An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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Photos:
Doug Friend, M/VK4OE/P at Therfield, IO92XA, during the Sept 10GHz cumulative contest. Note the modified IC202 on the right which contains a complete 10GHz transverter! See inside this issue for how he made the 10GHz LO unit.

In this issue ...

Latest News ...

- **New Slovak Laser DX record (see back page)**
- **Martlesham Microwave Roundtable almost here!**

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

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From the Editor's Desk

The summer contesting season is now over but that doesn't mean microwave activity should come to a standstill. There are winter activity days to try but really every day is an activity day so why do so many people only come on the air when there is a contest? The next few months, in the Northern Hemisphere at least, are also home construction time, when all those projects you've been meaning to completed actually get finished! I've certainly got plenty of those ... I just don't have the spare time!

The Martlesham Round Table is almost upon us. This is the major amateur microwave event in the UK so it's not one to be missed. If you haven't yet registered then do so now, after you've read these lines. Details can be found in this issue.

I've just returned from the RSGB HF Convention at Wyboston. I went down for the whole weekend wearing my DXer and HF Contester "hats" but did manage a couple of sessions at the UKuG Stand, which was located in a small room a little off the beaten track. However, I heard glowing reports from several HF DXers who were very impressed indeed with Sam G4DDK's talk on working for DXCC at microwaves. I think we may have found a few new recruits! Our thanks go to G8VHB and G3RIR for organising the VHF/uWave lecture stream and t many of the UKuG Committee who took turns manning the stand. It takes some courage to put all this on in front of died-in-the wool 160m DX chasers and CQWW Contesters, I can tell you!

See you at Martlesham ...

73 from Peter, G3PHO

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.

SCATTERPOINT ON THE WEB
…. a reminder

Around 100 of our approximately 400 members are now getting their monthly Scatterpoint via the Word Wide Web rather than by email or normal letter post. This system, set up over a year ago, is taking a while to catch on with the rest of the membership! By following the instructions set out below, any member can receive Scatterpoint reliably, regardless of any change of his email address (which several folk occasionally do and fail to let us know!). The Yahoo Scatterpoint Group described below is for UKuG members only and hopefully it will completely replace the email lists that your editor has to use and keep up to date each month. It is a much more efficient system …. The editor has to upload the newsletter to the Group files just once a month. The rest is done automatically by Yahoo. They, NOT THE EDITOR, email you to say the file is ready for download.

If everyone got Scatterpoint this way, the editor's workload would be much reduced and he could get on with some microwave construction work!

Another advantage of the Yahoo system is that the editor can now provide the newsletter in several formats…. Eg: High resolution colour, in both single or booklet page format or low resolution black and white. It is not often possible to provide a colour Scatterpoint for **email** distribution as it would exceed the attachment download limit for those of our members who have "unfriendly" ISPs. There's no problem at Yahoo Groups with large files.

At least two month's Scatterpoints are available on Yahoo any time so, if you miss a month, it will still be there next time. The newsletter is normally put on the site around the 20th-22nd of each month.

The Yahoo group is accessible anywhere in the world, wherever there are internet facilities, so you don't miss your Scatterpoint if you're on holiday in some far distant land!

I have set up this secure Scatterpoint Yahoo group from which you can readily download every month. To join this group please visit the following URL and sign up:

http://uk.groups.yahoo.com/group/scatterpoint/

and click on **JOIN THIS GROUP** which can be seen on the top right hand corner above the UKuG logo on the list.

THEN …. PLEASE EMAIL THE EDITOR, G3PHO, TO TELL HIM THAT YOU WISH TO BE TAKEN OFF THE REGULAR EMAIL LIST AND THAT YOU WILL BE USING THE YAHOO GROUP INSTEAD. ..... Muchas gracias amigos!!

UK MICROWAVE GROUP SUBSCRIPTION INFORMATION

The following subscription rates 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 €**
UK	14.00	-	-
Europe	18.00	36.00	26.00
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 2009 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 or Yahoo internet. If you want a paper copy **then the higher rates apply.**

Programme for Martlesham MMRT 2009

This premier event in the UK amateur microwave scene is almost upon us. If you haven't yet registered for the activity and booked your hotel room then you should do as soon as you've read this! Prior registration is mandatory due to Adastral Park security protocols. Full details of the Round Table can be found on the Martlesham Radio Society's website at:

http://mmrt.homedns.org

Friday 6th November:

19:30 Evening dinner at the Victoria Inn, Felixstowe. For those visitors who are around on Friday evening. Contact G4DDK <sam@g4ddk.com> for details.

Saturday 7th November:

09:30 Breakfast at the Orwell Truck Stop for early arrivals
11:00 - Martlesham opens
Limited equipment measurements available.
Limited catering available on Saturday.
12:30 - Trip to Bawdsey Radar Museum (Admission £3 plus an additional, £5 coach charge). If you are going on the trip, please bring your own food and refreshments.
15:15 - Flexible - Return to Martlesham
16:00 - Chats and flea market
16:30 - Close for the day
19:00 - Meet at the bar at the Ipswich Copdock Holiday Inn
19:30 - Microwave Dinner at the Ipswich Copdock Holiday Inn with an after dinner non-technical talk.

Sunday 8th November

09:00 - Martlesham opens
09:10 - UKuG Committee meeting
10:00 - UKuG AGM
10:30 - Measurements open
11:00 - 1 minute (Remembrance Sunday) silence
11:15-11:55 G4HUP (*What's on What?*)
12:00-12:40 WW2R (*The SDR as a Microwave IF- Part 2*)
12:45-13:30 - Lunch. Tea, coffee, soft drinks and filled rolls available.
13:30-14:10 Michael and Monika (*MI/DL1YMK - the first 5-band EME DXpedition*)
14:15-14:55 G4JNT (*6dB Better than CW - Weak Signals at Microwaves*)
15:00 - Refreshment break
15:15 - 15:55 - Kent Britain (*Pitfalls in Antenna modelling*)
16:00 - 16:30 – Forum – details to be arranged.
16:30/45 – Martlesham closes

18:30 Chinese Buffet at the restaurant on Felixstowe sea front (still £4.99/head) for those who are staying on until Monday. We are likely to have limited seating, so let us know soon if you want to join us. Contact G4DDK for details.

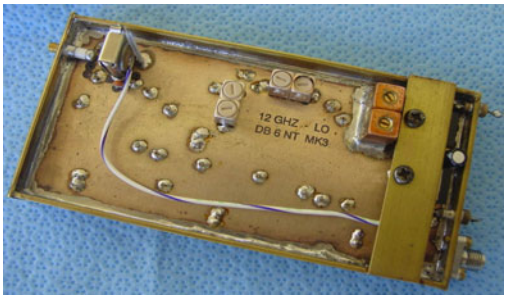
MODIFYING A DB6NT 12 GHz L.O. BOARD TO WORK ON 10.2GHz

By Doug Friend, VK4OE
<friends@squirrel.com.au>

The DB6NT 12GHz LO board is a tried and proven design and a huge number have been made by keen microwave radio amateurs over the years. Its chief attributes are compactness, ease of construction and reliable operation. Everything is present for delivery of a clean and healthy signal level in the (nominal) 12GHz range (dependent on crystal frequency) and it has the option of either an on-board crystal oscillator or can be used with an external TCXO.

Being originally designed for use with the DB6NT sub-harmonic mixer system for 24GHz, most of these 12GHz LO units have found their way into that service, as well as for LO chains for higher bands. This article describes the modifications that I did to 'pull' one of these boards down to 10.224GHz **for use with a small sized 10GHz stand-alone transceiver, a modified IC-202 radio** *(see front page photos ...editor).*

Firstly, and optionally, I didn't put it in a 'standard' box (tinplate or otherwise). As you'll see in the picture right , the PTFE board is soldered into a strong brass surround. This was to save volume, space being at a premium when intending to fit the LO board plus some other modules in the battery compartment of an IC-202! Since the pictures were taken, fittings for attachment of a brass bottom plate have been added, and this plate fits right at the bottom of the brass surround. No RF absorbing material was found to be necessary here.



Modifications to the original electronic design were in several places: (A) the oscillator; (B) helical filters in the multiplier stages; (C) the microstrip filters printed on the board; and (D) the choice of FETs in the microwave stages. In the following descriptions, I make reference to component designations that were used by DB6NT in his written material from 1996 relating to the 12GHz LO (Mk 3).

(A) Modifications to the crystal oscillator circuit:

(1) – An SMD inductor of 330nH was found to be necessary across the 106.5MHz crystal to limit the tendency towards instability. Of course, this led to the need for a small value coupling capacitor (I used 47pF) as a DC block between the emitter of the T1 and the crystal with its parallel inductor. A small slit is required in the printed trace at the place where this SMD capacitor is to be used.

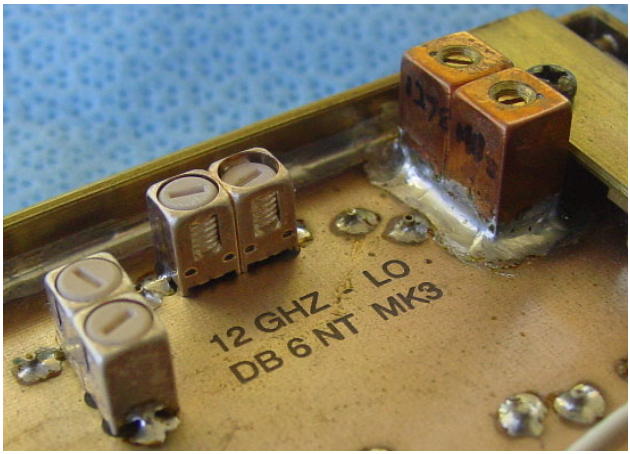
(2) – I have always found that, in publicised Butler oscillator designs, a value of 27pF for the coupling capacitor from the collector of T1 to the base of T2 is way too big. The crystal experiences too much drive which is evident as phase noise. Noise visible in the output spectrum was greatly improved when this capacitor was reduced to 3p9, and my impression was that it probably would still operate satisfactorily with an even lower value here!

(3) – The SMD trimmer capacitor I happened to have for the collector of T4 had a value of 10pF and this higher value was able to resonate nicely at 106.5MHz with the original 100nH collector inductor, using no additional capacitance.

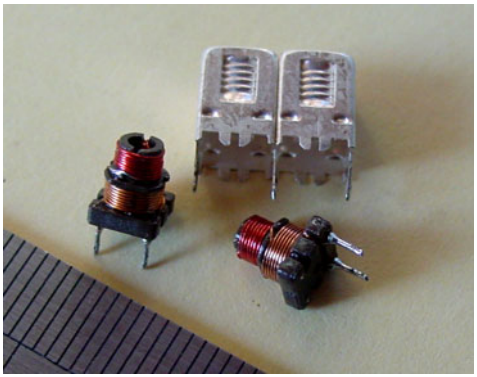
(4) - With the crystal oscillator now working around 106MHz instead of 125MHz, the collector

tuned circuit also needs to be 'pulled down'. I found that the 27pF removed from the T1-T2 collector-base coupling was perfect for establishing the desired new tuning range for the tiny Johansen collector tuning capacitor that is visible in the pictures. Incidentally, using this capacitor, frequency adjustment at 10.2MHz is smooth, as it needs to be.

(B) The helical filters in the early multiplier stages were originally intended for 375MHz, 751MHz and 1503MHz. The modified version needed these to be on 319.5MHz, 639MHz and 1278MHz respectively. This was no problem for the second and third helical filters – different ones with the required tuning range were simply purchased and fitted. [For F2, the TOKO 5HW-58080A-625 was just right whilst, for F3, the standard NEOSID filter many of use on 1296MHz was found to be able to tune down to 1278MHz]. However, the need for F1 to be resonant at a significantly lower frequency than the starting frequency of the TOKO 5HW helical filter list does pose more of a challenge. This was overcome in the following manner starting with an off-the-shelf TOKO 5HW-35045A-365 filter:



(B1) The tiny clasps holding the plastic coil assemblies inside the can are carefully raised and the two coils are removed ready for 'surgery'. Make sure you remember the orientation of the connection pins – they will need to be exactly right when you reassemble the filter! What follows is difficult, but not impossible..... The accompanying picture (right) of the two modified coils prior to reassembly should provide a good reference for these practical descriptions. The ruler markings are 1 mm.



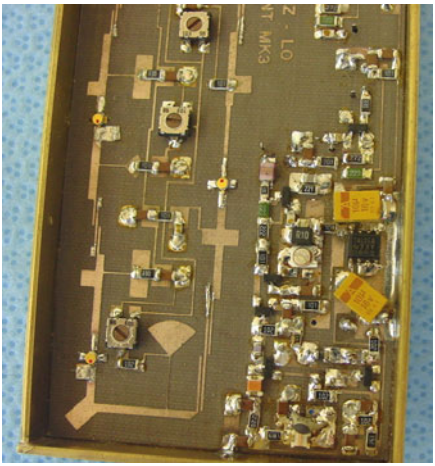
(B2) Before proceeding, have some 0.6 mm diameter insulated wire ready to use. About 150 mm should be adequate for what follows.

(B3) Working on one coil at a time, the 'top' or high impedance end is released and the wire is unwound completely from the smaller diameter section. But don't let go of the coil – you need to stop the larger diameter section from unwinding!

(B4) There is a wire positioning helical ridge right up the top section of the former that has to be removed. Using a needle file, carefully file this flat all around the former. (The plastic is quite soft and removal of the helical ridge is easy, except that you have to never let go of the wire end of the lower wound section.)

(B5) Snip the wire close to the tiny gap where the wire transitions from the large diameter section to the smaller section. The right place to cut it is such that the eventual soldered joint will sit right in close to the 'transition gap'.

(B6) Bare the ends of the wire on the coil and the new section of wire and form a tiny hook in each end. Before soldering, use needle nosed pliers to minimize what will be the eventual size of the join. Solder carefully, without melting the plastic.
(B7) Carefully rewind the top section, closely fitting each turn so that seven and a half turns now exist here. Holding the wire tight, bend it into one of the anchoring notches at the top and snip off the excess, leaving a maximum of 2mm hooked inside the top of the former at the location of the notch.
(B8) Just to be sure about mechanical stability, after this surgery was completed on both coil formers, I coated the windings with nail varnish and let it dry before reassembly of the filter.
(B9) Reassembly is now easy (remembering to get the connector pin orientation right!). When the coils are in position, the clasps can readily be bent back into position and the filter is ready for insertion into its place on the board.



(C) The several printed microstrip filters all need some attention to work with the lower frequencies. The output of T8 comes down from 3GHz to 2.5GHz, 6GHz at T9 now needs to be 5.112GHz, and the filters between the output stages now need to be resonant on or close to 10.224GHz. The accompanying images at the end of this article speak more clearly than a thousand words will do, so I won't describe this part of the modification any more, other than to say that these 'snowflakes' are rather tiny and a challenge to solder into position.

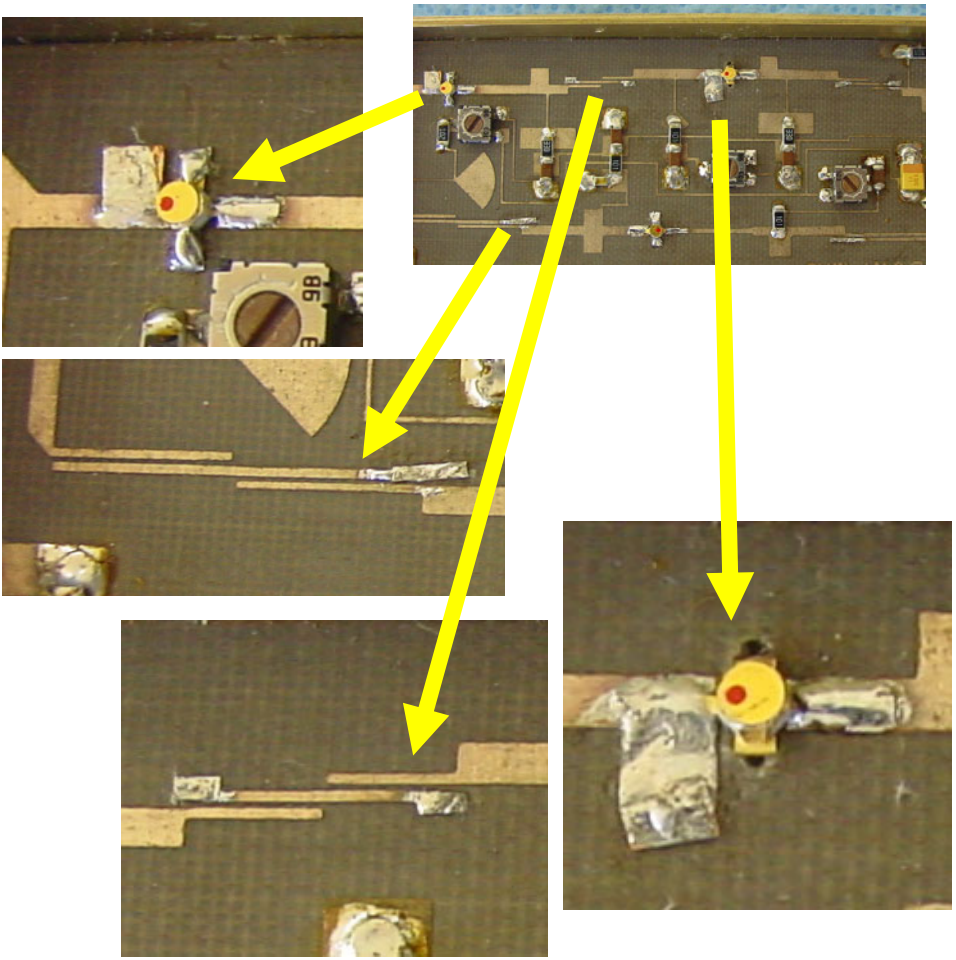
(D) The devices used in the output stages are all listed as MGF 1302 FETs. These are getting expensive these days but, if you have them, they should be good. However, following a little bit of experimentation on the board, I discovered (to my amazement!) that fitting what many of us in the past came to know as "Birkett Red Spot" FETs, led to very satisfactory results as well. [How many other folk have some of these FETs stashed away, wondering if they'll ever be used? Being rated to 18GHz, I expect that these devices should also work fine in the 'proper' 12GHz application of this DB6NT board].

(D) Some additional 'snowflaking' was found to be beneficial in maximizing output power. The locations for these were always where the original board had tuning tabs already printed at known critical locations. Increasing their size a little by the 'trial and error' adjustment method normally associated with 'snowflaking', led to an output power within a dB or so of the original specifications scheduled for use at 12 GHz.

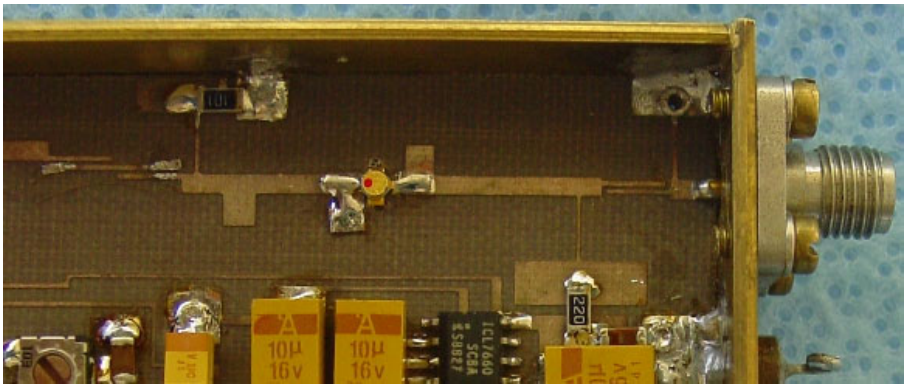
30mW was my final result and the dB or so lower result could well be the result of loss in the ¼ wavelength (at 12 GHz) coupling between T12 and the output connector. Such coupling is inherently very broad band but when it's 2 GHz away from design frequency is sure to be a little bit 'down'! I judged that one as too hard to adjust and the final result did not warrant any more work on the board!

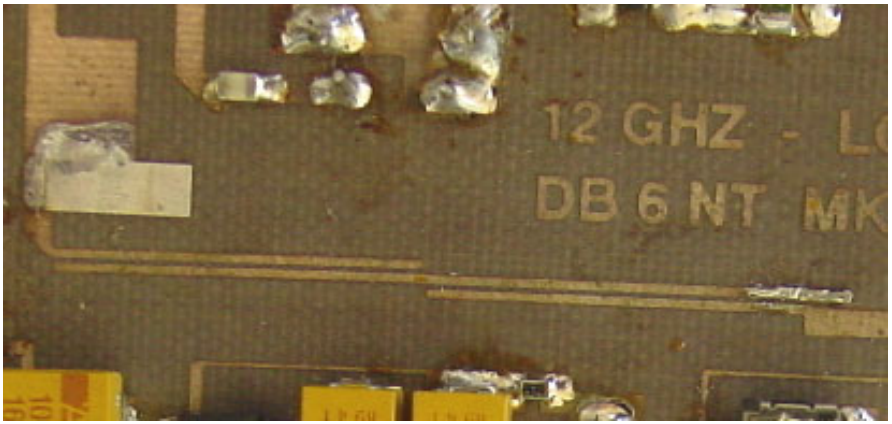
So, if you have one of these DB6NT boards 'hanging around' and you're wondering if you'll ever use it, here is another option for it. Its small size makes it really 'nifty' for compact LO installations. Over to you!

PHOTOGRAPHS BELOW & ON THE NEXT PAGE show the 'snowflaking' required in the modifications



I purchased my board and other key components from the Eisch company in Germany but I believe that PCBs are also available direct from the Kuhne company (DB6NT).





POSTSCRIPT....

The photos on the front cover were taken when I was portable at the well-known Therfield location where I enjoyed working two Cambridge stations (G4s BAO and BEL) - loud signals over a nearly line-of-sight path - plus G4DDK over a rather obstructed path with the small antennas shown and only 70mW output on 10.3 GHz. The 20cm diameter dish (thanks for the loan, Harold G3UYM) did perform better than the 20dB horn, as you would expect.

One other potentially interesting aspect of the modified IC202 system in the photos is that it can be used 'pedestrian portable' style. With one of the SLA batteries in a small back-pack, headphones on and with the 20dB horn attached, it's actually 'hand-holdable'. I've walked up the street near where I am staying in Kings-Langley, finding the different places where I can hear the GB3SEE beacon through some trees. ... a different bit of uWave fun indeed!

In relation to the modified DB6NT LO chain that is thermally insulated within the visible rectangular extension of the battery compartment. I was further pleased that, after about 30 minutes warm-up, it's quite stable enough for short QSO's. Frequency stability in relation to mechanical handling is very good too!

73 and good microwaving from Doug, VK4OE

Adding FSK keying to the G4DDK2001 source

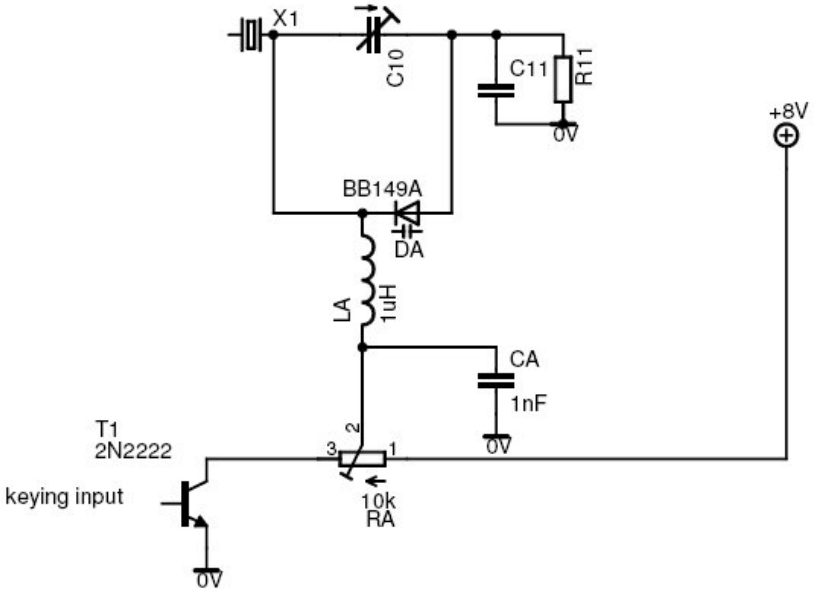
John Worsnop G4BAO

Introduction

I recently designed and built a 13cm beacon transmitter for the Bristol group. To get the project on air as quickly as possible, I decided to use Sam's tried and tested DKK2001 source at 1160MHz, followed by a modamp doubler.

The 2001 has no facility for FSK keying so this is the modification I provided to implement it.

Fig. 1 Circuit of FSK modification



Circuit description

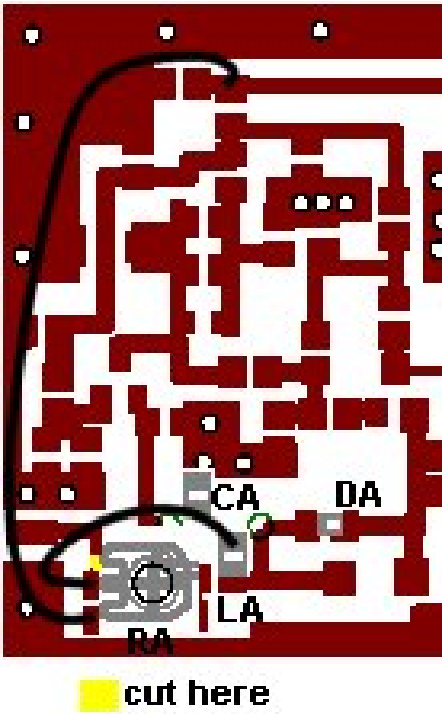
A BB149A SMD varicap diode (DA) is used in parallel with the trimmer C10 in place of (C9) in the original design. Reverse bias is provided via a decoupling choke and capacitor (LA, CA) and is adjusted from the existing regulated 8V supply via a 10k preset (RA). The keying transistor T1 is part of the WW2R PIC keyer but any circuit can be used.

Circuit operation.
The BB149A capacitance varies from a few pF to about 30pf as the reverse bias varies from 12V down to 0V, so when T1 is "OFF" the voltage on the diode is around 8V. Turning on T2 drops the ground end of RA to about 0.2volts so the reverse bias on the diode can be adjusted from 0.2 up to about 8V. This allows you to adjust the FSK shift to the value required

Implementation.
Refer to the G4DDK2001 circuit on Sam's website and Fig 2 below:

Remove C10. The diode DA fits on the same pair of pads as C10. RA can be fitted by removing the external input components R18 and C32 as shown in Fig 2 by carefully cutting the track joining C32 to conn1. LA and CA are joined by a fine wire, and on to the slider of RA. The keying signal from T1 can then be fed in via the Conn1 track

Fig 2 Implementation of FSK modification



Component list.

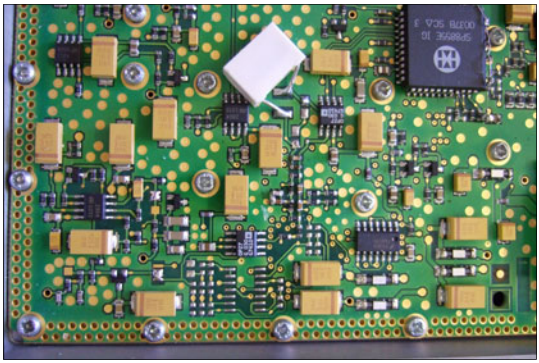
CA	1nF	0805 ceramic	(Farnell 718567)
LA	1uH	0805	(Farnell 1265547)
RA	10k		(Farnell 1173884)
DA	BB149A		(Farnell 1212469)

Acknowledgements
Thanks to Sam G4DDK for checking the draft and approving the modification

References
Sam Jewell Microwave Signal Source — Radcom September 2008

Improving the Alcatel 10GHz synthesiser

by Roger Ray G8CUB



Having now used the Alcatel synthesisers for 5.7/10GHz, 24GHz and 47GHz. The one thing that still bugged me was the close in spurii on the Zarlink 10GHz (9936MHz) synthesiser.

It was hoped that by changing the twin-T filter following the loop filter, that the spurious sidebands, could be notched out.

Looking at the output of the synthesiser at 4968MHz, the sidebands were 31kHz away. With help from Francois F1CHF, the original component values were identified, showing the notch was on 200kHz. The question was, could the filter be moved to 31kHz, without upsetting the loop stability.

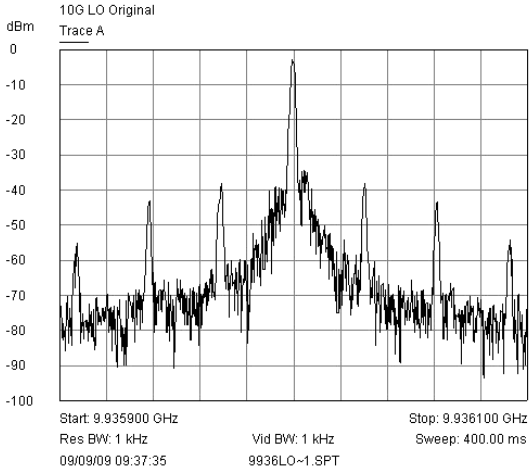
Using one of the twin-T design utilities on the web at http://sim.okawa-denshi.jp/en/TwinTCRkeisan.htm to compute the values for 31kHz, it was decided to keep the resistor values the same (12k21) and just change four capacitors. The capacitors C320, C321,C322, C323 were changed from 68pF to 420pF. They can be seen in the centre of the picture above, the twin-T components forming a sort of cross.

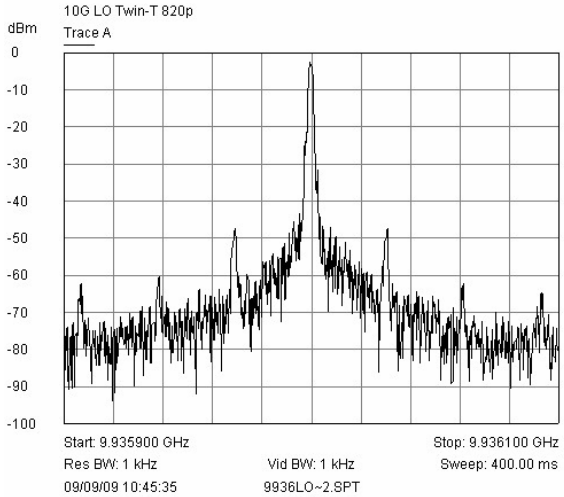
The improvement was useful, as the plots show but it was thought further improvement could be obtained. All capacitors were then changed to 820pF and the loop went unstable! One of the parallel capacitors was removed. The plot shown on the following page was obtained, giving around 10db improvement on the 31kHz spurs.

It is important to use SM capacitors (0603), as leaded components can inject more noise into the loop.

There was some effect on the initial lock-up time of the loop. A 'hick-up' occurring after about 20-30 seconds, after that it was fine. This should not in practice cause any problem.

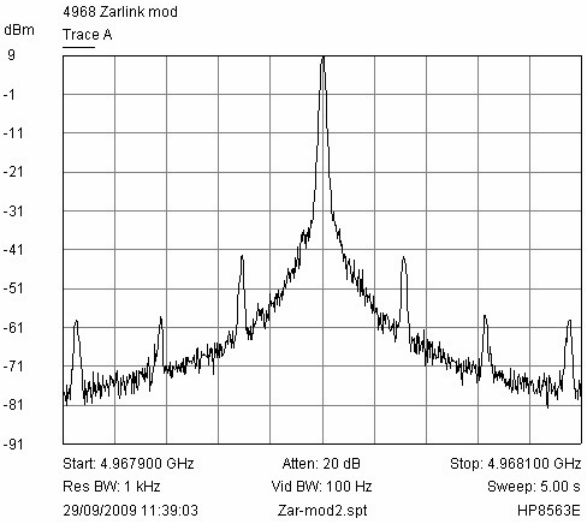
Unmodified unit

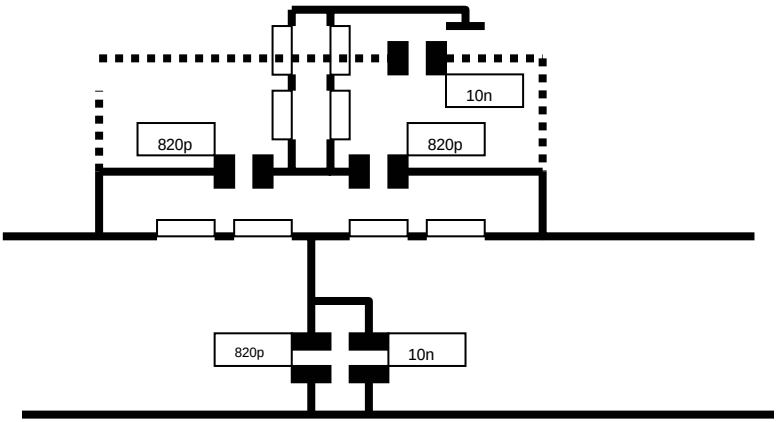




Above: Twin-T filter capacitors changed to 820pF (just one to ground)

When the loop was unstable, the two capacitors were bridged with 10n to make the loop stable. This improved the spurii and when a 10n to ground was added, the close in noise improved as well. See the circuit and plots below (note these are at synth o/p freq. 4968MHz). I don't know why this works, but it does and I have decided that I have played enough for now!



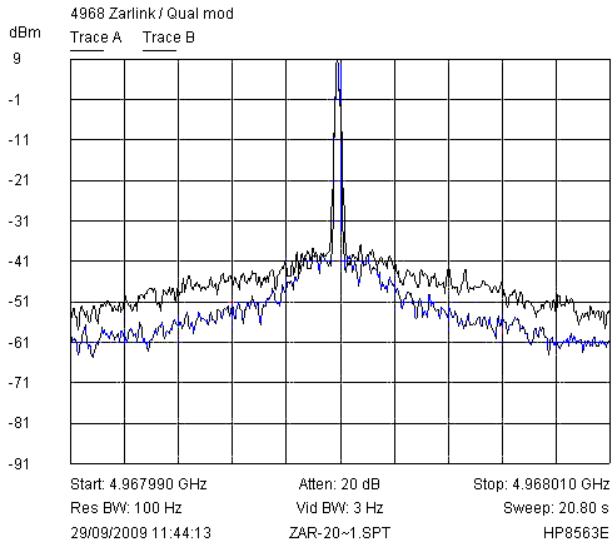


Above: Twin-T filter showing added 10n (dotted lines), and changed values

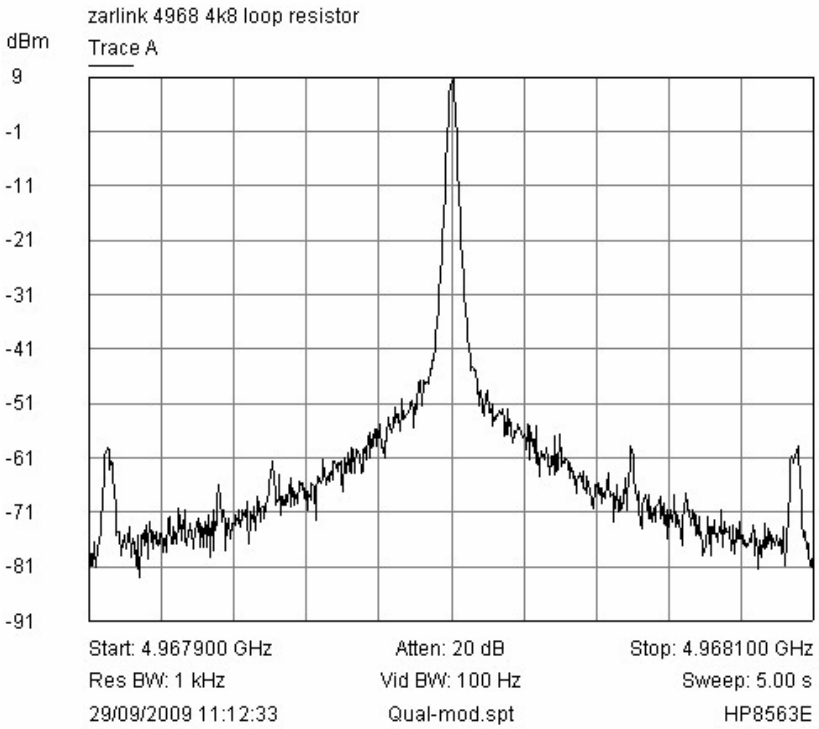
I later found that I had another synthesizer, bought at Martlesham last year, which covered the same frequency range but contained the Qualcomm synthesiser. I tried this and the 31kHz spurii were much better than even the modified Zarlink. Close in noise was worse but that was without changing the loop filter. In this case, changing the twin-T filter appeared to make things worse, so I left it alone.

It then occurred to me that improved noise performance would be obtained with a lower division ratio. If 6MHz was chosen as the loop frequency then the numbers still worked for 9936MHz (10G) and 5328MHz (5.7G). giving divisions of 207 and 222.

To obtain a 6MHz loop reference, the 10MHz source was externally multiplied by 3 to 30MHz. The internal R register was left at divide by 5. The result was much improved noise +/- 20kHz as the plot below shows.



The close in noise is much improved on the modified Zarlink synth (top trace), but even better on the Qualcomm with 30MHz reference and 4k8 damping resistor (lower blue trace).



The Qualcomm synthesiser with 30MHz reference, still has spurii, but they are 94kHz away, and nearly 70dB down.

On the Qualcomm synth the loop filter resistor consists of 2 resistors in series. I changed the 1k resistor to 2k7 making 4k8 total, to increase the damping. This improved the noise up to 2kHz away from the carrier by a couple of dB but is really just the icing on the cake. Also there is a mirror of the loop filter from pin 3 of the filter Op amp to ground. Any changes should be made to both filters. In my synth, the main filter caps were blue 68n so could be easily identified.

The 10 to 30MHz multiplier used, was based on the WA1ZMS design using two 1N5711 diodes, a 2 stage filter, and output amplifier.

The spurii on the Zarlink synth is likely to be similarly improved, by using a 30MHz reference, although I think the Qualcomm versions will always have the edge.

An update to the original article can be found at www.rfdesign.co.uk/microwave

By Robin Lucas, G8APZ

Since my return to the UK in late September, it has been a shock to the system! Colder WX here and plentiful grey days remind me that the autumn is well under way. In previous years, there would have been regular autumn "lifts", but these are very much less frequent than they were ten or fifteen years ago. We can only hope that they will return.

Not much input received this month, and some of it was solicited! I can only report what I hear about, so unless I get some input, next month may see a smaller column. It is up to you, the readership!

CONTEST and ACTIVITY REMINDER

October

20-Oct 1900-2130 1.3/2.3GHz Activity Contest
Arranged by VHFCC (RSGB Contest)
25-Oct 0900-2000 All-band Activity Day
Non competitive

November

17-Nov 2000-2230 1.3/2.3GHz Activity Contest
Arranged by VHFCC (RSGB Contest)
29-Nov 0900-2000 All-band Activity Day
Non competitive

December

6-Dec 0900-2000 Low band 1.3/2.3/3.4GHz
15-Dec 2000-2230 1.3/2.3GHz Activity Contest
Arranged by VHFCC (RSGB Contest)
27-Dec 0900 - 2000 All-band Activity Day
Non competitive

FRENCH JOURNEES d'ACTIVITE (JA)

24th-25th October - 1296MHz and up

The duration of the final JA of 2009 is from 17:00 on the Saturday to 17:00 Sunday.

UKAC ACTIVITY CONTEST

During the September 15th Low Bands event, Rob, **M0DTS/p** (IO94MJ) was on the North Yorkshire Moors hoping to use both **23cm** and **13cm** but was unable to get his **13cm** transverter ready in time.

He completed 14 QSOs on **23cm** within the first hour, and then the stations dried up. Lack of mobile phone coverage precluded the use of **'KST**, although there was a decent signal last time he was out a contest! **GB3MHL** and **GB3NO** were very good signals around 579 most of the time and **GB3ANG** and **GB3CLE** were a good 559.

Ray, **GM4CXM** seemed to have good propagation and made 20 contacts, all of them on SSB, apart from one with **OZ1FF**

SEPTEMBER HIGH BANDS

Although no activity reports have been received for this activity contest, there appeared to be a good level of interest, particularly on **3cm**. **G4KUX** in IO94BP worked fifteen stations with his best DX being **F6DWG/p** at 642km.

IARU OCTOBER CONTEST

The IARU contest (432MHz and higher) took place over the weekend of 3/4th October. The weather in the UK on the Saturday was extremely windy, with spells of rain. Comments from the logs of some participants, gives the overall picture: "Flat conditions" (**G3XDY** and **GM4CXM**). "Awful conditions and very slow going" (**M0SKC/p**). "Conditions flat, activity low" (**G4RFR/p**). "Wind and rain again and poor conditions" (**G3OHM/p**)

I was with **M1CRO/p** (JO01pu), and agree that activity seemed to be down on previous years. There were nevertheless some decent distances covered on most bands, despite the WX problems.

On **23cm**, a total of 78 QSOs produced a total of 8 countries and 33 locators. There were 14 QSOs over 500km, with the best DX being **DM7A** (JO60LK) at 828km 55 on SSB both ways. Conditions

may have been flat, but there was still some good DX about. Of special note, **DH9NBB** was worked in JN49WS at 645km. We gave him 529 and he was running just 1W.

13cm produced 20 contacts, with best DX **DL0GTH** (JO50jp) 674km. The best DX on **6cm** from 10 contacts was **ON7BV** at just 318km.

3cm seemed to be in reasonable shape at times, but the conditions were definitely very strange. **PA6NL** are usually 59++ but only managed 52 when we worked. However, SSB contacts with **F6KUP/p** (JN29pd) 413km and **DF0MU** (JO32pc) 411km showed that there were some reasonable conditions in places. A total of 22 QSOs in 15 locators and 5 countries.

24GHz was the usual struggle, with just two QSOs, and a third with John, **G4BAO** being too marginal to complete. The CW was barely out of the noise, with characters being chopped up by QSB. It was becoming very frustrating!

Above: Part of the antenna farm at **M1CRO/p** with **6cm/3cm/24GHz** in the foreground.

23cm IN SCOTLAND

Ray, **GM4CXM** (IO75TW) had a relatively quiet time on **23cm** in September, with not a lot to report regarding DX.

On 14th, **GM0HIK** was worked for a rare new square in IO65VO (Islay), and on the 15th, **OZ1FF** (JO45BO) was worked during the **23cm** UKAC at 782km.

The 17th saw a limited opening, which gave Ray his first German station in the log for 21 months in the shape of **DK6AS** (JO52) at 1,063km, and on the 18th, conditions to Holland were up, and the following went into the log: **PA2M** (JO21) 765km, **PE1DAB** (JO23) 707km, **PA0GRB** (JO23) 703km, and **PA3FHY** (JO22) at 743km.

10GHz IN THE FAR NORTH

From: Martin, GM6VXB, IO97AQ
Fraserburgh (North of Aberdeen)

I am probably the most northerly (except for **GM4GQM**, more later) **3cm** station in the UK. This presents plenty of problems. Most stations in central and southern England tend to beam east or south, but when you live up north all you tend to hear is white noise.

There are a few stations locally, my closest being around 25km, with the second closest being 178km, both over obstructed paths from home, and marginal paths from my portable location. If I draw a circle with a ring at 200km then at best there would only be about six amateurs on **3cm** and all over obstructed paths. To be honest, it is easier to work **OZ** from home, (**OZ1FF** 03/05/2007) than it is to work some of the more distant **G** stations! I have good sea paths from 275 degrees though North to 150 degrees but, to the south, it is just hills, hills and more hills !!

I have had an interest in microwaves since the late 80s having built one of the PW EXE systems and completed a couple of QSOs from IO81 when I lived near Hereford. Having moved back to Scotland, VHF has taken over but the interest was still there so, in 2007, I bought several items from **DB6NT** and boxed them up for a new system and invested in a 'LiDL' 80cm dish. The feed horn was made by (an unwilling) colleague to a design from the Dubus magazine (I now have a 'Silver Fox' offset feed).

Setting up proved slightly difficult as at that time I did not have suitable test equipment. Yes, I could use a beacon to set up the receive side but where is the nearest beacon to IO97 ? ... Norway and it beams south, so forget that idea straight away. Could I use another station for set up? At the time **GM4LBV** was the closest (117km obstructed path) so he's not really a good option.

Eventually I bought one of **DB6NT**'s beacon modules for setting up. It is not in the beacon band - I was warned off that idea quite early and it now transmits on **10368.758** as a personal beacon.

So all the bits were now in place for some contacts. The fun and frustration now started. First tests were done with **MM0DQP** Eric just south of Wick over a nice sea path of 100km. These proved difficult as Eric's dish was not pointing to the horizon and I was nearly 15kHz off frequency. Only a partial QSO took place but at least it showed some potential. So I invested in a decent frequency counter and, sure enough, the new out the box **DB6NT** transverter was 15kHz LF. A quick retune and the frequency is now as close as I can get without resorting to Ref-Locking. Transmit power showed as 11 Watts at the output of the PA, so I was ready for the next try.

Now we hit the next microwaving problem. Most southerly stations batten down the hatches when the wind gets up to mid 30mph. 30mph is a gentle breeze but try 120mph ... it does make your eyes water and we get this at least twice each winter with 45mph almost every week. So it's a winter without even trying to go portable, either too wet or too windy.

Now I (foolishly) decided to buy a second system so at least my wife (**2M1VXB**) could transmit for me and allow me to get the primary system optimised. This worked to a point but during one of my work trips to the Shetland Islands I ended up lending the system to Gerry **GM4GQM**, only a temporary loan, but he still has the system 12 months later !! At least we have been able to make a few contacts and it has allowed me to do a little fine tuning.

So the weekend of 27th September was approaching and a contest on **3cm** looked interesting. The weather also looked pretty good, so I decided to give it a go from Stirling Hill near Peterhead (IO97CL). Sunday dawned and it looked like a good day, so I loaded up and away to the hill. I started to set-up and it rained. Typical - no rain forecast until late evening, so where the heck did it come from? I got quite cold setting up but all looked OK and even 3G was a good signal so **'KST** was no problem.

The first attempt was with **GM4LBV**. This started well and heard tones ok but weak, tried calling to John but strangely, nothing was heard. So we tried tones again and nothing received, even stranger. Fortunately Jim **GM3UAG** was about, and only 20km away. A quick try and he could hear me at 52 but I could not hear him. A quick phone call home and the XYL switched on my beacon. I then spent around 15 minutes trying to find it but nothing. So with that I gave up and headed home to do some further checks.

At home 20 metres from a 1 Watt beacon it was just audible. I removed the pre-amp and as one would expect, an end stopping signal. So a duff pre-amp ... damn and blast !!.

I eventually traced the problem to a faulty feed through capacitor, and not having anything suitable this was replaced by 'a bit of wire'. A quick run into Fraserburgh and a 2km path now gave me an end stopping signal, so all was again well.

The contest unfortunately was now over and I did not fancy driving back to Stirling Hill in the hope that I could test with someone. So I'm now back home, no contacts, fed up and hoping that the next contest coincides with good weather (some hope !).

I will try to get out onto one of the local hills if the weather plays favourably. As far as I know, IO97 has not been active on the higher microwave bands for many years, if at all. It is a good challenge and under favourable conditions should give me many new contacts. So watch out for me and remember, I AM NORTH OF YOU.

Regards, Martin, GM6VXB

ACTIVITY FROM IO94

Nick Peckett, **G4KUX** (IO94BP) is now back in the UK, and has added **23cm** and **3cm** to his band capabilities.

On **23cm**, Nick has an IC-1271 together with a **G3WDG** Preamp, and 10W to a 33ele quad

loop yagi, and is planning to increase power to around 200-250W during the winter.

The **3cm** station consists of a **DB6NT** MkII transverter in conjunction with a **DB6NT** 8W PA in an outdoor enclosure at the 80cm offset dish mounted on the tower at 10M AGL.

Nick has a clear 360 degree horizon, as the photo above shows. This is the view to the south east and Nick says that the hills in the distance are near Market Weighton, around 75 miles away.

He has recently installed a crystal heater to improve the stability and drift problems but the winter project is to build an external GPS locked system feeding 106.5MHz from the shack.

In September, **23cm** produced a dozen or so different stations, with the best DX to **F1NUM** (IN88AJ), and there were 17 stations in the log on **3cm**, with **F6DKW** (JN18CS) being the best DX at 711km. French stations have been looking for IO94, and **G4KUX** will be a welcome addition to the **3cm** activity north of Watford!

EME

Peter Blair, **G3LTF** passed on some info which was posted on Moon-Net,

"At **PI9CAM** (JO32ET) we are working towards changing our feeds for **13cm**, **9cm** and **6cm** systems. All will be temporarily mounted in front of the existing **23cm** Septum feed. It will be easy for us to change to any of the three bands.

Since our 25m dish is almost world famous for it's performance, we invite all stations to prepare for operation on these bands if you wish to make an EME QSO. This will be the time it will succeed, we believe.

More information will follow once it comes closer to the November 7/8th operation time. Look forward to see you off the moon!"

Peter says that the **PI9CAM** team do tend to deliver as promised and it is a good opportunity for anyone with a 2m dish to make EME QSOs on these bands. He doesn't know what power they will have but expects it will be 250/50/30W on **13cm**/**9cm**/**6cm**. The **PI9CAM** team can be contacted via Jan - PA0PLY@tiscali.nl

BEACONS

www.beaconspot.eu was extended to cover VHF/UHF beacons in mid July. Conditions on VHF and UHF are often precursors to the higher bands opening up, so this change could possibly help to alert stations of conditions on the higher bands.

Sound clips of beacons are very welcome on all bands, but the VHF/UHF beacons are not well covered yet, so your help is sought to fill in the missing ones. Recordings in .mp3 are preferred, but .wav is OK too. See FAQ on the website for details, and email address.

The registered user count is around the 600 mark, so word does appear to be getting round.

The **23cm** beacon, **GB3MCB** went QRT during September for a planned move to a new mast (not far from the old mast). It was due to be back in service at the end of September, but has not been spotted so far in October. If you hear it, please spot it on the DX Cluster.

...AND FINALLY

I notice that there appear to be quite a few stations in Scotland who are either QRV on **3cm** or building for the band. I'll be happy to compile a list of stations and publish it in a forthcoming column. Just let me know either if you are QRV, or are building for the band or even just thinking about it! If you are not QRV but know some calls of those who are, I'll add the details to the list.

GM terrain can be rather hostile in most parts for microwaves , so it would be good for those further afield to know that there are stations to work in **GM**, and where they are located.

Please send your activity news to:

scatterpoint@microwavers.org

ADVERTISEMENTS & OTHER NEWS ITEMS

FOR EXCHANGE:

John Randall <m0els@yahoo.co.uk> has an oval Sky Satellite Dish with offset feed, 70cm x 55cm approx, in good condition with mount, to swap for 4 x square WG16 flanges with o-ring seals.

This dish must be collected unfortunately, or John can drop it off at G4DDK's QTH in Suffolk.

Please email John at the address shown above.

FRENCH MICROWAVE NEWSLETTER

HYPER is the French Scatterpoint equivalent. It is possible to read past issues by going to:

http://dpmc.unige.ch/hyper/

At the moment, a major update has been uploaded and issues up to December 2008 can be found there (some of them are in colour).

Thanks to F6HYE for the scans and to F1CHF for spreading the information.

Have a good read! **73 from Dom, F6DRO**

NEW SLOVAKIA LASER RECORD

From: "Robo - OM1LD Slovakia(Europe)" <robo@foton.sk>
Date: Tue, 06 Oct 2009 18:25:12 +0200
To: laser@mailman.qth.net

Hi optical fellows,

I would like to inform you about our recent successful optical contact between OM1LD and OM3KII. **The contact distance was 94km.**
It's a repeated attempt from May 2007.
For more information (why repeated, story, photos, audio) you can go to:

http://www.foton.sk/spojenia_7_0.html

73 from Robo, OM1LD

PHOTOS BELOW: They do it in style in the USA! These photos are of a recent 10GHz activity day in the Mid West. UKuG member Scott, N0EDV, sent them to us. That's one big dish on the left, mounted on a short tower section! Check out **http://www.youtube.com/watch?v=m2JcRpeoCV4** for some video also.