An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

Published by the UK Microwave Group

2010 JUNE

101 uses for a Sky dish ! G4BAO's antenna becomes a bird's annual nesting ground

John writes ...

It was the same last year!
Well they're going to get a shock when I take it down later in the week!

Editor's comment ... If he's not careful John's QTH could become a designated SSSI (Site of Special scientific interest) ...

In this issue ...

Latest News ...

- **Increasing 23cm activity in the UK continues**
- **EME Activity weekend on the same weekend as the Finningley Round Table**
- **When will the microwave tropo opening come?**

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

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From the Editor's Desk

After my appeal for Scatterpoint material last month I was most grateful to receive a number of articles and other items for this month's edition. My thanks go to ON4CDU, M0ELS, F6DRO, G0EWN, G4JNT, G3LYP, G8ACE and G3ZEZ and those of you who sent activity news to Robin. It was most heartwarming to get all this input within a few days of the May Scatterpoint's appearance !

Now, can we do all that again as the July issue is extremely short of input? !

73 from Peter, G3PHO
Editor

Next month.....

The next edition will be the July-August issue which spans the two summer months. Expect to receive it around the 10th of August. The frequency then reverts to the normal last week of the month in September.

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

May 2010 Scatterpoint Apology for late arrival

It's been drawn to my attention that the printed version of last month's Scatterpoint arrived very late, only reaching subscriber letterboxes on the 8th June and thus outside the month shown on its cover.

I sent the draft copy to our printers on the 23rd May and expected it to be printed and mailed out during the following week. It was posted as planned but, for some reason, it appears to have been delayed during transit in Her Majesty's Royal Mail!

Please accept my apologies for its lateness. I don't like the newsletter to come out the month after its published date!

One lesson we can all learn from this and the various email problems we have had in the past is that **the most reliable way to get your Scatterpoint is to download it from the Yahoo Scatterpoint Group**. This facility is available ONLY to fully paid up members of the UK Microwave Group, by the way, and is not in the public domain.

73 Peter G3PHO (Scatterpoint Editor)

LAST REMINDER ….

There are still a few places left at the

SOUTH YORKSHIRE MICROWAVE ROUND TABLE

FINNINGLEY ARS HQ

10-11 JULY 2010

REGISTER ONLINE AT:

Http://www.g0ghk.co.uk/table.php

AT LEAST ONE WEEK BEFORE THE EVENT

UK MICROWAVE GROUP SUBSCRIPTION INFORMATION

The following subscription rates now apply. **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!

Your personal renewal date is shown at the foot of your address label if you receive Scatterpoint in paper format. If you are an email subscriber then you will have to make a quick check with the membership secretary if you have forgotten the renewal date. From now 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 (the editor suggests having it tattooed on your forearm!).
Please also note the payment methods and be meticulous with Paypal and cheque details.

Renewal of subscriptions requiring a **paper copy** of Scatterpoint are as follows:

Delivery to:	**UK £**	**US $**	**Eur €**
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Rest of World	24.00	48.00	36.00

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!)

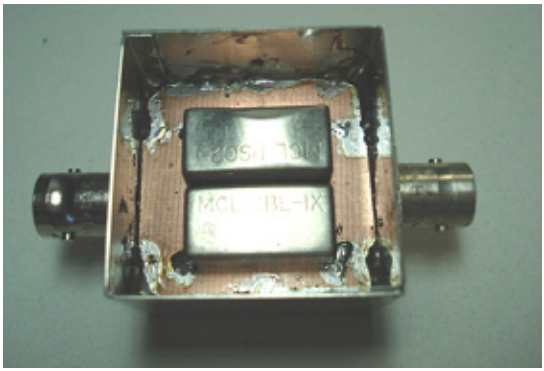
The standard membership rate for 2010 is:

UK	**£6.00**
US	**$12.00**
Europe	**€10.00**

This basic sum is for **UKuG membership.** For this you receive Scatterpoint for FREE by email. If you want a paper copy **then the higher rates apply.**

A Simple Frequency Multiplier

By Mike Scott, G3LYP



I recently needed a signal source at 600MHz to align the filter on the second mixer of Bernie's (G4HJW) 3cm LNB based receiver. My HP3200B VHF Oscillator covers from 10 – 500MHz in six switched bands, and initially I thought of using the second harmonic of 300MHz, but on looking at the output spectrum, I found that this was 45dB below the fundamental. Although this would probably have worked, I thought that a broad band doubler would usefully extend the range of this unit to about 1GHz.

By coincidence, Andy's (G4JNT) "Short Circuits" column in the May issue of RadCom on the use of various MiniCircuits building blocks suggested a neat solution. Over the years I have collected a number of these components from rallies, round-tables and salvaged from various pieces of junk. Amongst these I had several mixers and splitters. The PSC2-1 is a two way splitter with no phase shift between the outputs. Its frequency coverage is from 100kHz to 400MHz. The outputs from this were taken to an SBL1-X mixer which is rated at 10 – 1000MHz on the RF and LO ports and 5 – 500MHz on the IF port. In view of the lower frequency rating of the IF port, I decided to connect one of the inputs to this port and the other to the RF port, and take the output from the LO port.

With 300MHz input the desired 600MHz second harmonic was 40dB above the fundamental. As I increased the input frequency up to about 470MHz, the level of the fundamental rose to about -27dB relative to the second harmonic. Above this frequency, the level of the second harmonic fell rapidly and with the input at 500MHz, the two signals were of equal strength.

To see what would happen if the inputs were connected in a more logical fashion, I connected the two inputs from the splitter to the LO and RF ports of the mixer and took the output from the IF port. Although the second harmonic was greater than the fundamental the difference was only 10dB so I reverted to the original system for the final version which was built into the smallest of the Schubert tinplate boxes and fitted with two BNC connectors. (See photo)

It should be noted that the SBL-1X has a slightly different pinout to the SBL-1 in that the IF and RF connections are reversed. The SBL-1X also has the four ground pins connected to the case, whereas in the SBL-1 the ground pins require external connection.

The HPF-505X, about which there was some discussion on the Microwave Reflector a short time ago, works as well as the SBL-1X but requires the ground pins to be connected externally.

If improved spectral purity was required, a suitable high pass filter could be included of which there are many listed in the MiniCircuits catalogue.

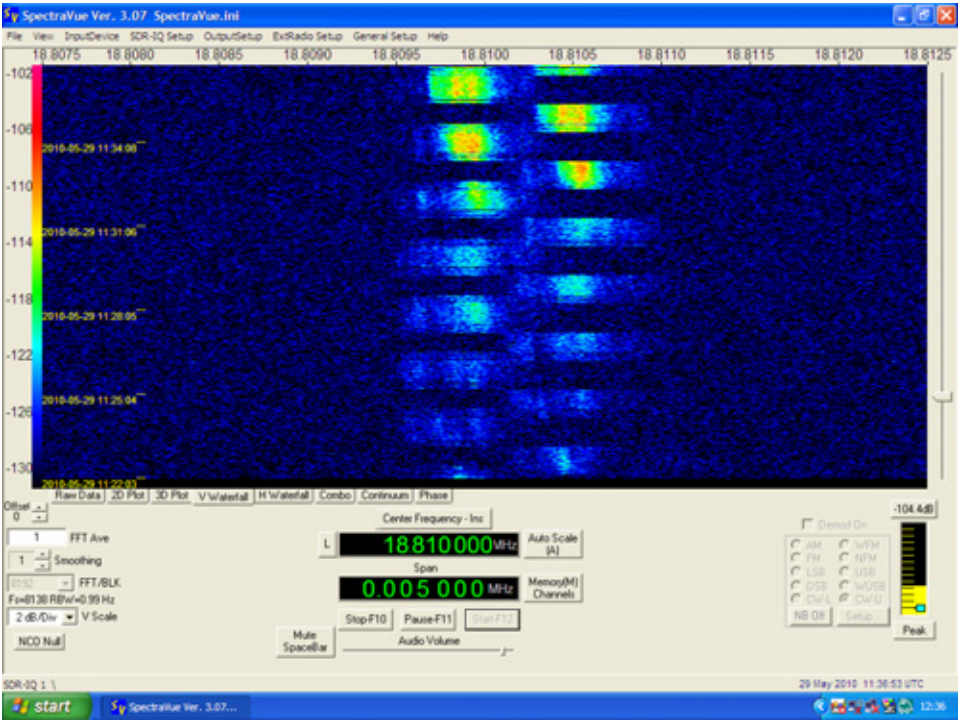
The main advantage of this simple circuit is that it requires no DC supply and can be connected in-line at any convenient point.

Using a G4HJW 10GHz LNB modification to receive beacon signals .... A brief note by Barry, G8AGN

Reception of 10GHz GB3XGH (Rochdale) beacon via rain-scatter by G8AGN (QTHR) using G4HJW's bare-foot 3cm LNB-based Rx and SDR-IQ with SpectraVue 3.07.

Distance = 48km. Saturday 29 May 2010. All times are UTC.

This beacon is not normally audible at G8AGN's home location QTH due to the very obstructed path.



JT4 Data for the UKµG Reverse DDS Module

Andy Talbot G4JNT May 2010

JT4 Overview:

The JT4g data mode, part of the WSJT Suite by Joe Taylor, K1JT, [1] has proved its capability for getting through under extremely weak signal conditions and can cope with fading, frequency drift and up to several hundred Hz of frequency scattering. Its weak signal performance alone appears to show about 6dB advantage over aural copied CW. A JT4g message has been added to three of the Bell Hill beacons, GB3SCS, GB3SCC, and GB3SCX on 2.3, 5.76 and 10GHz and is also in use on the Central Scotland 10GHz beacon GB3CSB. At the time of writing, it has just been added to GB3CAM on 24048.87MHz making this the first one on the band to use this mode.

JT4 consists of a four tone Multi Frequency Shift Keyed (4-MFSK) waveform, with the spacing between the tones chosen depending on the frequency band and expected spreading. 207 symbols are sent at a rate of 4.375Hz over a 48 second period. On microwaves the widest spacing, the G variant, has been adopted with 315Hz tone spacing. A rigid timing structure is employed and the start of the transmission must coincide with the UTC even-minute interval. For the decoder to work correctly, this start point must be no more than a few seconds late or one second early - the protocol was originally designed for EME with its 2 seconds delay. For beacon use the entire message contains exactly 13 characters taken from an alphabet of letters, numbers and a few punctuation symbols.

The UKµG RDDS board was described in the February and March 2010 issues of Scatterpoint and allows the frequency of a microwave source to be set to a high precision. By reprogramming (or changing) the PIC microcontroller and adding a timing source such as a GPS receiver module the RDDS module can be used to generate a JT4 beacon message with no further hardware changes. The PIC decodes the serial data from the GPS receiver and at the even-minute point reads pre-stored message data, converting this to JT4 modulation by reprogramming the DDS in real-time at a 4.375Hz symbol rate with values corresponding to each of the four tone frequencies. The four frequencies have to be calculated beforehand and are stored in the PICs non-volatile memory, along with the message symbol data and certain other setup parameters.

The PIC also stores the rest of the information for the beacon message, namely A CW message which is replayed immediately the JT4 transmission has completed, starting at approximately the even minute + 50 seconds mark. Then, at a precise user definable point after the start of the odd minute, the CW message is repeated. In typical usage this allows two CW idents spaced by around 30 seconds with periods of plain carrier of at least the recommended 20 seconds. Adjusting the time of the second CW message allows one extended period of carrier every two minutes. Apart from the four tone frequencies forming the JT4 data, up to three more different tone frequencies can be allocated to plain carrier, FSK CW key up and Key down – or tones can simply be reused if desired. This gives maximum flexibility with regard to tuning and setting to the nominated frequency. [5]

Connecting the GPS module:

The 20 pin expansion header provided within the RDDS unit is used for interfacing to the GPS. Three data lines are used, although only two are actually only needed for JT4 operation. The third allows GPS receiver setup information to be sent at start up of the controller if needed. In extreme cases, if reduced accuracy of the timing is acceptable, only the serial data is essential. The 7805 regulator in the RDDS module has sufficient spare capability to supply the 100 – 200mA needed by most GPS receiver modules that take a +5V input, although users may have to be aware of any additional heat sinking requirements that may be necessary.

Two different types of serial data from the GPS can be catered for. The proprietary binary version supplied by the Motorola Oncore or M12 type GPS module at 9600 baud, or standard NMEA text messages at 4800 baud. The type and polarity of the data can be selected at the time

the PIC firmware is compiled. Either native 5V logic or RS232 polarity can be catered-for, but note that if true positive/negative RS232 voltage levels are encountered, an additional resistor of around 4k7 needs to be inserted in the Data In line to prevent excessive current into the PIC interface

Suitable Oncore GPS receiver modules are available from [2] Note that this family of modules can be commanded to supply data in NMEA format, but given the choice, the binary version is preferable.

Figure 1 shows the interface connections, specifically for the Oncore Module with its 10 pin header, and includes an additional red/green LED for front panel mounting, although the ones already mounted on the PCB will suffice for testing.

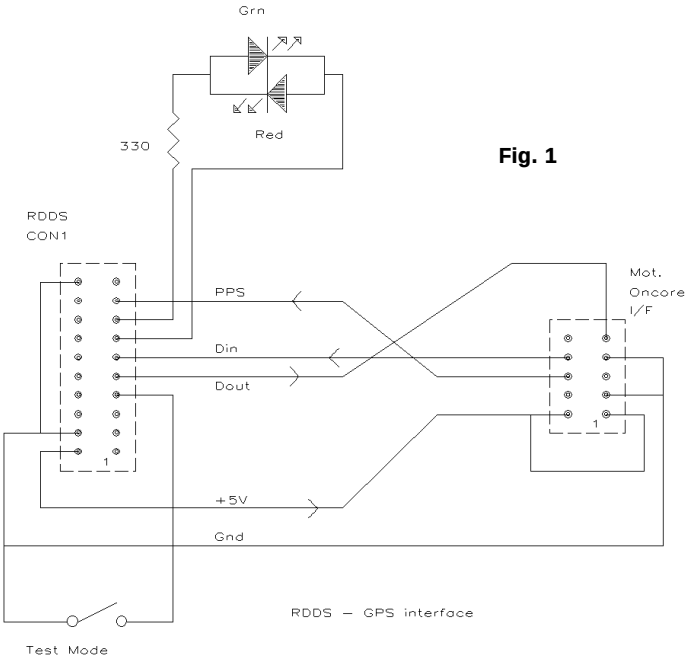


Fig. 1

Table 1, below, lists the generalised connection details for the RDDS interface for connections to other GPS receiver modules.

RDDS Header	Function	PIC I/F
2	+5V supply to GPS Module	
4 & 8	Ground	
7	Test Link to ground–carrier, leave O/C normally	PB5
9	Serial Data Out TO GPS (optional)	PB4
11	Serial Data In FROM GPS	PB3
17	One Pulse Per Second signal FROM GPS	PB0

PIC Coding Details:

All information relating to the message, frequencies and setup need to be programmed into the PIC at the start. There is no facility for field updating with an RS232 interface as was provided on the original RDDS implementation and all values need to be included within the source file which is compiled to give the .HEX file for download to the PIC device. Several compile-time flags need to be specified to customise the compiled code. These relate to the data polarity, the data format and whether the 1 PPS signal is used. Also whether, for straight DDS use, the internal PLL clock multiplier is to be enabled. This PLL must NOT be enabled for reverse DDS use as there will be a danger of over clocking (and cooking) the DDS chip.

The basic PIC firmware is contained in the source file JT4BCN_9851.ASM which is used unmodified. The JT4 symbol information resides in an auxiliary include file JT4SYMBS.INC which can be generated automatically by the utility GENJT4.EXE. Alternatively, the symbols can be derived from the WSJT software, following Joe's instructions supplied with the software suite, formatted and entered manually into the include file). User information such as frequencies and tone allocation s stored in another include file JT4_9851.INC which has to be customised for each individual source. This file also contains the CW message contents, CW speed and other setup constants and flags. Full details of how to define all these can be found at [3]

There is the option of just using the serial data to derive timing and ignoring the 1 pulse-per-second signal. This may be preferred if timing data is derived from a GPS simulator such as an MSF time code utility [4] where the provision of a 1 PPS timing pulse will likely offer no greater accuracy than that of the serial data alone.

The actual JT4 Symbol data stored in JT4SYMBS.INC is generated automatically in exactly the form shown as a result of running the utility GENJT4.EXE. available from [3]. It should not be necessary to alter the file in any way. The file is regenerated and overwritten each time GENJT4 is run, it is advisable to save a copy under a different name – eg, GB3SCS_JT4SYMBS.INC.

JT4 Software Operation:

When power is first applied the DDS will be initialised to the reference frequency and the CW message will be sent once, with the red led flashing in sympathy with the CW characters. The green led will flash once and the GPS data line is monitored for a valid 'GPS Valid' code arriving . In the NMEA $GPRMC string this is the "A" sent in the third data item, in Motorola protocol it appears as a flag in the appropriate position. Until the GPS is confirmed as valid, the CW message will be sent repeatedly with a single flash of the green LED between messages.

As soon as the GPS receiver indicates valid data is now present, the green LED will start to give a short flash once per second in synchronism with the serial data stream which is continuously monitored to determine the GPS lock status. Note that when NMEA data is used – the flash is very short. With the GPS-locked flag is detected, the pattern is long flash every second (for NMEA it will appear to be almost continuously on). If the GPS receiver subsequently loses lock, the PIC monitors the GPSValid flag and changes to a short green flash to show this. Since most GPS receivers will still be outputting valid data and retain their timing during such flywheel operation, no further action is taken by this software other than the short green flash to indicate loss of lock. When lock is reacquired, long green flashes resume.

The time sent from the receiver is decoded and as soon as the first second of the even minute is detected, the JT4 transmission starts on the next PPS edge. While JT4 data is being sent, the red LED flashes at half symbol rate, about 0.45 second intervals. When the JT4 message is complete, the frequency is shifted first to the reference tone for one second, then the FSK CW message is sent, with the red LED flashing in time with the key-down state of the CW. At the end of this, the green flashes resume while plain carrier at the reference frequency is being generated. When the programmed second CW time is reached, the red LED again flashes to show the CW characters, followed by green one second flashes until the even minute when the cycle repeats If the green flashing becomes of short duration, this means the GPS receiver has lost lock, possi-

bly due to interference or jamming. The timing will usually flywheel for many hours or even days before the resulting cumulative timing error becomes unacceptable.

Test Mode:
The link or switch installed on pin 7 of the interface header provides continuous carrier at the reference tone frequency for test purposes. If activated during the CW or JT4 sequence that is allowed to complete before Test Mode is entered. The red LED is on continuously.

New PICs:
The most flexible route is for you to programme your own PIC according to the instructions in Ref [3]. This will involve generating and editing the two .INClude files, then compiling / assembling the PIC source code before programming the device itself. Please note, you do not need to know anything about PIC assembler to do this – it ought to be a plug and play operation if you follow the instructions carefully.- but does require access to a PIC assembler suite as well as a programmer – they usually come together.
For the faint-hearted, I can supply ready-to-go programmed PICs for provided you supply all the information needed. This includes all the compiler flags, data types, frequency and tone allocation, message data etc. Mistakes made here can get complicated with PICs flying from one site to another clocking up postage costs. A utility to help in specifying the file contents , as well as ordering data can be found at Ref [3]

References:

[1] WSJT description, software **http://physics.princeton.edu/pulsar/K1JT/**

[2] Oncore GPS modules **http://www.alan.melia.btinternet.co.uk/**

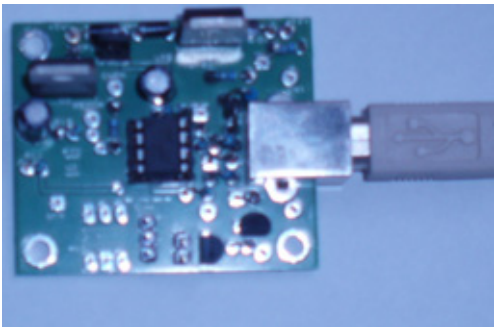
[3] Here is a fuller version of this description and provides access to all the design utilities needed **http://www.g4jnt.com/JTModesBcns.htm**

[4] A simple PIC based module is currently under development for generating pseudo-NMEA timing data from an MSF receiver. There are a number of low cost MSF clocks on the market that can be ripped apart and the receiver module removed in its entirety. Probably a cheaper solution than trying to obtain a suitable module, and still leaves a fully functional clock that can be set manually.

[5] Tone allocation for JT4 on beacons has followed different routes for each beacon-keeper. On GB3SC# only four tones were allowed, so JT4g Tone zero was set as the reference (the nominated frequency) and the optimum SSB carrier tuning defined as 800Hz below this – which is within a couple of Hz of the 'correct' JT4g tuning point. ON-off keying is used On GB3CSB, a fifth tone was introduced exactly in the middle of the JT4 waveform, and the tuning point specified appropriately. GB3CAM was different again, allocating a 1kHz tone as the nominated carrier frequency so the SSB tuning point is 1kHz below this. Any of these can be set by storing suitable values in the .INClude file.

QRP2000 USB controlled Synthesizer Kit

… a review by Gordon Fiander, G0EWN



The QRP2000 is a USB controlled frequency synthesizer sold by SDR-Kits. Typical uses would include USB controlled local oscillator for SDR projects, including the 'SOFTROCK' series of SDRs but it could be used for many applications like signal generator/ test oscillator and low power transmitter.

Two versions are available … a CMOS version and an LDVS version, the latter with higher output and specs as compared to CMOS. The frequency range is from around 3MHz to 160MHz for CMOS and 3MHz to 215MHz + for the LDVS packaged Si570 integrated frequency synthesizer, with steps and resolution to 1Hz. The Si570 is programmable via an I2C interface and the kit includes a ready programmed ATMEL AVR to connect via USB to PC/ free software. All components, less enclosure and connecting cable, are included in the kit. This includes a good quality plate through hole (PTH) PCB. Components are a mixture of surface mount and leaded components.

Assembly:

The kit takes a couple of hours to assemble and some form of magnifier will be required for the surface mount items. Assembly instructions are helpful and include testing various stages prior to completion and fitting the synthesizer itself.

Once the board is assembled it is necessary to download the freeware. I had some problems at this stage as my laptop wouldn't recognise the synthesizer was connected but by following a troubleshooting menu, and using another piece of freeware—USBVIEW the laptop recognised the connection and I was away.

In use:

Initially the chip is set to 56.3MHz. I checked with my frequency counter and found the frequency was a little low — by about 5kHz. However, as part of the setup, this is easily corrected. I tried a second programme, USBSynth, from the website, both for setup and to change frequency. It was fascinating to pick a frequency in the amateur bands from HF to 2m, type in the frequency and then check with my FT817 for the signal to pop up. Once corrected, frequency tracking and agility was very good … I could use a thumbwheel to move up or down for fine- tuning.

Cost:

Both versions of the Kit cost around £25.00, including delivery. All construction and testing notes are on the website including the address for orders. (Paypal accepted). The freeware programmes are also on the site. Another bonus is the synthesizer is compatible with many SDR programmes including 'Rocky' and 'PowerSDR' to name but a few.

My own intended use was/is for SDR related projects but the unit is very flexible and will find many other uses---possibly it could be used to drive a shack beacon for those without such an item. Whilst not the ultimate in frequency synthesizers, given that the Silicon Labs Si570 alone costs some £16, the complete kit—at around £25.00 is excellent value. For full specs and better pictures/ overview check the SDR-Kits website.

73 from Gordon Fiander, G0EWN

ONØGHZ/B now operational on 10 GHz

.... info from Hans, ON4CDU

From last May, ONØGHZ has been on the air on 10368.975 MHz.

The beacon is GPS and DDS controlled. More info about this subject on:

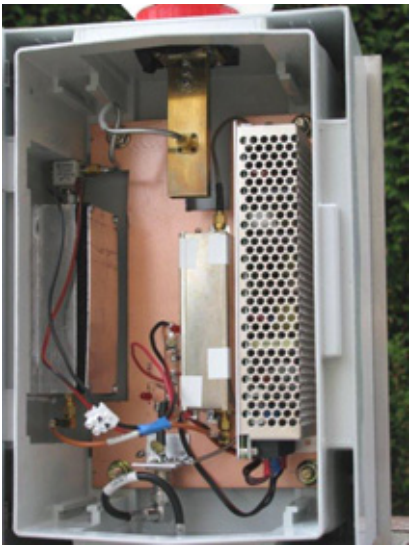
http://www.qslnet.de/member/on4iy/9912.html

The beacon is installed on a tower co-located with the other ONØGHZ beacons at 20 m AGL in JO20KV (74 m ASL).

The following beacons ON0GHZ are installed at JO20KV:

Band	Frequency (MHz)	Modulation	ERP (W)	Remarks
13cm	2320.975	FSK	15	Temporally QRT due to maintenance
6cm	5760.975	FSK	50	
10 GHz	10368.975	FSK	50	GPS controlled
24 GHz	24048.059	CW	5	GPS controlled

All these beacons are omni directional with slotted waveguide antennas.



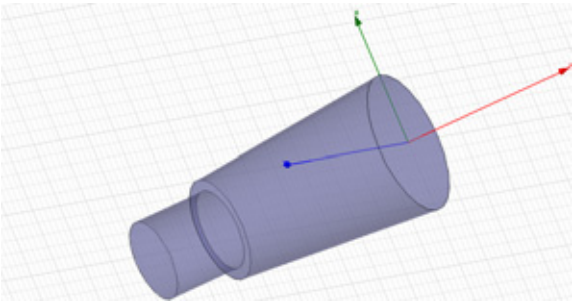
A 47GHz Horn for an Offset Dish

By Dom, F6DRO

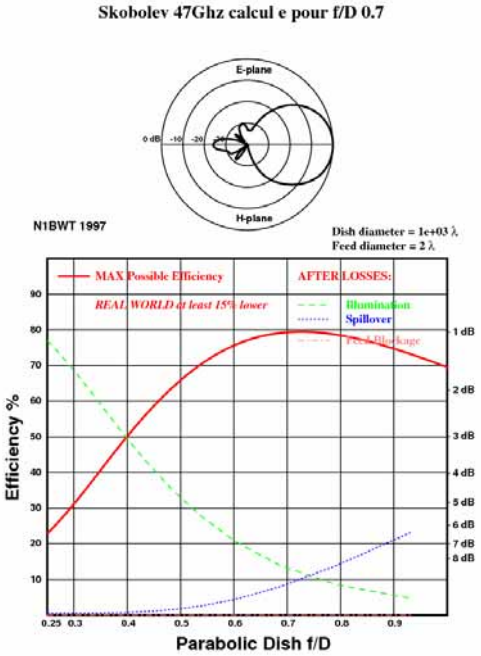
47GHz horn designs for offset dishes are not so common. As I wanted to get QRV on that band, I decided to design my own.

I used the guidelines given by Paul W1GHZ in his article "Optimised dual mode feedhorns". To make a long story short, an interactive procedure using HFSS was used and here is the result.

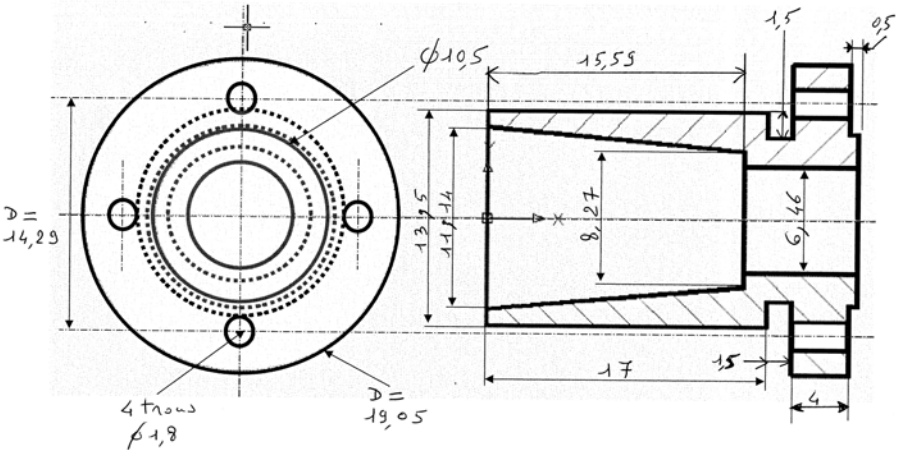
Skobelev 47GHz horn : HFSS model:



Skobelev 47GHz horn : computed efficiency versus dish f/D :



The design looks absolutely perfect for the traditional f/Ds we can find among offset dishes (between 0.6 and 0.8).



(**All dimensions in mm)**

An adapter between your waveguide and this horn has to be machined, as the circular waveguide dimension on the input of the horn must not be modified. It's part of the design and is mandatory for proper dual mode functionality.

If you use circular waveguide in your system, a gently tapered adapter will work. I've also designed, still using HFSS, a transition between the horn and rectangular waveguide but this one needs to be machined very precisely using electro-erosion methods

The finished horn:

STAINLESS STEEL HARDWARE SUPPLIER

I suspect that most people reading this need to buy small quantities of stainless steel fasteners from time to time. I've usually done this using Farnell.

A few days ago, I needed some M5 x 50 machine screws to fix a new main hatch on my boat but couldn't get them from the Farnell, who were out of stock. A 'Google' brought-up:

http://www.stagonset.co.uk/.

This company sells small quantities - down to one-off - of s/s fasteners at reasonable prices and have a wider range than the big distributors. They also charge reasonable amounts for p&p. I placed an order via their web site one evening, and the hardware was in my hands within 36hours.

I've no link with the firm, other than being a satisfied customer.

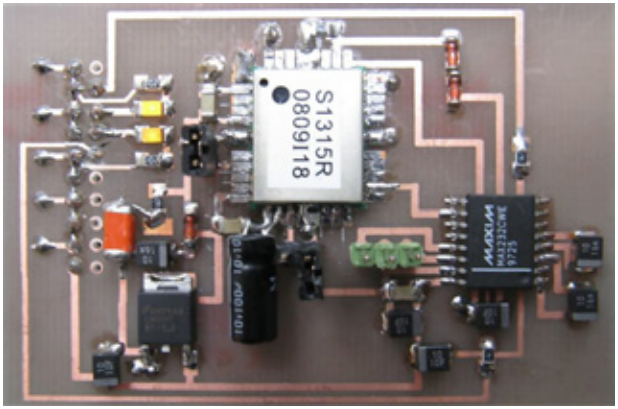
Vy 73 Chris GW4DGU

The RF Solutions GPS 1513R Module

… by John, G8ACE

The 1513R module described as a 65 channel receiver module is an attractive option when GPS timing signals are required for incorporating into a beacon running WSJT or for OCXO frequency stabilisation. It does require some surface mount skill to incorporate the module into a project as it's only the size of a postage stamp. However, it easily out performs older used GPS modules which are often adopted for amateur projects and is available new at a similar price to older modules on ebay. RF sensitivity is such that a passive antenna may be used or a 3.3v active antenna. The module requires 3.3v dc so a dedicated regulator may be needed. Output is in NMEA format at LVTTL level so a translator is required to drive the Com Port of a PC where commands are to be sent either using Hyper Terminal or a dedicated PC Programme. If used to drive the RDDS module in JT4 mode then its possible the 1513 default settings can be used so that no PC controller is required. For use with a PLL to discipline OCXOs then the 1pps output signal will need to be turned on and saved to become available at power up. Typical time to first fix is 29secs from a cold start and hot start with backup battery can be as short as 1 second. Update rate can be as fast as 10Hz if required but default is the standard 1 second. Communication is 9600 baud by default but easily set by link to 4800, the rate required for the RDDS module.

A prototype pcb (see right) has been produced for a RDDS JT4 beacon applications where it sits on the 20pin expansion socket of the main RDDS module. Power and timing signals are therefore connected directly between main PCB and GPS Rx sub module. The spare channel in the RS232 translator IC can be used as the 1PPS output line driver.



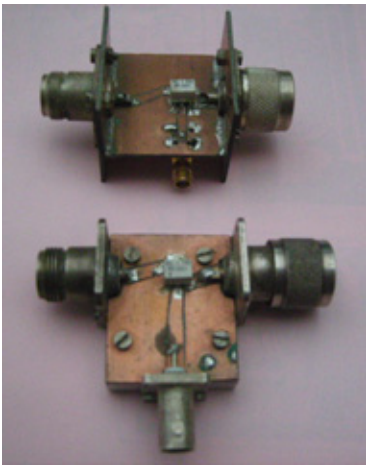
In addition to the RDDS articles in earlier Scatterpoints this year, there is an FAQ page I have created and is ongoing in content additions. The URL **http://www.microwaves.dsl.pipex.com/RDDS/FAQ.htm**
Or alternatively start at my homepage **http://www.microwaves.dsl.pipex.com/**

73 from John

Left: the board mated with an RDDS

An External mixer/frequency extender

by Gus, G3ZEZ



Although having a good selection of test gear, I do not have a signal generator that covers 1-2GHz. To overcome this problem, I have used a JMS.2411 mixer from a redundant Ionica unit and I have modified a G4DDK board using a 83.333Mhz crystal to give an output at 1GHz. This is fed to one port of the mixer and then I can use my 0-1 GHz signal generator on the other port to mix with it to give me 1-2GHz.

The mixer is mounted on a piece of pcb material, with suitable connectors at each port, as shown in the photograph left. As the original mixer was used at around 3.5GHz with other LOs, other frequencies can also be used.

The mixers can be removed from Ionica units using a hot air gun on the reverse side of the board. Hopefully the pictures and connection details are clear enough to see.

73 from Gus G3ZEZ

USEFUL 24GHz YAHOO GROUP

The posting below was forwarded to me by Robin, G8APZ. The 24GHzHam Yahoo Group is one I was not aware of but looks interesting and contains some useful information ... a pity about the word "ham" though!

Our Aussie friends seem to be making great strides in the microwave spectrum!

Thales 23 and 26GHz transceiver units
Date: Mon, 07 Jun 2010 1
From: Dave <dave.nelson@optusnet.com.au>

I wonder how many others on here got into the Thales units that were being sold back in March 2010 by an Israeli eBayer ??

I got one of the 23GHz units and several of my fellow microwavers got the 26GHz units. Some of us have been experimenting with Elcom synth's also available from the same ebayer. The Elcom 1201 covers ~ 11-12GHz and the Elcom 1295 that covers 12.220 to 12.950GHz. I have the later and running it on 12.670GHz.
After inputting this into the LO input on the Thales unit it gets doubled to 25.340GHz minus my 1292MHz IF freq gives 24.048GHz.

The Thales units are capable of ~ 1W at 24GHz. Tests by various experimenters has produced anything from ~ 900mW to ~ 1.2W .... VERY respectable!

Have a look at my www pages for my project pix and notes:

www.sydneystormcity.com/24GHz.htm

Cheers from: Dave VK2TDN

By Robin Lucas, G8APZ

CONTEST and ACTIVITY REMINDER

Jun

15-Jun 1900 - 2130 1.3/2.3GHz Activity Contest
Arranged by VHFCC (RSGB Contest)
27-Jun 0900 - 2000 2nd 5.7GHz Cumulative
27-Jun 0900 - 2000 2nd 10GHz Cumulative
27-Jun 0900 - 2000 2nd 24GHz Cumulative

July

3/4-Jul 1400-1400 VHF NFD (includes 1.3GHz)
Arranged by VHFCC (RSGB Contest)
18-Jul 0900 - 1700 2nd 24/47/76 GHz Cumulative
20-Jul 1900 - 2130 1.3/2.3GHz Activity Contest
Arranged by VHFCC (RSGB Contest)
25-Jul 0900 - 2000 3rd 5.7GHz Cumulative
25-Jul 0900 - 2000 3rd 10GHz Cumulative
25-Jul 0900 - 2000 3rd 24GHz Cumulative

August

17-Aug 1900 - 2130 1.3/2.3GHz Activity Contest
Arranged by VHFCC (RSGB Contest)
22-Aug 0900 - 2000 4th 5.7GHz Cumulative
22-Aug 0900 - 2000 4th 10GHz Cumulative
22-Aug 0900 - 2000 4th 24GHz Cumulative

FRENCH JOURNEES d'ACTIVITE (JA)

29/30-May Activity weekend - 30th matches UKuG
19/20-Jun Activity weekend
24/25-Jul Activity weekend - 25th matches UKuG
28/29-Aug Activity weekend
25/26-Sep Activity weekend - 26th matches UKuG
30/31-Oct Activity weekend - 31st matches UKuG

Duration of all JAs is 1700 Saturday - 1700 Sunday

APATHY - WHAT'S UP?

I have edited this column now for three years. My first column was June 2007, and in that time I've seen the input to this column diminish slowly but surely.

For over two years I was able to fill four pages, and sometimes five! There were even times when I had to reduce the font size to cram it all in.

However, for the past six months, there has been a noticeable lack of input, and I have had to reduce the number of pages.

I have been trying to understand the apparent diminishing interest but there isn't anything I can specifically put my finger on.

Of course, the lack of "openings" on VHF/UHF and microwaves doesn't help. In past years, the openings were far more frequent, and so we had much to discuss in terms of new DX. That's my own view of course, but I do go back a long way!

Since all anomalous propagation is in some way determined by what the weather is doing, we cannot control this particular aspect of inactivity. I have never known it to be so poor for such a long period of time.

However, is this a phenomenon which only affects us in Europe or are other countries affected too? For example, is there a similar lack of tropo openings in the USA, or Australia? What do others observe?

Then there is the apathy which seems to occur in winter, when many OM's shacks (both indoor and out) can be very inhospitable places if not heated!

Another factor may be the general lack of new blood coming into the hobby. As microwavers, it seems to me that most of us seem to be at the "older" end of the age spectrum - me included! - and maybe other things take over interests and time in later life.

Whatever the reasons, we can all do something about getting on the air more often. Having said all this, I'm very pleased indeed to be able to report some exceptional activity in the latest UKAC contests on **23cm**.

RECORD ACTIVITY IN 23cm UKAC

Regular correspondent Ray **GM4CXM** (IO75tw) (Glasgow) sent a very enthusiastic report for the most recent UK activity contest (Tuesday 18th May). Ray says “it was just incredible! Not that many years ago I was lucky if I managed a handful of contacts and the nearest was typically Tony **GW8ASD** at 332Km.”

For the entire duration of the contest, Ray said that **23cm** was absolutely bristling with activity, and **ON4KST** chat resembled a major 2m EU contest with lots of stations attempting some very challenging distances throughout the whole of the UK and into the continent.

Scottish activity was at an all time high too, it appeared. At least twelve **GM** stations were known to be participating, with four of them as portable operations.

Conditions were above normal, due to the high pressure appearing from the south west. The small uplift in conditions was enough for Ray to experience much of the new activity appearing out of IO83, with ten contacts in that square, many of them running very low power.

The lifting of flight restrictions also made a difference, enabling aircraft reflection assisted contacts after last month’s poor experience.

An incredible twenty contacts in the first hour included Kjeld **OZ1FF**(JO45) via aircraft scatter. A few calls to the south east resulted in a rather unfamiliar experience on **23cm** from Scotland, a pile up!

Ray continues...

“This welcome event also presented a tactical challenge because on the one hand you want to work everything that moves in case conditions are only fleeting, whilst on the other you also want to take advantage of more aircraft being available in the first hour of the contest for some of the really challenging distant contacts and multipliers.

Thirty three contacts was a personal UKAC best and included "initials" with Ted **G3WBB**, Mick **M0ICK/p**, Richard **G4HGI** (running 1 or 2w), John **G3WFK/p**, Keith **G4ODA** and Phil **G3TCU** who was incredibly loud with his newly installed 44el Wimo in Surrey.

The only downside was missing out on multipliers. Barry **GM4TOE/p** on the Lecht (IO87) went unheard with his 4w and I was buried in a pile-up when **GI0GDP** (IO74) and **G8PWX** (IO95) were looking for contacts.

Nothing was heard from IO93, IO82 or JO02 although I did try for 15 minutes with John **G3XDY** (JO02), but nothing was heard at that late stage of the contest with a lack of aircraft over our mid point and the slight enhancement to conditions not extending to that area.

Overall, a most enjoyable UKAC with activity spread throughout the UK.

73 Ray GM4CXM

The nine **GM** Stations worked by Ray were: **GM0USI**, **GM7GDE**, **GM3WIL/p**, and **GM4PPT** (all in IO75). Another four in IO85 were worked in the form of **GM0UHC**, **GM4GUF/p**, **GM4YLN**, and **GM4BYF**, with **GM4ZUK/p** representing IO86.

The best contacts in excess of 500km were with **M0GHZ** (IO81), **G4BRK**, **G8DKK**, **G0MJW**, and **G3TCU** (all in IO91) **G4EAT** (JO01) and the ODX **OZ1FF** (JO45) at 782km.

BEACONS - JT4g on 24GHz

GB3CAM on **24GHz** went back on the air on 19th May, 2010 and is believed to be the first **24GHz** beacon in the world to run JT4G.

The beacon has had a major upgrade, which involved the addition of a **"reverse DDS"** unit to lock it to a **G3RUH** GPSDO.

This beacon becomes the first to include JT4g generated by a reverse DDS unit, and almost certainly the first on **24GHz** in the world which includes JT4g.

Using the waterfall display in WSJT, it should be possible to “see” the four tones when on the beacon frequency, even if it is not audible.

The two minute keying cycle is as follows:

Even minutes. "**GB3CAM IO92WI**" in JT4g followed by "**GB3CAM**" in Morse.

Odd minutes. Unmodulated carrier until (minute +32 sec) then "**GB3CAM**" in Morse.

The **GB3CAM** beacons (**10368.755MHz** and **24048.870MHz**) are both located at Wyton (IO92WI) in Cambridgeshire are now both very accurate in frequency. The site is only 35m asl but the antennas are another 30m agl. with a generally good take-off.

All reports and spots are welcome either via DXC or www.beaconspot.eu

IMPRESSIVE 3CM DEMO IN USA

Scott, **N0EDV** sent an account of a recent **10GHz** demonstration he did for a ham club in La Crosse, Wisconsin (USA).....

...."On the evening of April 12, 2010, I was in La Crosse, Wisconsin for a work conference. I had contacted the local radio club that I used to belong to when I lived there, and asked if they would be interested in a **10GHz** demonstration. They enthusiastically told me they would love to see a **10GHz** demonstration, so I threw all my gear in the van and brought it with me.

After the conference ended for the day, I got on the local 2M repeater and coordinated getting everyone to the top of Granddad Bluff (EN43jt), a small lookout that is almost 600 feet above the city of La Crosse on the Mississippi River. The view is great from North, through West, to South, just about 180 degrees of unobstructed view!

Initially, I had planned to work Gary, **W0GHZ** in EN34lx direct (195km). The azimuth should have put my signal just about right up the Mississippi River valley for the length of the path. For some reason, we could not make contact.

Later, I suspected that I may have had my dish a bit too elevated, thus shooting at "cold sky" hi hi. I had Gary on the cellphone and he suggested we try rainscatter off a tiny cell off to my West. It was clear in La Crosse and I wasn't even aware there were ANY cells out there.

Anyhow, he gave me an azimuth to the cell and with a little beaconing, I found him! As we exchanged information, **K0KFC** came on line from EN35rj (205km) and we completed a QSO with him as well.

Here are a few of the club members taking in the information I was spewing at them about the intricacies of microwave communications.

There are more pictures, and links to two video recordings on the Missisippi Valley ARA website.

http://www.mvara.net/main/page_10_ghz_demo.html

73, Scott, N0EDV

HYPERATLANTIQUE REMINDER

In February's column, I mentioned Atlantic tests on **3cm**. I thought it worth reminding readers that there will be concentrated activity, with well equipped stations in a number of places such as Portugal, Morocco, Canary Islands, and Cape Verde Islands.

In July, conditions are often capable of long DX to **EA8** on 2m-**23cm**, and there is reason to believe that propagation can extend to the much higher bands too.

In the Canary Islands **EA8BFK** (**DJ9PC**) will be in IL38, and Jean Claude **F5BUU** with David **F1URI** will be operational as **EA8/F5BUU** from IL28XQ (from July 2nd till July 15th). Jean Claude expects to be QRV on 6m, 2m, **23cm**, **6cm**, and **3cm** and may also operate ATV on **5.7Ghz** and **10GHz**. **EA8/F5BUU** has a QRO station with 50w RF output.

This will be a good opportunity for UK stations to break some DX records!

MAY CUMULATIVE CONTEST

Ralph, **G4ALY** worked some good DX in the 30th May cumulative session on both **3cm** and **6cm**. Conditions were "nothing unusual", with some contacts taking over an hour to complete.

On **6cm**, five stations went into the log, **G4NNS**, **F1GHB/p**, **G3ZME/p**, **G4EAT**, and **G3LRP/p** for best DX at 399km.

The **3cm** contacts: **G4NNS**, **F9OE**, **G3LRP**, **M0DTS/p**, **G4EAT**, **G3PHO/p** (452km), and best DX of the session **G4KUX** at 489km.

From: Martyn, G3UKV (Telford & DARS)

G3ZME/p had a fine day on Brown Clee, in Shropshire. It was windy at times, but also lots of sun and no rain. The propagation was about average.

5.7GHz performed well, with six QSOs, the best being Ralph **G4ALY** at 249Km. I'm pleased he's joined the 'TREE' group (Tree Removal Extraction and Eradication) by having a local tree removed at his end, since that has been a problem in this direction for several years. I was surprised that the path didn't go on **10GHz** on this occasion.

On **10GHz**, we managed 18 QSOs, including a couple of locals (**M0ECM** and **M0EMM**) who rovered using borrowed equipment which would otherwise have been left at home unused.

Easily the best DX was **F6DKW**(JO18CS) who winkled us out of the noise on CW (529/519) at 533 Km.

24GHz activity was thin on the ground, but thanks to Keith's efforts (**GW3TKH/p** IO81LT and IO82KA) we had some good exchanges. Also, John **G4EAT** (JO01HR) with 2.5 watts was audible for ages just above the noise, but could not hear our half watt TX. The distance was a best-ever 235 Km. Has anyone got a 2.5W PA for sale?

G3XDY's activity lists still provide a valuable service - thank you John - sorry we didn't hear you at all on 2 metres, which remains our prime talk-back mode. We had two 'KST systems which once again were extremely unreliable and more or less a waste of time from Brown Clee, even though I made a special corner reflector to focus the 'dongle' in the required direction.
73, Martyn G3UKV

John, **M0ELS** ventured out portable too. He was at JO01IK for 4 hours and worked just one station, **G4EAT** on **3cm** ssb. John had no talk-back, and no 'KST and did not really expect to work anyone else. This is doing it the hard way!

However, he says he enjoyed the countryside, along with bacon rolls and hot cups of tea. Photos of his set up appear on the back page.

EARLY JUNE 23cm DX

The evening of 2nd June produced some UK beacon spots from Germany, and John Randall, **M0ELS** (JO01) took advantage of conditions to work **DC6UW** on **23cm** SSB at over 600km. He also worked **DJ6JJ** on both CW and SSB with signals up to 58. John said that there seemed to be an east to west tropo path, but there was little activity.

BEACONS

On 3rd June, John **PE1GHG** activated the new **PI7RTD 13cm** beacon on **2320.857MHz**. It was almost immediately reported by **G4EAT** at 599 at a distance of 264km.

RTD stands for Rotterdam, and this beacon replaces the former **PI7GHG**. The beacon has two outputs of 2.5w on headings of 100 and 280 degrees, and is located 105m asl.

John also expects to activate the new **3cm** beacon in Mid June, on **10368.270MHz** with a power output of 1 Watt into a 10dB slotted antenna with a gain of 10dBd.

... AND FINALLY

As usual, I'll be migrating to SW France for the summer. Last year, I took **3cm** for the first time, and had a very successful time using that band. I was able to work back to **G4ALY**(IO70), and **G4EAT** (JO01) on a number of occasions, either on tropo or via rainscatter. I also worked **ON4IY** on RS. These three stations were very active, and "in the right place at the right time".

This year, in addition to the 2m mainstay activity, I'll be QRV on 6m, and **3cm**. However, I'm considering taking **23cm**, and possibly **6cm** with me this year. The main problem is space on the mast. I can only put up a 9m mast, and there's a limit to what I can put on it, but I'll see what can be done!

I'll be QRV from end of June, so do look out for me as **F1VJQ** (IN95ol) if the conditions on the high bands look promising. I'll be on KST, or contact me by Email - **f1vjq@g8apz.org.uk**

73, Robin Lucas, G8APZ

Please send your activity news for this column to:

scatterpoint@microwavers.org

M0ELS/P 10GHz Sunday, 30 May 2010 in JO01IK

These three photos show John's 10GHz set up for the May cumulative contest. Notice his 'economic" use of the wooden sign post!

Also note the morse key on his operating table... we could do with more people taking out one of these for those weak signal contacts where Morse reigns supreme. Congrats John!

It looks pretty flat in Essex though .....

EME ACTIVITY WEEKEND … 10-11 JULY 2010

The weekend of July 10/11th was selected earlier this year for holding a 6cm Activity Week-end, the main idea is to get everyone who can operate or listen on that band to come on and hear and work some stations . It is an opportunity to test out new feeds, preamps, dishes, to compare station performances and, importantly, to have fun. There will be activity from VK, JA and N.America and plenty from Europe. See:

http://www.nitehawk.com/rasmit/NLD/eme0909.pdf

for a report on last year's event. Come on even if you have only QRP....I made 7 QSOs last year with only 7w at the feed of a 4.5m dish. Almost certainly there will be some big signals on the band. Joe, K1RQG has kindly agreed to make a sked list and so contact him at **kirqg@aol.com** if you want to use this. Publicising the skeds is very helpful especially for smaller stations and listeners. I suggest also the use of the HB9Q logger but please be careful not to spoil any QSOs by inappropriate postings there.
I'll put out a reminder in a months time.

73 from Peter G3LTF
6cm equipment: 4.5m dish, 0.7dB NF preamp, 20-25W at feed.