An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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2008 FEBRUARY

Backpack 10GHz portable is coming back!

Richard,G3CWI, has been making mid-week contacts on the band from north of England summits…. yes, he **walks** to the top and carries his microwave gear with him, just like we used to do in the wbFM days of the 1980s. Since then, the rest of us have developed bad habits like operating from the warmth of the home shack and having a cooked Sunday dinner!

Richard is shown here working from Shining Tor in the Western Peak District, working G0EWN/P near Sheffield.

photo by G3CWI

In this issue ...

Latest News …

- **10GHz up for sale … look at http://www.ofcom.org.uk/radiocomms/spectrumawards/liveawards/1040award/notices/applicants.pdf**
- **Crawley Microwave Round Table scheduled for 14 September 2008**
- **Sheffield Microwave Round Table and Intermediate Workshop will be on 12/13 July 2008**

MANY THANKS TO ALL OUR CONTRIBUTORS THIS FEBRUARY ... WITHOUT YOU THERE WOULD BE NO SCATTERPOINT!

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From the Editor's Desk

This month we have had a magnificent response to our request for newsletter articles and other items. It's so good at the moment that we have enough material for another two issues! Many thanks indeed for supporting the newsletter in this way. However, the glut of material means that some of you will not see your item in print this month and you'll have to be patient and wait until March (or even April !) before you can read your masterpiece. A consequence of this is that some important news items have had to be held over due to lack of space. If you want the latest microwave news you should really register with the UK Microwave Reflector on Yahoo Groups where you'll see news as it is made and get the chance to comment within hours of things happening.

Thanks to Richard, G3CWI and the Summits on the Air (SOTA) enthusiasts, portable microwave operation could be staging a comeback (along with 2m talkback?). This is because Richard has recently discovered the delights of backpack microwaving, something that many of us did in the 60s, 70s and 80s but discarded in favour of car based portable or even home station operating when narrowband came along. Not so with Richard... he's built up a lightweight DB6NT system and is coming on the air from various hill and mountain summits around the Northen part of England. These summits count towards various SOTA awards .... see the Activity News pages. Your editor is now encouraged to do the same and discard the 4 foot dish and 5 watt PA in return for 250mW to a PW 45cm dish carried in a rucksack instead of the van!

73 from Peter, G3PHO — Editor

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News, views and articles for this newsletter are always welcome. Please send them to G3PHO (preferably by email) to the address shown lower left. **The closing date is the Friday following the first Monday of the month** if you want your material to be published in the next issue.

Ofcom Update
Forthcoming GPS jamming exercises

The MoD has informed Ofcom of the following GPS jamming exercises:
Dates: 31 March to 4 April 2008
Times: between 08:00 and 18:00 hrs
Location: To sea from Bridlington: N54= B0 06.842'
W000=B0 05.045'
Contact: Trial Manager - 07766 134758

Dates: 20-21 April 2008 (26 April 2008 reserve day)
Times: between 09:00 and 17:00 hrs
Location: To sea from The Hebrides: N57=B0 14.4'
W007=B0 26.7'

Contact (during jamming exercise only) 07766 134520

HAVE YOU RENEWED YOUR UKuG SUBSCRIPTION YET? YOU CAN CHECK THE RENEWAL DATE ON YOUR ENVELOPE ADDRESS LABEL IF YOU RECEIVE A PRINTED SCATTERPOINT. THE DATE IS ON THE LOWER RIGHT CORNER OF THE LABEL. IF YOU STILL DON'T KNOW YOUR RENEWAL DATE PLEASE EMAIL THE SECRETARY, G8KQW.

SUBSCRIPTION ENQUIRIES SHOULD BE SENT TO THE UKuG GROUP SECRETARY AT THE ADDRESS SHOWN AT THE TOP OF THIS PAGE

The UK Microwave Group Spring Round Table

This annual event will, this year, be held at the **University of Bath** on **Sunday 20th April**, by kind invitation of the Department of Electrical Engineering. This is a change of venue from RAL and provides us an opportunity to develop a relationship with a University at the forefront of microwave communications. Indeed, we hope to cement this relationship by sponsoring a student project to build a microwave beacon to operate from the University which is also host to the GB3UB 433MHz repeater.

There will be emphasis on the higher bands but don't worry if you are not ready for those yet as there will be plenty of folks to talk to and material of interest to those on the lower bands too. We feel this theme is appropriate as 24GHz is to be included along with 5.7 and 10GHz in this year's cumulative contests. More home stations are becoming equipped for 24GHz and an increasing variety of surplus equipment is becoming available for the band.

There will be an **Antenna test session** at G4NNS 14:00 to 17:00 19th April 2008 for 2.3 to 24GHz. Some **test facilities** will also be available in the G4NNS shack.

A **Dinner will be held at The Cricketers Arms,** Tangley near Andover 19:00 'till late. Numbers will be limited to 28 so book early using the web site See link from UK Microwave Group site at **http://www.microwavers.org/** . The price is £19.50 excluding all drinks ... but this is a country pub with excellent beer, wines, etc. Please make payment to B. R. Coleman (G4NNS QTHR) in advance once you have registered.

The Cricketers Arms has 9 rooms available that can be configured as double or twin. The price for B&B is £55 for single occupancy or £75 for double. So it will pay to share. Book direct with The Cricketers Arms on 01264 730283 quoting Brian Coleman. There's more information at **http://www.thecricketers.eu/**.This is a country pub, so they appreciate calls during pub opening hours only i.e. avoid their closed times especially early mornings and 14:00-18:00. If you are unable to get in at the Cricketers contact me (G4NNS) and I will suggest alternatives.

Catering is available at the University on the Sunday in the form of a café and a very reasonably priced carvery. When you register on line at the UKuG website you will be asked to indicate your interest and requirements.

PROGRAMME OF LECTURES AND ACTIVITIES : UKuG SPRING ROUNDTABLE

10:00	Doors open: Sign in/ Set up for traders. Informal socialising/surplus swap tables. NO ONE to attempt access before this time please!
1230 - 1330	Lunch
1330 - 1340	Formal welcome: G4NNS Chairman UKuG
1340 - 1400	Presentation of Special Awards
1400 - 1445	Millimetre Wave Propagation Studies at Bath
1445 - 1530	Operation On the higher Microwave Bands (24, 47 & 76GHz).
1530 - 1545	Break
1545 - 1630	Beacon Reporting Web Site
1630	Meeting closes
ALL DAY:	Test equipment facilities/display of equipment/ surplus swap and trade.

Admission is by registration only so visit the UKuG Web site (www.microwavers.org) and follow the links.

A Simple 9cm Converter

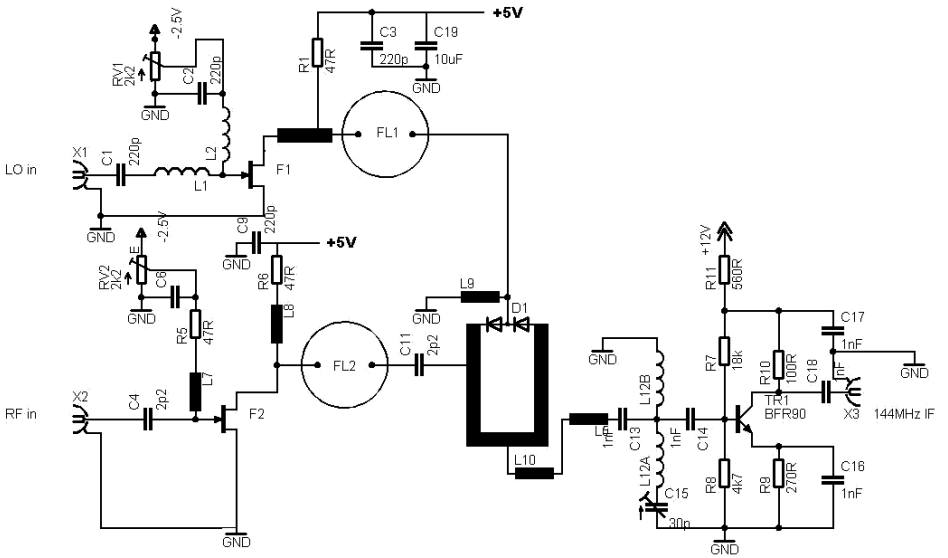
By Gus Coleman G3ZEZ

Introduction

On deciding to replace my existing 9cm interdigital converter, I looked around to see how I could, at the same time, improve performance. I had previously modified the G3WDG 10GHz receive converter to the 6cm band, so decided to see if a similar design would work at 9cm by rescaling the inductor lengths.

Circuit design

Full acknowledgement is given to the original G3WDG 3cm design in this article.
As I have an external 2 stage amplifier, to save space and size, only one RF stage was used. The final schematic is shown below. The other diagrams show the component layout.
The only changes to the components from the G3WDG design are the mixer diode (which is from a "bluecap" LNB) and the FETs, which are surplus NE32184A devices from the "junk box." The unit is driven at 1628MHz from a G4DDK oscillator multiplier.



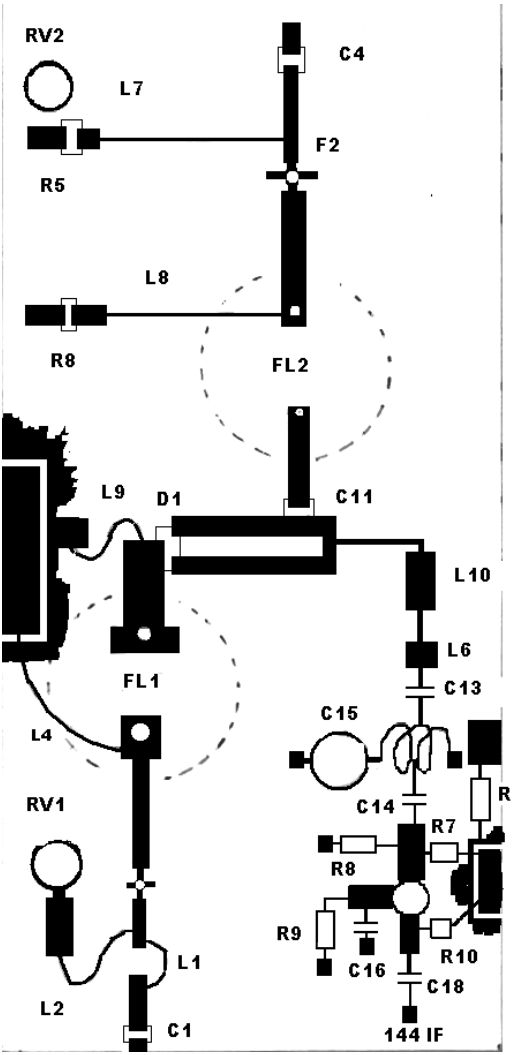
Results

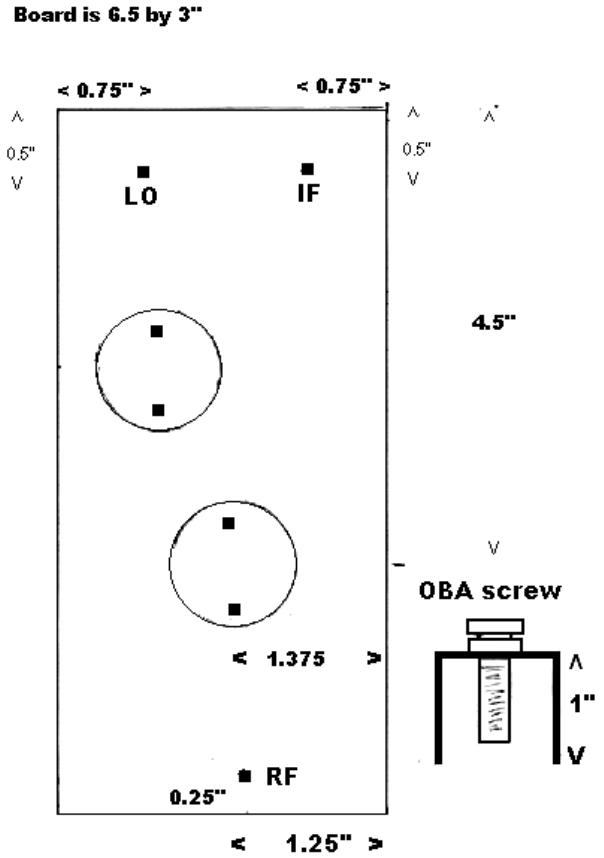
The new converter was completed just in time for the October 2007 microwave contest and outperformed the original interdigital converter, enabling two new stations to be worked. I am sure that performance could be improved, further, but I do not have the knowledge to design tracks and stubs to optimise.

Construction

Initially, I made a tuneable filter using a one inch piece of copper tube, with a cap and tuning screw to confirm it would tune to the desired frequency. A trip to the local plumbing store for commercial stop ends showed that they were £5 each, so home made ones were fabricated instead! Using a tube cutter gives nice square ends, allowing the end plate to be soldered down and tapped.

The resonators are one inch diameter and one inch tall and tuned with a 0BA screw one inch long, which, when on frequency, are almost all the way in to the tube with just enough room for a half nut to lock them in place. The probes are 8BA half inch long screws. 8BA nuts were soldered on the track to adjust the insertion length if necessary, but so far have not been altered from full penetration.





The PCB track layouts here are just sketches, but roughly to scale and give a good idea of the positions of the major components. Reference to them and the circuit should allow you to make the required connections. The majority of the PCB is left as copper with a 1/16 inch space between the copper and the main tracks as indicated close to L9 and R7. As I do not have good PCB facilities, I used a mini drill to grind away the copper on the double sided fibreglass board and make islands for the components and lines.

Component values are as per the circuit, non– critical track widths can be taken from the layout sketch and the inductors are as follows:

L1 = 49mm of 1mm wire bent in to a hairpin. L2 = as L1 but 60mm long
L4 = Length of 1mm wire as per layout. L7, L8 = straight length of 1mm wire as per layout.
L9 = 31mm of 0.6mm wire as per layout. L12 = 4 turns of 0.6mm 5mm i.d turns spaced 1/2 wire diameter, centre tapped and spaced 1mm above the board.
Mixer U is 1" x 3/8" and tracks are 1/8" wide

Each stage was assembled and tested in sequence. i.e 2m amp, x2 multiplier and mixer and finally the RF amplifier.

Editor's note—Apologies for the mix of metric and imperial measurements!

A Direct Frequency Synthesiser (DFS) for 106.5MHz

By Dave Powis, G4HUP

Editor's note: Since Dave's first article in last month's Scatterpoint, we have been reminded that very similar experimentation has been talking place in France at and around the same time as the work described here. André, **F9HX** writes, "I published in Radio-REF (12/2007) and in VHF-Communications (4/2007) an article about an exotic way to use DDS. In fact, I was surprised to read something similair in an Application Note from Analog Devices dated end of 2007. I sent a mail to the author and he also was surprised: at the same time, thousand kilometers apart and without any connection between us, we have done quite the same work ! "... André has sent us an article which we hope to publish next time.

Introduction

As a follow-up to the Introduction article [1], this paper describes the implementation of a DFS for 106.5MHz – providing the LO signal for a multiplier chain up to 10.224GHz – ie 10.368GHz with a 144MHz IF. While 10MHz is the 'normal' starting reference frequency for GPS locked DFS solutions, the example given here actually uses 15MHz, since this gives a simpler mix with a consequently cleaner end signal. Using a 10MHz reference is possible, as I will show in the following paragraphs but I also hope you'll see why I chose 15MHz.

The specific implementation shown uses the Issue 1 G4HUP F-DFS PCB – but there's no reason why you shouldn't replicate it in other layouts or technologies!

Generation Options for 106.5MHz

There are at least 3 options for deriving 106.5MHz from a DFS – and probably more! These three are enumerated in Table 1, below.

Source freq (MHz)	Schema	Main mult factor (*x*)	Divider 1 ratio (*y*)	Multiplier (*m*)	Divider 2 input (*r*)[1]	Divider 2 ratio (*z*)	Mix mult
10	90+16.5	9	2	1	2	10	3
10	110-3.5	11	10	3	2	2	1
15	105+1.5	7	10	1	-	-	-

Table 1 – 106.5MHz DFS Schema options

1 – the number in this column refers to the *r* input options from Fig 2 of the Introductory article.

The table uses references from Fig 2 in the Introduction article – this diagram is not repeated here. The first two columns show the reference frequency options and the frequency products that need to be generated to achieve the desired output. Remaining columns identify how that output can be derived. Thus for the first row, 106.5MHz is generated as the upper side frequency from mixing 90 MHz and 16.5MHz. This uses a diode multiplier factor (*x*) of 9. The first divider is set to divide by 2 (*y*), giving 5MHz, and a second divider takes this as its input and divides by 10 (*z*). The resulting 5MHz and 0.5MHz components are mixed together to give 5.5MHz, and this is multiplied by 3 after the mixer, resulting in the 16.5MHz we need to add to the 90MHz.

In the second option, the 10MHz is multiplied by 11 to give 110MHz. The 3.5MHz that must be subtracted is generated by producing 1 MHz from the 10MHz, which is then multiplied by 3. The 1MHz is also divided by 2 to provide the 0.5MHz signals which can be mixed with the 3MHz to give 3.5MHz.

In the final option shown, 15MHz is used as the reference, rather than 10MHz. For this option, x is 7 (105MHz) and the first divider is 10, giving 1.5MHz. Already we now have all the signals needed for the final mix – hence this option provides a single loop synthesiser, whereas all of the 10MHz reference options are by necessity dual loop synthesisers.

The advantages of this are several:

- Because we are taking a lower order harmonic from the diode multiplier, the amplitude is higher – meaning less gain is needed before the mixer. The multiplier output spectrum in Fig 1 shows the relative levels of the harmonics, and the difference between the 7^{th} and 11^{th} is approx 12dB
- The filtering is 'easier' due to the wider spacing of the multiplier harmonics
- There is only one divider required, which means less digital noise generated
- The lowest frequency created in the division process is 1.5MHz, as opposed to 0.5MHz in both other options, again making for more effective filtering, and giving less spurii to deal with in the output signal.

I think this a significant case in favour of a 15MHz reference for this solution, sufficiently so to make it worth implementing a 10 to 15MHz source converter [2], for the majority who may not have 15MHz OCXOs or GPSDOs (there are some about, but not terribly plentiful).

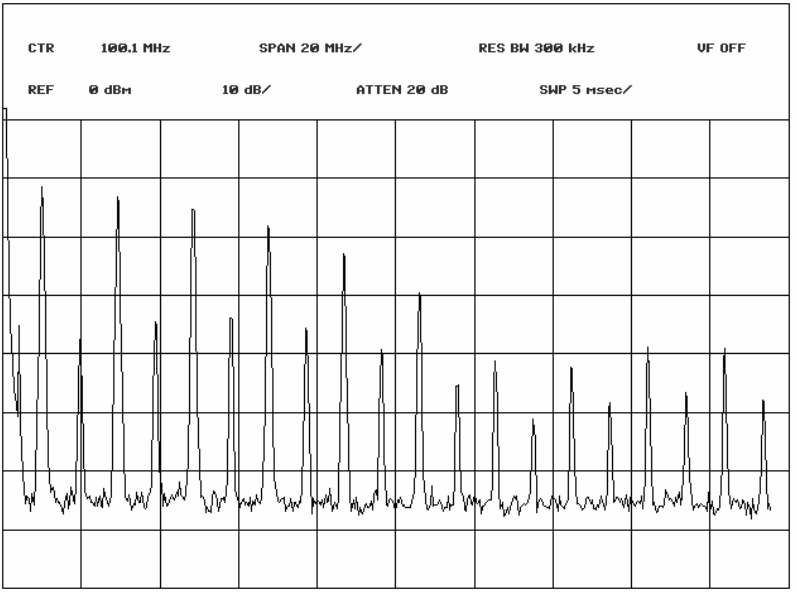


Fig 1 – Output spectrum of Diode Multiplier (10MHz input) before filtering

Implementing the 106.5MHz Solution

Fig 2 shows the stages required from the options available on the F-DFS PCB. The input buffer stage is optional – depending on whether:

1. you already have adequate drive available – around +10dBm, which is the range that most ex-commercial GPSDOs deliver – the G4HUP FC10-15 converter also can drive the diode multiplier directly, or
2. if you want to 'daisy-chain' DFS inputs, and use the buffered output option.

If neither of these apply, then the stage can be bypassed directly to the input of the diode multiplier and divider.

The diode multiplier is followed by a bandpass filter to select the 7th harmonic – Figs 3 and 4

show the circuit and the response of the filter respectively, as simulated in Ansoft.

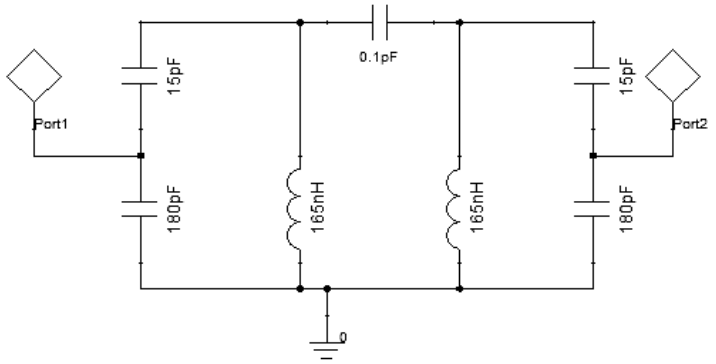


Fig 3 – 105MHz BPF – coils are Toko S18 yellow with ferrite cores

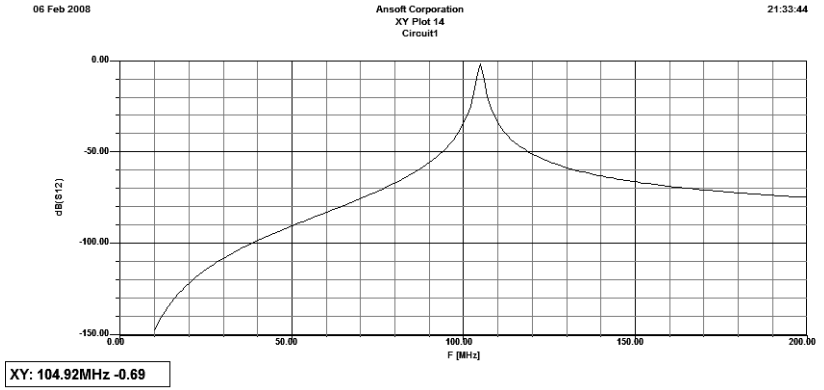


Fig 4 – 105MHz BPF response

At the filter output the 105MHz component is approx 30dB higher than any other ensuring that there are minimal unwanted products from the mixer. Two MMICs and a 3dB attenuator complete the 105MHz line-up.

The divider ratio is programmed to be 10 (ground pins 3 and 6, take pins 4 and 5 to +5v via a 10k pull-up resistor), giving 1.5MHz out. The LPF schematic and response are shown below in Figs 5 and 6

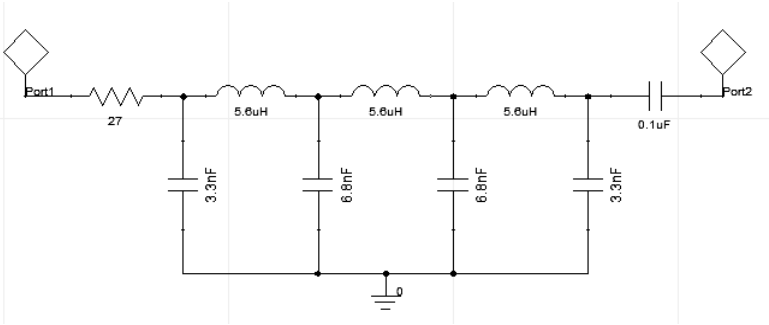


Fig 5: 1.5MHz Low Pass Filter Schematic

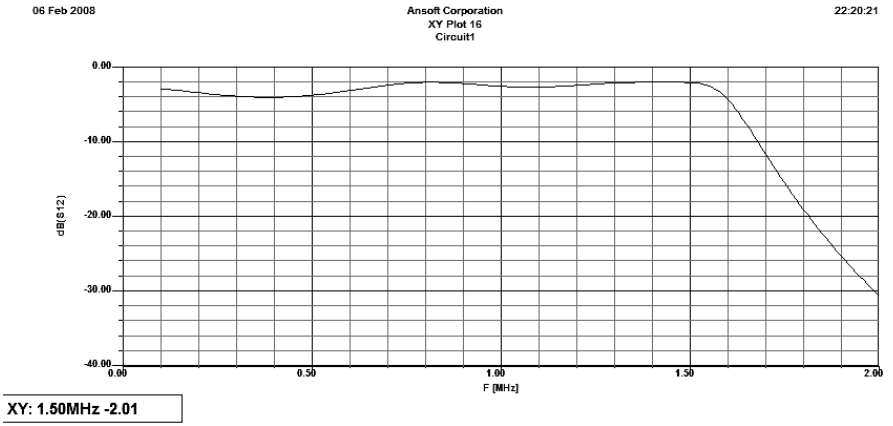


Fig 6: Response of the 1.5MHz LPF

Although no mixer is required, I used the available post-mixer amplifier and tuned circuits to further clean up the 1.5MHz signal before mixing it with the 105MHz – values for the filter can be pulled from the DFS website (as can all the other information presented here) [3]. Since this is a departure from the 'standard' architecture of the F-DFS PCB, the output from the LPF must be strapped across to the input of the amplifier.

A standard SBL-1 type mixer is OK for this mix, and this is followed by a copy of the BPF used in the diode multiplier, to select the 106.5MHz output.

Further filtering is provided by the three pole crystal filter, which reduces spurii to well below -60dBc and an output LPF to minimize the harmonics. Although this may appear superfluous, I have found that omitting it leads to the risk of other spurious products appearing round each harmonic – for the sake of a few SMD Ls and Cs it avoids problems later in the chain! The LPF schematic and response are given on the next page as Fig 7 and 8.

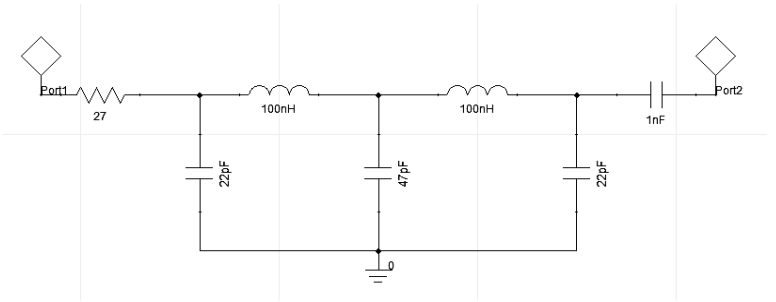


Fig 7: 110MHz Low Pass Filter

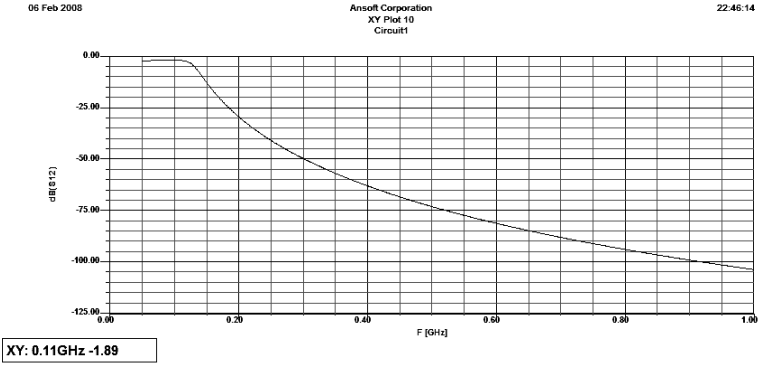


Fig 8: 110MHZ BPF response

Construction

All information to build the DFS can be found on the website, as well as colour pictures of the spectral output, and various construction notes.

I would add that I am now recommending that a brass screen is built around the diode multiplier filter – experience has shown that screening this filter reduces the spurii even further on other DFS implementations. In addition to the external screen, around the coils, there should be a brass screen between the two coils, and a small (0p3 or 0p47) capacitor provided as a top-coupling C. This addition is far easier to install before the coils are mounted. It would not hurt to apply the same treatment to the coils in the post-mixer filter at 106.5MHz.

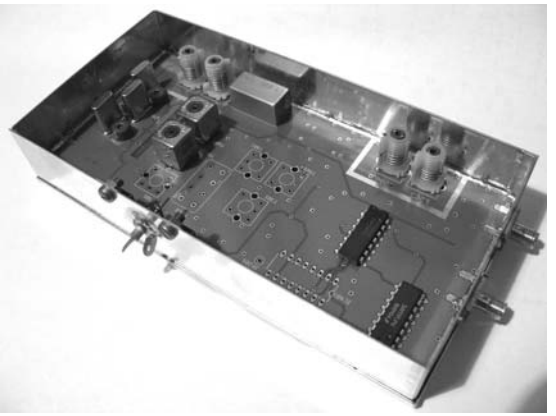
Fig 9 shows a view of the completed DFS (without the above screens!)

Performance

The 106.5MHz version gave the following results:

106.5MHz output	+2dBm
Spurii	<-60dBc
Harmonics	<-40dBc
Supply Current (at 13.8V DC)	210mA

Fig 9 – completed 106.5MHz DFS (minus screens!)



Support

Full information is available on the website, as previously stated, for this and other DFS versions. PCB's and some parts are available from the author – please contact me either QTHR, or via the link on the website home page.

References

[1] An Introduction to Direct Frequency Synthesis; G4HUP, 2008 UKuG Scatterpoint, Jan 2008

[2] FC1015 Reference Source converter; G4HUP, 2008 http://g4hup.com/FC/FC.html

[3] DFS106.5MHz; G4HUP, 2007 http://g4hup.com/DFS/VN106_5.html

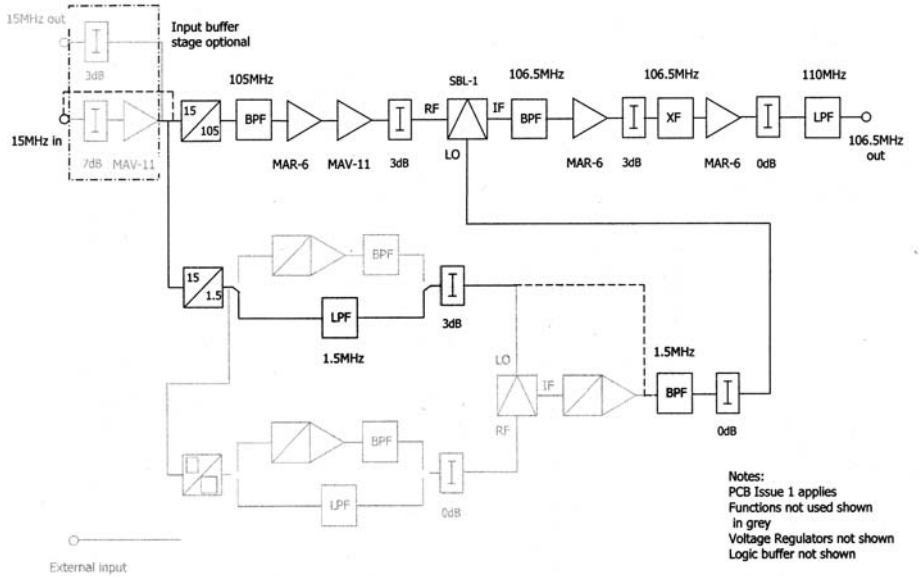


Fig 2 G4HUP Direct Frequency Synthesiser Configuration

Version: 106.5MHz

ANOTHER LOOK AT THE G4JNT GEO2 SOFTWARE SUITE

by Martyn Vincent, G3UKV

From time to time, UK microwavers, especially new recruits, ask what software is used to calculate distances, bearings and paths between two or more stations. For years I have used Andy's (G4JNT) software ***"geog2"*** which is available from many seasoned microwavers but mostly from Andy's website (**www.scrbg.org/g4jnt**) The full edition contains about 17 programs, the most useful of which I find are 'Terrain', 'Sitecalc', 'Location,' and 'Horplot' (and the later, but I find less easily interpreted, 'Horview'). Occasionally I also use 'Spothgt', 'Troppath', 'Localmap' and others.

However, these are DOS programs, which run fine on Windows 98 and earlier but often do not work on XP, ME or 2000. Whilst upgrading my shack PC I, or in fairness to my son Tim, he discovered the problem with XP – and it's not the OS itself but rather the ***graphics card*** (both plug-in and built-on-motherboard types) not being compatible. This explains why some people run 'geog2' from an XP Command OK, whilst others can't!

There are two solutions we found (maybe others too!):
The first – and the course we eventually took – was to plug in an older graphics card, which takes priority over the built-in (64 MB in my case) version. We tried a couple, and only the older one worked correctly – an 8 MB one. You may need to alter the BIOS accordingly. The 'JNT suite now works fine from the ***command*** prompt. (run < cmd < OK).

We found the ***print*** command works too – very useful for sheets of 'Sitecalc' (distances and bearings) to take with you, listing most UK portable sites and beacons when you don't have a laptop, PDA or even 'KST on your chosen chilly hilltop!

Once 'geog2' is loaded on your PC, it's easy to create a desk-top shortcut to go straight to one of the programs. One simple way to do this is by right-clicking the MS DOS Prompt icon (on the desktop or wherever) and going to Properties, where I made the Working line include the path (C:\geog\g in my case for a full 'geog' menu). I actually made a menu (file name 'g') from the shortcut which reminds me of what is in the suite, so I can just type the program name from this screen menu. No doubt you can personalise and improve that **frill**. Incidentally, as you probably know, typing ***'exit'*** at the usual screen prompt cursor returns you to Windows after a 'geog2' session.

The second approach, if you don't want to downgrade your 22nd Century PC graphics capability, (or you're using a fairly recent laptop) is to download the free 'DOSbox' program (**www.dosbox.com**) which also has options for Linux, MAC and other OS, which magically handles Andy's software perfectly on XP (and Vista they claim), both on a desktop or laptop.

First download and unzip the ***geog2*** programs and data into a newly created folder (eg geog) on your hard drive. Next, download the required version (eg Windows, Mac etc.) of DOSbox (about 1.2 MB of Windows). Install DOSbox, then run it.

At the Z:\> prompt you need to ***mount*** the geog directory (eg mount **c c:\geog**) which assigns **c** to open c:\geog. At the next Z:\> prompt, type c: which takes you into what looks like a DOS C:\ prompt (not the usual one for your hard drive! Confusing, isn't it ?) Now type any of the geog2 program file names (eg terrain, location, sitecalc) and they run just like old times! You will need to follow this ***mounting procedure*** each time you select a new DOS program, but you can arrange for DOSbox to automatically mount for you, to run a geog2 menu etc. as I did in the first approach given above – but at this point I would recommend you Google it for a tutorial.

The only shortcoming I found was rather slow program execution and the useful 'sitecalc' printout option seems to fail. Perhaps someone else can crack that one!

Despite all the hype of Google Maps etc, I find Andy's software extremely useful, easy to use and accurate, taking up miniscule drive space. I have added many sites and microwave beacons to the 1996 sites.dat file – highly desirable! If anyone wants my latest ***sites.dat*** file, just email me. (**ukv@ukv.me.uk**) The topography maps and profiles don't cover Ireland, Isle of Man or part of northern Scotland but the Locator (and other) calculations are universal.

Of course, you may find either of the above approaches useful when running other ancient DOS software. DOSbox is really made for the wide-screen-eyed gamester but there's no need to re-invent the wheel ....

73 from Martyn Vincent G3UKV

WILLIAM "BILL" JAMES _-G6XM SILENT KEY

As briefly reported in last month's Scatterpoint, Bill James, G6XM, passed away on New Year's Day this year at the age of 93 years. For some 80 years of his long life he was an amateur radio enthusiast and one of the earlier pioneers of the VHF and UHF bands. The photo right shows him in those early days with other pioneers of UK amateur radio such G2NH. The well dressed portable operators of those days would put many of us to shame! Bill was a keen 5 metre man in the early days of the band. The following text is a tribute from his eldest son Dick, who now lives in Canada. It makes fascinating reading...

Five metre band portable operation, 1933. Left to right: G2YD, G3MR, G2NH, G6XM.

William (Bill) James was born in Hanley, Stoke-on-Trent in March 1914 but spent his early years in married quarters at Aldershot where the family was posted. His father was a regular soldier, initially in the Royal Artillery, but after the First World War he transferred to the Royal Corps of Signals, and this seemed to rub off on the young William, as he soon developed an interest in radio and when about 10 years old was given a "crystal set" for Christmas by the Regimental CO.

When he was 14 he got his first radio license, a "dummy load" licence, with the call BRP and, in 1932, his full license and the call sign G6XM.

After leaving school Bill got a job at Curry's Electrical in Aldershot, installing and delivering radios by bike - this was at a time when a wireless was a piece of furniture. There were even gas-powered radios for the houses with no electricity! When he left Curry's he received a glowing reference as "a real live first rate wireless mechanic", to use the phraseology of the time. Bill stayed with Curry's for the best part of ten years, and, while the Aldershot store was not the main store, "old man Curry" showed up once in a while and laid down the law.

Meanwhile, in his spare time he was beavering away at building and operating VHF gear, and he expanded the terms of his license to 100W and portable use. A big part of his life was field days, up on the Hog's Back near Guildford, or Farnham Park.

In 1940 he was called up into the Royal Army Ordnance Corps and was formally taught radio. His course-work was so good - radio being his hobby as well as his job, that the powers that be would not let him keep his exercise books at the end of his training, and he was court-marshalled for insubordination, after demanding them back, and was demoted from Staff Sergeant to Private. He was posted back to Aldershot to teach radio, but such was his expertise that he was soon promoted back to Sergeant.

In 1942, he was posted to the new REME establishment at Gopsall Hall in Leicestershire, and when taking dancing lessons in Derby, he met Elsie Jones, and they were married there in July 1944. Courtship was hard work, since Bill had to cycle about 25 miles back and forth into Derby to see his beloved. One night he was cycling back to Gopsall through the black-out, and he was scared rigid when he heard something behind him – he looked back to see this white thing hovering over him like a ghost – it turned out to be a huge white barn owl out hunting! Bill was briefly posted to Canada in 1945, to assess Canadian manufacturing of military radios, a posting he thoroughly enjoyed, but it was foreshortened by the end of the war in Europe.

After de-mob from the forces Bill and Elsie moved down to Aldershot where he became a "War Department civilian" working at the REME workshops, and enjoying his radio at home in his "shack" at Farnborough. He had a 1933 Standard "Big Nine" car that he used for field days, with his equipment stacked across the front seats, while he sat in the back.

Whilst in Farnborough, the two boys, Richard and David were born, in 1948 and 1950. Seeking promotion, Bill moved the family to York in 1953, to their first new house, where he built a new 40' radio mast to go with the new location. He kept up more formal links with the military by serving in the Territorial Army through the fifties, earning a commission in the Royal Signals.

Further moves followed, as a technical civil servant attached to the Army, to Old Dalby in Leicestershire, to Rheindahlen in Germany with BAOR (where he became DL2XM), and then to Christchurch near Bournemouth. Bill was never happier than when in his shack or out on field days or meeting up with his fellow amateur radio enthusiasts. He was an avid builder of his own gear, constructing and operating amateur radio on most frequencies, always pushing the limit of what could be done, and including such bizarre experiments as bouncing signals off the moon.

Bill's final posting was to the Royal Military College of Science at Shrivenham, Wiltshire, where he managed the electronics workshop. Battles with the industrial trades unions in his workshops followed, ultimately settled peacefully but Bill was still happy with his radio and Elsie was happy to accompany him on field days. Ironically,

the work there that he enjoyed the most was after his formal retirement, when he helped out one of the professors in the lab, doing antenna research for a few months.

After retirement, Bill and Elsie moved back near Christchurch and then subsequently, in 1985, to Okehampton to be nearer their younger son, David, who was based in Plymouth, Richard having by then having settled in Canada. In 1994 they celebrated their golden wedding by visiting Canada and taking the train trip through the Rockies that Bill did not have time for back in '45.

Bill was by then building and operating, or trying to operate, in the microwave amateur wavebands, from sites on Dartmoor, keeping his radio gear dry by sheltering it in a plastic bucket. (**see photo right...editor**) His call sign stands out in the contest listings because by this time G6XM was one of the few four-digit call signs left, especially in the VHF arena.

Elsie passed way in 2003 and Bill soldiered on as best he could for the next few years, even buying and learning how to use a home computer, but at 90 years old he started to become very frail and could not continue with his radio on the scale that he had previously. He sold the bungalow in 2006 and moved into a care home with the intention of carrying on with some limited amateur equipment, but with failing eyesight and a succession of falls that required hospital care, he could not carry on.

Bill died peacefully in Okehampton Community Hospital on 1st January 2008, having been visited by both his sons and daughters in law, and his two grandsons, in the preceding few days. **Richard James. Jan. 2008**

I knew Bill for most of my amateur radio life. Our first QSOs were on 23cm AM in the early 1970s when I lived near Abingdon, and Bill lived at Highworth, near Swindon. Much later I used to bump into him in the street when we both lived in the Okehampton area. Bill was a true pioneer. He was active on 56MHz and 112MHz quite a few years before WW2 and was an early operator on 144MHz, once that band was released after the war. I'll remember Bill with considerable respect and affection.

Chris, GW4DGU (South Wales)

It's very sad to hear of Bill's passing. Although we never worked on the microwave bands, Bill was a regular QSO for me on 6m, back in the days of the first 40 'research' permits! Over a period of time we had CW QSOs on an almost daily basis from my QTH at Stoke on Trent - I was running just 1.5 to a dipole antenna!

My condolences to his family.

Dave, G4HUP (Suffolk)

I am very sorry to hear the news . He was a dear chap and a real gentleman.

Ralph, G4ALY (Cornwall)

Sad news indeed.. I used to work '6XM down the 'Severn Gap' from Birmingham when I was a schoolboy (in the days when band-plans were regionalised). He was an iconic signal on the bands and always so very supportive.
My condolences to Bill's family. RIP Bill.

Ian, G8KQW (Surrey)

Bill was one of those lovable characters of amateur radio. I first met him at a Microwave Roundtable held at RAL many years ago. I'd had 10GHz QSOs with him before then, so it was added pleasure to meet this rather "posh" sounding gentlemen in the flesh. He was taller than I'd imagined and his height was used to great effect when, at RAL, the late Alan Grayson G4FXW and I were looking through a box of 24GHz waveguide parts on the fleamarket table with the aim of picking some out for ourselves and this long arm reached over our shoulders, picked up the box and a rather military sounding voice said, "Good, I think I'll have all of those" ... and he did!! Alan and I just had to laugh!

During the late 90s, Bill joined the microwave net on 80m SSB. This ran from 0800-0900 every day apart from Sundays and he frequently checked in for a chat with others, some of whom are no longer with us ... G3KEU and G3FDW for example. He often announced his presence by using CW!

Bill was my best 10GHz DX, at 380km, for some time when I first got onto 10GHz narrowband. We were both using converted MACOM "white boxes" at 135mW output and no receive preamps. That RST 339 cw QSO over the very obstructed path from Merryton Low to Dartmoor was, for me, one the highlights of the early 1990s.

Bill also got onto 24GHz before many of us and worked the definitive 150km path from Dartmoor to the Prescilli Mountains in SW Wales... a real achievement in the '90s.

He was always very supportive of the UK Microwave Group, his subs only lapsing after he become frail and moved into care.

RIP Bill... from Peter, G3PHO (South Yorkshire)

ACTIVITY NEWS FROM THE WORLD ABOVE 1000MHz

By Robin Lucas, G8APZ

The last two issues of Scatterpoint were extended from 20 to 24 pages. Last month, I had rather too much for the normal four pages of Activity News, and so I had to ask the Editor for another page.

Peter was short of pages as it was, and so he added another four. Even so, I had a few items which I was unable to squeeze in, so these are included in this month's column.

When I have logged in to the ON4KST chat pages from time to time, I have noticed several unfamiliar callsigns. These are stations who are getting going on 23cm, and from the look of the conversations, it seems that there are plenty of offers of advice and words of encouragement to these newcomers.

There is the usual reminder for the contest and activity periods below. If ever I should call this Sport Radio, will someone please have me certified!

If you have been unable to operate in these contests and activity days during 2007, please try to participate in at least some of the 2008 events.

CONTEST and ACTIVITY REMINDER

February

19-Feb 2000 - 2230 1.3/2.3GHz Activity Contest (RSGB Contest)
24-Feb 0900 - 2000 All-band Activity Day Non competitive - Last Sunday in month

March

2-Mar 0900 - 1400 Low band 1.3/2.3/3.4GHz Last 5 hrs of IARU event
18-Mar 2000 - 2230 1.3/2.3GHz Activity Contest (RSGB Contest)
23-Mar French Activity day - 24GHz and up
30-Mar 0900 - 2000 All-band Activity Day Non competitive - Last Sunday in month

SHETLAND ISLES on 23cm

Keith, **G4ODA** planned a holiday trip to the Shetland Islands over the Christmas and New Year period, and as usual he took a lot of radio gear.

Whilst the main emphasis was to be on 4M/6M/2M meteor scatter and 70cm, he decided at the last minute to include some equipment for **23cm**. He was very fortunate indeed to catch the best of the December tropo openings.

Eshaness lighthouse - Shetland - IP90el

Photo © Nigel G3TXF

Keith operated as **GM4ODA/p**, (IP90el) at the Eshaness lighthouse in the north west of the main island. It is certainly a remote place, about an hour's drive from Lerwick, approximately 65km away.

He had not planned to run **23cm** as he did not expect to get a signal out from **IP90**. However, when he heard the conditions at home the night before he drove up to Aberdeen for the ferry, he decided to put in some basic kit just in case. He had little time or space, but in hindsight, now wishes that he had taken more.

Keith, GM4ODA/p wrote:

My kit on **23cm** was a FT290 Mk1 plus a Mk1 **DB6NT** transverter homebrewed from a kit some time ago. This was followed by a homebrewed PA with 2 x block modules giving 30 watts into a 28 el quad loop with poor SWR. If only I had taken a better antenna, I would have done so much better.

I had a bad trip to the north, and what normally takes 10hrs to Aberdeen took many more as both A1 and M62 were closed by accidents. I was within one

minute of missing the ferry.

On arrival, I was tired and hungry and not "performing" at my best. With hindsight, I should have done better but I was also trying to keep 2 and 70 running so I guess it was all so much better than I could have hoped for.

73 Keith

The best DX of all Keith's contacts on **23cm** was made with the very first QSO on 20th December, 2007 when he contacted **DL3WW**,(JO60gl) on CW (539) at a distance of 1423km. The only other contact on the 20th with **DK6AS**,(JO52jj) was a mere 1178km!

On 21st December, Keith worked another 14 stations on **23cm**. These are the contacts in excess of 1000km:
DJ5BV,(JO30ci) 1230km, **ON4POO**,(JO20dp) 1156km, **DJ6JJ**,(JO31) 1155km, **DF9QX**, (JO42) 1121km, **DL5YEE**,(JO42gf) 1110km, **PA0EZ**,(JO32) 1067km, **PA2M**,(JO21) 1059km, **SM7ECM**,(JO65) 1017km, with **SM7FMX**, (JO65) at 1014km completing the list.

There were also a few lucky **G**s who managed to make it, these being **G4EAT**, **G4DDK**, **G3LQR**, and **G4KIY** all at well over 900km.

With only one or two exceptions, the signal reports either way were between 51 and 55.

DECEMBER - OTHER REPORTS

From: John G3XDY, Nr. Ipswich, JO02ob

The tropo appeared better for stations further North. There were a few "getaways" where conditions changed, and I missed NAC/UKAC on the 18thDec due to work commitments. **10GHz** did not appear to be as good as the lower bands.

73, John G3XDY

John's log contains contacts on all the bands from **23cm** to **3cm**. The higher bands peaked mainly on 20th and 21st. On **23cm** the 17th brought in **SP4MPB**,(KO03) on CW at 1311km. On the 19th **SM7LCB**,(JO86) at 1100km, and on 20th, **SP4MPB** again with **SP1FJZ**,(JO84) 1037km, **SM6HYG**,(JO58) 947km, and **DL7YC**, (JO62) 822km. On 21st, just **DJ8MS**,at 761km.

On **13cm** the 20th produced **SM4LMV**, (JO79) on CW at 1181km, **SM7GEP**,(JO77) 1060km, and **DL7YC**,(JO62) at 822km who was also worked on **9cm** together with **DJ6JJ**, (JO31) 406km. On 21st **9cm** produced just **OZ2OE**,(JO45) on CW at 704km.

On the higher bands, **6cm** on the 20th produced a contact with **SM7GEP**,(JO77) on CW at 1060km, and **OZ2LD**,(JO54) (CW) 755km, **DL7YC**,(JO62) (CW) 822km, **DJ6JJ**,(JO31) (SSB) 406km, 21/12 **OZ2OE**,(JO45) 704km.

The only two contacts on **10GHz** were with **DJ6JJ**,(JO31) SSB 59/59 406km, on 20th, and **OZ2LD**,(JO54) 755km on CW at on 21st.

There were some really good contacts in the log for John, despite being on the edge of the conditions.

From: **Ian Lamb, G8KQW, Farnham, Surrey**

I worked **SK7MW** and **GM4CXM** on Tuesday evening, 18th Dec. I tried to work **SA4Z** but he couldn't hear me (like **SM7GEP** on 19th) so I'm now building a 1kW PA for **23cm**.

I also worked **SM4DHN** on **1296MHz** on Wednesday morning (19th) at 06h00; we heard each other on **13cm** but didn't complete what would have been a new UK record so that will have to wait for next time.

Apart from that I have spent my time listening to **SK** & **OZ** beacons on **13cm** and **9cm** but there has been no activity on those bands.

I also missed working **GM4ODA/P** on **23cm** today because I don't have the possibility to operate on the IF - 144 or 432MHz.

73, Ian

SUMMITS ON THE AIR - 10GHz

From: Richard Newstead, G3CWI

The UK's first recorded SOTA **10GHz** contacts took place on Sunday (20th Jan) with Richard **G4ERP** pipping me to the first contact from his site at Cleeve Hill. Good one Richard!

I was on from Cringle Moor - N York Moors, ascending in heavy rain. This turned to drizzle by the time that I reached the top and I was able to operate comfortably with the transverter system sitting on my lap in a plastic bag. Rob **M0DTS** was my QSO partner and was a huge signal over a short optical path. For those that like accurate readings, I can confirm that the signals were "on the end stop" at both ends of the path, and we enjoyed a nice relaxed chat.

The Manchester beacon was heard at 529 convincing me that narrowband is pretty potent

stuff! Emley Moor was 589 - I assume the "N" it sent meant I was on the north beam? First time I have ever heard that beacon despite many tests in the past.

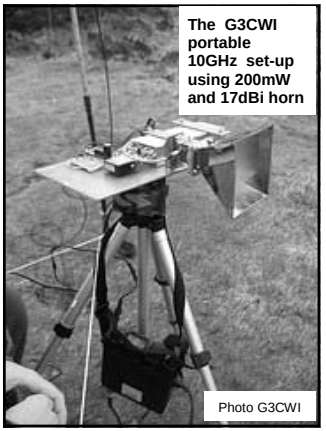
Given that **G4ERP** was also QRV it looks like the first **10GHz** SOTA "s2s" cannot be far away. **73, Richard, G3CWI**

MORE SOTA - FIRST 10GHz "S2S"

On 27th January, 2008 Richard **G4ERP** and Richard **G3CWI** made the first SOTA **10GHz** "s2s" contact. **G4ERP** managed to qualify his hill on **10GHz** making 6(?) contacts, whereas **G3CWI** managed only a single **10GHz** contact from his SOTA hill.

However, **G3CWI** then moved to Merryton Low (not a SOTA hill), and worked **G4PBP**, **M0DTS**, **G3LRP**, **G3FYX** (one-way RS) and his best DX was Sam **G4DDK,**(JO02) at 252km.

Richard, **G3CWI** wrote..... "It was cold, and at times very windy sitting on the hilltops. The talkback system was a great success with just a button press to move between 2m and **10GHz**. In fact almost everything was a great success. The number of contacts demonstrated that **10GHz** is a viable band for SOTA although clearly it will remain something of a challenge... but, then again, that's what makes it interesting. Thanks to everyone who came on and tried. I had a few attempts fail this time, but hopefully as time goes on I will improve the system.



The G3CWI portable 10GHz set-up using 200mW and 17dBi horn

Photo G3CWI

Inevitably lightweight portable will always be a compromise between weight and system capability." **73, Richard**

241GHz NEW WORLD RECORD ?

From: Brian Justin, WA1ZMS

During the January ARRL VHF contest I only had one QSO but it was one of the best QSOs I have ever had.

I would like to claim what should be a new world DX record of 114.4km for the **241GHz** band. The QSO was between myself, **WA1ZMS/4** and **W4WWQ/4** using CW. (The former DX record was 79km).

QSO Details: Jan 21st, 2008 at 01:24z
WA1ZMS/4 37-31-00N 79-30-35W **FM07fm**
W4WWQ/4 36-43-03N 80-19-23W **EM96ur**
Distance: 114.4km

WA1ZMS/4 WX: Temp: -15C Dew Point: -26C RH: 38% Wind: 32km/h Wind chill: -26C Time spent in the wind: 5 hours. Barometric pressure: 876mb Atmospheric loss: 0.29dB/km

W4WWQ/4 WX: Temp: -11C Dew Point: -22C RH: 40% Barometric pressure: 890mb Atmospheric loss: 0.41dB/km

Brian checks the gear in the back of the van

Photo courtesy of WA1ZMS

This QSO was over 2 years in the making, with several failed attempts at even shorter distances during that time period. The key to success was the very driest of winter air that may only take place one day per year in our part of the country.

One receiver mixer is better than the other by several dB thus CW copy was by ear on the **WA1ZMS** end, but required the aid of Spectran on the **W4WWQ** end.

The wind chill made for an interesting experi-

ence and as **W4WWQ** said, "it's amazing how a piece of RG-58 can become like a baton in such conditions."

Two hours into the efforts I lost feeling in my right toe from just standing around and had to resort to putting a chemical hand warmer in my boot. My laptop also refused to boot and the battery now suffers from a shorted cell.

My contest log might only show one QSO and one grid, but it was the best January contest I've ever had! My personal thanks to Pete, **W4WWQ** for dropping everything he was doing and going on a 3 hour drive away from home to attempt this QSO. **73, Brian, WA1ZMS/4**

*Congratulations to both stations on making this landmark QSO. Brian doesn't mention that the previous record of 79km was also held by him! That record was achieved on 17th February, 2004 between **WA1ZMS/4** and **W2SZ/4** using QRSS with a dot lasting a second, and a dash three seconds! ...editor*

FRENCH ACTIVITY DAYS

Ralph Bird, G4ALY,(IO70) sent an analysis of the 2007 Journée Activité (JA) which was published in the December issue of "Hyper Bulletin" (the French equivalent of Scatterpoint).

The amount of activity in France for these activity days certainly seems to indicate a very healthy interest in the microwave bands.

On the lower bands (**23cm** and **13cm)**, there were 72 French callsigns recorded as being QRV, of which 29 were portables, and 43 home stations. Other (non-F) calls which appeared in the logs were **DK3SE**, **DR6A**, **EA3XU**, **G4ALY**, **HB9AMH**, and **HB9DTX.**

On the higher bands (**5.7GHz**, **10GHz** and **24GHz**), there were 100 French stations QRV, of which 66 were portable, and 34 fixed.

12 **G** stations appeared in the logs, together with 7 **HB** (yes SEVEN!), 3 Italian, 2 German, and 1 Spanish station.

Journée Activité Dates 2008

Claude, F9OE has sent the dates. These are: 23rd March (**24GHz** and up), 26th/27th April, 24th/25th May, 21st/22nd June, 13th July F6BSJ JA using Mont Blanc as a reflection point, 26th/27th July, 30th/31st August, 27th/28th September, and 25th/26th October.

G4FRE CHRISTMAS VISIT

I arrived in Malvern on Dec 21st. I hand carried the **5GHz** twt tube, rigs and preamps so they got here unscathed. The 53lb bag with the **2.3GHz** gear arrived with me. The 50lb bag with the PSU for the 15w **10GHz**/**5GHz** twt, the 18" dish and the **5.7GHz** transverter is still "AWOL" thanks to American Airlines. Even today they still haven't a clue where it is.

On Dec 22nd, I heard the **HB9EME** beacon on **23cm**. On Dec 23rd, **GB3MHL** was still non existent but I worked **G4DDK**, **G8KQW**, **G4BRK**, **G0RRJ, G4BAO** and **G4PBP** on **23cm** and was heard by **G4FSG**. I also worked **G4DDK** on **2.3GHz**.

During the rest of the stay I worked **G4DDK** on **23cm** and **13cm** many times - not bad for a 240km path. On both bands the antennas were indoors, resting on storage boxes. Opening the window made no difference to signal strength on **13cm**, it just cooled the shack down!

I heard **GB3SCS** once on **13cm**, but never heard **GB3MHS**, even when **GB3MHL** was very loud. **GB3LES** was a huge signal on **13cm**.

I only heard **GB3MHX** on **10GHz** on one occasion via rainscatter.

On **23cm** I had 60w from the Demi transverter, and an F9FT 23 ele. And on **13cm** I have the **G3WDG** transverter + 60W pa + 25 ele Tonna (have others had to re-drill half the holes for the element insulators because they were too small?) **73, Dave, G4FRE**

SWEDISH ACCESS TO 3.4GHz

Mogglarp, **SK7MW** mentions that **SM** stations have access to **3.4GHz** again, this time to 30th June 2008. However, they still require special permission.

... AND FINALLY

To help with a project I am working on, I would like to ask readers to send me beacon recordings (up to 60 second clips) on an ongoing basis. Please email your .wav files to:

<g8apz@g8apz.org.uk> **73, Robin**

Please remember to send your activity news for this column to:
scatterpoint@microwavers.org

BRITISH AMATEUR TELEVISON CLUB

A few years ago I let my BATC (British Amateur Television Club) membership lapse, for several reasons, not least that I've not recently been using ATV on any band and the annual sub (£15) did not seem very good value for money at the time.

However, I've re-joined now as they do a 'cyber membership' for just £4 a year. Their website has a lot of downloadable resources too.

These might interest some others, including microwavers, out there too !

73 Martyn G3UKV

WANTED

Does anyone have a spare **IC202** they don't need these days? I'm anxious to get hold of another so I can tune around on the microwave bands. After many years of DX working at microwaves I'm now not as active as I used to be in the old days but I still like to be able to tune up and down the bands quickly and the IC202 allows that, even though the readout is not all that accurate by modern standards.
I'm located in Norfolk.

Please email me, John Tye, G4BYV at: **john.g4byv@tiscali.co.uk**

UK MICROWAVE GROUP PROCEEDINGS 2006-7

There are still a few copies available for those that missed them late last year.

We expect them to be all sold off at the Bath Microwave Roundtable in April so get yours while you can, right now!

Bonus Feature: Each copy comes complete with **free CD** of the Proceedings of the Eastern VHF/UHF Society and the North East Weak Signal Society's Convention held in April 2007 in New England, USA, courtesy of Paul Wade W1GHZ and Bruce Woods N2LIV

Prices inc P&P:

UK:	£7
Europe:	£9 or €14
Rest of World:	£12 or $25

For further information and to order contact our Secretary Ian Lamb, G8KQW, whose address can be found on page 2 of this Scatterpoint.

Details of the book's contest can be found at:
http://www.microwavers.org/proceedings.htm