones, generate a square-wave output rather than a pure sine wave. Some hams find that filtering the square wave into a sine wave improves phase noise. Several have resorted to a 10 MHz crystal filter – an expensive and unnecessary solution.

We know from Fourier analysis that a square wave consists only of a fundamental frequency, a sine wave, and the odd harmonics of that frequency – each harmonic is a sine wave at the harmonic frequency. If we remove the harmonics, we are left with only the fundamental frequency, a pure sine wave. Since the odd harmonics start at three times the fundamental frequency, they are well separated in frequency and easy to filter out. A sharp crystal filter is not necessary – a simple low-pass filter can do a fine job.

My latest 10 GHz transverter uses an N5AC A-32 synthesizer locked to the 10 MHz output of a simple 10 MHz GPS-lock unit designed by G3RUH. The 10 MHz output is a square wave, so I built a simple low-pass filter which cleans it up. Phase noise is still evident on my signal, but the filter does make a discernable difference. And I know my frequency.

Low-pass Filter design

A low-pass filter passes all frequencies below the design frequency and attenuates all higher frequencies. Only capacitors and inductors are required, and at 10 MHz, nothing fancy is required. Design equations and tables of component values can be found in numerous reference books including the ARRL Handbook, but I took the lazy way and let the computer do the work. I used free Ansoft Designer SV (www.ansys.com) software which includes a Filter Wizard – better than Harry Potter! Select the type of filter you want, the frequency, and fiddle with the parameters until you get the performance you like. I found that a 5-element (3 capacitors and 2 inductors) gave adequate performance, and selected a “Chebyshev Type-3” filter design, which adds a small inductor in series with the middle capacitor to improve the attenuation slope. A schematic is shown in Figure 1. My starting design frequency was 11 MHz, to provide a margin for error, and the results were pretty good, but the calculated values had lots of decimal places.

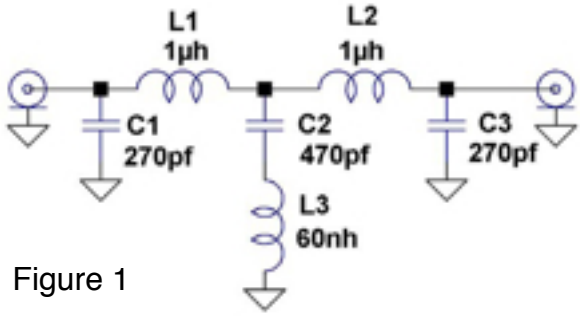


Figure 1

I adjusted the calculated values to common standard values, which I happened to have in

the junk box, and found that the response was still good. Finally, I adjusted the value of L3, the additional inductor in series with C2, to move the notch to 30 MHz, the undesired third harmonic. Final calculated response is shown in Figure 2 – all harmonic frequencies are many dB down.

Now to build it. A further search of the junk box yielded a hamfest find – a small Pomona box with

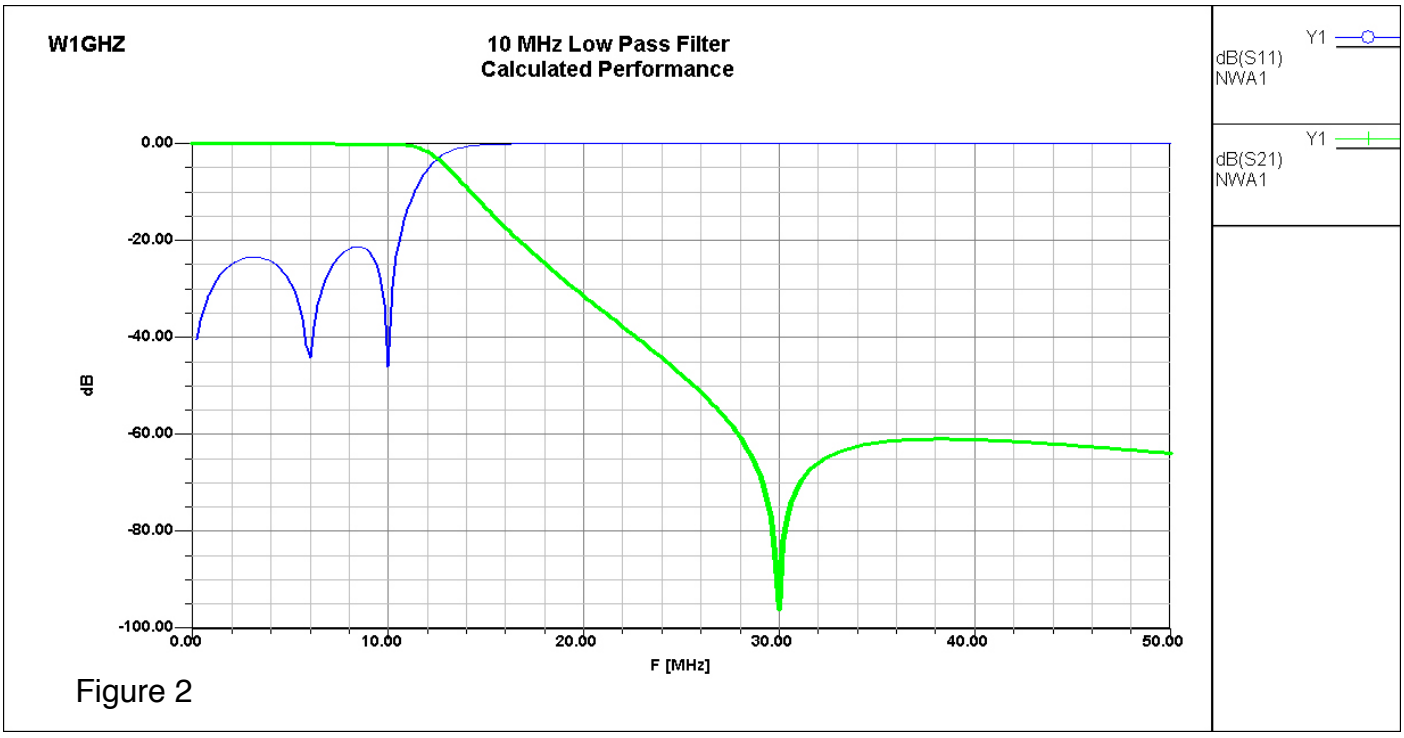


Figure 2

a BNC connector at each end and some components inside which were easily removed.

The filter components are common disc capacitors and ordinary RF chokes for the inductors, which fit nicely in the box. L3 is made by winding the capacitor leads into coils around a Q-tip; for 60 nH, about 3 inches of wire is needed – the leads aren't that long, but probably close enough. The completed filter is shown in Figure 3.

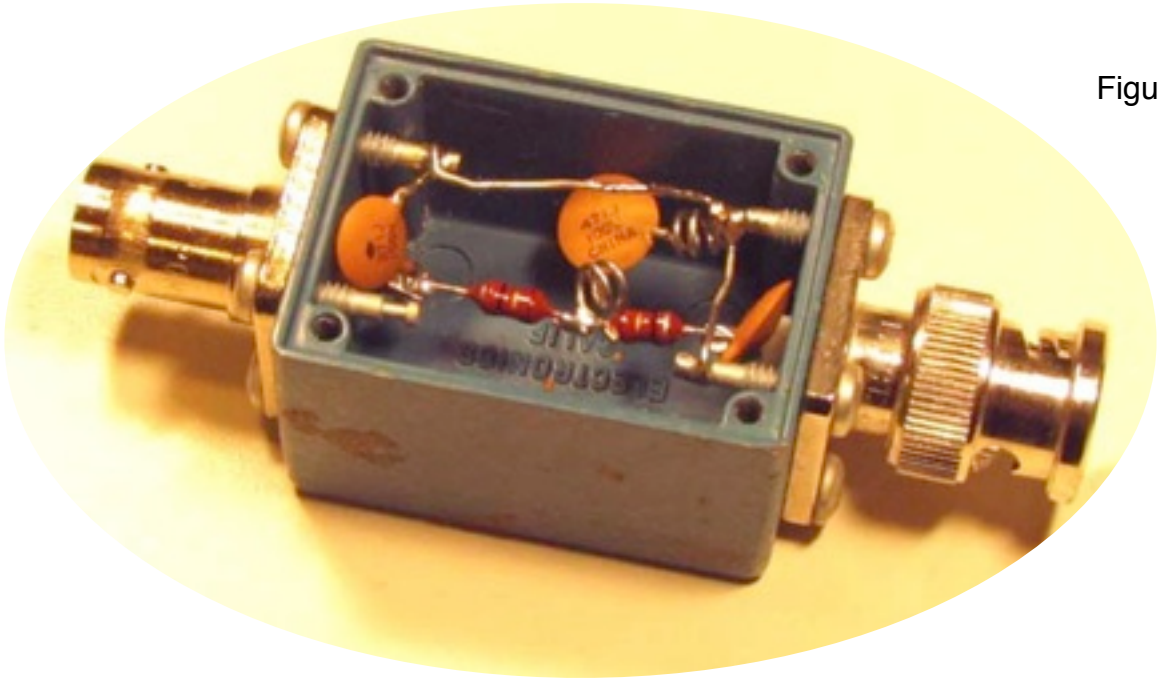


Figure 3

Testing

The first test is to see if the frequency response is similar to the calculated response in Figure 2. I don't have a fancy Network Analyzer with computer output, so Figure 4 is a digital camera shot of the screen, with some numbers added. Pretty close, but the attenuation at 30 MHz is not as good – with the smaller L3 due to shorter leads, the notch is closer to 50 MHz. This filter should still do a good job of attenuating harmonics.

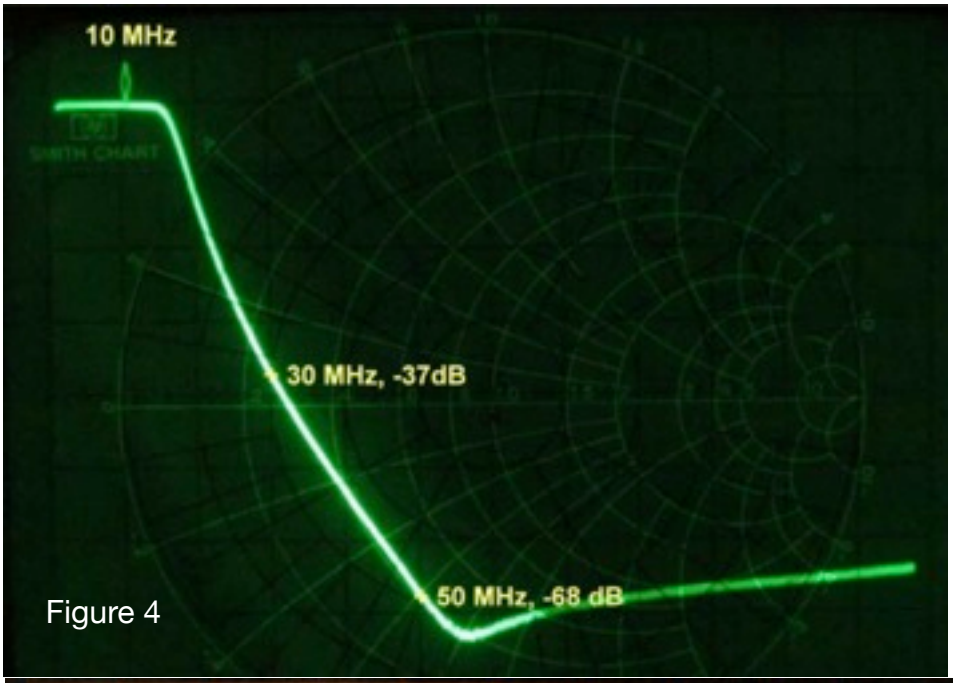


Figure 4

But does it really change a square wave into a pure sine wave?

Figure 5 shows the before and after – a square wave from a signal generator going in on top, and a nice sine wave coming out on the bottom. The sine wave is inverted from the square wave because the time delay of the filter is roughly 1⁄2 cycle.

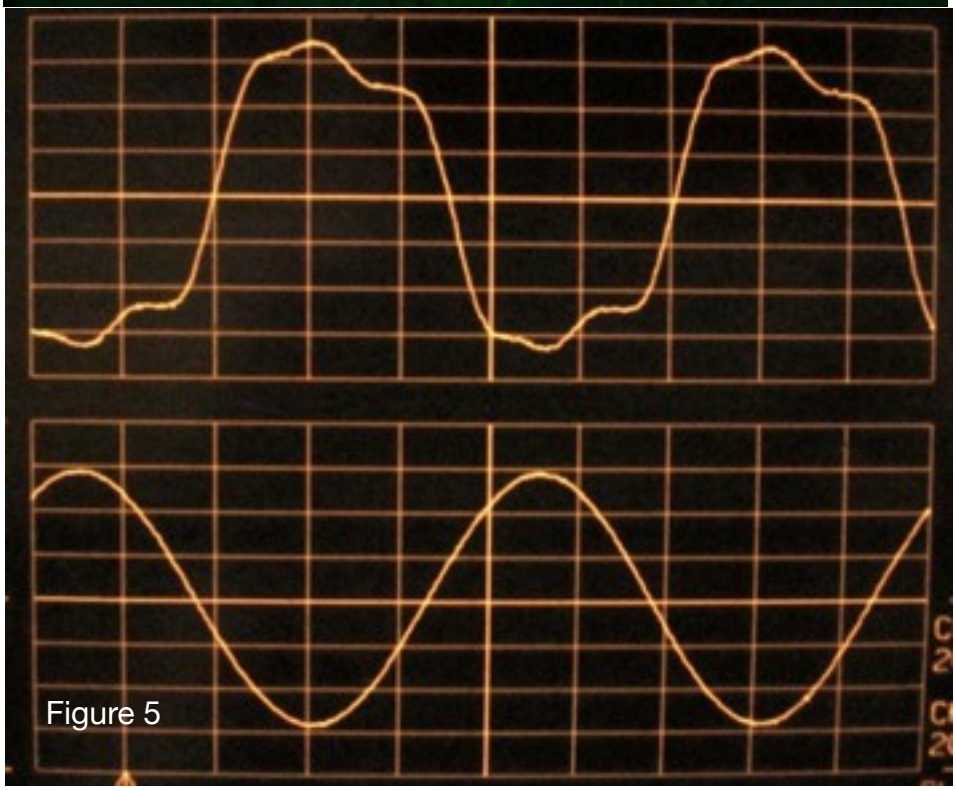


Figure 5

Summary

A simple low-pass filter is an easy and cheap way to clean up your 10 MHz GPS reference. And it is something that anyone capable of putting together a microwave system can build.

K1IIG reports that one of these filters has cleaned up close-in noise on his 432 MHz beacon.

Paul Wade W1GHZ

The Bodger's Guide to …….

The alignment of multi-resonator filters without a sweep generator

By Dr John Worsnop G4BAO

Introduction

Over half a century ago, Milton Dishal published a paper [1] on a technique for aligning multi-resonator filters. It tunes all sections close to the required frequency with one pass through the filter and does not require a swept source. This tuning method was one of the first things I was taught when I arrived in the now long –defunct Pye Telecom R&D lab as a 21 year old, and its brilliance and simplicity has stuck with me ever since.

The IEEE library's abstract to Dishal's paper summarises the method beautifully as:

"Very loosely couple a detector to the first resonator of the filter; then, proceeding in consecutive order, tune all odd-numbered resonators for maximum detector output, and all even-numbered resonators for minimum detector output (always making sure that the resonator immediately following the one to be resonated is completely detuned)"

Simples! (With apologies to a well known Internet comparison site)

It seems that this technique is not as well known as I always thought it was. This was brought home to me at Microwave Update in 2009 by the look of surprise on the face of the Rohde and Schwartz representative who was demonstrating a high – end network analyser, when I switched it to CW mode and used the method to align a 24GHz waveguide filter! He had been doing the "set it to sweep and then twiddle all the tuning randomly until the shape is right" method. (Give him his due, a true Bodger's technique!) You just can't get the staff these days……..

Background to Dishal's method

The method of course applies to any implementation of coupled resonator filters from LF to waveguide, but for simplicity, consider Figure 1, a four branch, lumped element coupled resonator filter. This is of course the equivalent circuit of the other types of filter.

C5, C6 and C7 are coupling between the resonator branches C1/L1 –> C2/L2, C2/L2 –>C3/L3 and C3/L3 –>C4/L4 respectively.

When the filter is correctly aligned, each branch is resonant at the centre frequency (f0) of the passband. If the second branch is de resonated by shorting it out or otherwise detuning it, L1 and C1 in parallel with C5) are resonated at f0, it presents a high impedance, and hence a voltage maximum at the input. Now, if this short is removed and the third branch is shorted, L1 and C1 resonate above f0 and L2 and (C2 in parallel with C6 resonate below f0, and the circuit has a low impedance AT f0 and hence a voltage minimum at the input at f0.

If the fourth branch is shorted, L3 and C3 in parallel with C7) resonates at f0 and again

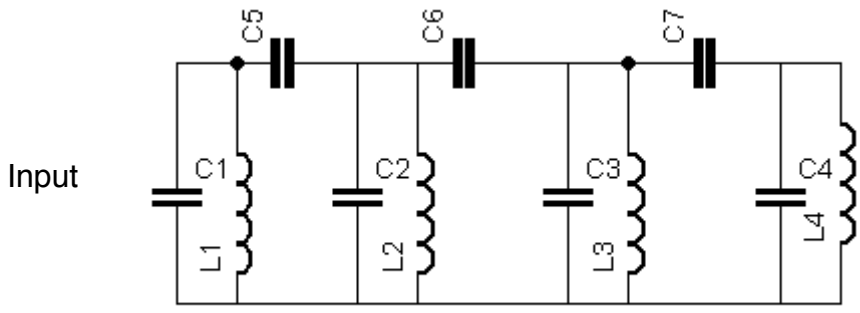


Figure 1 Four branch coupled resonator filter

presents a high impedance, and hence a voltage maximum at the input.

This repeats with subsequent stages in filters with more resonators and alternate high and alternate high and low voltages occur at the input.

Using a circuit simulator like QUCs (2) you can model this process and see the effect, or build a filter and try it!

Dishal alignment in practice

Terminate the filter in the design impedance (50ohms usually). Detune all the resonators (or short out all but the first) and drive the input of the filter with a generator or low power transmitter. Connect a high impedance RF voltmeter or oscilloscope via a very small capacitor connected directly to the input resonator, or use a short wire probe in the cavity.

Tune the first resonator for a voltage maximum at the centre frequency of the filter, then the second resonator for a voltage minimum. Succeeding resonators are tuned for alternating voltage maxima and minima.

Using a Vector Network Analyser or Vector Voltmeter

If you are fortunate enough to own either a vector network analyser, or a vector voltmeter and a suitable return loss bridge, you can make a much more accurate tune up of a filter with a CW source by looking at the phase of the input reflected signal (S11).

If you follow the Dishal setup, i.e, detune all the resonators, but look at the phase of the input reflected power S11. As you tune the first resonator through resonance you will see the phase suddenly start to change as it approaches resonance. Adjust the first resonator so that the phase of S11 goes through exactly 90 degrees from where you started. Then move on to the second resonator and you will see that as you tune it, the phase again starts to rotate. Move it a further 90 degrees from where you left the first resonator. Work your way down the filter, tuning each resonator for a further 90 degrees, and hey presto, once you've adjusted the last resonator for 90 degrees the filter will be perfectly tuned and centred on f0. All without a swept source, and in a fraction of the time taken for the "tweak and hope" method!

The big advantage of this method over just looking at voltage is that you don't need to connect to the actual resonator, just look at the reflected power, and more importantly it is easier to see an exact 90 degree phase shift than a fairly flat peak in input voltage.

Again, using a circuit simulator like QUCs (2) you can model this process, look at the phase of S11 and see the effect.

References

1. M. Dishal, "Alignment and adjustment of synchronously tuned multiple-resonant-circuit filters," Proc. IRE, vol. 39, pp. 1448–1455, Nov. 1951.
2. "Quite Universal Circuit Simulator" http://qucs.sourceforge.net/

Aircraft reflection

VHF/UHF and Microwave operators who utilise Ulf SM7LCB's website to ascertain the mid-point between locators to see were aircraft need to be positioned for optimum aircraft reflection results will find the old web address does not work.

The previous free domain is no longer available to Ulf so a new address has been established.

For singular locator information visit here

sm7lcb.dyndns.org/maps/qso_map/pathmap.htm

For multiple locator information visit here

sm7lcb.dyndns.org/maps/qso_map/pathmap2.htm

73 Ray GM4CXM

A Northumberland holiday

By Bernie Wright G4HJW

Having mentioned an impending holiday up in Northumberland to Stuart G8CYW a couple of months ago, it was immediately suggested that the Nanowave equipment should be loaded into the car and brought up with us so that we could try for a QSO one evening.

As things turned out, the 'North East group' did us proud. Of our party of a dozen, there were three other licensed amateurs, so when Stuart suggested that the NE group come over to check compatibility (of gear, not people), it was always likely to turn into a 'social' afternoon, with Eddie G0EHV, Brian G8KPD, Gordon G8PNN and Stuart arriving on the day, and no actual outdoor operation occurring as a result.

For such a big group, we normally manage to book a large baronial home (often a Landmark Trust property), and this year we were ensconced into Dunston Hall, about a mile from the coastal village of Craster. As the picture shows, this has a large dining room, and it was commandeered for the visit. Biscuits were bought and tea mashed.

During the visit, Stuart mentioned a useful mapping and profiling web-site which they use:

http://www.heywhatsthat.com

Though it took a while to learn how to drive, I now regularly use this site, since in addition, it has a 'visibility cloak' function which overlays line-of-site areas over the underlying map. This function allows the user to add a local height above ground figure to be inputed too (as it does for the profiling map). It doesn't like the Greenwich meridian though – a common fault, I'm told for software developed well away from the 0 degree line.

Dunstan Hall - *compatibility check*

The universal reaction to our guests from the non amateur contingent, I discovered afterwards, was one of admiration for the enthusiasm on show, and one that added to everyones enjoyment of the holiday rather than a disruption of it. So that was a good start...

Once it was realised that a QSO was not going to be had that day, an evening was penciled-in for later on in the week. It was agreed that we (Jenny G0VQH and I) would go out to the ridge near Shilbottle, with Gordon G8PNN being kind enough to talk us in and meet us just off the A1 and lead us the the final few miles to the site. Shilbottle is about 5 miles south-west of Alnwick – no more than 10 miles from Craster.

On the night, Stuart and Eddie G0EHV went out to Seaton Sluice (33km), and Keith G4MSF to Souter lighthouse (47km). It was initially dry, but quite blustery. Scotland was already suffering bad storms, and we were just beginning to appear on the edge of this. At the Shilbottle end, alignment was straightforward, We had simply to identify one of several lighthouses which Stuart had said would be within a degree of his location. His 1W LED/A4 fresnel lens transmitter was soon seen, and when fully aligned was surprisingly bright, as the second photo shows. Jenny took this from inside her vehicle, and the smeared image is a result of the van being buffeted around. Initial contact was made with Gordon, using similar optics. Both transceivers were using their transmit LEDs as a reverse biased photo diode on receive, further simplifying alignment. Having monitored both sides of the QSO, I then swapped my rx head for a 1W Tx head and exchanged reports with Stuart, giving me my first contact of any real distance. All this was done using baseband, since on transmit I was unable to generate subcarrier modulation. However, Stuart and Gordon then demonstrated ssb and fm at 25 and 15 kHz, the latter so that I could listen using Winrad on the lap-top. I must say, FM was very nice. Fully quieting, with that 'in the room with you' sound.

Eddie then fired up his 4-inch optics transmitter. It took quite a while to get this lined up on us, even though we had 70cm talk-back, but we copied it in the end.

The big disappointment was that we did not hear Keith at Souter lighthouse, though he did hear us, I'm still not sure how this failed to happen, but it must have been frustrating for Keith.

By this time, the occasional mild squall was beginning to turn into steady rain and we decided to call an end to proceedings, and a memorable one it was for me.

So my thanks to all who took part, and for all the organising that Stuart put in to make this happen so successfully. It has encouraged me to get on with things back home near Cambridge.

Bernie G4HJW

70MHz TTL Frequency Counter

by John Randall M0ELS

I happened to browse the internet and came across DL5NEG website with a hoard of interesting projects, of which one caught my attention.

It was described as a TTL frequency counter for 70 MHz with an optional upgrade to the microwave bands, with the addition of a suitable pre-scaler.

I proceeded to obtain all the parts required as follows:

ATMEL AVR micro-controller, ATMega16
40 pin DIP chip

3x 74HC4040

1x 74HC00

1x 4.060 MHz crystal

2x 22pF caps

0-40pF trimmer capacitor

a piece of plain Veroboard 4" square

a 7805 voltage regulator

some electrolytic caps

a suitable metal die-cast box

a 16 character x 2 line LCD display

The construction of the board layout is not critical at all with the exception of the components around and including the crystal, where rf procedures should be adhered to. The chips all run off the 5volt regulator, so a heat-sink is required on the regulator. The wiring was point to point and one needs to check the circuit diagram carefully, so as not to mix pin numbers with pin designations. The 40 pin chip has no pin numbers on the circuit diagram, so do look for the usual ident indicating pin 1. One the remaining chips, the pin numbers are enclosed in brackets. It's very easy to go off on a tangent and I simply worked on once chip at a time, connecting the pins and rechecking afterwards. I decided to place the 5V regulator on the same board, but it could be placed elsewhere, as you please. The completed board is shown as Figure 2 and Figure 3 shows the underside wiring.

The circuit diagram is shown in Figure 4.

The micro controller chip needs to be programmed with code written by Herbert, and is freely available on his website. I used a

Figure 1: Display on completed unit

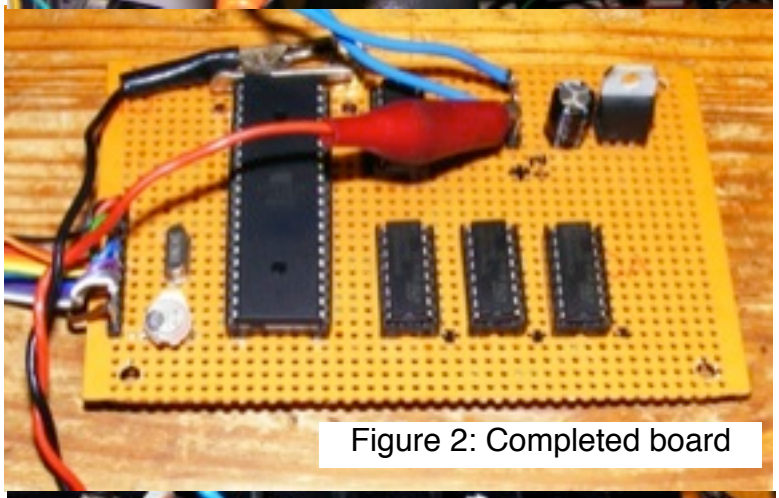


Figure 2: Completed board

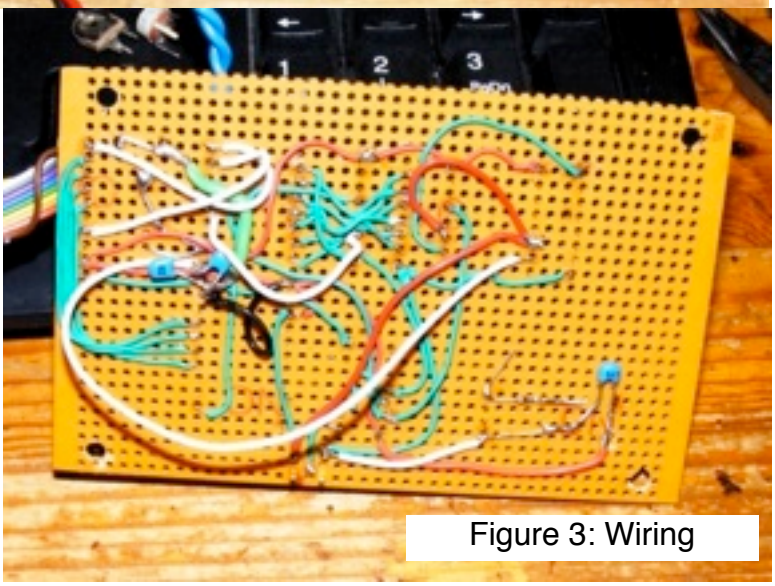


Figure 3: Wiring

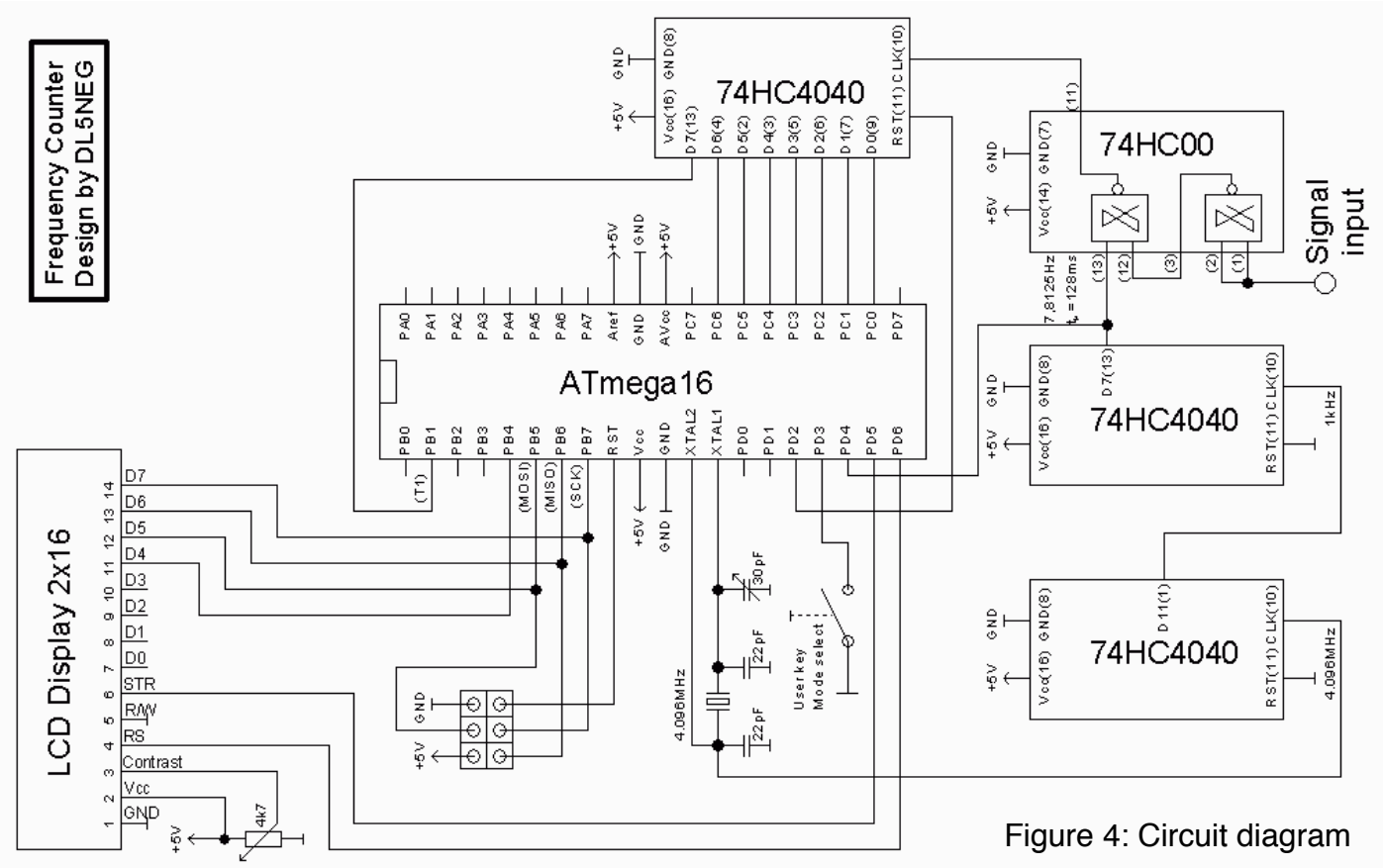


Figure 4: Circuit diagram

genius Genius G540 programmer, obtained via eBay. It is specifically for dip type chips and a wide variety of types accepted, are listed on the internet. The seller also supplies piggy back chips which take the surface mount type ATMega16 chip.

The only problem I had was to correctly set the programming characteristics so that the external oscillator is selected at not the internal one, which is what will happen if you simply flash the code onto the chip. The lcd display will appear garbled. See my web page for more details.

The first chip I obtained via eBay did not work at all and was a dud, three quid lost, but I then ordered another one from a different seller and it was fine. Another point worth mentioning is that if on switch on, the lcd display is blank, check that the contrast pin is grounded through say a 50 ohm resistor or even a variable pot. Its easy to miss this one which left me wondering for a while.

Upon powering up, the display will indicate as shown in Figure 1. Another problem I had was that the ceramic variable cap I used had a fine hairline crack which altered the crystal frequency and gave me a 5kHz higher reading. Once that was corrected the counter is quite good considering the TTL input.

One final tip is that the sensitivity can be increased by equalizing the input level with 2x 10k resistors, one from the input to ground and the other from +5V to the input.

Checking a 24.000MHz TTL oscillator block, the counter reads 24.998.89MHz.

Oh yes, there is a Version 2 code available for download from Herbert's website [link??] which allows pin 17 of the micro controller to be grounded when measuring less that 1GHz, and thereby changing the G in GHz to M as in MHz and back to G again.

Many thanks to Herbert DL5NEG for the his time & assistance with this project.

John Randall M0ELS

References

DL5NEG http://h1866352.stratoserver.net/

M0ELS: http://m0els.5gigs.net

100mW 24GHz Band x2 Multipliers

By Franco Rota I2FHW

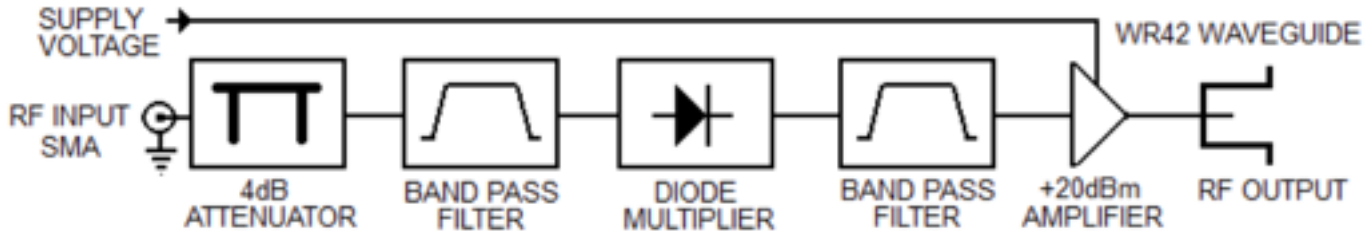
What I want to illustrate in this article is a x2 multiplier with input frequency at 12GHz and SMA connector and output frequency at 24GHz with WR42 waveguide. This is a high quality product designed for radio link applications.

It is built in a block of silver plated milled aluminium on a teflon substrate with beam-lead multiplier diode type Metelix MSS-50.146-B10B and 24GHz chip power amplifier directly mounted with wire bonding technology type TRIQUINT TGA1073 internally made of three stages with about 22dB of gain.

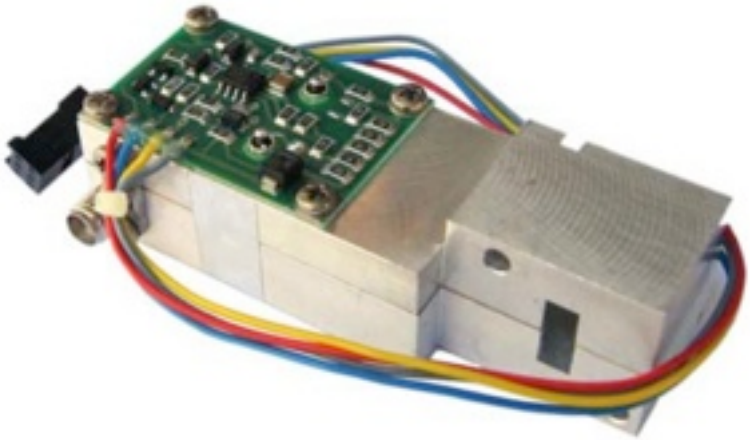
The block diagram below shows the main parts of this multiplier that are: an input attenuator to improve matching with driver stage, a band pass filter, a beam-lead multiplier diode, another band pass filter and the 100mW 24GHz final amplifier with direct output on waveguide transition.

This multiplier needs three power supply voltages: +5V, -5V and a control voltage from +1,2V to +8,2V to tune the output power.

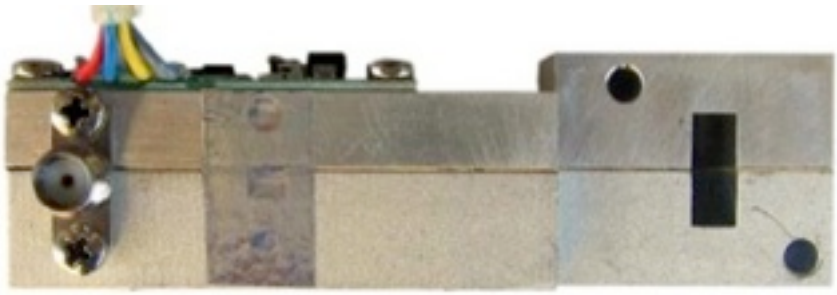
It is available in two versions with a very little difference in frequency range.



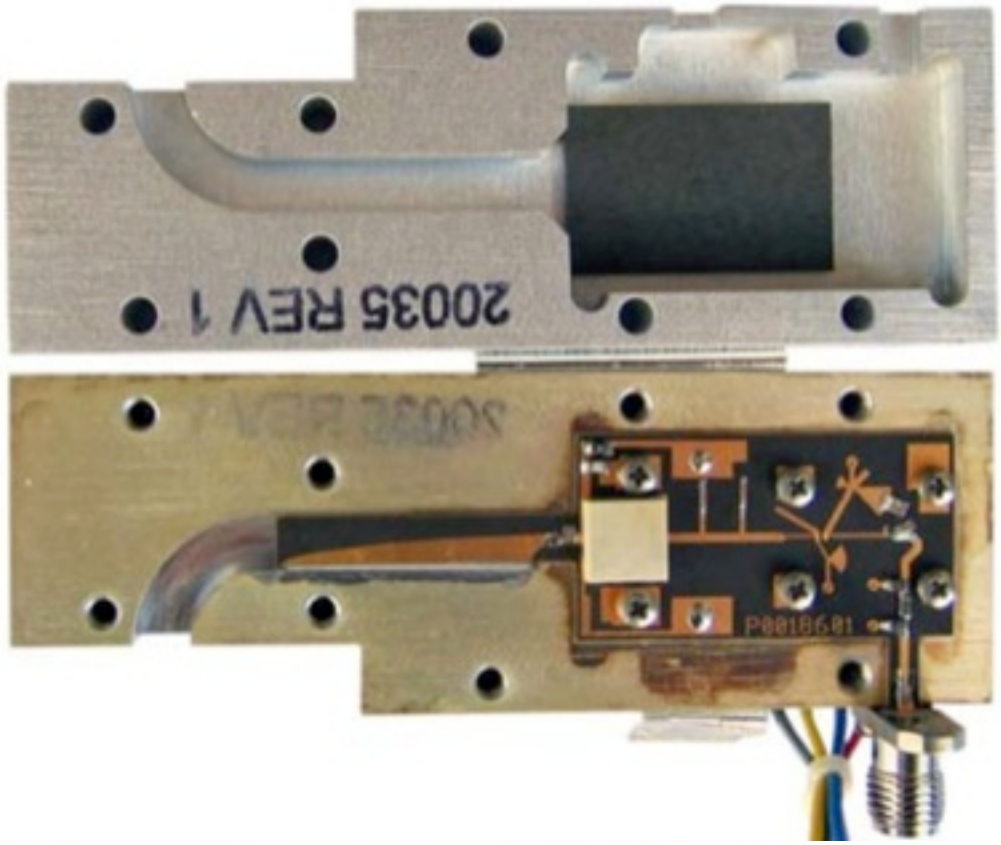
Block diagram



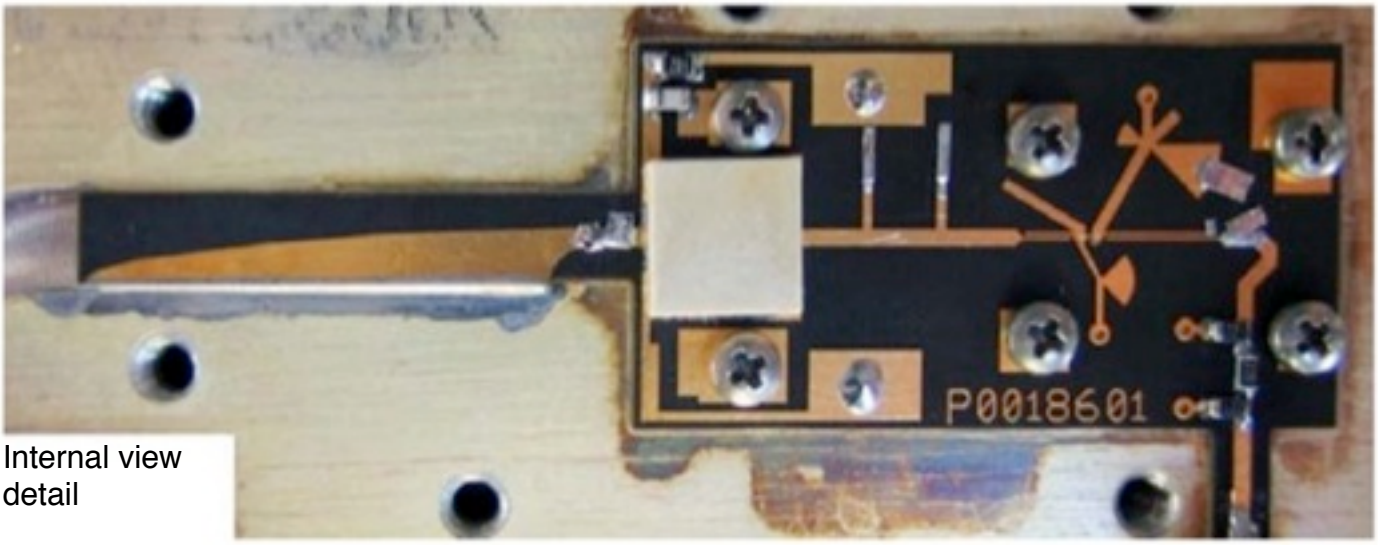
Top view



Side view, RF input with SMA connector and waveguide output



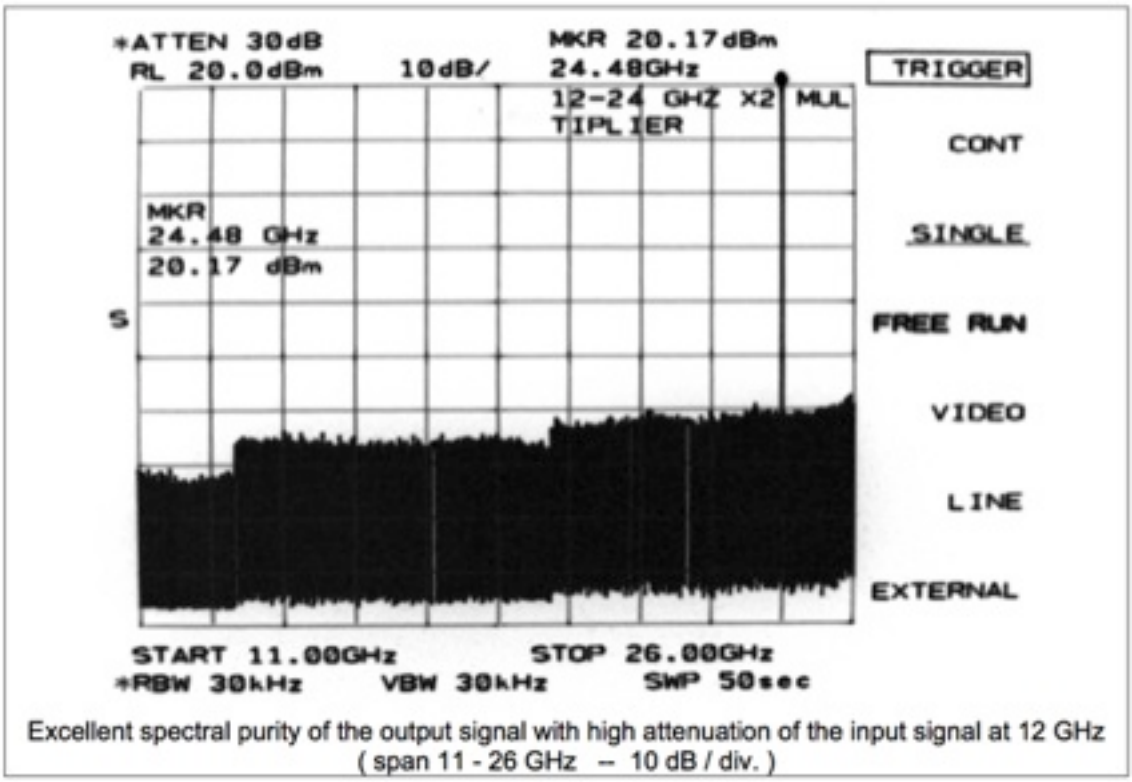
Internal view and top cover



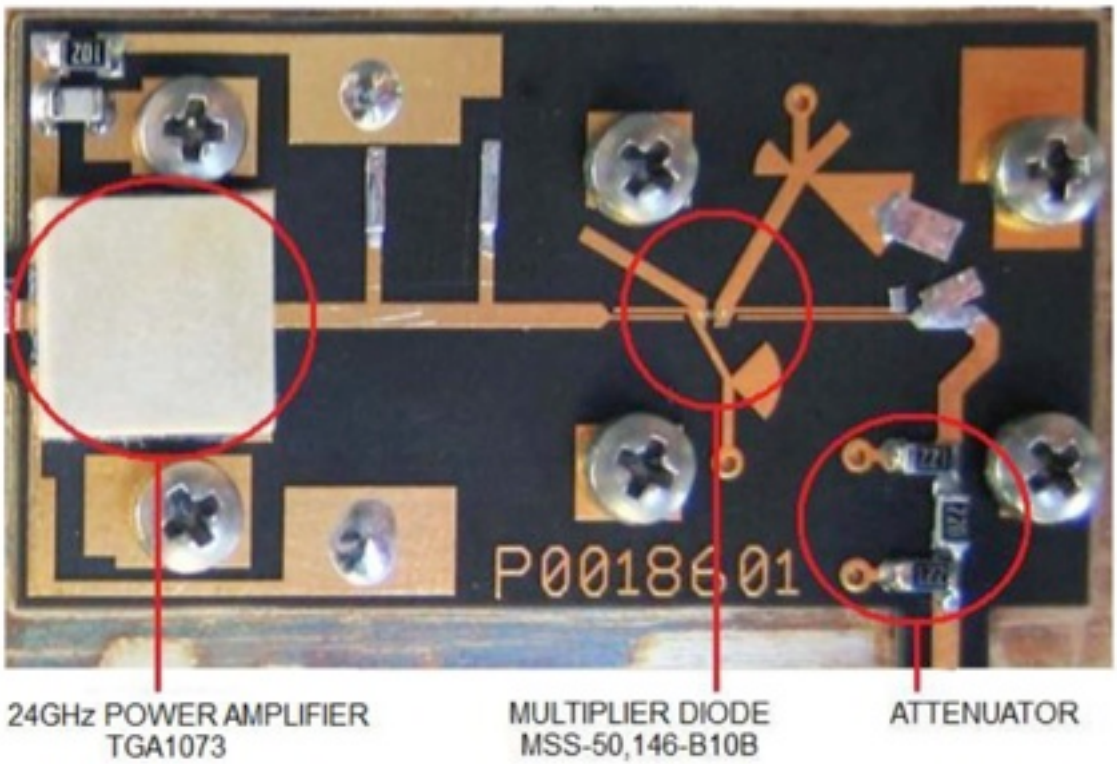
Internal view detail

Typical Behaviour of the Two Models												
Part number	Output Level @ f (GHz)											
	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0	27.5	28.0
MTP 12-24	19 dBm	19.5 dBm	20 dBm	20.5 dBm	20.5 dBm	20.5 dBm	20.5 dBm	20.5 dBm	20.5 dBm	20.5 dBm	20.5 dBm	-
MTP 13-26	-	-	18.5 dBm	18.5 dBm	20 dBm	20.5 dBm	20.5 dBm	20.5 dBm	205 dBm	20.5 dBm	20.5 dBm	20 dBm
Test at input level +19dBm												

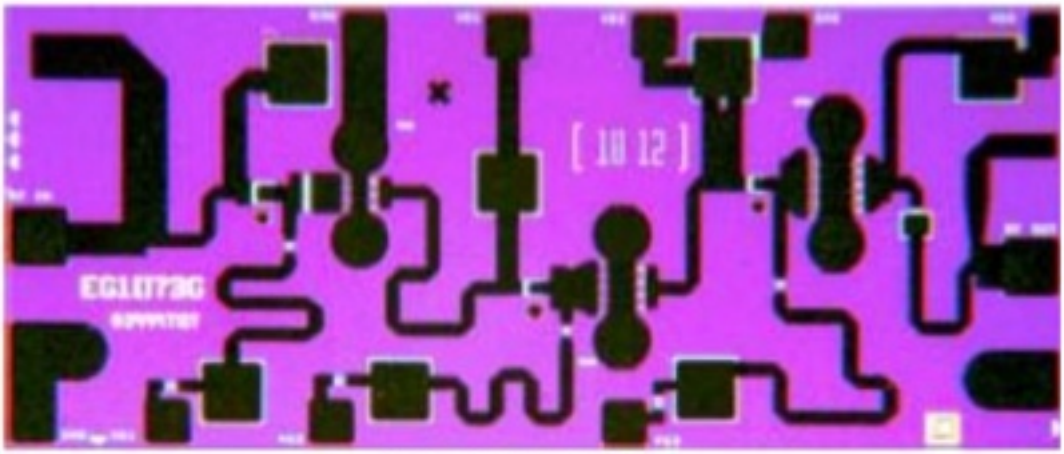
Technical Specifications		
Part number	**MTP-12-24**	**MTP-13-26**
Input frequency	11,75 - 13,25 GHz	12,25 - 13,75 GHz
Output frequency	23,5 - 26,5 GHz	24,5 - 27,5 GHz
	Usable also beyond +/- 1 GHz with lower performances	
Typical input power	+19dBm	
Output power	Tuneable up to +20dBm	
Attenuation of the fundamental	Typical >40dB	
Power supply voltages	+5V @ 200mA -5V @ 10mA	
Control voltage	From +1,2V to +8,2V (at +8,2V the max power is reached)	
Size (mm)	78 x 37 H27	
Weight (g)	110	



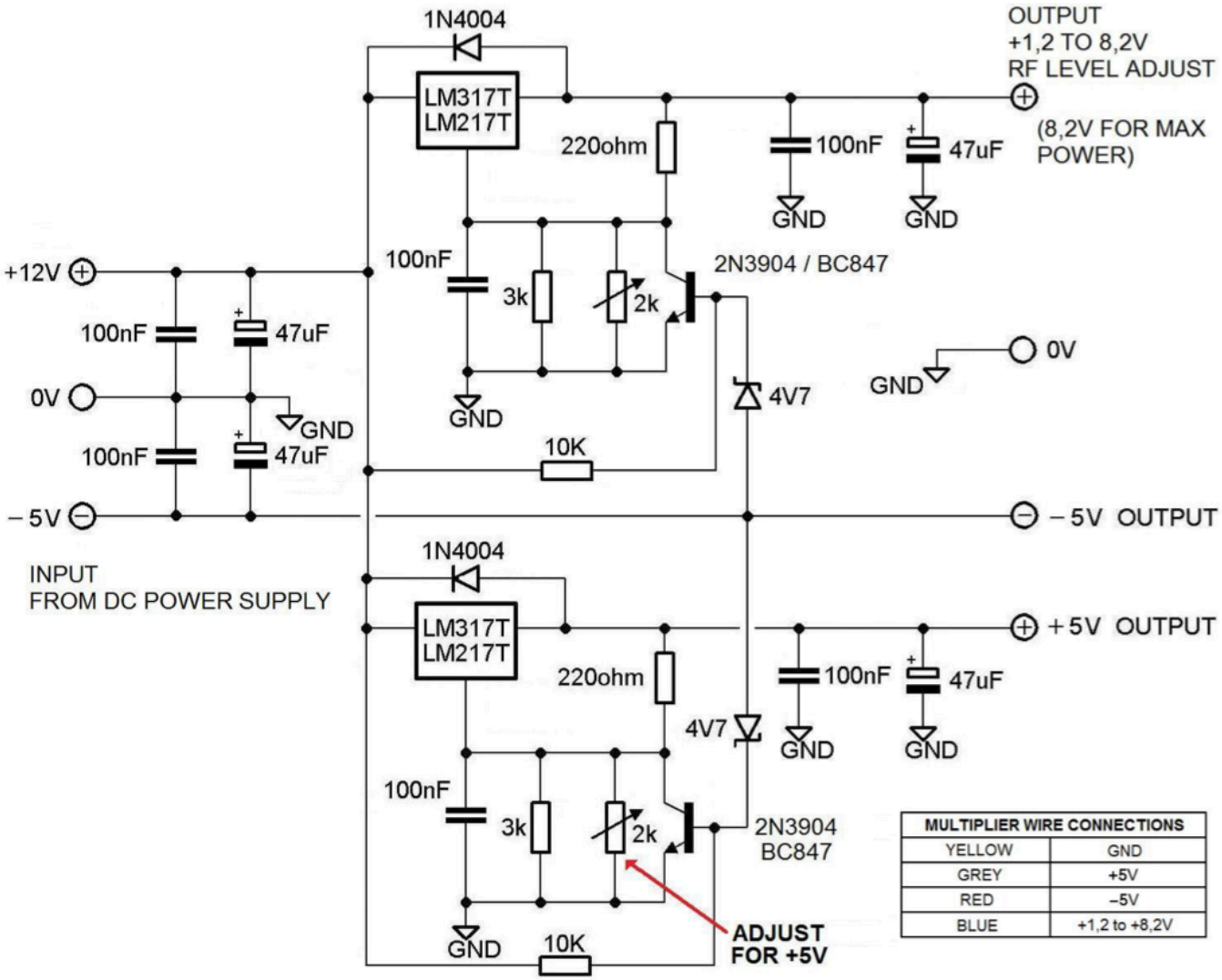
Excellent spectral purity of the output signal with high attenuation of the input signal at 12 GHz
(span 11 - 26 GHz -- 10 dB / div.)



Details of the RF circuit



Details of the 24GHz chip power amplifier



Power supply circuit diagram

This power supply has been designed to guarantee the protection of active microwave components (as it is usual to do) so the positive power supply is provided only if the negative one is available. So, with this circuit, there is no need to supply power in sequence because the circuit is auto-protected.

I will soon have these multipliers available for sale. Please contact me via email for details info@rfmicrowave.it.

Franco Rota I2FHW

www.rfmicrowave.it

microwaveUpdate 2012

October 18, 2012 through October 21, 2012

Hosted by: The 50MHz and Up Group of Northern California.

Chairman: Jim Moss (N9JIM) Honorary Chairman: Will Jensby (W0EOM)

Email contact: mud2012@pacbell.net

Registration not yet available. (to be announced) www.microwaveupdate.org

Accommodations:

Biltmore Hotel & Suites www.HotelBiltmore.com

2151 Laurelwood Road, Santa Clara, California95054 +1-800-255-9925 +1-408-988-8411

microwaveUpdate rates: (until Oct 1, 2012)

Garden Rooms: M,T,W $129/night Garden Rooms: Th,F,Sa $79/night

Tower Suites: Th,F,Sa $99/night

Biltmore Hotel shuttle to/from San JoseInternationalAirport available

High speed wireless internet

Full Hot American Breakfast each morning

Additional information:

ARRL National Convention & Pacificon is the weekend before (10/12-14/2012) at the Marriott in Santa Clara. http://www.pacificon.org/

Nearby attractions:

Silicon Valley, NASA, Intel, Texas Instruments, ComputerHistoryMuseum, Stanford, San Francisco, Fisherman's Wharf, Pier 39, Alcatraz, museums, Monterey 17 mile drive, Monterey Bay Aquarium, Cannery Row

Speakers: We are currently inviting all to submit abstracts and papers

Preliminary Schedule of Events

* Thursday
* Surplus Tour
* Sites Touring
* Hospitality Suite
* Friday
* Registration
* Introduction
* Presentations
* We also have a YL / Family Program (see YL Program above)
* Auctions
* Lunch (included)
* Demonstrations
* Test Lab
* Indoor Swap
* Dinner on your own
* Hospitality Suite
* Saturday
* Registration
* Introduction
* Presentations
* Test Lab
* Auctions
* Demonstrations
* Vendor Displays
* Evening Banquet (included)
* Keynote speaker
* Door Prizes
* Socializing
* Outdoor Flea Market

HEELWEG MICROWAVE 2012

Frans-Johan van Elk PE1FOT

The Dutch Microwave Meeting took place on

Saturday 14th of January 2012.

CAFE ZAAL "DE VOS"

Halseweg 2

NL 7054 BH WESTENDORP

HOLLAND

The team performing the measurements were:

PA0JEN, PE1BMC, PE1FOD, PA0EHG, PA7JB, PA3EXV, PA3CEG, PA3DZL,

PE1NFE, PE1FYB, PB0AOK, PE0SSB, PA1KR, PA2M, PA0RYL and PA3ACJ

THE 2011 VIDEO

Watch the video of this year's event at www.youtube.com/watch?v=fO6jP7G-HHI

Please send your questions or remarks to info@pamicrowaves.nl

Please join our Microwaves Forum on

www.PAmicrowaves.nl

73's

PA3CEG, PA0BAT, PA7JB, PE1FOT

Available equipment:

- Sweepers 0–26 GHz
- Spectrum analyzers up to 26 GHz.
- Spectrum analyzer 10KHz - 3.8GHz + Tracking generator
- Signal generator 10Khz - 3.3GHz (AM, FM, CW, and pulse)
- SWR 5MHz - 3.0GHz (RF-SWR Brug)
- Spectrum analyzer with mixers up to 325GHz
- Vector network analyzer up to 20 GHz
- Tektronix Video generator
- Tektronix VM700 video measurement
- Barco Receiver I & II for 23 ,13 and 3 cm
- NKF video demodulator with calibrated baseband
- Spectrum analyser Agilent up to 3GHz.
- Noise measurement up to 24 GHz
- Noise measurement up to 76 GHz
- Power meter up to 76 GHz
- Calibration unit 24 GHz Filters
- Signal generator 0 – 18.6 GHz (Mar 2031 / HP8673)
- Spectrum analyzer from 0 – 26,5 (or 31,8) GHz + Tracking to 2.7 GHz.
- AM – 70 cm ATV generator
- Counter up to 24 GHz rubidium controlled
- Power meter max 250 Watt up to 2.5 GHz.
- Frequency standard 10 MHz

This information came too late for the Nov/Dec issue but is included to show what you may have missed and perhaps encourage you (and me!) to book next year.

Report next month if I can twist an arm or two (you know who you are). Ed.

UKµG Microwave Contests – 2012

By John Quarmby G3XDY

Aims and comments:

This years calendar and rules have fewer changes than in 2011, most of the feedback on the changes made last year has been positive so they have been retained.

There will continue to be four low band events on 1.3/2.3/3.4GHz spread through the year. The period for the November one has been reduced so that portable operation in daylight hours is possible.

The 5.7/10/24GHz Cumulatives in the summer months are unchanged from 2011.

The 24/47/76GHz Trophy Contest in July is now extended to include all bands to lightwaves, with the lightwave section only running to midnight GMT.

The Microwave Field Day event in August will stay as a two band event on 1.3GHz and 10GHz until it becomes more firmly established, we plan to have more publicity about this event in mainstream radio publications to encourage wider participation. The coincidental timing with the RSGB 432MHz Low Power contest is maintained.

The online log entry system has worked well in 2011 and will be retained in 2012. Logs for cumulative events will need to be submitted after each session, rather than waiting until the end of the whole contest. We will continue to target publication of contest results in Scatterpoint within 1-2 months of each event.

Following feedback about the use of Radio versus ON4KST for talkback, separate tables will be published for each talkback method to judge whether this helps increase participation. There will be an additional certificate for the leading station using 10 watts or less on the 1.3,2.3 and 3.4GHz band events. Entrants are asked to check that they submit logs to the correct section and include details of power levels used.

Microwavers in Europe are most welcome to join in our UK contests. There is already a core of French, Dutch and Belgian stations that appear regularly in our summer contests. We would like many more to do the same!

THE RULES listed below are final and binding for 2012 (there are some changes from 2011). The following contests are scheduled for 2012:

- Low Microwave Bands - 1.3GHz/2.3GHz/3.4GHz (4 contest days).
- 5.7GHz Cumulatives (5 contest days with 3 to count for scoring), on the same days as the 10GHz/24GHz Cumulatives.
- 10GHz Cumulatives (5 contest days with 3 to count for scoring), on the same days as the 5.7GHz/24GHz Cumulatives.
- 24GHz G0RRJ Cumulatives (5 contest days with 3 to count for scoring), on the same days as the 5.7GHz/10GHz Cumulatives.
- 24GHz Trophy.
- 47GHz , 76GHz, and 100GHz-1000GHz
- 1THz and up (including lightwaves)
- 1.3GHz and 10GHz Microwave Field Day

The full contest program and rules are published in the January 2012 issue of the Scatterpoint Microwave Newsletter and are also available on the Internet on the UKuG website at http://www.microwavers.org

General Rules (applicable to all events)

The Contests are open to all comers (you do not have to be an RSGB or UK Microwave Group member). Stations located outside the UK (G, GW, GM, GI, GD, GU, GJ) may enter a contest, and will be tabulated within the overall results tables, but will only be eligible for their own awards.

Contestants are expected to enter in the true spirit of the event and to adhere strictly to any equipment or power restrictions that apply to the particular contest.

Operators may enter as home station or portable (either mixed or separately in cumulative events) unless specified in the rules for a specific event. In multi-band contests, single-band entries are always acceptable.

Stations: Entrants must not change their location or callsign during the contest, unless the Rover rule is invoked. In multi-band events, all stations forming one entry must be located within a circle of 1000m radius. An operator may reside outside the station's area ("remote station"), connected to the station via a "remote control terminal". In such a case, the Locator for the contest is the Locator of the station's position. An operator may only operate one single station, regardless if it is locally or remotely operated, during the same event.

Contacts: Only one scoring contact may be made with a given station on each band, regardless of suffix (/P, /M, etc) during an individual contest or cumulative activity period, unless the Rover rule is invoked. Contacts made using repeaters, satellites or moonbounce will not count for points. Contacts with callsigns appearing as operators on any of the cover sheets forming an entry will not count for points or multipliers.

Scoring: Contacts are scored on the basis of 1 point per kilometre for full, two-way microwave contacts and at half points for one-way (ie crossband) contacts.

Exchanges: Contest exchanges on the microwave bands consist of RS(T) + serial number (starting at 001). In addition, the six (or eight) figure QTH Locator must be exchanged either via the microwave band or on the talkback medium. In multiband contests, the serial number will start at 001 for each band (ie a common sequence across the bands is NOT to be used). No points will be lost if a non-competing station cannot provide an IARU locator, serial number, or any other information that may be required. However, the receiving operator must receive and record sufficient information to be able to calculate the score.

Talkback: Talkback can be used to assist in setting up a QSO, but note that the contest exchange must be made via the microwave band. It is not permissible to use the talkback as a means of checking the report or serial number – they must be copied via microwaves – and after the QSO is complete, care should be taken to avoid accidentally repeating the exchange via talkback. In some events there will be two sections, the Radio Talkback Only section and Unlimited Talkback section. For Radio Talkback, only amateur radio frequencies and technologies can be used for talkback (no internet or mobile phones). For Unlimited Talkback there is no restriction on the talkback methods that can be used – other amateur band, internet, phone, etc. In setting up the QSO, it is also permissible to send back received audio to the other station, for example to help with antenna alignment. An exception is that our contests do allow one way (cross-band) QSOs for half points, and in this case, the other band can be used by one of the stations. Stations not using any form of talkback should enter the Radio Talkback section.

Entries: Contestants are asked to make sure their entries have been scored correctly and that all relevant bonus points and multipliers have been claimed.

All entries must be prefaced with a summary / cover sheet showing: Title of contest, name(s) of operator(s), location(s) of station, section entered, callsign used, band score(s), multipliers or bonus points, final claimed score. The sheet should also detail equipment used, particularly the power output, antenna and receiver for both the microwave band and the talkback. This is very important if the logs are entered in one of the restricted sections. Where the contest has a 'rover' facility, it is essential that each location used is clearly stated.

Log entries are preferred to be received by email, but may also be submitted on paper. For electronic entries, the format should be one of the following: ASCII text, Microsoft Excel (no Macros to be included), Microsoft Word, or the G4JNT contest software format, IARU REG1TEST format. E-mail entries will be acknowledged to confirm receipt.

All logs should be submitted using the UK Microwave Group Contest Portal

Awards: Certificates will be awarded to overall contest winners and individual section leaders and their runners up. Additional Certificates of Merit will be awarded to stations in certain categories, as indicated in the rules for each event. With these, as with the logs, the adjudicator's decision is final.

Special Rules: Applicable if called up for the specific contest:

Rover Concept: The 'Rover' concept is to encourage lightweight, low power portable activity. This allows the location of the station to be moved as many times as desired and by a minimum of 16 linear kilometres, at any time during the contest period. From each new location, stations worked from any of the previous locations during the event may be worked again, both stations involved in the contact gaining points. The serial number, however, will not revert to 001 each time a move is made but will carry on consecutively from the previous contact.

Low Band Microwave Contest Rules

First introduced in 2004, these contests aim to encourage operation on the three lowest bands in the amateur microwave allocation, particularly as there is growing UK availability of 2.3GHz and 3.4GHz equipment. For 2012, there are four of these events, in March, April and June and November. The March and June events are timed to overlap with UHF/SHF events in some other IARU Region 1 countries. The times for the

November event have been shortened to make portable operation more practical.

1. The General Rules listed above apply.

2. There are four contests, one in March, one in April, one in June and one in November. The March, April and June events run from 1000 to 1600 UTC. The November event is from 1000 to 1400 UTC.

3. There are two sections for Radio Talkback and for Unlimited Talkback, but the leading stations in a number of categories will marked in the results table, with certificates awarded (see below).

4. Each band will be scored and tabulated separately. The total points for each band will then be normalised by the adjudicator to 1000 and the normalised band totals added up and tabulated.

5. Each event will be scored separately - there are no cumulative scores.

6. For each session, certificates will be awarded to the leading entry plus runner-up on each band, the overall leading entry and runner-up across the three bands, plus for each band the leading stations in each of the following categories: home station, portable station, station running less than 10 watts output.

5.7GHz Cumulatives Rules

The 5.7GHz,10GHz and 24GHz cumulatives are being run concurrently to take advantage of the growth in activity on 5.7GHz and 24GHz. Although they are on the same days, they are completely separate contests. Any band or all bands can be used on any of the 5 days, and any three days submitted for any band.

1. The general rules shown above apply.

2. There are five, monthly, events, from May to September inclusive, and the events run from 1000 to 1600 UTC on a Sunday.

3. Any three of the five events may be used for final scoring purposes. Logs for all events entered should be submitted in the two weeks after each session.

4. There are two sections, Radio Talkback and Unlimited Talkback, in addition the leading stations in a number of categories will be marked in the results table, with certificates awarded (see below).

5. Moving location during the contest is allowed - the Rover concept is applicable.

6. Certificates will be awarded to the leading station and runner-up in each section, plus leading stations in each of the following categories: home station, portable station, low-power (1W or less). The G3KEU Memorial Trophy will also be awarded to the leading entry overall.

10GHz Cumulatives Rules

The 5.7GHz,10GHz and 24GHz cumulatives are being run concurrently to take advantage of the growth in activity on 5.7GHz and 24GHz. Although they are on the same days, they are completely separate contests. Any band or all bands can be used on any of the 5 days, and any three days submitted for any band.

1. The general rules shown above apply.

2. There are five, monthly, events, from May to September inclusive, and the events run from 1000 to 1600 UTC on a Sunday.

3. Any three of the five events may be used for final scoring purposes. Logs for all events entered should be submitted in the two weeks after each session

4. Contestants may submit logs for any of the following sections:

Open Radio Talkback

No power or antenna restrictions (other than those laid down in the amateur licence) on either 10GHz or on the talkback band.

The ‘Rover’ concept does not apply to this section.

Radio Talkback only

Open Unlimited Talkback

No power or antenna restrictions (other than those laid down in the amateur licence) on either 10GHz or on the talkback band.

The ‘Rover’ concept does not apply to this section.

Unlimited Talkback.

Restricted Radio Talkback

10GHz transmit output not to exceed 1.0 watt to the antenna.

Moving location during the contest is allowed - the Rover concept is applicable.

Radio Talkback only.

Restricted Unlimited Talkback

10GHz transmit output not to exceed 1.0 watt to the antenna.

Moving location during the contest is allowed - the Rover concept is applicable.

Unlimited Talkback.

5. The final results table will show entries in rank order for each section. In addition to the usual leader/runner-up certificates for each section, the following certificates/trophies will be awarded:

- Leading entry in the Open sections - The G3RPE Memorial Trophy

- Leading entry in the Restricted sections - The G3JMB Memorial Trophy

- Certificates to the leading home station and portable station in each section.

24GHz G0RRJ Cumulatives Rules

The 5.7GHz,10GHz and 24GHz cumulatives are being run concurrently to take advantage of the growth in activity on 5.7GHz and 24GHz. Although they are on the same days, they are completely separate contests. Any band or all bands can be used on any of the 5 days, and any three days submitted for any band.

1. The general rules shown above apply.
2. There are five, monthly, events, from May to September inclusive, and the events run from 1000 to 1600 UTC on a Sunday.
3. Any three of the five events may be used for final scoring purposes. Logs for all events entered should be submitted in the two weeks after each session
4. There are two sections, Radio Talkback and Unlimited Talkback, in addition the leading stations in a number of categories will be marked in the results table, with certificates awarded (see below).
5. Moving location during the contest is allowed - the Rover concept is applicable.
6. Certificates will be awarded to the leading station and runner-up in each section, plus the leading home and portable stations. The leading station overall will receive the G0RRJ Memorial Trophy.

24GHz Trophy Rules

The 24GHz Trophy contest coincides with the 47GHz , 76GHz and 100GHz - 1000GHz events

1. The general rules shown above apply.
2. The contest will run from 0900 to 1700 UTC on a Sunday.
3. Moving location during the contest is allowed - the Rover concept is applicable.
4. Certificates will be awarded to the leading station and runner-up, and the winner will receive the 24GHz Trophy.

47GHz Contest Rules

The 47GHz contest coincides with the 24GHz Trophy, 76GHz and 100GHz - 1000GHz events.

1. The General Rules listed above apply.
2. The contest will run from 0900 to 1700 UTC on a Sunday.
3. Moving location during the contest is allowed - the Rover concept is applicable.
4. Certificates will be awarded to the leading station and runner-up.

76GHz Contest Rules

The 76GHz contest coincides with the 24GHz Trophy, 47GHz and 100GHz - 1000GHz events

1. The General Rules listed above apply.
2. The contest will run from 0900 to 1700 UTC on a Sunday.
3. Moving location during the contest is allowed - the Rover concept is applicable.
4. Certificates will be awarded to the leading station and runner-up.

100GHz – 1000GHz Contest Rules

The 100GHz – 1000GHz contest coincides with the 24GHz Trophy, 47GHz, and 76GHz events

1. The General Rules listed above apply. Contacts may be made on any amateur band between 100GHz and 1000GHz.
2. The contest will run from 0900 to 1700 UTC on a Sunday.
3. Moving location during the contest is allowed - the Rover concept is applicable.
4. Certificates will be awarded to the leading station and runner-up.

Lightwave Contest Rules

The 1THz and up (Lightwaves) contest will run during the evening on the same date as the 24,4,7,76 and 100GHz-1000GHz events

1. The General Rules listed above apply. Contacts may be made on any frequency above 1THz. Contacts with non radio amateur stations may be counted for points.
2. The contest will run from 1800 to 2400 UTC on a Sunday.
3. Moving location during the contest is allowed - the Rover concept is applicable.
4. Certificates will be awarded to the leading station and runner-up.

Microwave Field Day

1. The General Rules listed above apply.
2. The contest will run from 0900 to 1700 UTC on a Sunday.
3. Only Portable stations may enter the contest. Check logs will be welcome from fixed stations.
4. The contest will be on the 1.3GHz and 10GHz bands. Talkback can be on any band.
5. Contestants may submit logs for either of the following sections:

Open

No power or antenna restrictions (other than those laid down in the amateur license) on 1.3GHz, 10GHz or on the talkback band.

The 'Rover' concept does not apply to this section.

Restricted

1.3GHz GHz transmit output not to exceed 10 watts to the antenna.

10GHz GHz transmit output not to exceed 1watt to the antenna.

Moving location during the contest is allowed - the Rover concept is applicable.

6. An overall score will be derived from the normalized scores on 1.3GHz and 10GHz
7. Certificates will be awarded to the leading station and runner-up in each section, on an overall basis and for each band.

Other Microwave Contests

The first weekend of May sees the RSGB 432MHz -248GHz Multiband Contest staged in parallel with the Region 1 IARU UHF/SHF Contest. The 10GHz Trophy is run in parallel by the VHF Contest Committee on the Saturday of that weekend, and the rules can be found in the RSGB VHF contest rules.

The first weekend in July is VHF National Field Day which includes 1.3GHz as one of the bands.

The first weekend of October sees the RSGB 432MHz -248GHz Multiband Contest staged in parallel with the Region 1 IARU UHF/SHF Contest. The 1.3GHz Trophy and the 2.3GHz Trophy are run in parallel by the VHF Contest Committee on the Saturday, and the rules can also be found in the RSGB VHF contest rules.

The RSGB also runs a cumulative UK Activity Contest on 1.3GHz on the third Tuesday from 2000-2230 local time, and on 2.3GHz – 10GHz on the fourth Tuesday of every month, from 2000 – 2230 local time.

In addition there are other Continental UHF/SHF Contests held during the year and interested UK microwavers are urged to be active during these. Their details may be found on the Internet.

Attention, Radio Club members

Please give publicity for a recently introduced contest aimed at clubs and portable groups which provides a good opportunity to introduce club members to the microwave end of the spectrum. Microwave Field Day was introduced by the UK Microwave Group last year, for 2012 we are looking to get a wider range of clubs involved, hence this letter.

Microwave Field Day takes place this year on Sunday 5th August 2012, from 0900 – 1700z (1000 – 1800 BST), on the 1.3GHz and 10GHz bands (23 and 3cm). There are open and restricted sections, the restricted section has power limits of 10W for 1.3GHz and 1W on 10GHz. Single band entries will be very welcome. Only portable stations can enter the event, but fixed stations are encouraged to come on and give points away and submit check logs

The RSGB runs its 144 and 432MHz Low Power Contests on the same weekend, so a group can enter several events over one weekend for a small incremental effort.

The UK Microwave Group is keen to see more stations getting active on the microwaves and we think this event is a great way to get club members interested. Active microwavers are being encouraged to loan their stations to local clubs to get them started.

Complete rules can be found at:

http://www.microwavers.org/files/2012-mwrules.pdf

John Quarmby G3XDY

Activity News

By John Worsnop G4BAO

Well I've got a strong cup of espresso on the desk, and I'm embarking on my first activity column for Scatterpoint. Everything that needed to be said to thank my predecessor has been said, so I'll "get on with it".

I have received loads of input (which is GOOD, thanks!) so some of it may have to be a bit condensed and if I missed your best QSO out this month, I apologise!

Winter is traditionally the time when many microwavers turn up the shack heating and start those constructional projects that we all have on our "to do" list.

Beware though; you can miss some interesting propagation!

Microwaves from the Fen Edge

Here at G4BAO I've been concentrating on the higher bands, namely 3.4, 10 and 24GHz with some interesting results. I'm pleased to see Tony, G4CBW (IO83UB) now active on 9cm. I worked him for the first time on the 20th of November and on a number of occasions since. My highlight on 9cm though has to be that on 22nd November in the SHF UKAC I finally worked Ralph G4ALY (IO7ØVL) 365km via aircraft scatter. Ralph is always a consistent signal on 23cm here in Waterbeach, but 9cm has always eluded us. The path is over Dartmoor, so is quite a challenge. We are aiming for a 3cm contact next! During the same contest I also surprised Martyn G3UKV (IO82RR) 193km by easily completing an aircraft scatter contact using 1 minute periods. The following weekend I worked DK2MN (JO32MC) 466km for my best DX on 9cm for the year.

Highlights for me on 3cms have been the winter rain scatter produced by storms in the English Channel in mid December. On the 13th I copied the F5ZTR beacon (JN19FK) 352km, from early evening right through to the following day, peaking 56S, when in late afternoon I finally managed to hook up with Maurice F6DKW (JN18CS) 414km on CW, followed later in the evening by Marc F6DWG (JN19AJ) 345km.

On 24GHz, sadly it's been a case of listening for beacons. The Martlesham team very kindly re-oriented the GB3MHK 24GHz horn to point at me, and I've started to receive it over a very obstructed path when conditions are suitable, mainly via rain scatter. The beacon is currently low of its nominal frequency at 24,048.817MHz and remarkably is inside the equipment room pointing through double glazing!

Before the antenna was re-oriented, between the 19th and the 20th of November, East Anglia was blanketed by fog, up came the tropo and I heard GB3MHK for the first time. Then, remarkably it stayed copyable for two days, peaking 539 early in the morning of the 20th.. later in the week, the antenna was re-oriented and I started receiving the beacon regularly by rain scatter. Any light rain and up it comes. 24GHz is a remarkable band!

Notable tropo reports

The 15th to the 16th of November brought some good tropo conditions to the North and East of the UK. No UK stations reported QSOs, but SM6AFV (JO67) reported hearing the Edinburgh beacon GB3EDN IO85JW at 1003km On 23cms, OY3JE in the Faroe Islands (IP62OA) reported contacts with DK6AS (JO52) 1495km, DC6UW (JO44) 1239km, DK1ZD (JO44we) 1303km, OZ1FF (JO45BO) 111km. Further South, on the 27th, EA2TO/1 (IN83FD) reports working DB6NT (JO50) 1375km and LX2LA (JN39CP) 1038km. Propagation on the 27th extended up to 10GHz with F6DKW (JN18CS) reporting QSOs with F5BUU (JN03PO) 578km and F1VL (JN03RX) 535km.

From our correspondents

Ray, GM4CXM reports on the November low band events

In the 23cm UKAC, I managed to make 38 contacts which equalled a previous highest count made earlier in the year and would have been surpassed had conditions not been against me the longer the contest went on.

UKuG Microwave Contest Calendar 2012

Dates, 2012	Time UTC	Contest name	Note	Certificates
4-Mar	1000 - 1600	Low band 1.3/2.3/3.4GHz	1	F, P,U,R,L
22-Apr	1000 - 1600	Low band 1.3/2.3/3.4GHz	2	F, P,U,R,L
27-May	1000 - 1600	1st 5.7GHz Cumulative		F, P,U,R,L
27-May	1000 - 1600	1st 10GHz Cumulative		F, P,U,R,L
27-May	1000 - 1600	1st 24GHz Cumulative		F, P,U,R
3-Jun	1000 - 1600	Low band 1.3/2.3/3.4GHz	3	F, P,U,R,L
24-Jun	1000 - 1600	2nd 5.7GHz Cumulative		F, P,U,R,L
24-Jun	1000 - 1600	2nd 10GHz Cumulative		F, P,U,R,L
24-Jun	1000 - 1600	2nd 24GHz Cumulative		F, P,U,R
22 -Jul	0900 - 1700	24GHz Trophy / 47 / 76/100-1000 GHz		
22 -Jul	1800 - 2400	>1THz (Lightwave)		
29 -Jul	1000 - 1600	3rd 5.7GHz Cumulative		F, P,U,R,L
29 -Jul	1000 - 1600	3rd 10GHz Cumulative		F, P,U,R,L
29 -Jul	1000 - 1600	3rd 24GHz Cumulative		F, P,U,R
5 -Aug	0900 - 1700	Microwave Field Day		P,L
26 -Aug	1000 - 1600	4th 5.7GHz Cumulative		F, P,U,R,L
26 -Aug	1000 - 1600	4th 10GHz Cumulative		F, P,U,R,L
26 -Aug	1000 - 1600	4th 24GHz Cumulative		F, P,U,R
30 -Sep	1000 - 1600	5th 5.7GHz Cumulative		F, P,U,R,L
30 -Sep	1000 - 1600	5th 10GHz Cumulative		F, P,U,R,L
30 -Sep	1000 - 1600	5th 24GHz Cumulative		F, P,U,R
25 -Nov	1000 - 1400	Low band 1.3/2.3/3.4GHz	4	F, P,U,R,L

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

73 John G3XDY, UKUG Contest Adjudicator

UKµG Contest Portal: http://microwave.rsgbcc.org/cgi-bin/vhfenter.pl

The tropo duct enjoyed by those on the east coast and further south did not extend to the west of Scotland, if anything, there appeared to be a weather front obstruction to working anything to the east after the first hour.

Things started well enough with big signals from G8PNN (IO95), G0MJW (IO91), G4EAT and G8XIR (JO01) and G3PYE/P (JO02).

ODX was an aircraft reflection contact with Kjeld OZ1FF (JO45) at 782Km and whose signal peaked 579 with me and 59+ with nearby GM0USI/P (IO76) who was well placed to tailend.

It later became obvious I was missing a number of reachable square multipliers like IO93, 94, 86, 87. Despite attempts with G8EOP & G8GXP (IO93), G0EHV/P (IO94) and GM3UAG (IO87), nothing was heard either end.

The end result was a final 45 minutes of concerted effort producing just one contact. This was with Ian at G8OHM with a superb serial number of 61 and an impressive ODX of 1,067Km via tropo to SM6HYG.

Ian has soundly surpassed his previous "55" highest QSO number made earlier this year by a substantial margin. Well done!

From what I observed there were at least 14 GMs active during the 23cm UKAC.

SHF UKAC was blessed with good activity but flat conditions on 13cm. Local contacts therefore become very important and it was excellent that

seven stations within GM were available on this band.

Alan GM0USI/P activated IO76 and John GM8OTI/P (IO85) also braved the November weather elements. Robert GM4GUF (IO85) came on from home as did Andy GM7GDE (IO75) with an indoor flat panel fixed on the GB3CSB beacon location.

Unfortunately I had no success with Jim GM3UAG (IO87) and despite attempting to contact Jon GM4JTJ (IO86) early in the contest and for 30 minutes at the end, nothing.

The first 40 minutes produced seven contacts including all the GMs workable plus an aircraft reflection contact with Kjeld OZ1FF (782Km to JO45) and two into IO91 with Mike G0MJW catching one aircraft reflection and Neil G4BRK starting when Mike finished but having to wait until a second aircraft came into our mid-point zone in order to complete all required exchanges.

The next hour produced three tropo contacts with good readable signals from Tony G4CBW (IO83) and Ian G8IFT at G8OHM (IO92) but Bob G8DTF (IO83) and I struggled for a long time before confirmation could take place.

In the November UKuG Low band Contest I found activity fair in the first two hours then many drifted away.

A few comings and goings in the middle but come the last hour a sudden influx led to anyone entering pouncing on anything that moved which was a frustrating rush after a few hours twiddling thumbs.

In situations when up to 3 separate band contacts were wanted, this last hour influx led to a number of missed contact opportunities for everyone entering though great fun for those not entering and just appearing and being in immediate demand.

Two stations ventured out /P (GM8OTI & GM4GUF) for a very short time and only one of them made any contact. My ODX on 13cm was a contact with G4BRK (IO91HP), 517km and on G3WBQ/P (IO91RF) 582km/

GM8OTI/P, IO86JF reports on the November UKuG Low band Contest

As a "newbie" to microwaves I'm still experimenting with locations - I can't easily operate from home (no proper antennas as we live in a city "conservation area") so my contesting is usually portable. The chosen site was at the public car park near the radio masts on East Lomond, at

about 335m asl. I arrived at the site at about 11am, in lovely blue skies but a howling wind.

Fortunately I had taken a heavy tripod and fixed up a lightweight tripod carrying the antennas for 1.3GHz and 2.3GHz on top of it (see photo).
I listened a lot and called CQ but without the results I'd hoped for. Over a couple of hours (before I became too cold and abandoned for the day) I heard nothing on either band from the south. A sked with GM4JTJ resulted in my single contact - on 2.3GHz as he still had the antenna on the mast from the UKAC on the previous Tuesday, though lowered to about 4m because of the wind, so the contact was through his cottage roof! An attempt was made on 1.3GHz with GM4CXM, but although I have worked Ray in the past on 70cm from that location, the local horizon does block the direction to the north of Glasgow.

John G3XDY reports his highlights, starting with the nice tropo opening on the 15th/16th October

1.3GHz	SM4DHN	JP60VA	1176km
	EA2TO/1	IN83FD	1053km
2.3GHz	F6DRO	JN03TJ	964km
3.4GHz	OZ6OL	JO65DJ	816km

and in the 18th October 1.3GHz UKAC he reports fair conditions and good activity, 31 QSOs in 16 locator squares, best was OZ9KY in JO45VX.

On the 11th and 13th November, another tropo opening (Better on VHF than the Microwaves, but best DX for 2011) with

11th			
1.3GHz	OZ3ZW	JO54RS	
	YL3AG	KO06WK	1421km
13th			
1.3GHz	SM7LCB	JO86GH	1100km
	DG7TG	JO43SV	
2.3GHz	OZ3ZW	JO54RS	
	OZ2LD	JO54TU	
3.4GHz	OZ2LD	JO54TU	
5.7GHz	DK2MN	JO32MC	
10GHz	DK7QX	JO42KH	

In the 15th November 1.3GHz UKAC John reports good conditions and activity, 43 QSOs in 24 locator squares, the highest number of squares he's worked in the 1.3GHz UKACs. Best DX was SM6AFV in JO68GQ. Conditions to SM were marginal, with a couple of other SM squares heard but contacts incomplete.

In the 22nd November SHF UKAC, 5 QSOs on 2.3GHz, best was DF9IC in JN48IW. On 3.4GHz 3 QSOs also with DF9IC as best DX. Nil on 5.7GHz this time and just G4KUX (IO94BP) on 10GHz at 352km.

In the 20th December 1.3GHz UKAC, average Conditions, reasonable activity, 27 QSOs in 13 locators, with DF9IC (JN48IW) as best DX.

Guy, F2CT posted on the French reflector, kindly translated by G8APZ.

Despite a delay of about an hour from what I had planned, and the late hour, I still decided to go out portable, since the weather conditions were exceptional:

+ 15 ° C at 4:30 p.m. local at 900m above sea level with a magnificent view of the snow covered Pyrénées, and the bonus of a beautiful sunset to come!

On the Tropo side, I was a little disappointed! On 10 GHz, (beacon) F5ZEP/IN94QT was 599 and (beacon) F5ZWM/JN05VE 579 at times with 30dB of deep QSB

Several takers in the Paris area, but Ralph G4ALY was watching!

A very easy QSO resulted on 5.7 GHz in CW and SSB with peaks at 55, a super DX gift to end the year at 830 km! The 2 attempts on 10 GHz failed, I thought I heard something but maybe it was another station?

Nanowaves

The hardy nanowave gang have not been letting the cold weather get in the way of their activity or dim their LEDs. We have a new daylight red light DX record of 54.9kms to report.

On Wednesday 14th December, during a lull in a spell of wild weather Barry, G8AGN, and Gordon, G0EWN, took advantage of the better weather to

extend the daylight nanowave DX above the 50km mark. The actual path length was 54.9km from a site near North Cave, IO93QT81 to Beacon Hill, IO93JL50.

Both stations were equipped with baseband rigs using Phlatlight LED TX's and both stations employing various optical filters to reduce noise/ de-sensing of the RX in the bright winter sun (50,000 LUX). Further details have been posted on the nanowave reflector. The pair hope to further extend this daylight distance by trying a 66km path that was previously made last year as a night time contact, along with extending the current 122km night time record (M0DTS, G0EWN) by testing a 126km path when conditions allow. Nanowaves are currently offering a similar experience to operating on the microwave bands above 24GHz; those familiar with testing 47GHz, 76GHz or higher would find many similarities with nanowaves.

EME

Chris GW4DGU reports on his 10GHz EME results:

My antenna is a 2.4 m Prodelin dish with a Skobelev dual-mode feed. I have about 45W at the input transition of the feed. I've resurfaced the dish with self-adhesive aluminium foil, as the original reflective layer had a seriously antenna noise temperature problem. After an incident where a glint of sunlight from the unpainted surface caused several cables to melt(!), I've painted it.

I have worked about #35 initials with that system, and at perigee could read my own SSB echoes. I still have quite a lot of work to do on the receiver, and I've replaced the coax antenna switch with a WG switch. I've also developed a preamp with the input match performed in entirely in waveguide, not as most amateur designs seem to do, in microstrip with its attendant losses. I was seeing ~8 dB CS/G noise without a lot of optimization, which agrees fairly well with my corrected HP346 measurements of ~0.4 dB NF. I can now see ways of reducing losses due to bias, so I'll be iterating it once I've got access to workshop facilities again. Presently I am QRT due to a change of QTH. I'm hoping to be back on the air next summer, providing I can get planning permission for the dish at my new QTH. When I rebuild the system, I'm hoping to finally use the 200 W PA, which has been sitting here for some years. I've also got 24 GHz well under way, and may consider coming on the LF bands such as 1.3 and 2.3 GHz! I plan to be at Cambridge this summer.

A report from John PA7JB, who is doing some interesting work with 150 watts to a 2,4 meter offset dish 23cms. He reports on his activity during the November 19th, 20th EME contest:

I had some problems at the start of the contest in that I could not hear my echoes, but later I worked 6 stations on JT modes and 8 on CW. New stations worked were:

On CW, DL3EBJ , I1NDP, IK1MTZ, K2DH , K1JT , CT1DMK , SM6FHZ and on JT65C, OK2ULQ, OK1CS and RA4A.

On January 6th Peter G3LTF worked Bruce PY1KK on 6cm for his initial #31, country #19 and first G-PY (first G-SA). Bruce uses a 4m dish and about 70W while Peter illuminates the centre 4.5 m of his 6m dish and has 22W at the feed and his system is all homebrew except for the PA. Peter tells me that Bruce's activity has created at least 2 WACs on 6cm.

Brian G4NNS also worked PY1KK a few days later.

John Worsnop G4BAO

Please send your activity news to:

scatterpoint@microwavers.org

November 2011 Lowband Contest Results

There was a small increase in the number of entries for this year on all three bands, although the leading score on 1.3GHz was some way down on last year. Conditions and the weather were poor so there were few highlights in this event. It was nice to see three stations braving the elements to go portable.

Ray GM4CXM was the winner on 1.3GHz, with G3WBQ/P quite close behind, and then a large gap to the rest of the field. Neil G4BRK won the 2.3GHz section by a convincing margin, with Ray GM4CXM as runner up. On 3.4GHz G3WBQ/P took the top spot followed by John G4BAO. On this occasion more contacts were made on 3.4GHz than 2.3GHz for the first time your adjudicator can remember.

In the overall table, the Combe Gibberlets (G3WBQ/P) triumphed, operated by G3TCT, G3TCU, G4SJH and G1EHF. Neil G4BRK's leading position on 2.3GHz helped him to take the runner-up spot and leading fixed station. The above mentioned will receive certificates.

John G3XDY

UKuG Contest Adjudicator

November 2011 Low Band Contest Results

Overall

Pos	Callsign	1.3GHz	2.3GHz	3.4GHz	Total
1	G3WBQ/P	927	536	1000	2463
2	G4BRK	471	1000	525	1996
3	GM4CXM	1000	645	0	1645
4	G3UKV	268	0	599	867
5	G4BAO	0	0	668	668
6	GW8ASD	441	0	0	441
7	G0DJA	240	0	0	240
8	GW3TKH/P	41	175	0	216
9	G4LDR	60	57	66	183
10	GM8OTI/P	0	46	0	46

1.3GHz

Pos	Callsign	Locator	QSOs	Best DX	Points
1	GM4CXM	IO75TW	14	G3WBQ/P 582km	4499
2	G3WBQ/P	IO91RF	23	GM4CXM 582km	4172
3	G4BRK	IO91HP	12	GM4CXM 517km	2120
4	GW8ASD	IO83LB	9	GM4LBV 405km	1985
5	G3UKV	IO82RR	7	GM4CXM 377km	1204
6	G0DJA	IO93IF	5	GM4CXM 361km	1081
7	G4LDR	IO91EC	2	G4ALY 195km	272
8	GW3TKH/P	IO81LS	1	G3WBQ/P 184km	184

2.3GHz

Pos	Callsign	Locator	QSOs	Best DX	Points
1	G4BRK	IO91HP	6	GM4CXM 517km	1350
2	GM4CXM	IO75TW	3	G4BRK 517km	871
3	G3WBQ/P	IO91RF	5	G4CBW 237km	724
4	GW3TKH/P	IO81LS	2	G3WBQ/P 184km	236
5	G4LDR	IO91EC	1	G3WBQ/P 77km	77
6	GM8OTI/P	IO86JF	1	GM4JTJ 62km	62

3.4GHz

Pos	Callsign	Locator	QSOs	Best DX	Points
1	G3WBQ/P	IO91RF	7	G3LRP 271km	1158
2	G4BAO	JO02CG	6	G3UKV 193km	773
3	G3UKV	IO82RR	5	G3WBQ/P 216km	694
4	G4BRK	IO91HP	4	G3LRP 218km	608
5	G4LDR	IO91EC	1	G3WBQ/P 77km	77

Events calendar 2012

Jan 14	Heelweg, Zaal de Vos in Westendorp	www.pamicrowaves.nl/website/
Feb 11	GHz-Tagung, Dorste	www.ghz-tagung.de/
Mar 31	CJ-2012, Seigy	cj.ref-union.org/
April 21	RSGB AGM	
April 28-29	Martlesham Microwave Round Table and UKμG AGM	(mmrt.homedns.org/)
May 18-20	Hamvention, Dayton	www.hamvention.org/
Jun-10?	RAL Roundtable tbc	
Jun 22-24	Ham Radio, Friedrichshafen	http://www.hamradio-friedrichshafen.de/
Jul 7-8	Finningley Roundtable	
Jul 27 – Aug 12	Olympics Games, London, UK	
Aug 16-19	15th International EME Conference, Cambridge, UK	eme2012.com
Aug 29 – Sep 9	Paralympics, London, UK	
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 12–14	RSGB Convention, Horwood House, Milton Keynes	www.rsgb.org/rsgbconvention/
Oct 18–21	MUD 2012, Santa Clara CA	(http://www.microwaveupdate.org/) mud2012@pacbell.net
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 2012

See page 27 for UkμG Contest calendar

Jan 17	2000–2230 1.3GHz Activity Contest RSGB VHFCC
Jan 24	2000–2230 2.3GHz Activity Contest RSGB VHFCC
Feb 21	2000–2230 1.3GHz Activity Contest RSGB VHFCC
Feb 28	2000–2230 2.3GHz Activity Contest RSGB VHFCC
Mar 4	1000–1600 Low band 1.3/2.3/3.4GHz. First 4 hours coincide with IARU event
Mar 20	2000–2230 1.3GHz Activity Contest RSGB VHFCC
Mar 27	2000–2230 2.3GHz Activity Contest RSGB VHFCC

EME Activity weekends

2012 REF/DUBUS EME Contest:

Mar 3/4 00–24 UTC 432 & 3.4 GHz : CW/SSB

Mar 31– Apr 1 00–24 UTC 144 MHz & 10 GHz + up : CW/SSB

April 28/ 29 00–24 UTC 2.3 GHz : CW/SSB

May 26 / 27 00–24 UTC 1.2 GHz : CW/SSB

June 23 / 24 00–24 UTC 5.7 GHz : CW/SSB

Don't forget that

Every Monday evening is Microwave Activity Evening

The RSGB 2012 VHF+ Contest Calendar is available at www.rsgbcc.org