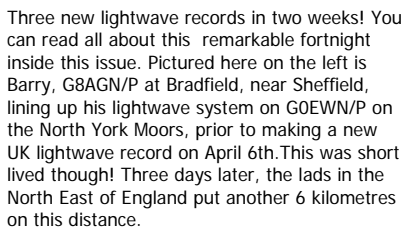




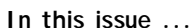
scatterpoint

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2011 APRIL



"Where will it all end ?" You may well ask!



- A video linked azimuth indicator
- A Basic ADF4110 Lockbox
- Two weeks, three records and a First!
- March 2011 Lowband Contest Results
- Beacon News
- World 76GHz record smashed .. Full report
- Activity News

Latest News ...

- Two new light wave records and a “first” in two weeks
- Germans smash 9 year old 76GHz world record

MANY THANKS TO ALL OUR
CONTRIBUTORS, G3LYP and G3LLV, THIS
MONTH ...
WITHOUT YOU THERE WOULD HAVE BEEN NO
SCATTERPOINT!

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From the Editor's Desk

The recent flurry of lightwave activity may not seem to be of microwave interest to some of our readers but it brings back the nostalgic days of my early 10GHz wideband activity in the late 1960s and early 70s, when similar closely spaced record microwave DX attempts were being made by various groups of keen experimenters and individuals (notably GM3OXX, GM8BKE and GW3PPF,) to push the boundaries of what was then the new Gunn diode technology. Indeed, the Radcom microwave column writer of the time, G3RPE expressed his dislike of the intergroup rivalry that was very apparent at the time! Not so this editor of Scatterpoint! I think this is healthy and friendly competition of the best kind. It was from activities like these that our simple 10GHz technology of the 70s began to metamorphose into the high tech narrowband stuff we now enjoy. Who knows what another 10 years of lightwaving will bring? If you haven't had a go on this highest of frequency bands then do make an effort. It's not

expensive to do and involves electrical, electronic and mechanical home construction. Radcom is running a series of articles by G8CYW and there's loads of material on the internet See you soon?

Finally, many thanks indeed to Mike Scott G3LYP and Joe McElvenney G3LLV for their articles this month. It gives me particular pleasure to be able to publish Joe's article as he is an old mate going back to the "good old days" of amateur radio .. ie the 50s and 60s ! While not a microwaver per se he is a very keen experimenter and home constructor. On top of that he's even a member of UKuG!

73 from Peter, G3PHO
Editor

News, views and articles for this newsletter are always welcome. Please send them to:-

editor@microwavers.org

preferably by email, or to the editor's address shown above. **The CLOSING date is the FIRST day of the month** if you want your material to be published in the next issue.

LAST REMINDER!

Next month, May 2001, will see the last printed (paper) issue of Scatterpoint. If you haven't yet arranged to download this newsletter from the Yahoo Scatterpoint website then you haven't much time left to do it! If, during June, you don't receive an email from Yahoo to tell you Scatterpoint for that month is available for download then you should check that you are indeed registered with Yahoo. Only YOU can do this. The UKuG Committee cannot.

See www.microwavers.org for details how to join the Scatterpoint Yahoo Group.

EDITORIAL CHANGES FROM JUNE ONWARDS ...

The May 2011 Scatterpoint will be the last one to be edited by Peter, G3PHO. After 26 years at the keyboard (Scatterpoint, in its present form, used to be the RSGB Microwave Newsletter) he has decided to 'gracefully' retire from what has been a most enjoyable and rewarding job (not rewarding in the money sense though!). All items for Scatterpoints after the May issue should be sent to the new editor, Martin G8BHC, who also happens to be UKuG Secretary. His contact information can be found on page 2, opposite.

Microwave Update will be in Enfield, CT this year, October 13-16.

see www.microwaveupdate.org for details - more information will be added soon.

Please consider giving a talk or paper for the Proceedings - contact w1ghz@arrl.net for more information. Enfield is in central New England near the border of Massachusetts and Connecticut, close to the Hartford airport and convenient to both Boston and New York City. October is foliage season in New England, so plan some extra time to see the spectacular colors.

Also this year, the Eastern VHF/UHF Conference will be co-located with the Microwave Update on Saturday, Oct 15. Papers from this conference will also be included in a joint Proceedings. So if your activity this year has been VHF or UHF, please consider a talk or paper. contact w1ghz@arrl.net for more information.

We all learn by sharing - please contribute.

UK MICROWAVE GROUP SUBSCRIPTION INFORMATION

The following subscription rates now apply.

Please make sure that you pay the correct amount 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!

Until May 2011, your personal renewal date will be shown at the foot of your address label if you receive Scatterpoint in paper format.

Scatterpoint distribution by email ceased with the January 2011 mailing, and is now distributed electronically as a .pdf download by means of Yahoo! Groups.

If you are a former email only subscriber, and you have forgotten your renewal date, please ask the membership secretary for a reminder. 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!).

Whichever payment method you use, please remember to include your **name** and **callsign** with your Paypal or cheque details.

Payment can be made from the UKuG website membership page

**www.microwavers.org
(Paypal, or any credit card)**

or

**a cheque (drawn in £ on a UK bank)
payable to 'UK Microwave Group' and
sent to the membership secretary**

or

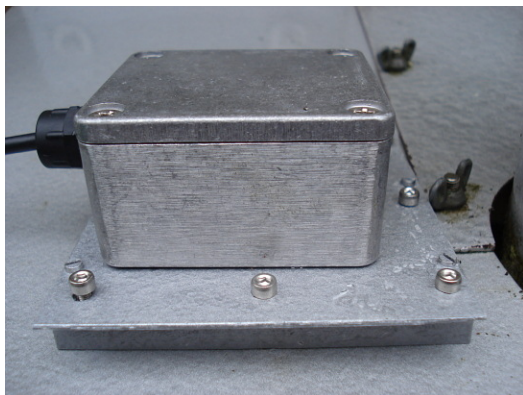
(as a last resort, by cash to the treasurer!)

The UKuG membership rate for 2011 is:

UK	£6.00
US	\$12.00
Europe	€10.00

For this you receive Scatterpoint as a .pdf file.

A Video Linked Azimuth Indicator ... by Mike Scott, G3LYP

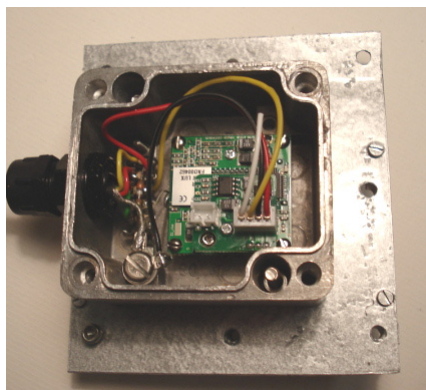


Although commercially available antenna rotators come with some form of azimuth indicator, either as a calibrated meter or circular display, the resolution is usually no better than about 5 degrees. While this is adequate for HF and VHF use, it is not adequate for microwave use, particularly at 10GHz and above. Another problem is that they are usually based on a potentiometer which tends to become noisy, or fail after a number of years use.

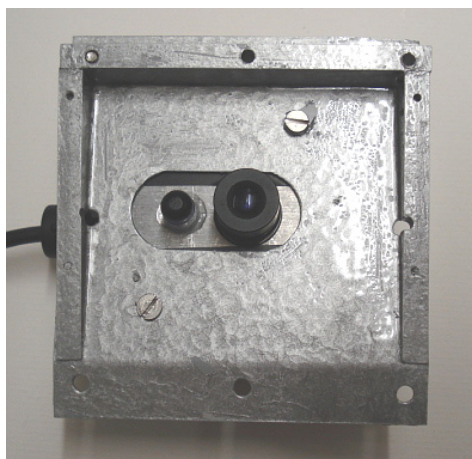
For many years, I have used a pair of ten turn pots in a bridge circuit, with one of the pots driven from the mast through a 4:1 sprocket and belt system. The indicator in the shack is a digital panel meter. The antenna is set at zero degrees and the bridge is balanced so the meter also reads zero. The antenna is rotated through 360 degrees, and the supply voltage to the bridge is adjusted with a third pot so that the meter reads 360 millivolts.

This system has worked quite well but occasionally needs recalibration using a circular protractor which is permanently attached to the mast.

Some years ago, I bought a small ccd



camera mounted on a pcb with a view to using it to read the scale on the protractor directly. Recently I bought a small monitor at a rally which works well with the output from the camera. The camera is fitted with a 6mm lens which is adjustable and gives a well focused image when mounted about 50mm from the protractor.



The camera is mounted in a small waterproof diecast box on the rain shield above the rotating mechanism, and is fitted with a white LED to provide illumination after dark. Initially, the LED was too bright and caused flare from the shiny surface of the protractor. This was overcome by fitting a shade made from the end of the outer case of a cheap ball point pen. The black plug was left in place so that the light did not shine directly downwards.

Ideally the video signal should be transmitted along 75 ohm coax, however, for convenience, I used about eight metres of four way cable with an outer braided screen. Two leads are used to provide separate switched 12 volt regulated supplies to the camera and LED, the latter via a 470 ohm resistor. A third lead is used to transmit the video signal to the monitor, and the fourth lead is unused. DC and video grounds use the shield.

Three of the four photos show views of the camera unit and the fourth is a view of the monitor screen showing the clear image of the protractor.



A BASIC ADF4110 LOCK-BOX

... by Joe McElvenney, G3LLV

This is an experimental local-oscillator locking project that, while it has a well-trying topology, differs in the chips and the PIC programming language used. Code listings for such items are often supplied as a hexadecimal dump together with the assembly source code. These are often not very clear to an experimenter who might wish to use them as a basis for their own code in another project. It was thought then that a higher-level language would be more transparent and so it was programmed using the "MikroBasic PRO" compiler [1].

This note's purpose then is to not only to encourage constructors to try a PIC Basic but also to point to the unlicensed version of this particular software as an example of what is available. Though having a compiled file length of only 2kb, it is full-featured and it is quite surprising what may be achieved within this single limitation. For those who may be interested in Pascal or C compilers, they are also available along with one for the AVR micro-controller. Obviously, just like any other commercial organisation, MikroElektronika are in the business of selling their products that include development boards as well as software.

The schematic shows the 10MHz-referenced lock-box with four user-selectable, rational-numbered, local oscillator frequencies. The ADF4110 is a low noise, 550MHz, 3-wire programmable, synthesizer with flexible dividers, a phase-frequency detector (whose reference frequency depends on the divisors used - see the simulator at [2]), a precision charge pump with no 'dead zone' and a digital 'in-lock' circuit. Actual frequency/housekeeping data is loaded from the 8-pin 12F629 PIC and is selected by a pair of DIL switches. The loop filter employs a LM6211 op-amp; a chip designed for this particular job, and is powered by 9V to give a greater output voltage swing on the VT terminal. If only one frequency is desired the DIL switches may be eliminated and just one set of data entered at 0x00 in the EEPROM. A 'reset' switch is provided in case of hang-ups and for 'hot-switching'. The PIC has six port pins (GPIO) of which three of them are used to transfer the data that is presented to the synthesizer as the 'Load Enable', 'Clock' and 'Data' waveforms. The 'Counter Reset Method' uses 4 x latch loads (excluding 'Initialisation') to do this; as is explained on pages 14 and 20 of the data sheet [2]. So on power-up or reset -

- LE is taken low and a burst of 24 CLK pulses is generated.
- On the falling edge of each of these, one bit of data is transferred until...
- LE is taken high again to finish the loading of an EEPROM block.
- This is then repeated three times to finish the DATA load.

There are 12 words (double-bytes) used in each operation and, being timed by the PIC's 4MHz internal RC clock, no external crystal is required. EEPROM editing is via a built-in utility in the compiler and consists of the entry of data into a simple table. To align them for ease of viewing, they are padded out with a single 'FF' and a numerical reminder of the frequency; neither of which are sent to the ADF4110. As all code streams have several bytes in common with only the central ones defining the frequency; this allows any differences to stand out.

Here are two sample strings with those parts underlined -

```
1F 80 16 70 00 C8 00 3E 1F 80 12 FF 10 02 00 (100.2MHz)
1F 80 16 70 01 90 00 9B 15 1F 80 12 FF 12 45 00 (124.5MHz)
```

This may all seem like gobbledygook but it is nothing more than a series of calculated bit patterns that trigger internal switches to set up the chip and, with the exception of the division ratios, all are much the same. A very few programming boards will not load the EEPROM directly from the hex code and so the BASIC must be modified to do this at start-up by including 'read' and 'writes' to the EEPROM.

Most components are 1206 SMDs and their values, being just what I had at the time, are not critical except perhaps for the 2.6:1 ratio of R1/2. The MSA-0885 has so much gain that just a simple resistive load, limiting the current to 20mA, was used. The 10k (R12) pull-up resistor was included because the GP0/LE combination tends to float a little when set high. The cost of the principal chips was around £10 [3] and the unit was built RDDS-style in one of G3NYK's [4] 1000105 (74 x 55.5 x 30mm) boxes. The compiler's BASIC project files, with its source code and programming hex-dump, are available on the "Software" page of my web site [5], as are pointers to the full packages and viewers for the "sPlan 70" schematic and "Sprint-Layout 50" PCB software used in this project.

Integer-N systems usually have a higher phase-noise than fractional-N and so are probably better employed on the lower frequency microwave bands; even so it is the intention of a fellow amateur to try this out on 24GHz. Division numbers and loop filter values for the project were generated by the "ADsimPLL" utility also found at reference [2]. This project was not particularly intended for duplication (although it may be) but was simply meant as a pointer to other things. Bye-the-way, I do not claim much originality for the basic circuit concept, as there have been several notable precursors, especially one by DF9IC [6]. This is in German but do look out for "PL-VCXO" in his archives.

Finally, you may wish to look at another PLL chip - National's LMX2306 [7] which has a similar architecture and, it would be also remiss of me not to mention another piece of useful (though not free-of-charge) software, the Oshonsoft PIC Simulator IDE [8]. It is a one-man effort, emanating from Serbia (as does MikroBasic Pro), and has a dedicated Yahoo group for support. The hex code generated by the mikroElektronika and OshonSoft products will also operate in the Microchip [9] MPLAB IDE environment should one need to. Suffice to say that the usual personal disclaimers apply with respect to all the companies mentioned above.

[1] <http://www.mikroe.com>

[2] <http://www.analog.com>

[3] <http://uk.rs-online.com>

[4] [alan.melia\(at\)btinternet\(dot\)com](mailto:alan.melia(at)btinternet(dot)com)

[5] <http://www.ximac.org.uk>

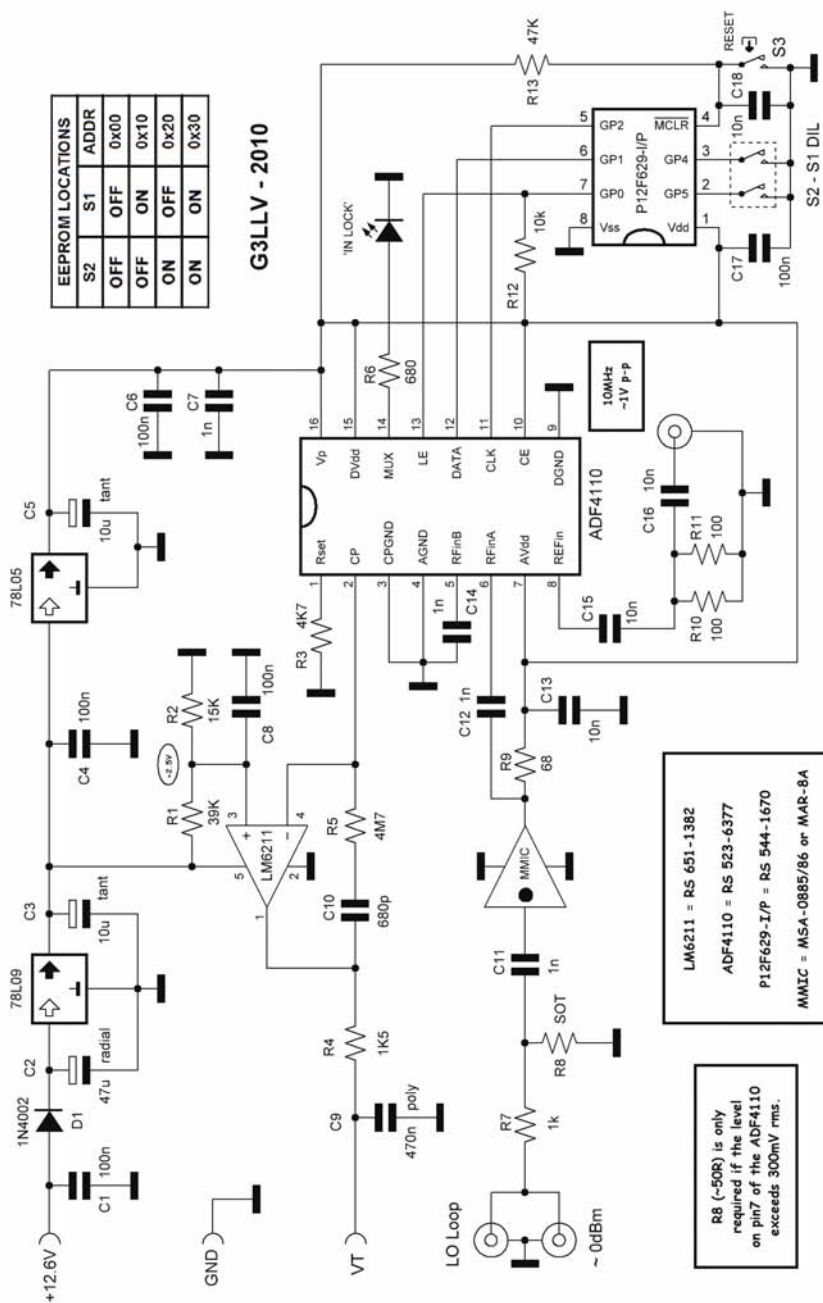
[6] <http://www.df9ic.de>

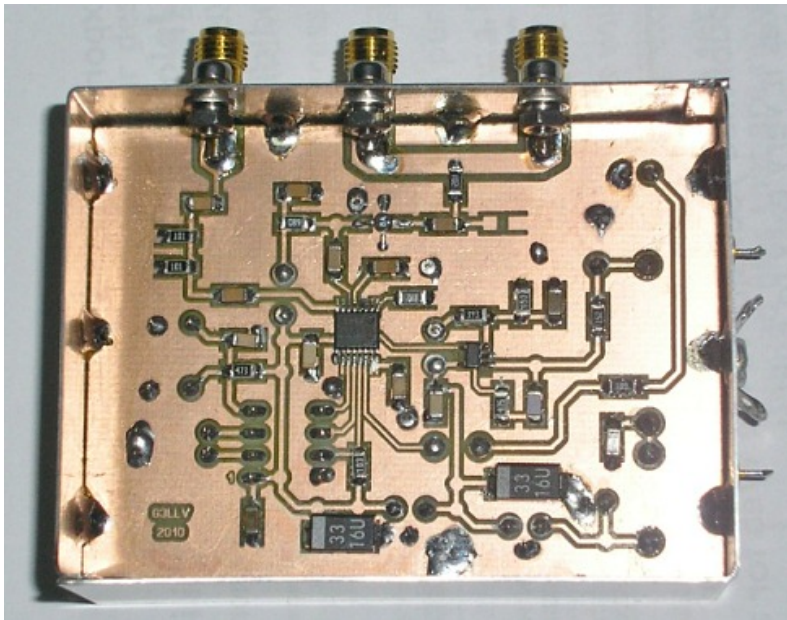
[7] <http://www.national.com>

[8] <http://www.oshonsoft.com>

[9] <http://www.microchip.com>

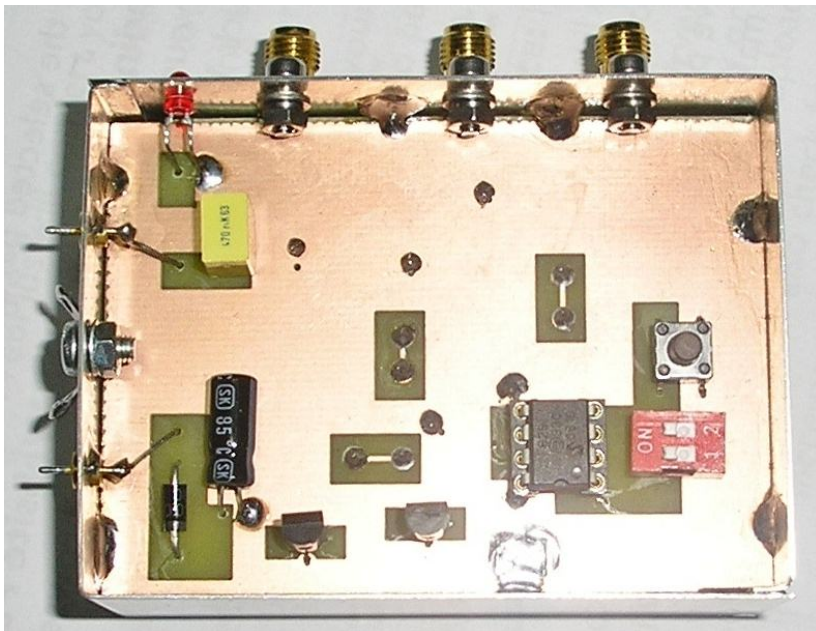
The circuit diagram and photographs are on the following pages.





Above: COMPONENT SIDE

Below: GROUND PLANE SIDE



TWO WEEKS, THREE RECORDS AND A FIRST ...

April brings exciting happenings in the THz spectrum
... a report by Peter, G3PHO

April 2011 will go down in amateur lightwave history as a landmark month for not only was the UK DX record for the red light band (approx. 610nm) broken once but it was broken again just three days later! On top of that, a "first" was made when the English– Scottish border was spanned by a modulated red light beam for the first time! Then, just when your editor thought it was all over bar the shouting, along comes a third UK record! Read on and feel the adrenaline rush

DX Record breaking contact NUMBER 1:

A report from Stuart, G8CYW, of the North East England Optical communications group ...

Sunday April 3rd 2011 saw a new distance record set for Optical Communication by a group of Radio Amateurs from North-East England. The distance worked was just a few metres short of 90km.

The contact was made from **Race Head IO84VS**, west of Stanhope in County Durham, to **Danby Moor IO94NK** near Whitby. The team at Race Head included, Stuart G8CYW running the transverter and LED transceiver of his design featured in recent articles in Radcom and Brian, G8KPD also running his version of the designs, plus separate receive and transmit heads. The two stations were located about 5 metres apart. Also present were Nick G4KUX and Peter, G8POG who provided welcome support. Particular note must be made of the station on Danby Moor, operated by Rob, M0DTS who single handed, operated his version of Stuart's transverter, the 70cm talkback gear, contact through the local 70cm repeater to interested parties and, if that was not enough, set up his Amateur TV station and streamed live video (and audio) of the event through GB3KM, the local TV repeater and out onto the web!

Operations began as the sun went down, with Robs signal being seen through Nick's telescope in almost daylight conditions. A little later Rob spotted Stuart's 20W LED beacon flashing at 2.5Hz as soon as it was switched on. The beacon was then switched to 20kHz and Rob tuned this in as a carrier on his hf rig, and alignment was optimised. Judging by the loudness of the tone coming back on the 70cm link from him he had no trouble in locating us. Stuart then switched to the LED transceiver and worked Rob on FM which was fully quieting both ways, end-stopping Stuart's FT817 driving the transverter. SSB was tried next which was S9+ 30dB with a remarkable peak at 60 over as reported by Rob. This contact was immediately followed by contacts between Rob and Brian on his station, testing both his LED transceiver and his separate heads at similar strengths to Stuart's results.

This all worked so well that no-one wanted it to stop, and we chatted on over the link for over an hour. At one stage we were effectively operating a spatial diversity receive set-up as Robs optical signal could be hear booming out of both Brian's and Stuart's rigs just a few meters apart, but ten million wavelengths apart in light terms. It is obvious to us that this system is capable of much greater distance than the nominal 90km.

Much of the initial contacts were witnessed by Peter and Nick, who photographed and videoed the activity at Race head. **73 Stuart G8CYW**



DX Record breaking contact NUMBER 2: 111.7km

The 90km record was just being savoured by the lads around the NE counties when the writer was invited by Barry G8AGN to accompany him to a local Sheffield highspot from where he was going to try to work G0EWN/P over a 111km path.

Now you might at first think that this was a direct response to the lads up North but in fact this attempt had been on the cards ever since Barry and Gordon set up the 87km record in January. The weather forecast for Wednesday 6th April included very good visibility in the Northern part of the UK. Gordon G0EWN/P was up on the North York Moors (IO94) doing some Summits On the Air (SOTA) work and so took his lightwave equipment with him on the off chance that a path down to the



Sheffield area might be on. Barry G8AGN/P set up around 1930 local time at Bradfield, Sheffield IO93FK while Gordon did likewise at Blakey Ridge, IO93MI06. As it was starting to go dark, faint signals were heard at both ends and, as it became fully dark, they peaked up to good strengths of S7 or so when a complete QSO was achieved with full details and final "Rs" being exchanged directly on the lightwave band. 144.175MHz SSB was used for initial liaison. These signals were much better than those on the 87km path of last January. Gordon G0EWN comments further ... "Why were signals stronger than 87km path? Factors include: Equipment modifications/ optimisation (PMX lens) plus more time and less extreme WX which allowed us to optimise beam alignments, good seeing conditions and less light pollution/ background light noise on this path. Signals were still rising and could well have reached 59 had we been able to stay and allow the



sky to darken even more. The KA7OEI front end is REALLY touchy regarding excess light--- K3PGP is not far behind in terms of overall sensitivity but is more forgiving of background light levels. Our baseband equipment gives true indications of the received signal strengths and based on last night I would suggest both of our groups (NE England and South Yorkshire) have equipment capable of much longer paths. My understanding of the sub carrier system is that signal strength as noted on the IF is not directly related to the strength of the main carrier due to a threshold effect. This is similar to what used to be reported in the days of 10GHz wide-

band where signals were often received with large apparent audio signal to noise. This remained the case until signals fell below the threshold. At that point signals rapidly became noisy and then disappeared. However last night tends to suggest that given good conditions, we are someway above this threshold limit and it is quite likely that you will continue to have 59+ on your sub carrier IF's, though in reality the main signal will continue to obey the laws of physics and fall with inverse square relationship to distance. As we push distances further Barry and I will inevitably report weaker signals. Conditions last night were optically close to optimum. Last night's test followed quite a busy time towards the end of March of testing using Barry's remote light metering set up. **73 from Gordon"**

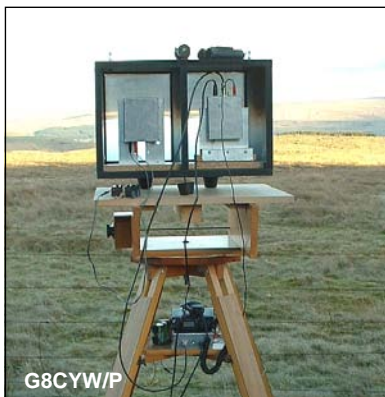
A video of this record breaking contact is now posted on YouTube ... just enter G3PHO in the YouTube Search box and it will take you to Peter's YouTube page where this and other lightwave and microwave videos can be found. Barry and Gordon use very similar equipment to each other ... half watt output Luxeon LED transmitters with photo diode + high gain audio amplifiers on

receive. The receivers have a filter facility to notch out low frequency interference from street lighting and such. The TX and RX use separate Fresnel lenses, easily obtainable at High Street stationery shops and packaged as page magnifiers. Peter took his own photo diode RX, built many years ago, along that night and just heard Gordon's signal above the noise floor. The 100mm glass lens in this does not compare to the much better fresnel lenses used by Gordon and Barry.

By the weekend, Barry, Gordon and Peter were still enjoying the euphoria of that night when news came in that the NE group had made the **first lightwave contact between Scotland and England** ! Read on

England to Scotland on a light beam ... a report from G8CYW:

Thursday April 7th saw the active North-East opto stations once again checking visibility over various paths in an attempt to increase the UK distance record they had held for all of three days before the Sheffield group's excellent 111.7km contact the previous day. Visibility seemed quite



good in the morning but deteriorated later in the day. Gordon, G8PNN, had been out in the afternoon and reported the visibility near Alnwick to be only round 25km. Towards 5 o'clock activities were abandoned for the day.

At this point, subject to a phone call between Brian, G8KPD and Stuart, G8CYW, they decided to activate an old plan to make a contact believed to be a first, for an England to Scotland QSO, on light. Since they were both all packed up ready to go and nowhere suitable on the east coast due to sea mist, they decided to try the west coast. Accordingly, an email was sent out to all active stations explaining where they were going and inviting anyone to join in. In the event, Brian was accompanied by Peter, G8POG, and Stuart by Gordon G8PNN who had already put many miles in that day assessing the situa-

tion. It was decided that they would not attempt too trivial a distance but would match the distance made by the first England to France contact over the channel some years ago, and look at paths across the Solway Firth between 30 and 40km in length. In addition, Stuart thought it would be a good idea to work from one major QRA square IO84, to another, IO85.

Arriving in west Cumbria, Brian and Peter operated from The Promenade, Maryport, right next to the Senhouse Roman Museum (well worth a visit if you are ever in the area) on a road well lit by street lamps and a line of houses on the landward side of a steep grassy bank that must rise 100 feet above the sea. Stuart and Gordon headed for the hills above Carrutherstown, just off the main A75 between Annan and Dumfries. On gaining height there, it was found that a local rise in the ground obscured the path when the bearing given by Peter of 195 degrees was checked. Running rapidly out of light, the Scotland team headed back to Carrutherstown and stopped at the junction on the A75. A quick check with the compass revealed a clear path, unfortunately directly across the A75 at about 2m above the tarmac. A request to Peter to turn on the strobe was made and it was spotted straight away. In view of the time it was decided to set up then and there, just 3m away from the base of a streetlamp in its full glare, and another dozen bright sodium lamps within 50m, the junction was well lit for road safety purposes. Lorries were thundering past on the way to Stranraer and back. This would be a stern test for the gear!

When set up, the 2.5Hz beacon was switched on (the safety policy decided on was that we were only to transmit when there was no traffic in the vicinity of the beam, which went above car roof height anyway, but was blocked by lorries. This was strictly adhered to at all times), The Maryport team reported an immediate sighting, and the beacon was switched to 20kHz, resulting in an if signal being tuned in and optimised at 3.602MHz. Both stations were operating FT817s into the transverter and LED transceiver, no photodiodes were taken on this trip. It helped in this location to use the LED transceiver because light is only emitted on transmit.

The light level at Carrutherstown resulted in a continuous noise level of S5 on the receiver, and looking inside the lens enclosure, several bright splashes of amber light were visible on the walls inside from the street lamps. It was bright enough not only to see to erect the gear but to be able to read and write down the contact details. Despite this, G8KPD's signal was heard immediately, and GM8CYW's reply was equally strong. Contacts were then made on FM with end stopping signals, SSB was way over S9, and even AM was used just for good measure. These were witnessed by the other team members and two recordings made. All contacts were made around 9pm BST.

On the attached sound file, the callsigns, signal reports and locators can all be heard clearly with no sign of noise or QRM over the optical link, except for directly into the microphone at GM8CYW's end when transmission was interrupted for a lorry which can be heard passing. Similarly on another sound file G8KPD's SSB signal was "edited" by a passing lorry at speed. It took exactly the same time for Brian to say "five and nine plus" as it did for the lorry to pass, fortunately Brian repeated the signal strength report twice and the second one was heard.

After a quick roadside picnic, both stations then departed for home, a round trip of some 160 miles, Gordon actually covered more than 250 miles in total for the days activities, that is enthusiasm! **73 from Stuart G8CYW.**

And now, just when you thought it was all over

New UK optical communication distance record 117.6km ... A report by G8CYW:

In the early hours of Tuesday, 12th April, Stuart, G8CYW/P located west of Alnwick, Northumberland in IO95CJ made contact with Rob, M0DTS/P on Danby Beacon, on the North York Moors, west of Whitby in IO94NL. The contact was over a distance of 117.6km on a difficult path involving 70km over the North Sea where the beam was at a low altitude over the waves. Signals were weak at 51/52 but easily readable on SSB.

The contact began with Stuart asking on Sunday if anyone was available for a further attempt at the record in the following week. He thought Rob was joking when he said he would be available from 11pm due to his work rota in the coming week. On Monday, after the morning show-ers, (SEE THE END OF THIS LIGHTWAVE ITEM ..EDITOR) it was noticed by Stuart and Nick, G4KUX that visibility had improved and maybe it was worth making an attempt later that day. Things were set further in motion after dark when at 8pm Rob and Stuart, aided by Gordon, G8PNN agreed to go out later. A quick call from Stuart to Rob on the local 70cm repeater at 10pm confirmed that all would go out, the latest time the group have ever gone out and would involve a set-up in total darkness including lining the gear up when all landmarks visible in the day were in darkness.

A word here about the path, the website "Heywhatsthat" was used to check the path and visibility and although there was an indication that the path was possible in one way (the "visibility cloak"), the path profile looked decidedly dodgy since it indicated that no less than 40km of the path was literally under the sea!, from 45km out to 85km from Danby Moor the line plotted was below sea level, and from 85km to 90km there appeared to be land obstructions. Some help from refraction in the atmosphere was definitely needed here. Fortunately, the atmospheric pressure was above normal and so it was thought to be worth taking a chance.

Later analysis of the path using more accurate software showed that at $k = 1.0$, the path was indeed obstructed but just clear (far station 0.1 degree above central bulge in the path profile), at $k = 1.33$, the usual value used for radio signals. The path clearance at this value of k was shown to be just 50m at a distance of 50km.

On arrival at the Alnwick end of the path at 11pm, Stuart and Gordon contacted Rob on 70cm who was still driving to his vantage point. The view from the Alnwick site was indeed good, several lighthouses at intervals down the coast were busy doing their stuff, and distant streetlights could be seen. The path is just to the seaward side of the three North-East conurbations of Tyneside, Wearside and Teeside and the orange glow in the sky was intense. Stuart tried to get a bearing on his compass in the dark with the "aid" of a far too bright LED torch and noted the

path was within a degree of a particular lighthouse. The Alnwick location was actually literally on the "wrong" side of the B6341 road to Rothbury, fortunately Gordon only counted six cars that passed late that night necessitating turning the beam off while they passed.

When Rob arrived and set his gear up, he put out a light on the correct bearing, which paradoxically, was spotted immediately, slap bang on the correct heading. Maybe all this recent practice on 3rd April's successful 90km record attempt, and the first G to GM contact on 7th April had finally paid off. Rob's light was seen at an estimated 0.3 degrees above the central bulge in the path profile (estimated using the given field of view of a pair of binoculars).

Stuart then switched the powerful LED beacon on to its 2.5Hz setting and sure enough, Rob immediately radioed that he could see it at Danby Beacon. The LED beacon was then switched to 20kHz and Rob tuned this in on 3.602 MHz. Rob was using the optical transceiver and separate RX and TX heads. Stuart continued the use of the LED transceiver that had performed so well over the past few days. Both stations noted how weak the red dots were this time and spent time lining up but to no avail. It must have been something to do with the marginal path and the opto signal having to travel just above the waves as the signal was bent by refraction around the curvature of the earth (or should that be sea?) Neither station was particularly high above sea level, Rob just short of 300m asl and Stuart less than 200m asl. The local horizons as calculated from each station just do not quite meet.

Rob's "red dot" as seen by Stuart and Gordon was barely visible to the naked eye, and not really a dot but in the binoculars a blurred out patch of red, probably due to having to travel just over the water in the humid air. It was estimated that the optical signal could not have been anywhere near a tenth of what was observed a few days ago over the 90km path when it was the brightest thing on the horizon. The red dot was even dim compared to streetlights in the Teeside area. This would be a stern test of the gear, it was hard to imagine whether a usable signal could be recovered from such a dim red splotch of light lost in all the amber streetlight glow. It was now past midnight.

Rob went on transmit using LSB and Stuart switched the LED transceiver to receive and made small adjustments to the aiming of the 0.3 degree beamwidth optics that were much narrower than the 2 degree LED beacon. Rob's voice then duly appeared out of the noise. All the QRM had raised the noise level in the receiver to about S5 but as Rob spoke, the AGC action of the FT817 was apparent. This amounts to an interesting test of the sub-carrier system in use by all in the North-East group. Much discussion had centered on how the system would perform in weak-signal mode. The answer seems to be that it can return readable signals right at the bottom of the S meter range. As Rob spoke the noise level dropped just as in "normal" rf communications, to gradually return in the longer pauses as the AGC recovered. Rob passed all his details and went to receive. Stuart then replied on light, repeated all Rob's details and added his own. Rob then confirmed reception to complete the contact, made at 12.10am on Tue 12th April. After a little more chat, Stuart recorded a sample of Rob's signal as Rob had done earlier on the formal exchange, completing this at nearly 12.30am.

Due to the weak optical signal, FM was not used. This finally shows the benefit of being able to use SSB, the group have never before had to cope with such a weak signal that SSB was actually necessary.

The group had an extra witness to their activity, a County Durham amateur Keith, G0VCL had picked up our talkback channel at the dead of night and was listening intently trying to figure out what was going on. All stations had an over to him and related our activity to the recent contents of RadCom.

All stations then dismantled their gear and set off for home, Stuart had the furthest to travel and finally pulled into his drive at 1.30am. **73 from Stuart G8CYW.**


~~~~~  
**AN ODE TO THE LIGHTWAVERS:**  
**(to the well known Al Jolson tune, "April Showers")**

Though April showers may come your way,  
They block the lightwaves  
That make your day,  
But if it's raining,  
Don't moan and sigh,  
Because, it isn't raining rain, you know,  
IT'S ANOTHER RECORD HIGH ...  
And if you find hills,  
That suit your style,  
Make sure they add up  
That extra mile,  
So, keep on looking for the red lights  
And listening for their tone,  
Whenever April showers make you moan.

~~~~~

March 2011 Lowband Contest Results

Well! What a difference from previous events. A record entry was received, with almost all participants enjoying above average conditions and activity, with an impressively quick take up of the new contest entry web site.

The main action was on **1.3GHz** where continental activity gave many their best DX, but conditions within the UK were good too, with GM3UAG in IO87 in several logs. GM4CXM was at the western edge of the conditions but amassed a great score to take the leading position on this band, but it was a close fought battle between the top four stations, with log accuracy determining the outcome. It was pleasing to see Bolton Wireless Club putting in several entries to ensure IO83 was the best represented square, and to see entries from four GM stations.

Entries on **2.3GHz** were also well up, and again good continental DX was in evidence for many. G4BEL made an impressive number of contacts and leads by some distance on this band.

3.4GHz was a bit of a Cinderella by comparison, with four entries (up from two last year though), but the DX was still there to be worked. GW3TKH/P ended up with a commanding margin over G4BEL with twice as many contacts.

The overall winner was Roger Taylor G4BEL, with a strong showing on all bands, and the overall runner-up and **leading portable station is Keith Winnard GW3TKH/P**. In third place was Ray James GM4CXM, entering on 2.3GHz for the first time this year.

Certificates go to the overall Winner G4BEL and Runner-up GW3TKH/P and to the following band leaders and runners up and leading portable station:

1.3GHz GM4CXM, G4NBS, GW3TKH/P
2.3GHz G4BEL, G4RGK, GW3TKH/P
3.4GHz GW3TKH/P, G4BEL

Checklogs from GM7GDE and ON4IY are gratefully acknowledged.

John G3XDY
UKuG Contest Manager

Overall

Pos	Callsign	1.3GHz	2.3GHz	3.4GHz	Total
1	G4BEL	883	1000	423	2306
2	GW3TKH/P	403	380	1000	1783
3	GM4CXM	1000	296		1296
4	GW8ASD	893	255		1148
5	G4RGK	687	444		1131
6	G4NBS	981			981
7	G8AIM	392	365	123	880
8	2E0NEY	580		196	776
9	G3UKV	200	298		498
10	GM4GUF/P	390			390
11	GM4JR	386			386
12	G8DTF	107	217		324
13	G0EHV/P	304			304
14	G4EAT	262			262
15	G0BWC/P	136	77		213
16	G3TCU	211			211
17	G4FZN/P	168			168
18	G1SMI	125			125
19	GM8IEM	55			55
20	G4LDR	26			26
21	G6GVI	8	1		9

1.3GHz

Pos	Callsign	Locator	QSOs	Best DX	Points	Normalised
1	GM4CXM	IO75TW	28	PI4GN 768km	9720	1000
2	G4NBS	JO02AF	34	GM3UAG 590km	9536	981
3	GW8ASD	IO83LB	34	ON4HRT/P 602km	8680	893
4	G4BEL	JO02BI	34	DF9IC 715km	8587	883
5	G4RGK	IO91ON	26	DK7QX 668km	6676	687
6	2E0NEY	IO81VK	19	GM4CXM 521km	5635	580
7	GW3TKH/P	IO81LS	15	PA0EZ 567km	3916	403
8	G8AIM	IO92FH	20	GM4LBV 492km	3812	392
9	GM4GUF/P	IO85EO	15	PA6NL 650km	3793	390
10	GM4JR	IO85FB	15	G4EAT 463km	3749	386
11	G0EHV/P	IO84XT	15	G3ZEZ 395km	2953	304
12	G4EAT	JO01HR	8	GM3UAG 654km	2544	262
13	G3TCU	IO91QE	7	PA0EHG 376km	2047	211
14	G3UKV	IO82RR	13	GM4CXM 377km	1946	200
15	G4FZN/P	IO94JF	11	G0MJW 292km	1632	168
16	G0BWC/P	IO83RO	11	PA6NL 484km	1321	136
17	G1SMI	IO83PM	7	PA6NL 491km	1212	125
18	G8DTF	IO83SM	12	GM4CXM 296km	1042	107
19	GM8IEM	IO78HF	2	GM0USI 268km	530	55
20	G4LDR	IO91EC	2	G4ALY 1 95km	250	26
21	G6GVI	IO83SN	2	GW8ASD 68km	73	8

2.3GHz

Pos	Callsign	Locator	QSOs	Best DX	Points	Normalised
1	G4BEL	JO02BI	15	DK1VC 519km	3181	1000
2	G4RGK	IO91ON	7	PA2M 380km	1411	444
3	GW3TKH/P	IO81LS	7	PA6NL 493km	1210	380
4	G8AIM	IO92FH	8	PA6NL 389km	1161	365
5	G3UKV	IO82RR	8	GM4CXM 377km	949	298
6	GM4CXM	IO75TW	3	G3UKV 377km	940	296
7	GW8ASD	IO83LB	7	G4BEL 228km	810	255
8	G8DTF	IO83SM	7	G0MJW 228km	689	217
9	G0BWC/P	IO83RO	6	G3VKV 193km	246	77
10	G6GVI	IO83SN	1	G8DTF 5km	2	1

Continued overleaf

3.4GHz

Pos	Callsign	Locator	QSOs	Best DX	Points	Normalised
1	GW3TKH/P	IO81LS	6	PA6NL 493km	970	1000
2	G4BEL	JO02BI	3	PA6NL 277km	410	423
3	2E0NEY	IO81VK	1	G4BEL 190km	190	196
4	G8AIM	IO92FH	1	GW3TKH/P 119km	119	123

BEACON NEWS



The Scarborough 10GHz beacon, GB3AZA, was put back on the air (10368.900MHz) on the 5th April. The location is IO94TF. The beacon has been rebuilt with a high stability 10MHz reference oscillator, RDDS locking unit, plus a 10dB power increase from a new PA .

The beacon site is very close to the coast, with an excellent take off down the UK and across the North Sea into Northern Europe. ERP is approximately 25W.

Our thanks must go the Ted Agar, G8AZA, for hosting the beacon for so many years. The beacon is very much a combined effort from several stations including the following:-

- Finningley ARS for the RS 10MHz reference source.
- G8ACE for the RDDS.
- G4DDK for the PA
- G3PYB for base unit and head rebuild.
- G8AZA for antenna and head end work and the electricity!

Reception reports would be most welcome to:

tedarag@btinternet.com or peter.blakeborough@pop3.hiway.co.uk



DL2AM on Zugspitze

German Microwavers smash the 76GHz World Record

228 km from the
Zugspitze to Feld-



DL2GWZ on Felberg

A huge success - a world record at 76GHz by Philip Prince DL2AM, Alex Wetzel DL2GWZ and Gerhard Schmitt

(translated from the original article in German on the DL2AM website)

After 5 years of planning, using the latest technology, weather monitoring, test date changes and calculations discarded, the German team finally did it they broke the 9 year old record held by the U.S. radio amateurs AD6PF, KF6KVG and W0EOM.

At 0545 on Tuesday morning, the 8th March 2011, the team left for the Zugspitze (altitude 2951 metres a.s.l.) with all their radio equipment. Also present was DL2AM's wife and Wilfried Merk, who is technically savvy. More than 40 kg of equipment was taken along. The group already tried five times before between late January to the 8th of March and had to constantly abandon their efforts because of bad weather conditions. However, the weather predictions on the the Zugspitze for 8th March were very favourable. The visibility was 220 km! These excellent visual conditions were due to very little water vapour in the air so that the radio waves were less attenuated. The team took the Eibsee cable car to the Zugspitze (JN57IK) at 08.00. The horizon to the north seemed quite grey but the west was bright. The temperature was -14 ° C with an icy wind. The dew point was low (-15 ° C) ... ideal for a world record attempt.

Philip's radio partners at the other end of the path were Alex Wetzel (DL2GWZ) from Leutkirch Bensheim Gerhard Schmitt (*callsign not given ... editor*) from Villingen, both licensed radio amateurs. Like last year, they were all ready for tests with all their equipment dragged up by sled across the snow on the Feldberg / Black Forest (altitude 1,450 metres in JN47AU). Alex was already travelling by car towards Feldburg by 04.00 clock in the morning!

Once the gear was set up at both ends of the path, the dishes were very accurately lined up to within an accuracy of about 0.3 ° Photos, taken six months before, were very helpful in determining the exact bearing. The stand on which all devices were mounted has a very good optical sight which helped even more. Philip, DL2AM, had problems with the icy winds which forced him wear gloves so he could not screw together the smaller parts of the station! At 71 years of age, he felt he was pushing himself to his limits although he had completed 2000km of cycling last year!

At 10:23 they made the first contact on 47GHz. The signals were S9. At 10:30 clock they tried 76GHz and spent some 10 minutes searching for a signal when, suddenly, contact was made.

For those concerned, this meant a new world record in all three analogue modes, CW, SSB and even FM. The signals peaked S7 over the 228km path, equivalent to 51km more than the previous world record. The Americans held a distance of 177km for their world record for 9 years.

All equipment and accessories on both sides, except the 47GHz transverter amplifier used by Gerhard, was built by DL2AM, using the latest technology. These involve working in the micron range and must be the world's newest technology, otherwise you're nothing at all. The output power is 35 mW. As a comparison, a conventional flashlight is 1 watt. The frequency difference between the two German stations was only about 300 Hertz, thanks to the modern GPS locked sources employed.

For more photos and information (in German) go to: www.DL2AM.de

Scatterpoint gratefully acknowledges DL2AM for all the information he has put into the public domain on his website.

ACTIVITY NEWS FROM THE WORLD ABOVE 1000MHz

By Robin Lucas, G8APZ

CONTEST and ACTIVITY REMINDER

April

- 19-Apr** 1900 - 2130 1.3GHz Activity Contest
Arranged by VHFCC (RSGB Contest)
- 26-Apr** 1900 - 2100 2.3GHz+ Activity Contest
Arranged by VHFCC (RSGB Contest)

May

- 30-Apr/1-May** 3.4GHz EME
(Arranged by DUBUS)
- 7-May** 1400 - 2200 10GHz Trophy
Arranged by VHFCC (RSGB Contest)
- 7/8-May** 1400 -1400 432MHz & up
Arranged by VHFCC (RSGB Contest)
- 7/8-May** 2.3GHz EME (Arranged by DUBUS)
- 17-May** 1900 - 2130 1.3GHz Activity Contest
Arranged by VHFCC (RSGB Contest)
- 24-May** 1900 - 2100 2.3GHz+ Activity Contest
Arranged by VHFCC (RSGB Contest)
- 29-May** 1000 - 1600 1st 5.7GHz Cumulative
- 29-May** 1000 - 1600 1st 10GHz Cumulative
- 29-May** 1000 - 1600 1st 24GHz Cumulative

FRENCH JOURNEES d'ACTIVITE (JA)

Activity dates cover all bands from 23cm up.

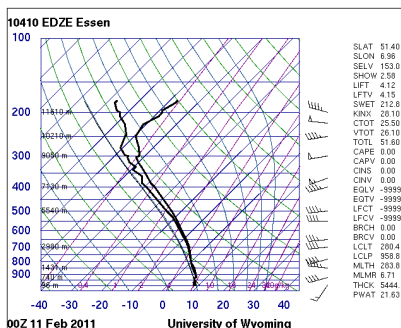
- 16-17 Apr** Activity weekend
- 28-29 May** Activity weekend - 29th matches UKuG
- 25-26 Jun** Activity weekend - 26th matches UKuG
Plus « Grande Bleue » activity
- 30-31 July** Activity weekend - 31st matches UKuG
- 27-28 Aug** Activity weekend
- 24-25 Sept** Activity weekend - 25th matches UKuG
- 29-30 Oct** Activity weekend

Duration of all JA is 1700 Saturday - 1700 Sunday

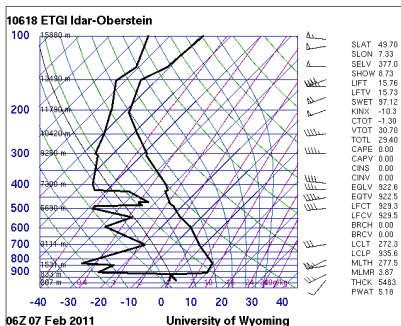
24 GHz WORLD RECORD

In the February/March Scatterpoint, news of the new **24GHz** tropo record between Claus, **DL7QY** and Maurice, **F6DKW** on 7th February arrived just as I was about to file my copy. I have since had a look at the radiosonde ascent data for the nearest weather station on the path between the two stations, which is **ETGI** Idar-Oberstein (JN39qq). Data is collected twice a day, at 00:00utc and 12:00utc, but is enhanced occasionally by ascents at 06:00utc and 18:00utc. (This happened on 7th Feb!)

The first plot below shows a "typical" ascent at Essen on 11th February with the temperature on the right and dew point on the left both decreasing with height.



The next plot at 06:00utc on 7th February shows an inversion above Idar-Oberstein, which no doubt was what helped Claus and Maurice! The layer was stable at 900m.



Skew-T diagrams can be accessed using
LINKS > UPPER AIR in www.beaconspot.eu

EARLY FEBRUARY TROPO EVENT

From: John, G3XDY, Nr Ipswich, JO02

We start on 31st January. The tropo had been building during the day but I was not able to get on until late on the Monday evening. A QSY from 70cm brought a nice contact with **DL5DWF** in JO71AA for a new square on **1.3GHz**. After a couple of more local **PA** and **DL** stations were in the log, **OE5VRL/5** (JN78DK, 1012km) reported hearing **GB3MHL**, so a contact was quickly established on **23cm** at 59 both ways, then we QSYd up the bands with 56 reports on **13cm** and 55/53 on **6cm**. Nothing was heard either way on **3cm**. As well as **GB3MHL**, **OE5VRL/5** was hearing the **GB3MHS** beacon on **13cm** during this opening, but nil from **GB3MHC** on **6cm**.

By the next morning the tropo was still there to the SE Germany/Austria region, but activity was low, so no new contacts were made on the microwaves.

The next opening started on the 5th Feb but really got into its stride on the morning of the 6th. We had the good fortune to have a French contest on 432/1296/2320MHz coincident with the tropo (I wish that happened more often!) I was in the shack by 07:30 and worked **F4CWN** soon after on **1.3GHz** with 59 reports from JN03KN, followed by a QSY to **13cm** with equally impressive reports for a new square on the band. **F5BUU** and **F1JRD** also in JN03 square followed on **23cm**, then **F6FHP** in IN94TR who was 59 when we QSYd to **13cm**.

After going QRT on microwaves at 0820, I returned in the evening at 18:00 to find that conditions were even better, although fewer stations were about.

Various beacons from the Bordeaux area were heard on **23cm** and **13cm** followed by a QSO with **F6CBC** (IN94) on **13cm**. **F6FHP** called in and end stopped the S meter - over 800km on **13cm**.

A QSY to **3cm** brought a good QSO with **F6CBC** at just over 800km with 57/58 reports. Next in line was **F6CIS** (also IN94) on **13cm** at 59, then coming nearer home **F5DQK** near Paris who was 57 on **23cm** but weak on **13cm** for a marginal QSO. Clearly the tropo did not favour the nearer French stations. Last QSO of the evening was **F8ALX** in JN06 on **23cm**.

The following morning when I checked at 0730 the bands had dried up towards the South, but I should have looked East. **DL7QY** was hearing all the **GB3MH*** beacons up to **9cm** at 599 at 0830. By the time I returned to the shack at 0930 it had all dropped away again, with **DL7QY** just hearing me at 519 on **23cm**. In the intervening hour he had set the new **24GHz** tropo world record with **F6DKW**!

73, John G3XDY

Keith Winnard, **GW3TKH** (IO81) spotted some distant 70cm beacons on 6th February, with **HB9F** some 983km away at +15dB/N, and by 11:00 on **23cm** **GB3IOW** was up to +30dB/N. Keith logged beacons in Central and SW France, including **F1ZBC** (JN06jg) +12dB/N at 654km, and **F1ZTF** (IN95vo) +18dB/N at 694km.

Around 17:45, a search on **13cm** brought in **F5ZMF** (JN06jg) +25dB/N at 654km.

Unfortunately, Keith was unable to find any takers for tests during this period and by 20:00 propagation had returned to normal, and the Isle of Wight beacon **GB3IOW** was 0-5dB/N.

Interestingly this was one of the very few occasions when Hepburn's Tropospheric Ducting Forecast came true at his location!

During the morning of 6th, Neil, **G4BRK** (IO91) worked Jean-Claude **F5BUU** (JN03) on **23cm** for Neil's best DX to the south on that band. The signals were not strong, but they were readable. Neil runs 400w and a 35ele yagi.

During the evening, David, **MOGHZ** in IO81vk made some excellent contacts on **13cm** SSB.

First of the super DX was Joel **F6FHP** in IN94tr at 59/55 over a 758km path. Joel runs 200w and a 2m dish. This was followed by Flo, **F4CWN** (JN03kn) at 905km. Flo's signal report (200w into a 1.5m dish) was 53 and David's was 51. To complete the hat trick, this was followed by Sylvain **F6CIS** (IN94wl) 57/54 at 789km.

David's equipment is a TS780 and transverter with a 100W SSPA, plus a **G4DDK** preamp into a 48 ele Quad loop yagi at 9m agl.

23CM UK ACTIVITY CONTEST

The February session of the UKAC was on 15th February. Ray, **GM4CXM** (IO75tw) normally participates in the **23cm** event and achieves

some very good results.

The contest was certainly buzzing with activity from **G**, **GM**, **GI**, **GD**, **GW** and **GU**, and Ray noted at least 13 **GM**'s were active during the evening. Conditions appeared to be somewhat mixed, with some signals up on usual, whereas others were down.

Being some distance from the **G** activity, Ray quite often has assistance from aircraft scatter. On this occasion, aircraft activity tended to be over a westerly flight path over England and contacts assisted by aircraft reflection were much harder to come by into the south east.

G4NBS 503km, **G4BRK** 517km, **M0GHZ** 521km, **G0MJW** 523km, **G8CUL** 525km and **G4EAT** 572km, also produced some very good long haul signals, with fewer "got-aways" than usual.

Ray's best DX was a contact with **OZ1FF** at 782km by aircraft reflection, followed by a rapid change of frequency and beam heading to net **PA0EHG** at 729km just as two aircraft arrived at the mid-point.

Ray's equipment: **DL2AM** SSPA 150w, SP23 mk2 LNA, 4x44el Wimo @ 11m. QTH 110m ASL.

GM8IEM CORRECTION

In the last issue of Scatterpoint, I referred to a **23cm** QSO between Martin, **GM8IEM** and Ian, **GM3SEK** which I reported as his first QSO on **23cm** from his location in the far north-east of Scotland. A misunderstanding on my part I'm afraid, for which I apologise. I should have said the QSO was actually the first between Martin and Ian on **23cm**.

Martin pointed out that his first contact on **23cm** from his IO78hf QTH was with **OZ1CTC** on 10 October 2010 in CW, during the big tropo opening, followed by a QSO with **DC6UW** in both CW and SSB. On 12 October he had a QSO with **GI6ATZ** in SSB. All these were with just 10 watts output.

In November, after increasing the power to 150w, tests resumed with **GMOUSI**, resulting in successful QSOs on 13 November 2010 in both CW and SSB via aircraft reflections. On the same day, both CW and SSB contacts were completed with **G4CBW** via what appeared to be aircraft-enhanced troposcatter propagation.

First contacts were later made via aircraft

scatter with **GM4GUF** in SSB on 21 January 2011, and with **GM3SEK** on 25 January.

Martin's **23cm** equipment consists of an Icom IC-910 followed by a **PE1RKI** linear giving 150 watts into a 39 el quad loop yagi at 9m agl. A borrowed MV1296 masthead preamplifier is in use currently, but a **G4DDK** VLNA is on the stocks.

GM8IEM will be delighted to try tests in SSB (and will attempt CW) with anyone wanting to work IO78. Contact may be made via e-mail to martinhall@gorrell.co.uk or via **ON4KST**.

BEACON UPGRADES

At the end of February, **GB3SEE** (IO91vg) on **3cm** at Reigate - returned to service, having been maintained and upgraded.

From the same site, a new **24GHz GB3SEE** beacon has been set up on a temporary mast. It has already been heard on several occasions by **G4EAT** at 77km, and on 8th March was 59+20 whilst the early morning temperature was -2 degrees.

Both of the **GB3SEE** beacons are now GPS locked and are transmitting JT4g.

A few days later in early March, the upgraded Martlesham **3cm** beacon **GB3MHX** (JO02pb) is now also locked to GPS.

On very hot summer days in the past, I used to hear the two beacons converging on each other as they drifted. **GB3SEE** would go LF and **GB3MHX** HF - eventually meeting somewhere around 10368.840!

The **24GHz** beacon operated by **F6DKW** from JN18cs has recently had some maintenance too, along with a change of crystal. It is now on the new frequency of **24048.392**

BEACON DX

From: John Fell, G0API

I was alerted on 3/3/2011 via an auto email from www.beaconspot.eu that our local beacon **GB3SCF** on **3400.905MHz** had been spotted at 07:21 by **DK1ZD** in JO44we.

Looking on beaconspot.eu I then realised that this was the best ever DX for **GB3SCF** at 897km! Not too bad for a device built nearly 10 years ago that is operational 24/7 with an eirp (when built) of 8dbW.

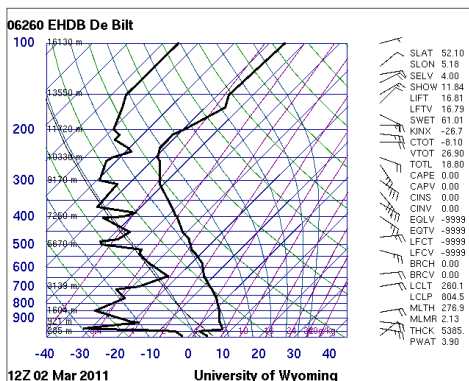
In fact this report seems to be the best DX to date of all our co-sited beacons, on the bands between **2.3 to 47GHz**, at **IO80UU59QO**.

This ties in with the high pressure over the last few days (peaking at 1040mb) and reports of elevated ducts over the North sea.

Our beacon site is several hundred kilometres west of the North sea at 265m asl so some degree of overland extension is involved During this same period, John **G4EAT** reported our **24GHz** beacon **GB3SCK** over the fully overland path at a distance of 224km.

73, John, G0API. Keeper GB3SC* beacons

Once again, the upper air sounding at the time showed a very pronounced inversion, as can be seen here in the diagram for De Bilt (Holland).



The temperature inversion in this case was at a height of 285m. **GB3SCF** was just under the inversion layer, and coupled into the duct. Of course the presence of an inversion on the path doesn't always mean you can get into it though!

EARLY MARCH STARTS WITH DX

From: John Quarmby, G3XDY, Ipswich

Conditions were up on 2nd March, contacts on **1.3GHz** were made in the early evening with **G16ATZ** and **GD8EXI** with good signal reports. A couple of hours later the band was opening to the NE, with **SM7GEP** in JO77 worked at over 1000km, although signals were quite weak. Russ **G4PBP** was 59 on **10GHz** and we had an armchair copy chat for some time. Unfortunately activity was rather sparse.

The contest weekend on the 5th-6th March

was also good. On the Saturday evening the band was open to the East to **OK**, but the ducting was very selective. **OL4K** in JO70tq was very loud on **23cm**, **OK1IA** was called but the QSO was not completed, and **OK1VAM/P** in JO60 was worked with no problems. This was followed by contacts with **DL9GK** (JO50) and **DH2SAV** (JN48), both on CW, **LX/PE11TR/p** (JN39), and finally **DH9NFM** (JO50), at which point I moved to 432MHz for the RSGB contest.

During the morning of the UKuG Low Band contest on the Sunday, conditions were above normal to the North. **GM3UAG** (IO87) was a good signal on **23cm**, and we then moved up the bands to work on **13cm** and **9cm** as well. **DF9IC** (JN48) was worked on all three bands too, as was **DK1VC** (JO31) and **PI4GN** (JO33). **GM4CXM** was audible on tropo from IO75, and **GM4LBV** was also worked on **23cm** but by then conditions had dropped, so a test on **13cm** failed. **GM4JR** (IO85) and **G16ATZ** (IO74) also provided some good **23cm** DX.

Overall 2011 has got off to a good start for tropo openings, lets hope it keeps this up!

73, John G3XDY

DUBUS EME CONTEST

From: Brian Coleman, G4NNS, Andover

I was operational on **10GHz** during the Dubus EME contest over the weekend 12/13 March.

I completed with 12 stations with one new initial - **R3YA**. All contacts were random. There were just a couple of stations I heard but didn't work as they didn't call CQ while I was on and they didn't hear my calls.

On the Sunday morning I came on for the sub IF 4m contest and made 9 contacts, proving that there's more activity off the moon on **10GHz** than on 4m terrestrial !! Small stations only working the big stations and not bothering to call CQ is far worse on 4m than on **10GHz** EME. The advantage with EME of course is that we're all pointing the same way (or at least trying to). While 4m suffers from slow QSB, for **10GHz** EME we have to deal with changing Doppler shift and libration – spectral spreading.

In the last issue of Scatterpoint, we reported **F1PYR**'s first EME contact on **10GHz**. André was also QRV in the DUBUS contest. His first tests in an EME contest were very successful.

André worked **F2TU**, **ES5PC**, **R3YA**, **G4NNS**, **HB9SV**, **ON5TA**, **OK1KIR**, **F5JWF**, **LX1DB**, **WA7CJO**, and **R3QA**.

He also heard **PA0EHG** and **OK1CA**, but these stations were not found a second time. Two other stations were heard, but too weakly.

André has no comments on the propagation conditions, since he has no experience in this area ...yet, but he says that it was amusing to hear the SSB QSO between **WA7CJO** and **OK1KIR**!

The station consists of a 3.5 M cassegrain fed dish (recycling made possible by **F5RYZ**), the 30W PA was designed by **F6BVA**, with LNA from **DB6NT**, and tracking hard/software from **F1EHN**.

Philippe, **F2TU** was also QRV during the event, and he had 16 QSOs with 2 new calls: **F1PYR** and **R3YA**. He contacted **JA6CZD** crossband, and was heard by **F2CT** on an offset 1.8m dish.

Outside the contest, on 15th March, Philippe made a "first" on **10GHz** between **F-9A** with **9A5AA**, and on 17th, initial number 61 was achieved in a QSO with **I2ZDJP**.

Eric **ON5TA** reported a lot of activity during this contest and relatively good, stable conditions. Despite the poor state of his offset reflector, the lunar noise was about 1.6dB. Eric runs about 35W TX into an offset 2.3 m dish.

He was particularly pleased with his first EME QSO with **F1PYR** who Eric says has an excellent signal. The smaller station **R3YA** was contacted (he runs a 2m offset dish) and whose signal was perfectly stable throughout the weekend. The tally for the contest was 14 QSOs on random.

Stations contacted: **F2TU**, **OK1CA**, **F1PYR**, **OK1KIR**, **PA0EHG**, **F5JWF**, **G4NNS**, **IQ4DF**, **HB9SV**, **WA6PY**, **R3YA**, **LX1DB**, **ES5PC** and **W7CJO**.

MARCH 23CM/13CM UKAC

Ray, **GM4CXM**, reports on the **23cm** session on Tuesday 15th March: "Conditions in the first hour were well above average with some pretty good signals from distant stations via tropo. A number of stations usually worked on CW were contacted on SSB for a change. I managed 17 contacts during this period including **PA0EHG** (JO22) on SSB via aircraft reflection.

The remaining 90 minutes produced a further 10 contacts as conditions (and aircraft numbers)

fell away though **OZ1FF** was worked off an aircraft before the skies got too empty.

QSB caused a problem on some contacts, taking out the odd needed letter or number at a crucial point.

Activity was well up though I missed IO81, 82, 93 and JO01 multipliers this month. Everyone appeared to be busy scrambling to get another contact into the log just before the end. At least 12 stations from Scotland were active."

One week later, in the **13cm** event on 22nd March, **GM4CXM** reported plenty of activity, but not enough time to test with almost half of the active stations...eight of them in Scotland.

After an attempt in a previous contest failed, **OZ1FF** was worked for the first time on **13cm**. Unlike the very stable **23cm** aircraft reflection signal that Ray normally experiences on **23cm**, the **13cm** signal came and went repeatedly for an unusually long duration.

Despite working almost double his previous contact numbers, Ray felt that conditions were pretty flat.

SCOTTISH 13CM BEACON GB3CSB

The new **13cm** beacon **GB3CSB** (IO75XX) on **2320.985MHz** went on the air on 29th March. The beacon signal is beaming south-east from the Kilsyth Hills, to the north-east of Glasgow.

BEACONSPOT.EU MILESTONE

At 11:49utc on 6th April, 2011 the 1000th user registered with www.beaconspot.eu - it has taken less than three years to reach this figure since the site was launched at RAL in 2008.

...AND FINALLY

February and March have produced some very good propagation, which makes a change on the higher bands.

Now that April is here, we can look forward to some long distance rainscatter paths on the higher bands. The rainscatter "season" typically starts towards the end of April.

73, Robin Lucas, G8APZ

Please send your activity news for this column to:

scatterpoint@microwavers.org