An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

Formerly the RSGB Microwave Newsletter and now published by the UK Microwave Group

2007 SEPTEMBER

New UKuG member Scott, N0EDV, sent along this photo of himself and his 902MHz dish antenna (which is a band that we over here in Europe unfortunately do not have). Scott, among many other things, is a keen contester and an avid pilot. Check him out at www.qrz.com.

In this issue ...

- A Very low Noise Preamp for 23cm
- Don't try this at home!
- Martlesham Round Table details
- UK Microwave beacons… the next batch of applications
- 10GHz EME at FRARS
- General news from Ofcom, beacon keepers and others
- Activity News
- Wanted and for Sale ads
- Job Vacancy

Latest News ...

- **New round of beacon applications almost ready for submission**
- **Martlesham Round Table … online booking open soon**

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

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From the Editor's Desk

Appalling summer weather in the UK certainly reduced activity in the portable sections of UKuG microwave contests, so much so that we have not received any activity reports apart from those covering the millimetre bands! As this edition of Scatterpoint is being edited, the September weather has suddenly "come good" but a little late for many of us. With only one 10 and 5.7GHz cumulative to go (just about the time you will be reading this) we anticipate much reduced scores from those in previous years.

Congratulations to David Wrigley, G6GXK, who can be very proud of his 10GHz beacon, GB3XGH, now that it is installed and working very well at its permanent location near Rochdale. David has had to wait many years for this moment! He has also installed a 24GHz beacon in the shape of GB3MAN and this has already been received at good strength in the Peak District. He's got plans for more beacons on other bands so watch the pages in Scatterpoint and check the UK Microwave Reflector for the latest news. Another batch of beacon applications is almost ready for submission to Ofcom. Page 13 shows the full list.

My thanks as ever to all those who have sent in news, technical articles and other information for this issue. You make Scatterpoint what it is. Articles are always most welcome. **Please write to the editor using the email address shown below but not my personal one. This ensures that your material goes to G8APZ, the assistant editor as well as myself... a very necessary backup procedure... many thanks!**

73 from Peter, G3PHO — Editor

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

WELCOME …

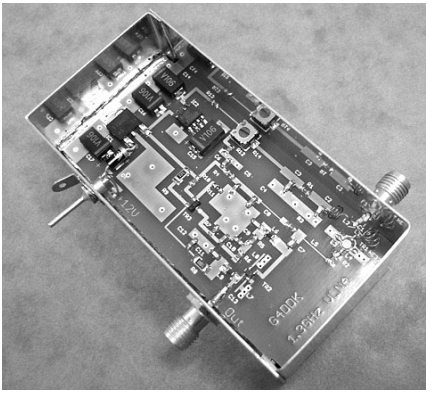
The following recently became members of UKuG . We extend a very warm welcome to them all:

N0EDV	**-**	**Scott**
DG8MCA	**-**	**Joachim**
F5IWN	**-**	**Christophe**
GW4DGU	**-**	**Chris**
VK2KYP	**-**	**Gary**
G4PGY	**-**	**Ronald**
GM0USI	**-**	**Alan**

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

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

23cm VLNA Very Low Noise Amplifier for 1.3GHz



by Sam Jewell, G4DDK

Introduction

One of the most effective 1.3GHz low noise pre-amplifier designs of recent years was designed by Tommy Henderson, WD5AGO. Tommy's design uses an NE32586 HEMT followed by an ATF10135 MESFET with 'air spaced' input 'T' matching to minimize parasitic losses from the substrate that the pre-amplifier is built on. The same technique was also used by W5LUA in his successful 2.3GHz low noise pre-amplifier design [2]. The WD5AGO 23cm pre-amplifier is used extensively by 23cm EME operators around the world.

Last year it became apparent how difficult it was becoming to obtain ATF10135 MESFETS. They had been discontinued for some years prior to this and supplies have been quickly drying up. This caused me to look at an alternative second-stage device. I chose to use the ATF54143 GaAs-FET from Avago. As this is a very different device to the 10135, it was found necessary to change the bias arrangement and matching between stages. WD5AGO's 23cm pre-amplifier achieves between 0.3 and 0.33dB noise figure with about 30dB gain, according to the article [1] and also verified by numerous measurements.

The new 23cm VLNA prototype measured 0.26dB NF with 35dB gain using the 'Martlesham' HP8790A and HP346A noise head. The same pre-amplifier measured 0.25dB/34dB at RAL RT 2007 and 0.26dB/34dB by WW2R. I took one to the CSVHF 2007 meeting where Tommy measured it at 0.25dB NF and 35dB gain. G3LQR regularly measures 0.5dB more sun noise on his 23cm EME system with this pre-amplifier than with his original WD5AGO pre-amp.

The pre-amplifier is best suited to 23cm EME use, as it is rather wide band. It should prove useful across 1 - 2GHz and especially at 1420MHz (Hydrogen line).

Commercial, silver-plated, plated-through-hole (PTH) PCBs and kits for the 23VLNA are available from the author.

Circuit description

The circuit schematic is shown in **Fig 1.**
The component list is shown in **Table 1.**

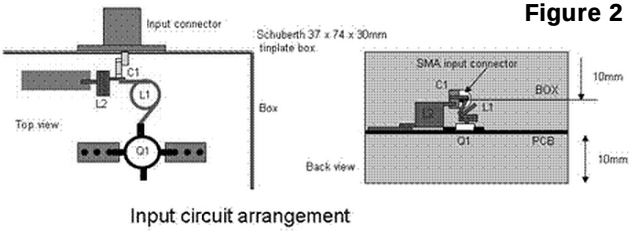
The input circuit consists of a 'T' match with suitable low loss capacitors and inductors. **Fig 2** shows the input arrangement. Low noise matching is achieved by slowly adjusting the spacing of the turns of L2. Careful adjustment is critical to achieving lowest NF. Lowest NF will not coincide with maximum gain. Maximum gain will occur at about 1260 - 1270MHz when the NF is lowest at 1296MHz.

Input impedance match is improved by the use of source series inductance. This is already designed into the PCB, so you don't need to worry about tuning this parameter.

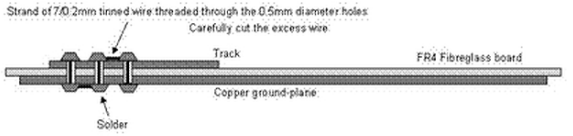
Except where indicated, 0603 size surface mount components are used on the board in order to minimize component parasitics. This has proven most successful and it is a genuinely good reason to move towards 0603 or even 0402 size parts in all designs above 1GHz.

Negative bias for the NE325 is provided by an 7660 DC-DC inverter IC. R14 allows a range of adjustment. It may not be possible to achieve exactly 2 volts on the drain of TR1 with 10mA drain current. Don't get too hung up on these exact values. Active bias was chosen for Tr2 as the drain current is set quite high, at 65mA, to achieve a good dynamic range. At this elevated current I felt that active bias would help to maintain circuit performance. This is provided by Tr3, a BC807 PNP transistor .

Figure 2



Input circuit arrangement



How to provide the low inductance, low profile, vias

The whole unit runs from a 5 volt, 500mA regulator IC that uses a surface mount (SOT223) 78M05 regulator soldered to the PCB ground plane as the heat sink. A TO92 packaged 78L05 will not supply enough current without over-dissipating. D1 is there to ensure that an accidental reversal of the supply doesn't destroy the pre-amplifier.

Construction

The PCB is designed to fit into the popular size tin plate box of size 74 x 37 x 30mm.
It is advisable to solder the four 10uF Tantalum capacitors and 78M05 voltage regulator to the board before this is soldered into the tinplate box as the capacitors near the 78M05 will be found difficult to solder afterwards. Do watch the polarity of the tantalum capacitors.

Prepare the tinplate box, drilling holes for the SMA RF connectors and the DC feed-through capacitor. The layout is shown in **figure 3.**

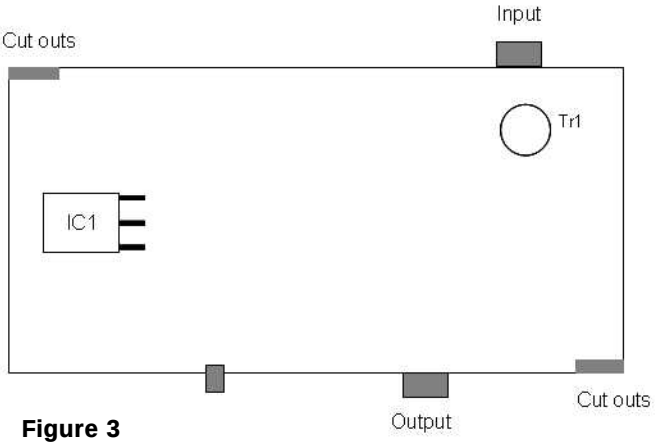


Figure 3

The input connector hole should be 10mm below the rim of the box. The output connector hole should be level with the pre-amplifier output track. The feedthrough capacitor hole should be 10mm below the rim of the box and on the same box wall as the output connector. Mark a line 10mm below one rim of the box (a vernier caliper is ideal for this). This is the ground-plane position. Seam-solder the

PCB into the box, taking care to ensure it is level and then soldered all the way round including on the component side at the regulator end of the box. It will be necessary to file small cut-outs in two corners of the PCB in order to clear the seam overlaps in the box. These should be in diagonal corners as shown in **figure 3.**

Use small gauge solder (28swg - nothing larger) and a fine-pointed small soldering iron to solder all the components onto the board. The component layout is shown below in **figure 4.**

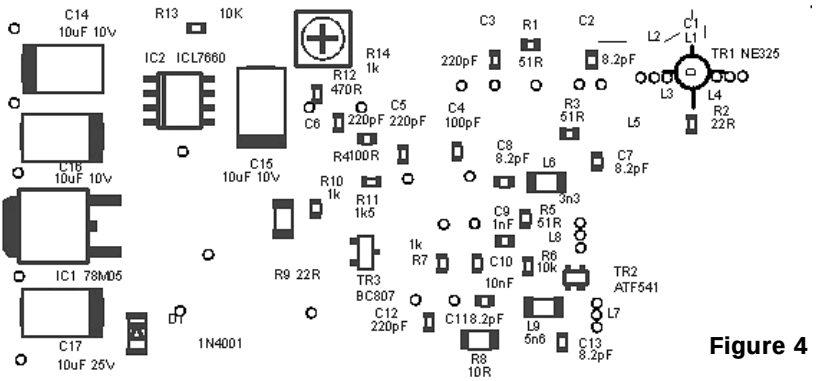


Figure 4

Regular 22swg solder is GUARANTEED TO MAKE A MESS OF THE BOARD! Suitable solder can be obtained from Rapid Electronics of Colchester as a SMD rework kit. Regular 22SWG solder is probably best used to assemble the box and seam soldering the PCB. The PCB is shown in the **title photo on page 3.**

Solder C1 onto the spill of the input connector. Solder L2 so that one end is on the track pad, as shown, and the other end is soldered carefully to the free end of C1. Solder L1 so that the TOP end lead is free to be soldered to Q1 gate. D1 can be soldered direct between the feedthrough capacitor and the (cathode - bar) PCB land or soldered onto the board in the place indicated, with a wire connection between the diode anode and the feedthrough. Solder in the two GaAs FETs after the initial setting up.

Initial Setting up

Connect +13v to +16v to the feed through capacitor. Check the output of IC1 for +5V at its output.

Check that the output of IC2 is -5V. Check that the variable resistor R14 adjusts the output voltage at the free end of L1 down to about -1 to -0.5v

If any of these tests fail, check for incorrect component values or bad joints.

Solder the GaAs FETS into place, ensuring correct lead orientation, especially the leads of Q2. It is best to use a small insulated soldering iron to prevent static damage. Touch the soldering iron to the tin plate box before soldering the GaAs FET leads.

Correct the power supply to the box and check that Tr1 drain voltage is 2.0v. Also check that TR2 drain voltage is 4.5 - 4.8v.

With L1 still close-wound, measure the noise figure. Now carefully bend the first two (top) turns up and away from the remaining turns. The turns should be spaced as shown in **figure 2.** Re-measure the noise figure. It should now be very low. Now CAREFULLY adjust the spacing of these two turns for the lowest NF. Care here will be rewarded.

RF absorbent material should be stuck to the inside of the lid of the tin plate box. If using the supplied piece of ARC material, remove the protective paper from the rear of the absorber. Stick the absorber towards the end of the lid nearest the amplifier section. Putting the lid in place

should not result in any increase in noise figure or loss of gain.

The magnetic field absorber material supplied with the kit has been carefully selected to ensure stability.

Results

These should already speak for themselves. The input third order for the NE325 version is about -8dBm. Whilst this is not outstanding, the gain of the pre-amplifier will degrade the overall dynamic range of the pre-amplifier and transceiver or transverter combination. Careful attention to system gain distribution will allow you to achieve a very sensitive receiver with a useful dynamic range when used with, e.g. a TS2000X or LT23S.

Where strong out-of-band signals are a problem, the very low noise figure of the pre-amplifier will allow the use of a low-loss inter-digital filter in the antenna lead, without increasing overall system noise figure too significantly.

Caveat Emptor

Very low noise figures are notoriously difficult to measure with any accuracy. No specific noise figure is claimed for this pre-amplifier. I have quoted the numbers measured at different VHF/ Microwave events and with different noise figure measuring equipments and operators. Since the pre-amplifier is offered as a kit, the noise figure and gain achieved will depend on the individual constructor's ability with the soldering iron and ability, and patience in setting up the pre-amplifier. The pre-amplifier can be operated without a lid and the stability will be good. However, without the high quality commercial magnetic field absorber material inside the tin plate box lid, putting this in place is guaranteed to degrade performance. Foam absorber, such as 'CMOS' foam, will not work very well in this application. Please use the right material. It is as much a part of the design as the FETs used!

For the printed version ....

Updates and further construction details are published on my web page at **www.g4ddk.com** Follow the links from Technical Content.

Update

Since designing this pre-amplifier I have become aware that the NE32586 has also been made obsolete. However, there are plenty of these devices still available on the surplus market. However, even these will become harder to find in the future. For this reason I have investigated alternative devices to be used in the pre-amplifier. The Avago ATF36077 works well in this circuit, although noise figure will be very slightly worse than with the NE32586. For terrestrial use the difference will not be noticeable.

For those who are able to source their own NE325 devices, the kit is offered without Tr1. If you need an active device then the ATF36077 can be supplied at extra cost. Contact the author for details: **Sam@G4DDK.com**

References

[1] ARRL Microwave Update 1999
[2] ARRL Microwave Update 1994

Figure 1: Circuit diagram

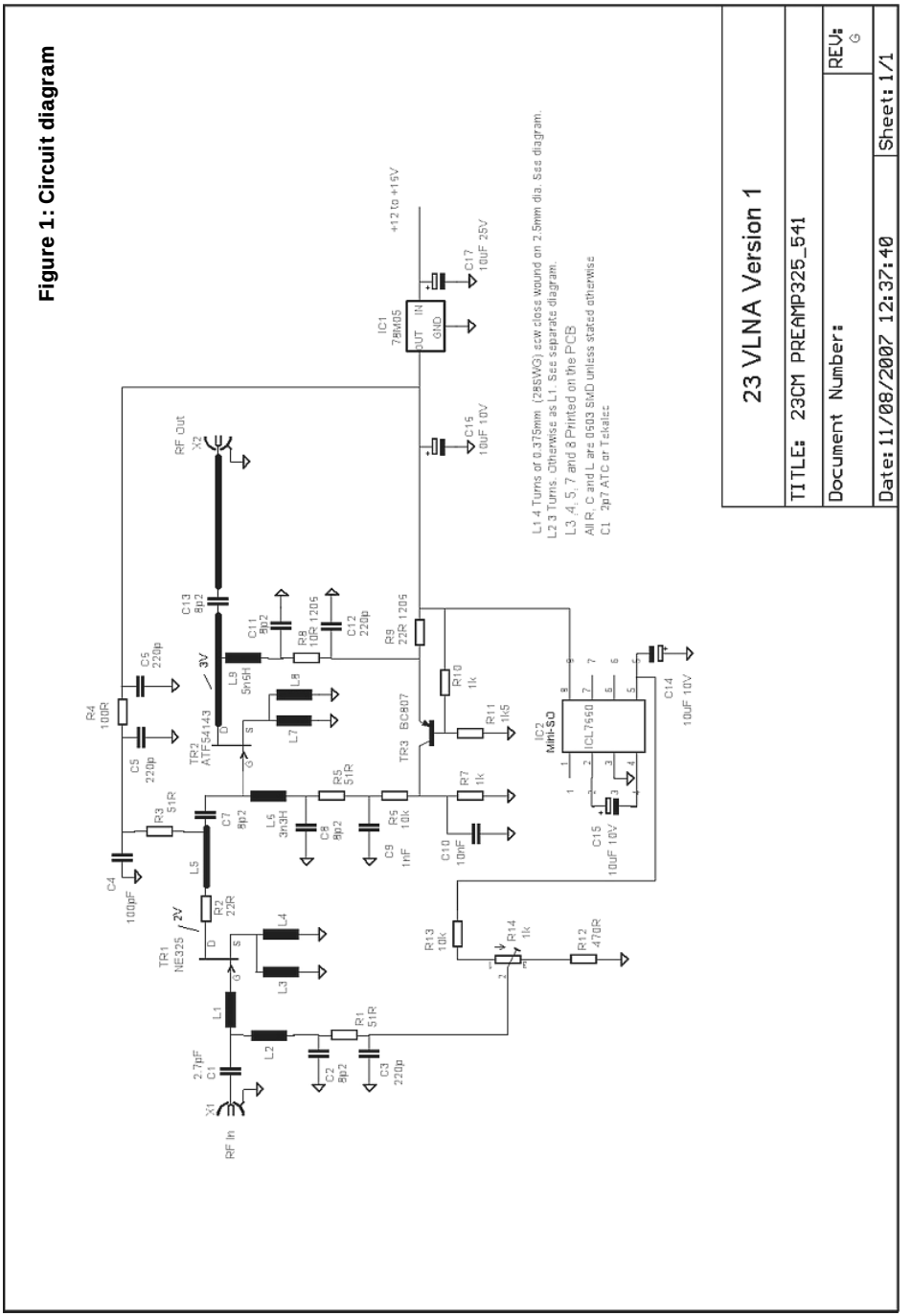
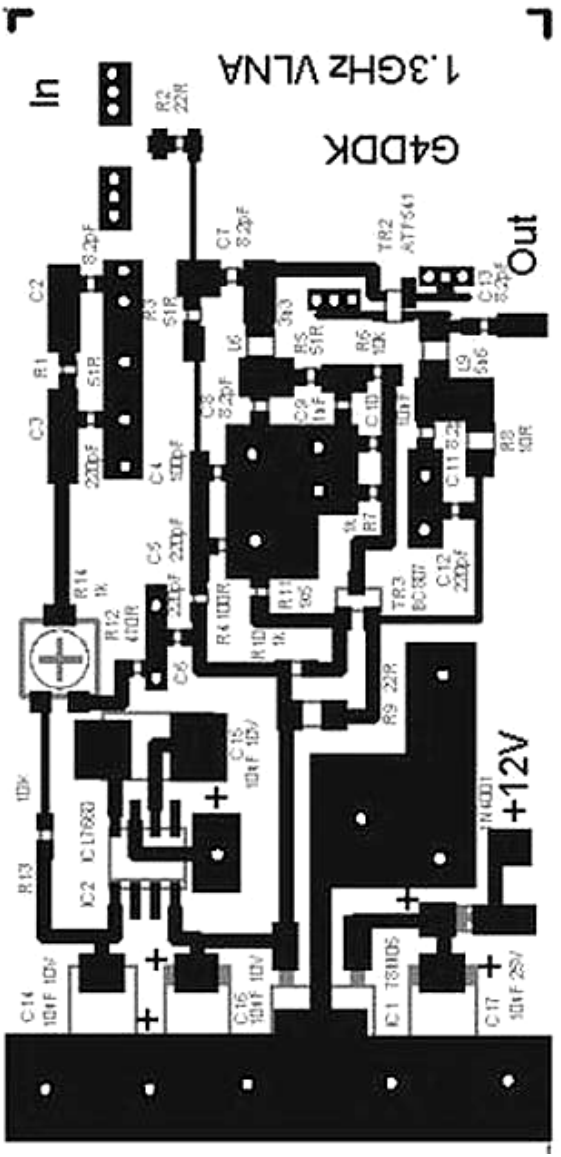


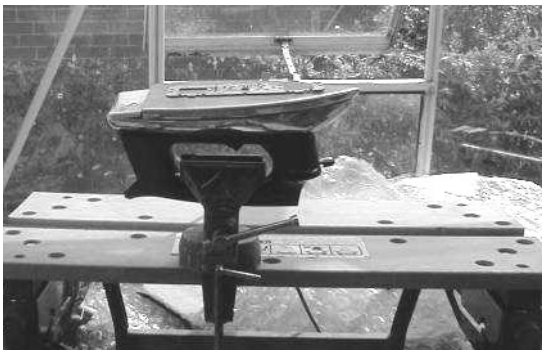
Table 1: 23cm VLNA Component list

Device	Package	Description
C1 2p7 ATC or Tekalec	C-EUC0603	CAPACITOR,
C2 8p2	C-EUC0603	CAPACITOR,
C3 220p	C-EUC0603	CAPACITOR,
C4 100pF ATC	C-EUC0603	CAPACITOR,
C5 220p	C-EUC0603	CAPACITOR,
C6 220p	C-EUC0603	CAPACITOR,
C7 8p2	C-EUC0603	CAPACITOR,
C8 8p2	C-EUC0603	CAPACITOR,
C9 1nF	C-EUC0603	CAPACITOR,
C10 10nF	C-EUC0603	CAPACITOR,
C11 8p2	C-EUC0603	CAPACITOR,
C12 220p	C-EUC0603	CAPACITOR,
C13 8p2	C-EUC0603	CAPACITOR,
C14 10uF 10V	CPOL-EU139CLL-2R	Tantalum CAPACITOR,
C15 10uF 10V	CPOL-EU139CLL-2R	Tantalum CAPACITOR,
C16 10uF 10V	CPOL-EU139CLL-2R	Tantalum CAPACITOR,
C17 10uF 25V	CPOL-EU139CLL-2R	Tantalum CAPACITOR,
R1 51R	R-EU_R0603	RESISTOR,
R2 22R	R-EU_R0603	RESISTOR,
R3 10R	R-EU_R0603	RESISTOR,
R4 100R	R-EU_R0603	RESISTOR,
R5 51R	R-EU_R0603	RESISTOR,
R6 10k	R-EU_R0603	RESISTOR,
R7 1k	R-EU_R0603	RESISTOR,
R8 10R	R-EU_R0603	RESISTOR,
R9 22R	R-EU_R1206	RESISTOR,
R10 1k	R-EU_R1206	RESISTOR,
R11 1k5	R-EU_R0603	RESISTOR,
R12 470R	R-EU_R0603	RESISTOR,
R13 10k	R-EU_R0603	RESISTOR,
R14 1k	R-TRIMM4G/J	Trim resistor
L1 4 Turns of 0.375mm (28SWG) ecw 1 close wound on 2.5mm dia. self supporting. See diagram.		
L2 3 Turns. Otherwise as L1. See separate diagram		
L3/4 Printed on PCB		
L5 Printed on PCB		
L6 3n3	SMD 0603	Inductor
L7/8 Printed on PCB		
L9 5n6	SMD 0603	Inductor
Tr1 NE32585	Widely available, but no longer listed by NEC	
Tr2 ATF54143	SOT343	Avago Enhancement mode Pseudomorphic HEMT
Tr3 BC807	SOT23	NPN bipolar
IC1 78M05	HSOP3	Voltage regulator
IC2 ICL7660	MINI-SO8	Voltage inverter
D1 1N4001	Leaded diode or SMD	
37 X 74 X 30mm tin plate box	Schuberth.	
Magnetic field absorbent material	ARC	
Feedthrough capacitor	1000 – 2200pF solder-in	
PCB 23VLNAV1	34.5 X 72 1.6mm RF4 1oz Cu	
X1 BU-SMA-G	FEMALE SMA CONNECTOR	
X2 BU-SMA-G	FEMALE SMA CONNECTOR	


1.3GHz VLNA
G4DDK
In
Out
+12V
IC1 78M05
IC2 LT1930
TR2 ATF541
TR3 BC337
1N4001
C1 82pF
C2 82pF
C3 220pF
C4 330pF
C5 220pF
C6 220pF
C7 82pF
C8 82pF
C9 1nF
C10 100nF
C11 82pF
C12 220pF
C13 82pF
C14 10nF 10V
C15 10nF 10V
C16 10nF 10V
C17 10nF 25V
R1 51R
R2 22R
R3 51R
R4 100R
R5 51R
R6 10K
R7 1K
R8 10R
R9 22R
R10 1K
R11 56R
R12 470R
R13 10K
R14 1K
L6 3n3
L9 5n6

Don't Try This at Home Folks!

By Alan Melia, G3NYK



Health Warning: ....Rolling pin contusions can be extremely painful and even sometimes FATAL!

I was considering doing some component retrieval from a set of my "sweeping" pcbs and I quickly found that normal soldering iron procedures were not very successful. Then I recalled a very detailed Scatterpoint article by Dave Powis, G4HUP, describing the building of a temperature controlled hot plate. This was very detailed and I realised it was what I really needed. I found a small milled aluminium enclosure with a flat base and dug out old 1KW fire bar with some thick nichrome wire, and a number of reels of smaller gauge nichrome (maybe a low voltage winding would be easiest). Then I found a tin of fireclay cement. That brought back fond memories of my childhood (time for a cup of tea) and moulding rock escarpments and masonry tunnel entrances for my model railway. You can see why projects takes an infinite amount of time to complete! As I finished the tea and realised that I had just consumed the last chocolate digestive, reality struck home. Hang on .... I have just the thing somewhere ! A quick root in the cupboards revealed the prize, at the bottom of the airing cupboard .... a ready made temperature controlled flat steel hotplate. This would be recognised by any "New Man" or domesticated male as an electric iron ! I must admit, it is not my favourite tool around the house but, contrary to much opinion, it does get used but with not a great deal of skill.

All that was now required was a way of supporting it in an inverted position and a test was possible. The handiest suitable support turned out to be a cheap clamp vice, which seemed to be able to grip round the handle holding the Iron secure and level. The test was completely successful and at full heat (Cotton ...burned!) I was able to push off the SMDs from a "sweepings" PA pcb with little trouble and a cocktail stick (essential for all SMD work I am told)

After the first successful efforts, I became a bit more adventurous and just heating the end of one pcb pushed off the 6.5dB pad on the amplifier input. Then I carefully removed the input pad (14dB) from a precision Detector pcb input track and replaced it with the recovered 6.5dB item, thus increasing its sensitivity by 8dB or so. I also removed a similar 14dB pad from the end of the coupled line on the end of another pcb, replaced it with another 6.5dB pad and scored and cracked off a square containing the coupler just big enough to fit in a small tin-plate box (available from you know where) with three SMA connectors. That must certainly be the cheapest 3.5GHz directional coupler around !!

I now need to do some calibration of the thermostat as it would be easier, in some cases I think, to heat a pcb just below solder melting-point and apply a little extra heat with a traditional soldering iron.

Things to watch .... beside the rolling pin, if you don't ensure it is really a surplus item... there is no protection and you can get a nasty burn. (Some males probably don't realise an iron gets that hot !) Generally being a domestic item, the metalwork is usually well earthed. This might be a problem with some sensitive FETs, so is worth checking. To save domestic disharmony, offer to

take the XYL to the next Car Boot sale at the local Council Car park. She will zoom round buying bargains (Clarice Cliff, Susy Cooper, Charlotte Rhead, etc, or maybe Beswick horses), and you can pick up a few very cheap grotty looking irons to "recycle".

Happy heating!

The 2012 Olympics & UK Amateur Microwaves ..

An update from The RSGB Microwave Manager

There have been a few scattered reports as to when the substantial Spectrum needs for the London 2012 Olympics will become clear, including the July 2007 edition of Radcom and in Ofcom statements relating to their 2.5GHz and 10GHz auctions

The topic is a regular item at recent RSGB/Ofcom forum meetings. RSGB has been considering both spectrum and special event / branding issues.

Originally Ofcom had planned to launch the full consultation this summer, which then slipped to this autumn. However, we now understand that an extended 2-3 stage process is likely

The latest understanding is that Ofcom are now planning to release a general discussion document in late 2007. This will describe the issues and the sheer scale/complexity of the task. An interval will then occur as they are keen to see what occurs for the August 2008 Beijing games which are the first to be in full HDTV (which obviously needs more bandwidth)

Fairly quickly after Beijing a spectrum plan consultation will be released with more detail. I therefore confidently forecast that the topic will feature at next year's Martlesham Roundtable !

73 from Murray Niman, G6JYB
RSGB Microwave Manager

UK MICROWAVE GROUP WEBPAGE UPDATES

Radcom 10GHz Quickstart Project
The article on how to quickly get started on 10GHz DX by UKuG in the August-2007 edition of Radcom has been kindly made available for free download on the UKuG website:

http://www.microwavers.org

Other Updates:
If you haven't looked recently, other updates include ..

- Crawley Roundtable programme
- 75GHz QSO video
- The next Microwave Beginners Workshop at RSGB HQ!
- Updated tables of Microwave Firsts
- Beacon applications

Regards, Murray G6JYB, webmaster

LAST MONTH'S COVER PHOTOGRAPH

Ian Lamb , G8KQW, emailed Scatterpoint to name the people pictured on the front page of the July-August 2007 Scatterpoint. Left to right are:

Ray James GM4CXM, Wendy (G4SVG's XYL), Steve Wensley G4SVG, Paul Longstaffe G6UAJ, Ian amb G8KQW and Ian G4EZP (in the far right corner).

Ian casually added, " That was in the days I was known as the Birmingham And District Amateur Radio Specialist - or BADARS for short!" ... we wonder why Ian :-)

Many thanks to Ray, GM4CXM for providing the photo in the first pace...editor.

We are always on the lookout for "historical" photos of this kind. Please scan and email to the editor at:

scatterpoint@ukmicrowavers.org

The UK Microwave Group and the Martlesham Radio Society will be staging the annual Microwave Round Table on **Saturday 10 November and Sunday 11 November 2007** at BT Adastral Park, Martlesham, Suffolk.

This is the premier amateur microwave event in the UK and is very popular, with usually well over 100 attendees, including microwavers from North America and Europe in addition to the UK "regulars".

If are new to microwaves you will be made most welcome. You owe it to yourself to attend!

Full details of the event will appear on the UKuG website at:

http://www.microwavers.org

as soon as the programme of lectures and activities is finalised.

Pre-registration for the whole event is essential as BT security requires a list of attendees beforehand. You will not be allowed past the security guards unless your name is on the list! During September, a special on-line registration website will be set up. Keep checking www.microwavers.org for the link to this.

Test equipment facilities should be available throughout the weekend. You are invited to bring along your latest microwave equipment to be checked out.

On both days, in addition to the test equipment facilities, **an indoor "fleamarket"** (Bring and Buy) will be available at which you can pick up all manner of useful microwave parts and surplus equipment. If you wish to bring items for sale please **contact G3XDY** as a table will have to be prebooked ... a small % of your takings is required for this.

We are currently looking for lecturers!

If you have a talk of microwave interest that you would be willing to share with a hundred or so fellow microwave enthusiasts, then please contact me as soon as possible.

If you are not available to give a talk at Martlesham then how about submitting an article in written format so that we can incorporate it into next years UK Microwave Group Proceedings?

For those who wish to stay overnight, accommodation will be arranged at a local hotel. Again, pre-booking is essential. Details will appear on the UkuG website during September. The **annual dinner** takes place at the hotel on the Saturday evening. More details later!

Sunday morning sees the UKuG AGM at the start of the morning's session. This will include the election of the officers of the committee and the presentation of the Chairman's, Secretary's and Treasurer's Annual Reports. We are looking for enthusiastic volunteers to join our committee and help shape the future of UKuG.

This year Steve Davies G4KNZ is standing down as UKuG Treasurer so we are interested to hear from anyone numerate who would be willing to take on this vital UKuG officer position. If any UKuG member is interested in the office then please submit your name (and the name of your seconder) to the UKuG Secretary, G8KQW as soon as possible.

On behalf of the UKuG Chairman Brian Coleman, G4NNS, the UKuG Committee and the UKuG membership I would like to formally thank Steve for his dedication and efforts during the last 5 years as Treasurer.

If you are interested in joining the committee, have any agenda or AOB items for the AGM please contact the UKuG Secretary by email to:

ianlamb@btconnect.com

at least **21 days prior** to the AGM (ie: by 21st October 2007)

Thank you & I'm looking forward to meeting as many of you as possible at the Martlesham Round Table.

vy 73 from Ian, G8KQW,
UKuG Secretary
Little Court
Churt Road
Beacon Hill
GU26 6PD
United Kingdom

UK Microwave Beacons – The next Batch?

In the first half of 2007 nine microwave beacon applications were approved, all of which are operational or on test as Scatterpoint went to print. In addition, an initiative after RAL led to restoration work on some other beacons as far a field as N. Ireland, Cornwall and Leicester. In conjunction with some pioneering VHF beacons at RAL (assisted by some notable microwavers), the UK is currently seen as being proactive in this area compared to years gone by.

With the end of the summer, the next batch of applicants is shaping up and the list below represents those which have lodged draft applications with RSGB for coordination, etc, and is also on the UK microwave site vetting page.

There are a number of interesting features are present in the provisional list:

- A novel dual output 5GHz proposal by Dave G6GXK, in liaison with Amsat-UK and with the potential for differential fading/reception tests.
- A new, powerful, Central Scotland Cluster by Dave GM6BIG aimed SSE to support aircraft scatter work.
- A fresh attempt at local beacons for the Cambridge area
- A revamped proposal for the low power Paisley beacon
- A long awaited 5.7G beacon from our Editor, G3PHO, in honour of the late G3KEU

A couple of the new proposals use the 750-800 area outside of the main DX-Beacon band. As discussed with IARU-R1, this is one way of solving the dilemma of supporting local experimentation and tests, whilst avoiding blocking weak-signal DX reception.

Some work and liaison remains to be done on the ones below so there is a period when comments are welcome prior to submission

Callsign	Freq	Location	Type
GB3MAN	5760.870*	Rochdale	New Beacon (*and 5668.880)
GB3KEU	5760.925	Sheffield	New Beacon
GB3CSB	1296.985	Kilsyth	New Beacon
GB3CSB	2320.985	Kilsyth	New Beacon
GB3CSB	3400.985	Kilsyth	New Beacon
GB3KAM	24048.870	Cambridge	New Beacon
GB3CAM	10368.750	Cambridge	New Beacon
GB3FRS	1296.850	Farnborough	Site change and revamp
GB3COA	1296.755	Paisley	Frequency/bearing change (from 1296.920)

Useful Links:

GB3MAN http://www.gxk.org.uk/beacons/
GB3CSB http://rayjames.biz/gm4cxm/id14.html

And finally ....

Do you want to contribute to a new beacon reporting web system or further improvements to the IARU-R1 handbook on beacons ? -You do? Then get in touch!

Ofcom have ended the NFAP applications stage, which means beacon applications should now get approved ~ 3weeks quicker than would have been the case.

73 from Murray, G6JYB, RSGB Microwave Manager

DMC 23/24GHz UNITS

A recent posting on the UK Microwave reflector from Peter SP9TTG has some interesting and useful information for those readers who have some of the DMC surplus gear. There ius still a lot of it about in the UK... just check out Ebay and the various amateur rallies. ... Peter comments:

I'm new to the group. I have seen that the "DMC-theme" is HOT these days, so I wanted to share an interesting approach to get cheaply into 24GHz narrowband. The whole idea came from Norbert, DL4DTU, and was successfully repeated by many others. I was given all the units needed to complete my first 24GHz TRV by Norbert himself at the recent JO80EI meeting (http://www.dl6nci.de/news.htm)

The unit in unmodded form has a good RX with some 4dB NF and plenty of gain (can be regulated at IF stage), 20-30mW 'barefoot' with up-converter alone or 200-250mW with DMC PA.

You can watch my first steps with this gear at:

http://uk.youtube.com/watchv=3DpSz5X0_aicM

As many of you will notice, my LO brick seems to be 'odd'. Yes, this is a newer type, that needs only 8.4V, an additional -5V being needed in older types. A second change is that it has the circulators built in, so there's no need to attach external ones. I have a personal beacon, SR7VC/B 24048.820MHz, temporarily on my balcony for a test run before putting it at the final location. There is fine site where you can find more details about this approach to 1.25cm:

http://ok1vvm.aitech.cz/projekty/24g.htm
http://ok1vvm.aitech.cz/projekty/24Gnew.htm

If anyone is interested in sharing the details and ideas, please don't hesitate. I'm preparing a presentation based on meeting materials, maybe it can find the place in 'files' section of the UK Microwave Reflector archives

Best 73 from Peter, SP9TTG

INTERESTED IN MICROWAVE ATV ?

Then take a look at DGØVE's website where you'll find some very reasonably priced products

http://www.dgøve.de/

(Many thanks to Adrian. G8PSF for the pointer to this one...)

BEACON NEWS

GB3GXK: Rochdale 10GHz beacon

The beacon previously operating as G6GXK on 10368.810 is now operating from the new location at IO83WO as GB3XGH on 10368.810 (GPS locked) as from 19:07 GMT on the 3rd September 2007. Beacon status can be obtained at:

http://www.gxk.org.uk/beacons/index.htm

Reports are requested to determine coverage from the new location with a new antenna which has a more evenly distributed pattern. There should be a possibility of Scottish reception since the take-off all round is far better especially to the north which was screened at the previous location. Please send reports to either g6gxk@arrl.net . **73 from David G6GXK**

GB3MAN: Manchester 24GHz beacon

The Manchester 24GHz beacon, GB3MAN, built by G6GXK, was activated on 26 August 2007 at 09:00 GMT. A check was carried out later at 16:00 GMT. At that time the frequency was measured at 24048.850800 MHz to within a few hundred Hz or so with the general internal temperature showing as 30.2 deg C. The PA temp was 35.8 deg C with voltage at the ODU 13.35V

The PA is a Milliwave type, working at the 1dB compression point (around 350mW output) Estimated ERP is 3W.

Only one reception report has so far been received, from G3PHO/P near Macclesfield Forest in NW Cheshire. From a roadside layby on the 9th September 2007, he received an S7 signal, over a 34km path, on 24048.865.0MHz +/- 1kHz, some way off the original frequency shown above. David, G6GXK is now investigating the apparent drift.

10GHz EME @FRARS 26/8/2007 - By John Fell, G0API

I am writing this after finishing unpacking my car for the second time after collecting the "kit" from our Flight Refuelling Amateur Radio Society's EME day, held yesterday, 26th August 2007, at our Wimborne, Dorset, club HQ.

For those of you who missed it, we spent all day, from 0930 until midnight Sunday, stripping down and rebuilding our 12 ft dish antenna system in preparation for EME on 10GHz, something we last did in 1994. During those years, several members of FRARS have built equipment for this band for terrestrial operations and one of these, built by Paul M0EYT, was used as the principle item used yesterday.

In order to make it happen, we had to replace the original angle iron grid suspended on a tripod system at the dish focal point (64.75" out from the dish face), with a new tubular focus box, designed last week to accommodate Paul's entire transverter and the attached 'choke ring' feed (See photo right). This was constructed from 14" steel duct and a sliding tray mounted inside to allow in/out fed position adjustment and 90 degree polarisation rotation. A jack has been built into this structure, with remote control at the operators position.

The rear counterbalance weight system has been upgraded to allow for the additional feed weight involved and to retain fine balance.

The original Azimuth motor gearbox drive had fallen into disrepair and was rebuilt after a tad of MIG welding and some fettling... this can now drop into position and is retained with a single fixing. Again this is remote controlled at the operating point and time was spent beefing up the anti-backlash weight arrangement to add steel ropes, additional weights and bolt retainer to the vertical central column.

The Elevation jack bracketry has been redesigned and is stronger and easier to deploy.

To assist in Moon tracking the Az and EL protractors were fitted with monochrome video cameras, feeding a pair of monitors at control point.

The dish face had become tatty, with much of the aluminium joint tapes frayed – these were all replaced. The new feed was finally in place by 1900 Hrs and the transverter integrated.

This system uses a DB6NT 144MHz i.f. based module at its heart but has been heavily modified by addition of sequencing control, 4 port waveguide switching of r.f. at 10GHz, a modified ex-SatTV LNB used as the front end LNA (waveguide 17 feed integral) and a 14W GaAsFET PA + driver. The height of this unit has been engineered down to just 7", to keep the feed aperture blockage to a minimum. Rf feed, d.c. power at 12V (approx 10A on TX) and remote temperature stabilised high accuracy LO feeds complete the r.f. lineup.

At the control point with the club meeting room we had no less than 4 separate SDR radios running on RX using down conversions to 19 and 10.7MHz. These were used to look at the Moon surface noise level , and Waterfall displays to show incoming signals (echoes from our own TX in this instance) .
The drive rig at 144MHz was an FT221R, used in CW mode this time.

As the Sun had set before the RF system was ready we had to wait for the Moon to fall into a gap at 160 to 180 degrees as seen by the dish. Until then we could not calibrate our Azimuth protractor but we could see nearly 5db of cold sky/ground noise (or hot tree) on our measuring instruments .When the Moon appeared at after 2100 Hrs, we initially got the antenna on bore sight, using the illumination of the Moon and the shadows cast over the dish face, followed rapidly by 2dB of Moon surface noise. This was the first positive sign that we had built a working device.... After this calibration was completed, we started sending CW and were amazed to hear and see on screen a return carrier echo! To do this first time after 13 years was asking more than we could rightly expect, but nobody was disappointed by this result, which is the ultimate test for an EME capable station.

We has provisionally arranged a sked with Brian G4NNS , who is based at Andover. A 144MHz direct link was established and a nervous eye kept on the Moon's progress between the trees. Just as we started to hear ground noise dominating our incoming signal, Brian called to say he need an extra 5 minutes. True to form our window closed and Brian's opened! However we are confident that this can be repeated when the moon is at higher elevations and QSOs will follow.

The possibility of 30W solid state and potentially 100W + from a TWT would allow echoes of considerable strength – bordering on SSB possibility.

Well done to all involved for making this happen. This was a classic example of club team efforts making something out of the ordinary happen on our doorstep.

Those who took part were:
Jules G0NZO, Julian G3YGF, Paul M0EYT, Andy G4JNT, Carl G6NLC, Tony G3PFM and John G0API

There's not a great deal of UK activity reported this month. Maybe it's the result of the atrocious 'summer' weather we've been having.... it has certainly deterred your scribe from going out portable more times this year than any other during the past 30!

So it's really good to get some interesting overseas news to compensate.

News from the USA ..

First of all we hear from one of our newest UKuG members, **Scott, N0EDV**. Whose photo appears on the front page of this issue. He sent in these details along with his UKuG application form:

"Attached is my latest project ... a 4 foot dish (approx. 123 cm) for our 902 MHz band (not sure if you guys have a frequency allocation up there)...I have a transverter from Downeast Microwave for 902. It runs at 10 Watts output. I built it from their kit (as I do with all of their stuff). I like to save money and build stuff :) A quick rundown on my VHF and up gear...

50MHz - Kenwood TS-690S and Yaesu FT-857 + 5 element Yagi
144MHz - Yaesu 857 and 11 element Yagi.
Modified Icom IC-251A (-8 dBm output) for use with transverters.
222MHz - Homebrew W1GHZ transverter (5W) and homebrew 6 element Yagi
432MHz - Yaesu 857 and homebrew 8 element Quagi
902MHz - Downeast Microwave transverter (10W) and a pretty much stock Andrew 4 foot dish with
902MHz dipole feed.

What of the Future?

10GHz- Downeast Microwave transverter (~3W output). I have an 18" (45cm) modified DSS satellite TV dish already built
3456MHz- homebrew design. I bought a 4W amp at a hamfest for cheap, ie $20 !!
5760MHz- I won a 15W TWT at the Central States VHF Society annual convention in 2006, so I might as well get on the band. Have a look at my webpages for more info:

http://corbenflyer.tripod.com

News from mainland Europe...

Some interesting photos of **French microwave activity** arrived via **Ralph, G4ALY (IO71VL).** The photo below shows, in order from the left**, F5TTU**, **F9OE** (The old sea salt) and Hervé

F5HRY at the laptop.
This was taken on Sunday 26 August 07 during the French Journée de Activité. The site is Menez Hom in IN78, not too far from F9OE's home in Camaret. He worked G4ALY on ssb, as well as F1PYR/P, F6DKW, F2CT/P and a few others. He now has 5W into what looks like a Procom dish. He only had a mobile phone for talkback then Hervé turned up with his friend and a laptop so they had KST link too.
F9OE is doing very well now and has really got bitten by the microwave bug!
73 from Ralph, G4ALY

From: Murray Niman G6JYB <murray.niman@btopenworld.com
Subject: 3.4GHz in France
As you may know the VHF /Microwave scene is rather more restricted in France than here in the UK. Our colleagues in France now appear to be working on a new request to get access to 3.4GHz. Visit the following URL for more info...

http://thf.refunion.org/3400mhz/070601_demande_3.4ghz_v0.PDF

I don't know if they will have any better luck than earlier efforts but we should wish them well. I will shortly be adding a 3400MHz status page onto the UKuG's **www.microwavers.org** based on the material that G4DDK and I gathered for recent articles/papers.

News from the UK Microwave Scene

Millimetre Bands

From: Peter Blakeborough G3PYB/P, IO90MX <peter.blakeborough@pop3.hiway.co.uk>
Sunday 5 August was quite good for the **Millimetre Bands Contest**, I was with G8VOI on the summit of Butser from where I worked 7 or 8 stations on 24GHz, 3 on 47GHz (80 km was the best on 47G), two on 76GHz. There was very good weather but it was too humid to do the 80km on 76GHz.

The 5.7/10GHz at the end of July was ok with quite few worked but no great distances until Jon Noel, F6APE, popped up on 5.7GHz with a good signal at 400km plus

Reports on 76GHz operations on Sunday 5 August 2007 ... collated by John, G8ACE

The relative humidity (RH) was 59% and the temperature (T) was 30c so this was probably the worst day for mm wave propagation so far during 2007!!!

(1) G8ACE/P from Lane End IO91JA
G3PYB/P was worked easily at Butser Hill which is LOS from Lane End at 17km distant. FM 59+ signals were exchanged using duplex, the FT 290 S meter being pinned hard across. In fact, initially in monitoring my outgoing signal, I mistakenly tuned to PYB's incoming signal, which was far stronger than my own out going, using scatter reception. As a visual sighting was obtained over this short path, 47GHz was not needed for dish alignment from Lane End, the BT tower on Butser Hill making antenna alignment easy.

G8BKE/P was the most challenging yet on this well worked path to Ocknells in the New Forest. Initially 47GHz was a very weak signal calling for repositioning of the dish at Ocknells. It rather looks as the foliage growth into the fresnel zone means this path for 76GHz is coming to its useful end of life. Visually, the mid-path clearance appears rather less than the 30m clearance the K=1 profile suggests. 30m high trees would, of the course, illuminate the clearance. The heading was decidedly double peaked. Alignment of the 45cm 76GHz Rx at G8ACE was achieved by receiving the 47G signal first and then the 30cm TX was carefully aligned to match the Rx dish. Signals exchanged varied from RS41 and RS54 on FM over a path of 32.6 km. The differential in reports is mainly due to the differing antenna gains in transmitter and receivers. Foliage is a definite killer to 76GHz signals and must be avoided.

Tests with **G8KQW/P** on the Isle of Purbeck at around 70km were negative due to both the very high humidity and the known fresnel zone intervention near Sway.

(2) G8KQW/P on the Isle of Purbeck IO90AP11
Initial tuning on 47GHz revealed the Bell Hill beacon G8BKE/P around 10dB signal to noise at 0915 BST, this beacon is 35km from Purbeck.

The first test was with **G8BKE/P** at Picket Post - IO90DU in the New Forest. Signals on 47GHz were enormous over this 32km path and, following the QSY to 76GHz, G8BKE found G8KQW's signal at 1028BST. A steady signal QSO resulted with G8BKE receiving signal report of 519 for his CW and G8KQW being copied in the new Forest at 55 on SSB - this 32km was G8KQW's ØDX to date.

Several tests were conducted during the day with both **G3PYB/P** on Butser Hill (81km) and **G8ACE/P** at Lane End (70km) without any success. There are known fresnel zone interventions on both the Purbeck to Lane End and Purbeck to Butser Hill paths at k=<1 which combined with the high RH and T caused both paths to fail on this occasion.

The G8BKE/P 47GHz beacon gradually became weaker during the day and at 1600 BST was only 3-6dB above noise, indicating higher path loss than during the morning. By 1700**,** even 47GHz signals to both Lane End and Butser Hill were variable strength, weaker than earlier and with deep QSB.

(3) G8BKE/P at Ocknells IO90EV27
In addition to the activity described above, G8BKE/P worked **G3PYB/P** on 47GHz from Ocknells to Butser Hill however the path failed on 76GHz, no signals were heard either way.

Conclusion
We all have a better understanding of what the worst possible case propagation is on 76GHz after today!

The 76GHz contact reported by G8KQW/P can be accessed in TEXT,VIDEO AND AUDIO at:

http://www.microwavers.org/75ghz.htm

Editor's comment: *Many thanks for a detailed report from all stations involved. It's good to see such keen interest in the higher microwave bands.*

French Microwavers seek 3.4GHz allocation ...

http://www.southgatearc.org/news/august2007/French_amateurs_want_3ghz.htm

has reports of a fresh French move by the REF VHF/ Microwave committee, THF , to get permits for a narrowband 3.4 allocation. UK radio amateurs should support the French microwavers in anyway they can so that they, the French, can also share in the delights of the excellent 9cm band.

More Beacon News

Good news from the Faroe Islands … (from Ivan, OZ7IS)

On 11 August 2007 the 1296MHz transmitter of OY6BEC was re-installed on Sornfelli. It has been QRT due to interference to a local radar but the problem is no longer an issue.

To my best knowledge the data are as follows:

OY6BEC

Frequency: 1296.885MHz
Locator: IP62OA (700 m.a.s.l)
Power Out: 100W ERP ?
Antenna: Double quad on 135 deg. by OY9JD.

It may need some time to settle on the right frequency. It may need readjusting.

The 50 MHz beacon is now repaired and OY1CT will bring it back at the end of August. **Vy 73 de OZ7IS**

Later, we had this email from Ray, GM4CXM ..
Jon OY9JD came on KST and informed that OY6BEC is on 1296.879 and he hopes it will settle eventually on 885. It is running 6w to a 9db gain PA23R on a heading of almost 150 deg.

For an accurate list of SWEDISH beacons visit the following URL:

http://www.sk6yh.org/beacons/

GB3LEX beacon frequency re-set …

The output frequency of GB3LEX (Leicester) was reset on Friday 31st August to a few kHz higher than 10368.955MHz. Aging of the 108MHz crystal is still producing a LF shift in the region of 0.5kHz per day.
73 from Geoff, G3TQF, beacon keeper

First Claim for 3.4GHz between GW and GD

From: G3XDY <g3xdy@btinternet.com>
Date: 5 September 2007
I now have a formal claim from GW3TKH for a 3.4GHz First between GW4BRS/P and GD3FYB/P that took place on 11th September 1978 at 14:00, using NBFM derived from a "Balloon Board" and SRD multiplier into a 4 foot dish.

I will issue a certificate in early October if there are no other claims for this First before then. It will also appear as an update on the Microwavers.org web site.
73 John G3XDY (UKuG Awards Manager)

CONTEST REPORTS

Some of these were held over from last month's Scatterpoint due to lack of space then ..

July 5.7/10GHz UKuG Contest

From: Bob, G8VOI/P
<bobg8voi@reeves59.freeserve.co.uk
Location: Butser, IO90MX
A strange day with generally poor conditions,
lots of scattering and multipath on distances over 100km or so.
I found I had to increase the dish elevation on a number of contacts to peak them up. I ended up working:
9 on 5.7GHz, G3PHO/P (IO93PW) best DX at 329km
21 on 10GHz, F6DKW (JN18CS) best DX at 334km

I have to admit I almost pulled out on Sunday morning, found it difficult to build up the enthusiasm having had a few poor outings last year. It had appeared to me that the use of KST was killing the chances for those of us only running 144MHz talkback, hardly making the effort of going out worthwhile, so I very pleased with the days haul despite everything. It looks like we faired much better with the weather than those even just 30 or so miles further North.

A number of regulars were not heard on during the day, so the number worked could have been even better, approaching the number I typically used to work in the mid 90's.
I had a few 'problems' to sort out ... the generator started playing up again, but staggered on until the end of the day, and my IC202 took a flying lesson and smashed the DC connector when it jumped off the tripod! 73 from Bob G8VOI

August UKuG Millimetre Bands Contest

Another report from G9VOI ...
I had an interesting weekend on Butser Hill, and booked it for the 144/432MHz RSGB Low Power contests ... I like to keep my hand in! Something went wrong on Saturday! Contest, Good weather and excellent tropo on 144MHz all at once!! I worked a string of EAs and Fs on the F/EA border, plus down to HB9 all with 59+ signals, a dozen or more contacts over 850km, the best being 970km. I believe similar paths were being worked on 70cm and 23cm during the evening.

Peter G3PYB contacted me about the millimetre wave contest, so I ditched the 432MHz LP one and had a good day operating with Peter on the Sunday. We both worked 8 stations on 24GHz. We failed with John G4EAT but I worked him on 10GHz with my 35cm ex BSB dish and dual 10/24GHz feed. We also failed with G4BAO, nothing heard either way. It was lovely WX, but very high humidity, so not ideal conditions.
It was good seeing Peter 'in action' on 47GHz and doing a couple of tests on 76GHz. Hopefully Peter might come up to the top of Butser in the future for the 5.7/10GHz events as well since there's certainly room for 2 up there and I welcome the company and opportunity to compare and learn.

I'm sorry to see the North / South divide on 24GHz. At the moment my 24GHz system only runs 5 - 10mW so pointless straying too far. Perhaps when it's rebuilt and hopefully a bit more respectable, might venture a little further North, especially if anyone else can be encouraged to do the same. I would have thought with the higher powers now around paths of 100 - 150km should be easily achievable on 24GHz. The trouble might be people planning for possible 47GHz paths and therefore neglecting pushing 24GHz limits as much? 73 from **Bob G8VOI**

From: Ian G8KQW <ianlamb@btconnect.com>
G8KQW/P - Isle of Purbeck - IO90AP11
I had 24GHz 9 QSO' with stations operating from 6 different locations. Paths worked were to:
Walbury at 89km (G4NNS/P, G0RRJ/P & G0MJW/P)
Butser Hill at 81km (G3PYB/P and G8VOI/P), Lane End at 70km (G8ACE), Salisbury at 59km (G4LDR), Southampton at 50km (G1JRU), Picket Post at 32 (G8BKE/P). Tests were carried out with G4DDK and G4EAT (who are both on exactly the same QTF from Purbeck) but nothing was heard either way.
47GHz: I had 3 QSOs. ... Paths worked were to: Butser Hill at 81km (G3PYB/P), Lane End at 70km (G8ACE), Picket Post at 32 (G8BKE/P) . Conditions were awful. It was the worst / most challenging day of the year so far considering the path loss.
73 .. Ian

Invitation to IARU Region 1 VHF/UHF/uW Contest

Dr OMs,

On behalf of the IARU, Region 1 I would like to invite you and your fellow radio amateurs to participate in the annual UHF/SHF/ Microwave Region1 Contest, which will take place, as usual, on the first weekend in October(6-7 October 2007). This year, Czech Radioclub (CRC) is adjudicating this contest.

Please read the Rules of this Contest, based on chapter 4 in the VHF Manager's Handbook V 5.21. **Logs in standard digital format (only EDI) shall be sent to:** ok2zi@atlas.cz . **The deadline for this year is 9. December 2007** .

Logs received later will be accepted only as check logs!

Very Important :
All national contest managers are responsible for the national evaluation and precheck the logs. **Logs in "NON standard EDI" will not be accepted.**

Recently we discovered that lot of EDI logs from Germany (DL) contain some additional data and some required data is missing. More details I can send you via personal mail.

Good luck in the contest ... **Karel Odehnal, OK2ZI**

UKUG June 2007 Lowband Contest Result — errata

Unfortunately the individual band scores got left out last month when the results were published. Please refer to the July-August 2007 issue of Scatterpoint for the overall band scores, after these raw scores were normalised.

The operators whose call-signs are in bold print will each receive a certificate at next year's UKuG Spring Microwave Roundtable.

Overall Position	Call	Overall Normalised Score
1	**G3XDY**	2544
2	**G8KQW**	2476
3	G4BRK	1912
4	G3RCM/P	1785
5	G4SJH/P	1696
6	G8VOI/P	1261
7	GM4CXM	778
8	M0GHZ	760
9	G8AIM	723
10	GW3TKH	643
11	G0DJA	371
12	G0JMI/P	226

1.3GHz

Position	Call	Locator	Best DX	km	QSOs	Score
1	**G3XDY**	JO02OB	DM7A	837	23	11138
2	**GM4CXM**	IO75TW	G8KQW	587	20	8660
3	G4SJH/P	IO91GI	GM4LBV	597	36	6299
4	G4BRK	IO91HP	DR5A	556	31	5976
5	G8KQW	IO91OC	GM4CXM	587	34	5638
6	G3RCM/P	IO93FL	DJ5BV	672	21	4474
7	G0DJA	IO93IF	F5PEJ	442	25	4128
8	G8VOI/P	IO90MX	G0DPS/P	304	23	2591
9	M0GHZ	IO81VK	GM4CXM	521	12	2075
10	GW3TKH	IO81JM	G4BAO	249	11	1392
11	G8AIM	IO92FH	G8VOI/P	153	8	825
12	G0JMI/P	IO91JB	G3FYX	106	8	288

2.3GHz

Position	Call	Locator	Best DX	km	QSOs	Score
1	**G8KQW**	IO91OC	G3RCM/P	269	22	2793
2	**G3XDY**	JO02OB	DL0GTH	684	7	2630
3	G4BRK	IO91HP	F1PYR/P	377	15	2344
4	G4SJH/P	IO91GI	G3RCM/P	236	21	1674
5	G8VOI/P	IO90MX	G4ALY	233	14	1446
6	G3RCM/P	IO93FL	G8KQW	267	7	1070
7	GW3TKH	IO81JM	G8KQW	174	7	835
8	G8AIM	IO92FH	G8VOI/P	153	6	778
9	M0GHZ	IO81VK	G3LRP	248	7	692
10	G0JMI/P	IO91JB	G3FYX	106	7	259

3.4GHz

Position	Call	Locator	Best DX	km	QSOs	Score
1	**G3RCM/P**	IO93FL	GM4LBV	364	11	2420
2	**G8KQW**	IO91OC	G3LRP	281	17	2348
3	G3XDY	JO02OB	DK1VC	440	5	1458
4	G4BRK	IO91HP	G3LRP	218	11	1296
5	G4SJH/P	IO91GI	G3RCM/P	237	14	1284
6	G8VOI/P	IO90MX	G3RCM/P	281	12	1235
7	G8AIM	IO92FH	G8VOI/P	153	8	895
8	M0GHZ	IO81VK	G4DDK	250	6	790
9	GW3TKH	IO81JM	G8KQW	174	4	531
10	G0JMI/P	IO91JB	G3FYX	106	6	259

FOR SALE & WANTED

For Sale: Icom 1271E all-mode 23cm transceiver in mint condition. This rig is fitted with the internal PSU module, the speech synthesizer module and the computer interface module. It has never been aired, only removed from original packing at intervals to check into a dummy load. It comes complete with all standard kit, fist microphone, mains lead, etc and also the official Icom workshop manual. Also included are an **Icom SM8 station mike** and two-off **Tonna 23 element antennae** plus an assortment of N-type patch leads and a couple of lengths of FSJ4-50 Heliax, with connectors.

Price: £450.00 the lot, no offers. Buyer collects from Petersfield, Hampshire (just North of Butser).

For more info, phone 01730 300414 (landline) or email **Pete.weedon@ntlworld.com**.
73, Pete Weedon, G8ZKZ

For Sale:

RE: The "Cheap and Cheerful L Band synthesizer" from Scatterpoint, June 2006 issue:

I have three PCBs and U6239B synth chips available.

Price for one PCB and U6239B is £11 inc post to the UK.

The first three emails to g8zha-1@blueyonder.co.uk will be selected.

Rich G8ZHA
<g8zha@blueyonder.co.uk>

JOB OPPORTUNITY AT THE UNIVERSITY OF LIVERPOOL

I believe that amongst the UK Microwave Community and readers of Scatterpoint, there may be a young person looking for a long term post working with Electronics / Microwaves.

The University of Liverpool are anxious to find a replacement for me now that I have retired and provide very limited support to the research as a Part time Consultant. Whoever fills the post will be a "hands on", practical type of individual who can design and built electronics items/interfaces/bits and pieces of mechanical equipment (use a lathe, milling machine etc), do a bit of programming and get involved with the 14GHz Microwave systems in the Laboratory.

The post will be advertised on the University of Liverpool Staff Vacancies Web Page, in the very near future, as an Experimental Officer in the Department of Earth and Ocean Sciences. I would stress that this is a long term appointment; it is not a contract post. The salary goes way up the scales all the way to the very top for the right person. This was my old post ... I worked for the University for 42 years and retired as a Senior Principal Experimental Officer (SPEO)

They are looking for a graduate and could easily be persuaded to offer the opportunity to obtain a Masters Degree. With a lot of persuasion, a PhD might even be possible.

Anyone interested should keep an eye on the Web page:
http://www.liv.ac.uk/working/job_vacancies/index.htm
or contact me at: **<J.A.Share@liverpool.ac.uk>**
and I can give them the vacancy reference number as soon as it is made known to me but I only come into the office on rare occasions so this may not be the best method.

John A. Share, G3OKA