



An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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**“The light shines in the darkness and the darkness can never extinguish it”
(John 1:5)**

Well G0EWN/P's red light was not extinguished between 1600-1800 UTC on January 8th this year when he and Barry, G8AGN/P, broke the UK lightwave record with an 87km two way voice QSO between IO93PW37 and IO93EI, Gordon G0EWN/P, pictured here making the contact, being at the latter locator. Full coverage of this historic contact can be found in this issue of Scatterpoint.



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Latest News ...

- UK lightwave record increased to 87km
- Martlesham Microwave Roundtable moved to April

**THIS IS THE LAST
ISSUE TO BE SENT
BY EMAIL!**

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From the Editor's Desk

Hello again,

This issue of Scatterpoint is the last to sent to subscribers by email. Only those who have asked specifically to be excluded from the Yahoo download service will continue to receive theirs that way and it is hoped that even they will come around to the Yahoo Scatterpoint group before too long. The printed version will finish with the May 2011 edition and, from June onwards, 99.9% of Scatterpoint distribution will be via the Yahoo Scatterpoint Group. Details of how to register for this appeared in last month's newsletter and they can also be found at <http://www.scatterpoint.org/>

If you are reading this after receiving Scatterpoint by email this month then you won't be seeing your newsletter again unless you sign up at Yahoo before mid February!

As some of you know, I've been compiling this

newsletter since early 1985 when it was the RSGB Microwave newsletter. I've seen great changes in the UK microwave scene over that period and I hope I've reported them accurately in these pages during those 26 years. Due to other commitments this year, for which I need all the time I can find, I have decided, as of the May 2011 edition, to step down from the editor's chair and hand this job over to someone younger than my 73 years (!) so that I can organise the revamping of my house and a move of location to a place where I can do microwaves from home. I also hope to get back into home construction of radio gear, something I've not done for five years or so and which I have missed very much. My website might even get that updating it hasn't had for about three years! **73 Peter G3PHO**

News, views and articles for this newsletter are always welcome. Please send them to G3PHO (preferably by email) to the address shown above. **The CLOSING date is the FIRST day of the month** if you want your material to be published in the next issue. **(This is a change from previous dates)**

Important Information about the distribution of Scatterpoint and UK Microwave Group subscriptions

There are two changes that are imminent regarding the distribution of Scatterpoint.

1. **After this January 2011 edition, Electronic PDF copies of Scatterpoint will no longer be distributed directly by e-mail.** You must register in the Scatterpoint Yahoo group (<http://groups.yahoo.com/group/scatterpoint/>) to receive your electronic copy. A majority of members have already followed this process and are successfully receiving Scatterpoint by this means. **If you do not do this then this will be the last copy that you receive if you pay the basic membership fee!** We do not want this to happen so PLEASE register now or make a diary note/ yellow sticky/write on the back of your hand a reminder to do it very soon..... Additional instructions regarding the Scatterpoint Yahoo registration were in the Nov/Dec-2010 edition of Scatterpoint and are also on the UKuG sub-site <http://www.scatterpoint.org/>
2. The last printed copy of Scatterpoint will be published in May 2011 due to increasingly prohibitive printing and mailing costs. After that you will only be able to receive Scatterpoint electronically via the Yahoo group. With immediate effect there will only be a standard membership fee of £6/€10/\$12 which will mean that new members will only be able to register for the standard PDF version. If you currently receive a printed copy then see below for the process that will apply.

The change from email to Yahoo distribution was first published in October-2009 and Peter, our editor, explained the changes relating to the printed copies in the December-2010 edition of Scatterpoint. The UKuG committee recognises that this will cause some concern but concluded that, as with many organisations across many disciplines, using the most appropriate and cost effective means of delivering the newsletter has to be addressed.

If you are a current subscriber receiving a printed copy then the following will apply.

- If your renewal date was between July 2010 and January 2011 then you will continue to receive a printed copy until these cease and the amount that you have paid will be pro-rata'd so that your membership will be extended by an appropriate amount. The membership secretary will advise you what this change will be.
- If your renewal date is between February 2011 and May 2011, please wait for a reminder from the membership secretary who will advise you what you should pay to cover the period to June 2011 for the printed copy after which your fee will cover a standard (electronic) membership. There are only about 13 members who fall into this category so each will be notified individually.
- If you last paid in June 2010 then you will receive a reminder in May 2011 asking you to pay the standard (electronic) subscription of **£6/€10/\$12**.

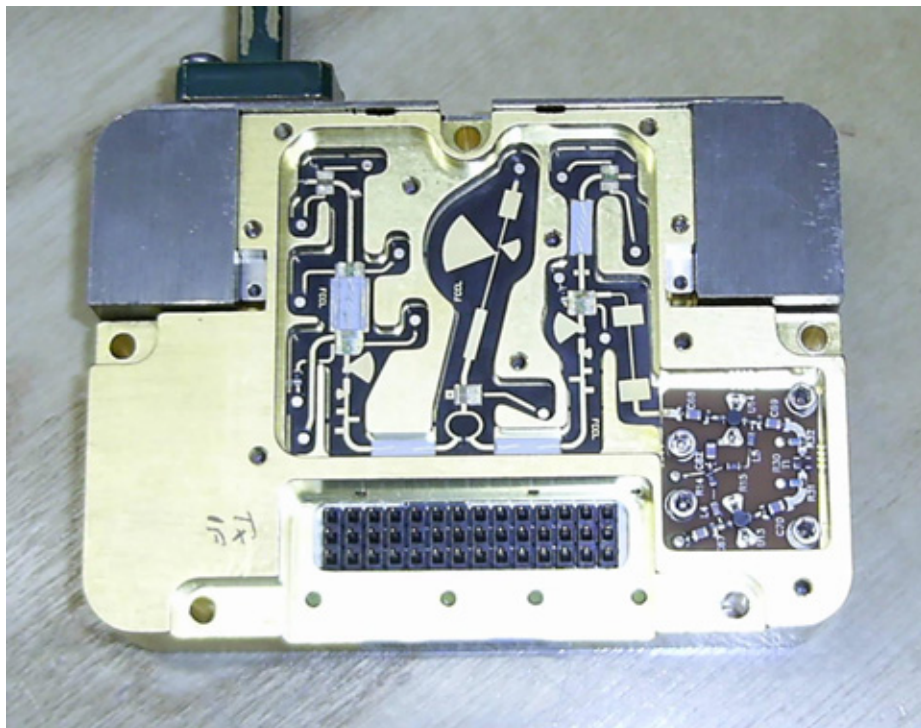
We do recognise that there are a handful of members who do not have access to the internet and understand that they will not be able to register with the Yahoo group. Several have indicated that they are likely to reach an agreement with a local amateur who will print a copy for them. If this is not possible and you do not have access to the Internet then please write to the Chairman (see page 2 for his address) who will offer an interim option.

These changes have not been undertaken lightly and so please do not 'blame' Peter who has, for many years, done and continues to do a brilliant job. If you are unhappy with these changes then address your comments to treasurer@microwavers.org but please recognise that all members of the committee are charged, by virtue of their elected position, with delivering the best, most cost effective way of managing the UKuG.

Graham Murchie – G4FSG
UKuG Treasurer

28 – 47GHz Amplifier

...by Roger Ray G8CUB



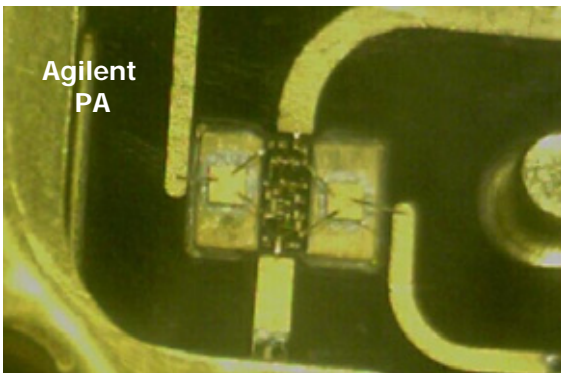
I was intrigued by a 'millimeter transceiver' on ebay from 'rf-buy2008' described as a 'Signal Technology' unit but with no frequency information. From the dimension of the waveguide aperture, I guessed at 40GHz. What I was hoping for was >40GHz, what I got was 37.4GHz bother! The picture above shows the business part of the unit, with the duplexer and waveguide power coupler removed.

What looked potentially hopeful was that it had a LNA amplifier on the receive side and a driver and PA on the transmit side. Looking under the microscope, I identified the PA as an Agilent HMMC-5040. Looking further, the LNA (marked 6561H) driver (marked 6742) & LO amplifiers (6561H) were UMS dies CHA?. However, asking UMS to identify them appeared akin to asking for the launch codes to France's nuclear arsenal! Both mixers were Hittite devices but, again, un-identified.

Firstly, I decided to try the unit. Supplies were marked with voltages, except for the Tx amplifier supply, which turned out to be +5V to give around 4.5V on the PA supply. On the opposite side to the one shown was a VCO (V950ME01) which covers 4.3 – 4.65GHz. There are two X3 multipliers in the LO chain (back to back diodes), thus the

LO was 38.7 – 41.85GHz. I connected the supplies, and applied 5mW of 2GHz to the IF in port. The output was +17dBm, peaking (by adjusting VCO voltage) at 38GHz. Could I get anything out at 47GHz? I put a piece of foil on top of the filter and applied 5GHz to the IF. I got at best -17dBm out at 47GHz not too good ... and very little if I made the IF 5.76GHz, so I decided this was not going to work as a 47GHz transverter. In playing with the Tx filter, I broke the bond wire from the filter to the driver ... double bother!

Could I make something of what was left? I first thought of trying to use the Tx and driver stages as an amplifier. However, trying to find a way of coupling into the board was defeating me. Then I hit on the idea of using the wr-28 input and output ports. Would it be possible to connect the LNA through to the driver? The most likely outcome I guessed, if it worked at all, was that it would oscillate. Nothing ventured nothing gained, etc, so I gave it a try.

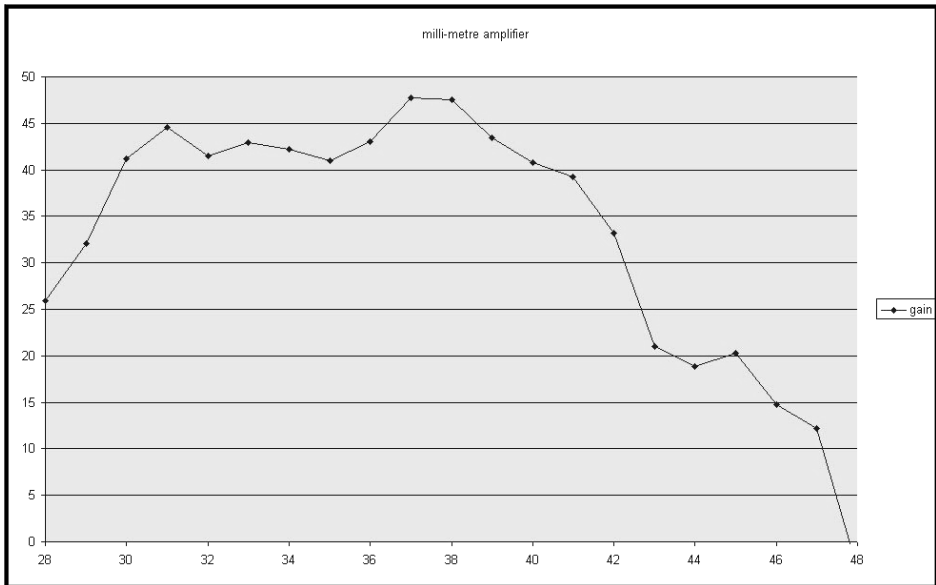


I used miniature coax that was to hand, as it was likely to propagate the high frequency and give some attenuation between LNA and driver. I soldered the inner on to the track at the LNA end, and used liberal amounts of silver epoxy to connect the outer. This I found I needed to cure, so I put it in the oven at 100 deg.C for an hour, which seemed to do the trick. At the Tx filter end, I bent the inner down and used silver paint to make the connection.

I disconnected the positive and negative supplies to the parts that I had now shorted, and applied power. Firstly, I was very pleased to find that I had gain and, secondly, that it was stable! I did a sweep from 40 – 48GHz and found very healthy gain at 40GHz (41dB!) but very little at 47GHz. The amplifier was at its best with the lid in place.

The photograph on the following page above shows the test set-up for measurement from 40 - 48GHz, with 47.088GHz on screen. This used a Wiltron 40 -60GHz generator and a Flann attenuator and transition WR-19 to WR-28. On the output side,

there is a transition to WR-22 and a WR-22 attenuator fixed at 40dB and a 33-50GHz HP harmonic mixer with HP 8563E analyser. I later checked the 28– 40GHz response, using a Spacek doubler on my signal generator and an MI power meter.



The response shows gain in dB on the vertical scale, against frequency along the bottom, in GHz.

Gain was a massive 47dB at 38GHz, 40dB at 40GHz, but only around 10dB at 47GHz. 1dB compression was 21dBm at 40GHz, around 18dBm at 37GHz but only 8dBm at 47GHz.

To get the best performance at 47GHz, I added a small tab on the line between driver & PA, and turned the current up on the amplifiers a bit. At best, I got 11.2dB at 47.088GHz but could not quite repeat that later.

There may be more to be had by adding tuning screws to the waveguide ports, and more careful tabbing. Also, I think that if I had ground off the unwanted filter elements it might have helped – though I could easily have broken another bond wire in doing so.

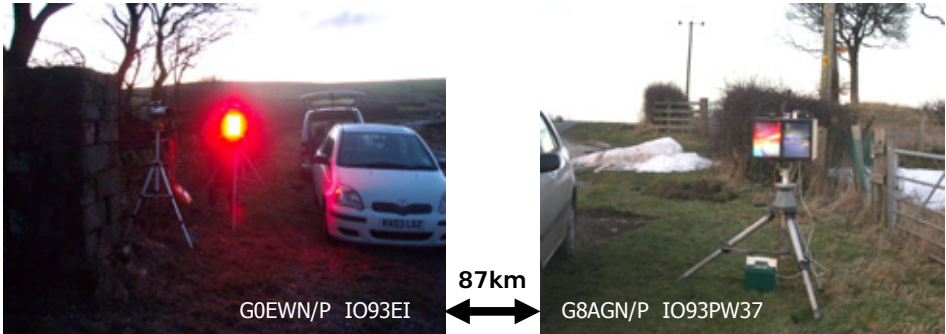
So, was it worth it? As a 47GHz amplifier it probably was not. As a wideband amplifier to drive a mixer X4 for 134GHz, we are hopeful!

To use the module as a X3 multiplier, it should be possible to use the last Tx X3 LO multiplier. Possibly use a coax connection after the Tx LO filter and short out the mixer. In this way it could be used with a minimum amount of modification, although it may be necessary to shift the Tx filter dependant on the frequency required.

At the time of writing, these units are still available on eBay.

Dxing on Lightwaves New UK Record

A report by Peter Day, G3PHO



Experiments in the spectrum above 400THz took on a whole new light when an 87km path between the Yorkshire Wolds and the highest parts of Sheffield in South Yorkshire was worked on two way voice modulation by Barry, G8AGN/P and Gordon, G0EWN. Saturday January 8th, 2011, was a bitterly cold and windy day in Sheffield but with excellent visibility and it didn't deter these two from attempting what they had been planning for many weeks to set up a new UK light-wave/optical communications record.

The photo right shows G0EWN/P's very bright Luxeon LED transmitter operating from the Sheffield end. This was, like Barry's location, a rural roadside situation and more than one motorist and a cyclist were given a surprise when they came around the corner of the road to be bathed in this beautiful red light! To the left of the LED TX is G3PHO's receiver which also managed to pick up Barry's signal at 87km and which he used years ago when he and Barry experimented with lower power lasers. Sadly Peter does not yet have a transmitter so he couldn't get in on the record breaking this time!

This record attempt was set up at 4pm, just before it started to go dark. Even in the low light we could both see Barry's LED at 87km, as soon as he switched it on first through binoculars and then by 'naked eye'. Once darkness came it was very easy to see it flash on an off as Barry's beacon keyer sent his location and callsign. However, Barry could not see Gordon's transmitter by eye and even the sighting telescope or binoculars did not produce a very clear image. The electronic detection used in Barry's receiver did the business so no one could say that the two operators may as well have sent semaphore to each other!

There was a marked difference in signals received at each end. As darkness increased, Barry's voice signal became an easy to read RS53 or so but there appeared to be a little QSB as well... just like the lower bands! Gordon's signals heard at the G8AGN/P end of the path were about an S unit down on this and may have been due to a number of factors such as a less sensitive receiver at G8AGN or, more likely, less effective modulation by G0EWN. Like the old 10GHz wideband FM days, both stations sent a 1kHz tone modulated 'carrier' to assist line up antennas, or should we say lenses at this frequency. Gordon's tone signal was harder to copy than Barry's. In fact the writer, a keen CW operator, would have preferred to complete the contact using the MCW mode as Barry's MCW beacon signal was an easy to read RST529 from the very beginning of the test. The voice contact took longer as we had to wait for full darkness after 5pm. Barry, being east of us, had to beam into the setting sun and so it was essential for his horizon to his west to be totally dark in order to get a readable signal, unlike the G0EWN end where signals from the east were good before complete darkness fell the eastern horizon being already dark.

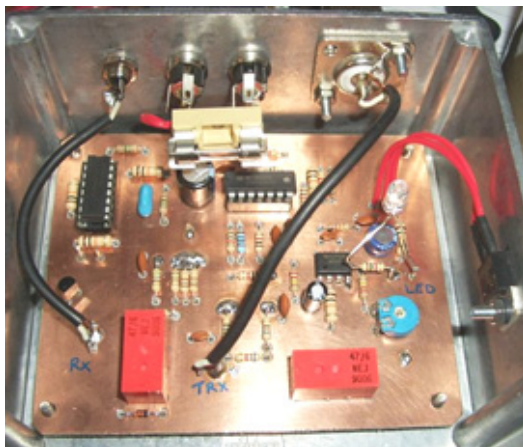
This new record is a marked improvement on the previous one of 76km, set up in 2003 by Alan G8LSD and David G0MRF. These two optical comms enthusiasts used low power laser diodes and at the time this represented very good DX indeed. They are also the holders of the first G to F contact at red light. Such international QSOs may become more frequent in future as the "jungle telegraph" tells me that certain microwavers in East Anglia are even thinking of trying trans-North Sea light wave paths using cloud scatter! However that must be some considerable time in the future!

The 2-way world red light record, 278km, is held by KA70EI and K7RJ in Utah, USA and they too were using Luxeon LED transmitters. These diodes are nominally 3 watt devices but they are not very efficient. G8AGN reports an output of around half a watt from his diode.

Today's equipment, certainly in the UK, seems to centre around the Luxeon as a transmitter and cheap (£1) flat, plastic fresnel lenses, rather than glass optics, so a typical station looks like the one pictured on the front page of this issue of Scatterpoint. The station is contained in a large wooden enclosure, mounted on a sturdy tripod. One half of the enclosure contains the transmitter while the other half houses the receiver which also uses a fresnel lens. In each case, a diode is accurately positioned at the focus of the lens.

A 10 minute, unedited video of this 87km contact can, be found on YouTube. Just enter G8AGN or G3PHO in the search box and you will be taken to G3PHO's page where the video file can be accessed very easily.

At present there are three "cells" of optical communications activity in the UK..... The Sheffield region, East Anglia and in the North East of England from County Durham (M0DTS) to Tyneside (G0EHV). Some North easterners are using transverters from 80m (3.6MHz) to approximately 25kHz which is used to modulate the Luxeon LED. On receive, the 25kHz is upconverted back to 3.6MHz where everything sounds like an HF QSO! An example of the transverter is shown to the right. The FT817 is the most popular IF transceiver for this work. It's highly suitable as it can be programmed for the rear antenna output to drive the lightwave gear while the front antenna connector feeds the talkback (say 2 metres No KST chat room here, yet!). Some very interesting audio files can be found at Stuart G8CYW's website (see below) along with much useful material on circuits and ideas for getting going on this fascinating communications mode.



Useful weblinks:

All the the following web pages have interesting audio files and circuit diagrams, plus practical ideas on putting together a working system.

G8AGN's webpages: www://barry-chambers.staff.shef.ac.uk/laser_files/laser.htm and www://barry-chambers.staff.shef.ac.uk/LED_files/led.html

G8CYW's webpages: www.aladal.net/toast/detector.html

KA9OEL's webpages: www.ka7oel.com (much very useful information here)

UK MICROWAVE GROUP CONTESTS

2011 RULES AND DATES

Aims and comments:

Following a review of the contest programme and feedback from participants, either via logs or at the Martlesham Contest Forum, a few changes have been made to the 2011 programme. The 24/47/76GHz Cumulatives have been condensed into a single event and the timing of other cumulatives changed to make setting up easier and allow earlier close down.

The major new event in the 2011 calendar is a "**Microwave Field Day**", intended for portable stations. This is timed to coincide with the RSGB 432MHz Low Power contest and is the day after the 144MHz Low Power event, so clubs may well already have set up stations in suitable locations and we can introduce more operators to microwaves. For 2011, it will be on 1.3GHz and 10GHz only, if take up is strong then other bands may be added in future.

A new online log entry system is planned to be introduced this year, which will be similar to that used by the RSGB Contests Committee. When this becomes available all logs must be submitted online. We will aim to publish contest results in Scatterpoint within 1-2 months of each event.

As usual we have tried to avoid clashes and adjacent weekends with major VHF contests and events such as rallies and microwave meetings but, inevitably, this has not been possible in all cases.

Entries will continue to be listed in one table, but leading entries in certain categories marked, with certificates awarded where appropriate. These categories include Portable, Low-power, and Radio-only talkback. The exception is that there will continue to be a separate Restricted section for the 10GHz cumulatives.

Microwavers in Europe are most welcome to join in our UK contests. There is already a core of French, Dutch and Belgian stations who appear regularly in our summer contests. We would like many more to do the same!

THE RULES listed below are final and binding for 2011 (there are some changes from 2010). The following contests are scheduled for 2011:

- **Low Microwave Bands** - 1.3GHz/2.3GHz/3.4GHz (4 contest days).
- **5.7GHz Cumulatives** (5 contest days with 3 to count for scoring), on the same days as the 10GHz/24GHz Cumulatives
- **10GHz Cumulatives** (5 contest days with 3 to count for scoring), on the same days as the 5.7GHz/24GHz Cumulatives
- **24GHz GORRJ Cumulatives** (5 contest days with 3 to count for scoring), on the same days as the 5.7GHz/10GHz Cumulatives
- **24GHz Trophy**
- **47GHz**
- **76GHz**
- **1.3GHz and 10GHz Microwave Field Day**

The full contest program and rules are published in the January 2011 issue of the Scatterpoint Microwave Newsletter and are also available on the Internet on the UKuG website at <http://www.microwavers.org>

General Rules (applicable to all events)

The Contests are open to all comers (you do not have to be an RSGB or UK Microwave Group member). Stations located outside the UK (G, GW, GM, GI, GD, GU, GJ) may enter a contest, and will be tabulated within the overall results tables but will only be eligible for their own awards.

Contestants are expected to enter in the true spirit of the event and to adhere strictly to any equipment or power restrictions that apply to the particular contest.

Operators may enter as home station or portable (either mixed or separately in cumulative events) unless specified in the rules for a specific event. In multi-band contests, single-band entries are always acceptable.

Stations: Entrants must not change their location or callsign during the contest, unless the Rover rule is invoked. In multi-band events, all stations forming one entry must be located within a circle of 500m radius. An operator may reside outside the station's area ("remote station"), connected to the station via a "remote control terminal". In such a case, the Locator for the contest is the Locator of the station's position. An operator may only operate one single station, regardless if it is locally or remotely operated, during the same event.

Contacts: Only one scoring contact may be made with a given station on each band, regardless of suffix (/P, /M, etc) during an individual contest or cumulative activity period, unless the Rover rule is invoked. Contacts made using repeaters, satellites or moonbounce will not count for points. Contacts with callsigns appearing as operators on any of the cover sheets forming an entry will not count for points or multipliers.

Scoring: Contacts are scored on the basis of 1 point per kilometre for full, two-way microwave contacts and at half points for one-way (ie crossband) contacts.

Exchanges: Contest exchanges on the microwave bands consist of RS(T) + serial number (starting at 001). In addition, the six (or eight) figure QTH Locator must be exchanged either via the microwave band or on the talkback frequency. In multiband contests, the serial number will start at 001 for each band (ie a common sequence across the bands is NOT to be used). No points will be lost if a non-competing station cannot provide an IARU locator, serial number, or any other information that may be required. However, the receiving operator must receive and record sufficient information to be able to calculate the score.

Talkback: Talkback can be used to assist in setting up a QSO, but note that the **contest exchange** must be made via the microwave band. It is not permissible to use the talkback as a means of checking the report or serial number – they must be copied via microwaves – and after the QSO is complete, care should be taken to avoid accidentally repeating the exchange via talkback. There is no restriction on the talkback methods that can be used – other amateur band, internet, phone, etc. In setting up the QSO, it is also permissible to send back received audio to the other station, for example to help with antenna alignment. An exception is that our contests do allow one way (cross-band) QSOs for half points, and in this case, the other band can be used by one of the stations.

Entries: Contestants are asked to make sure their entries have been scored correctly and that all relevant bonus points and multipliers have been claimed.

All entries must be prefaced with a summary / cover sheet showing: Title of contest, name(s) of operator(s), location(s) of station, section entered, callsign used, band score(s), multipliers or bonus points, final claimed score. The sheet should also detail equipment used, particularly the power output, antenna and receiver for both the microwave band and the talkback. This is very important if the logs are entered in one of the restricted sections. Where the contest has a 'rover' facility, it is essential that each location used is clearly stated. Log entries are preferred to be received by email, but may also be submitted on paper. For electronic entries, the format should be one of the following: ASCII text, Microsoft Excel (no Macros to be included), Microsoft Word, or the G4JNT contest software format, IARU REG1TEST format. E-mail entries will be acknowledged to confirm receipt.

All logs should be sent to the Contest Adjudicator, G3XDY, within 16 days of the end of the contest. G3XDY's email address is: g3xdy@btinternet.com . Postal entries should be sent to 12 Chestnut Close, Rushmere St Andrew, Ipswich, IP5 1ED, UK

During 2011 a new online entry system will be adopted to replace email submission and paper logs will cease to be accepted. Details will be published in Scatterpoint and online before this change takes effect.

Awards: Certificates will be awarded to overall contest winners and individual section leaders and their runners up. Additional Certificates of Merit will be awarded to stations in certain categories, as indicated in the rules for each event. With these, as with the logs, the adjudicator's decision is final.

Special Rules: Applicable if called up for the specific contest:

Rover Concept: The 'Rover' concept is to encourage lightweight, low power portable activity. This allows the location of the station to be moved as many times as desired and by a minimum of 16 linear kilometres, at any time during the contest period. From each new location, stations worked from any of the previous locations during the event may be worked again, both stations involved in the contact gaining points. The serial number, however, will not revert to 001 each time a move is made but will carry on consecutively from the previous contact.

Low Band Microwave Contest Rules

First introduced in 2004, these contests aim to encourage operation on the three lowest bands in the amateur microwave allocation, particularly as there is growing UK availability of 2.3GHz and 3.4GHz equipment. For 2011, there are four of these events, in March, April and June and November.. The April and June events are more likely to suit portable operators, and the March and June events are also timed to overlap with UHF/SHF events in some other IARU Region 1 countries.

1. The General Rules listed above apply.
2. There are four contests, one in March, one in April, one in June and one in November. All events run from **1000 to 1600 UTC**.
3. There is one section, but the leading stations in a number of categories will be marked in the results table, with certificates awarded (see below).
4. Each band will be scored and tabulated separately. The total points for each band will then be normalised by the adjudicator to 1000 and the normalised band totals added up and tabulated.
5. Each event will be scored separately - there are no cumulative scores.
6. For each session, certificates will be awarded to the leading entry plus runner-up on each band, the overall leading entry and runner-up across the three bands, plus for each band the leading stations in each of the following categories: home station, portable station.

5.7GHz Cumulatives Rules

The 5.7GHz,10GHz and 24GHz cumulatives are being run concurrently to take advantage of of the growth in activity on 5.7GHz and 24GHz. Although they are on the same days, they are completely separate contests. Any band or all bands can be used on any of the 5 days, and any three days submitted for any band.

1. The general rules shown above apply.
2. There are five, monthly, events, from May to September inclusive, and the events run from 1000 to 1600 UTC on a Sunday.
3. Any three of the five events may be used for final scoring purposes. Logs for all events entered should be submitted.
4. There is one section, but the leading stations in a number of categories will be marked in the results table, with certificates awarded (see below).
5. Moving location during the contest is allowed - the Rover concept is applicable.
6. Certificates will be awarded to the leading station and runner-up, plus leading stations in each of the following categories: home station, portable station, low-power (1W or less), radio-only talkback. The G3KEU Memorial Trophy will also be awarded to the leading entry.

10GHz Cumulatives Rules

The 5.7GHz,10GHz and 24GHz cumulatives are being run concurrently to take advantage of of the growth in activity on 5.7GHz and 24GHz. Although they are on the same days, they are completely separate contests. Any band or all bands can be used on any of the 5 days, and any three days submitted for any band.

1. The general rules shown above apply.
2. There are five, monthly, events, from May to September inclusive, and the events run from 1000 to 1600 UTC on a Sunday.
3. Any three of the five events may be used for final scoring purposes. Logs for all events entered should be submitted.
4. Contestants may submit logs for either of the following sections:

Open

No power or antenna restrictions (other than those laid down in the amateur licence) on either 10GHz or on the talkback band.

The 'Rover' concept does not apply to this section.

Restricted

10GHz transmit output not to exceed 1.0 watt to the antenna.

No power restrictions on the talkback band. No antenna restrictions

Moving location during the contest is allowed - the Rover concept is applicable.

5. The final results table will show entries in rank order for each section. In addition to the usual leader/runner-up certificates for each section, the following certificates/trophies will be awarded:
 - leading entry in the Open section - The G3RPE Memorial Trophy
 - leading entry in the Restricted section - The G3JMB Memorial Trophy
 - certificates to the leading home station, portable station, radio-only talkback station, in each section.

24GHz GORRJ Cumulatives Rules

The 5.7GHz,10GHz and 24GHz cumulatives are being run concurrently to take advantage of of the growth in activity on 5.7GHz and 24GHz. Although they are on the same days, they are completely separate contests. Any

band or all bands can be used on any of the 5 days, and any three days submitted for any band.

1. The general rules shown above apply.
2. There are five, monthly, events, from May to September inclusive, and the events run from 1000 to 1600 UTC on a Sunday.
3. Any three of the five events may be used for final scoring purposes. Logs for all events entered should be submitted.
4. There is one section, but the leading stations in a number of categories will be marked in the results table, with certificates awarded (see below).
5. Moving location during the contest is allowed - the Rover concept is applicable.
6. Certificates will be awarded to the leading station and runner-up, plus leading stations in each of the following categories: home station, portable station, and single session entry. The leading station will receive the GORRJ Memorial Trophy.

24GHz Trophy Rules

The 24GHz Trophy contest coincides with the 47GHz and 76GHz events

1. The general rules shown above apply.
2. The contest will run from 0900 to 1700 UTC on a Sunday.
3. Moving location during the contest is allowed - the Rover concept is applicable.
4. Certificates will be awarded to the leading station and runner-up and the winner will receive the 24GHz Trophy.

47GHz Contest Rules

The 47GHz contest coincides with the 24GHz Trophy and 76GHz events

1. The General Rules listed above apply.
2. The contest will run from 0900 to 1700 UTC on a Sunday.
3. Moving location during the contest is allowed - the Rover concept is applicable.
4. Certificates will be awarded to the leading station and runner-up.

76GHz Contest Rules

The 76GHz contest coincides with the 24GHz Trophy and 47GHz events

1. The General Rules listed above apply.
2. The contest will run from 0900 to 1700 UTC on a Sunday.
3. Moving location during the contest is allowed - the Rover concept is applicable.
4. Certificates will be awarded to the leading station and runner-up.

Microwave Field Day

1. The General Rules listed above apply.
2. The contest will run from 1000 to 1600 UTC on a Sunday.
3. Only Portable stations may enter the contest. Check logs will be welcome from fixed stations.
4. The contest will be on the **1.3GHz and 10GHz bands**. Talkback can be on any band.
5. Contestants may submit logs for either of the following sections:

Open

No power or antenna restrictions (other than those laid down in the amateur licence) on 1.3GHz, 10GHz or on the talkback band. The 'Rover' concept does not apply to this section.

Restricted

1.3GHz transmit output not to exceed 10 watts to the antenna

10GHz transmit output not to exceed 1.0 watt to the antenna.

No power restrictions on the talkback band. No antenna restrictions

Moving location during the contest is allowed - the Rover concept is applicable.

6. Certificates will be awarded to the leading station and runner-up in each section, on an overall basis and for each band

Other Microwave Contests

The first weekend of May sees the RSGB 432MHz -248GHz Multiband Contest staged in parallel with the Region 1 IARU UHF/SHF Contest. The 10GHz Trophy is run in parallel by the VHF Contest Committee on the Saturday of that weekend, and the rules can be found in the RSGB VHF contest rules.

The first weekend in July is VHF National Field Day which includes 1.3GHz as one of the bands.

The first weekend of October sees the RSGB 432MHz -248GHz Multiband Contest staged in parallel with the Region 1 IARU UHF/SHF Contest. The 1.3GHz Trophy and the 2.3GHz Trophy are run in parallel by the VHF Contest Committee on the Saturday, and the rules can also be found in the RSGB VHF contest rules.

The RSGB also runs a cumulative UK Activity Contest on 1.3GHz on the third Tuesday from 2000-2230 local time, and on 2.3GHz on the fourth Tuesday of every month, from 2000 – 2200 local time.

In addition there are other Continental UHF/SHF Contests held during the year and interested UK microwavers are urged to be active during these. Their details may be found on the Internet.

UKUG MICROWAVE CONTEST CALENDAR 2011

Dates, 2011	Time	UTC	Contest name	Certificates
6-Mar	1000 - 1600		Low band 1.3/2.3/3.4GHz 1	F, P
10-Apr	1000 - 1600		Low band 1.3/2.3/3.4GHz 2	F, P
17-Apr			(Martlesham Round Table)	
29-May	1000 - 1600		1st 5.7GHz Cumulative	F, P, L, R
29-May	1000 - 1600		1st 10GHz Cumulative	F, P, L, R
29-May	1000 - 1600		1st 24GHz Cumulative	F, P
5-Jun	1000 - 1600		Low band 1.3/2.3/3.4GHz 3	F, P
26-Jun	1000 - 1600		2nd 5.7GHz Cumulative	F, P, L, R
26-Jun	1000 - 1600		2nd 10GHz Cumulative	F, P, L, R
26-Jun	1000 - 1600		2nd 24GHz Cumulative	F, P
9/10-Jul			(Finningley Round Table)	
17-Jul	0900 - 1700		24GHz Trophy / 47 / 76 GHz	
31-Jul	1000 - 1600		3rd 5.7GHz Cumulative	F, P, L, R
31-Jul	1000 - 1600		3rd 10GHz Cumulative	F, P, L, R
31-Jul	1000 - 1600		3rd 24GHz Cumulative	F, P
7-Aug	1000 - 1600		Microwave Field Day	P, L, R
21-Aug	1000 - 1600		4th 5.7GHz Cumulative	F, P, L, R
21-Aug	1000 - 1600		4th 10GHz Cumulative	F, P, L, R
21-Aug	1000 - 1600		4th 24GHz Cumulative	F, P
12-Sep			(Crawley Round Table)	
25-Sep	1000 - 1600		5th 5.7GHz Cumulative	F, P, L, R
25-Sep	1000 - 1600		5th 10GHz Cumulative	F, P, L, R
25-Sep	1000 - 1600		5th 24GHz Cumulative	F, P
27-Nov	1000 - 1600		Low band 1.3/2.3/3.4GHz 4	F, P
Key:				
	F		Fixed / home station	
	P		Portable	
	L		Low-power <1W TX	
	R		Amateur radio only talkback (no KST or telephone)	

MICROWAVE SQUARES AWARDS

Until recently the RSGB has administered a range of Squares Awards on the bands above 30MHz. Last year the UK Microwave Group agreed to take over the running of the Microwave Squares Awards, and we are now re-launching them with a new certificate design shown here to the right).

The rules have not changed significantly and existing RSGB records have been transferred so that claims for extra stickers to add to existing RSGB awards can be accepted. The existing sticker design has been retained.

Awards are available in 5 square increments on the following bands:

- 1.3GHz 5 squares to 150 squares
- 2.3GHz 5 squares to 75 squares
- 3.4GHz 5 squares to 75 squares
- 5.7GHz 5 squares to 75 squares
- 10GHz 5 squares to 75 squares
- 24GHz 5 squares to 25 squares

- Initial claims will require submission of QSL cards for all contacts claimed.
- Subsequent increments will need the additional cards and the countersigned check list from the previous claim.
- QSL cards must include the IARU QTH locator of the station worked.
- Contacts must have been made after 31 December 1978.
- All contacts must be two way on the band in question, cross band contacts are not eligible.
- Awards are available for fixed or portable/mobile stations but these categories cannot be mixed.
- Claims for portable operation must be for contacts made from one site, defined as anywhere within a 5km radius of the point operated from.
- Cards should be listed and sorted in IARU QTH Locator alphanumeric order.
- A self addressed envelope must be included for return of the QSL cards, with sufficient postage value in UK stamps or IRCs.
- Certificates are free for members of the UK Microwave Group.
- Claims from non-members must include payment of £3 or \$5 when an initial certificate is requested.
- Subsequent stickers will be enclosed with returned QSL cards and checklists.

Claims should be made using the application form and squares checklist available on the UK Microwave Group web site.

All claims should be sent to John Quarmby G3XDY, UKUG Awards Manager, 12 Chestnut Close, Rushmere St Andrew, Ipswich, IP5 1ED, UK

Please note that data provided for the above awards will be held by the UK Microwave Group for the purposes of providing a published list on the UKUG Web Site and in the group's newsletter Scatterpoint, of achievements by award holders. Data will not be used for any other purposes.

You do not have to be a member of the UK Microwave Group to lodge a claim.

The decision of the UK Microwave Group committee on the validity of claims is final.



UK Microwave Group **Summary of Accounts 2010**
Covering period 01/Jan/2010 to 31/Dec/2010

Item	Income	Expenditure	Balance	Notes
Opening balance 01/Jan/10			10826.85	
Subscriptions	3095.61			
RAL	204.54			RAL dinner
Beacons	0.00			
Interest	3.66			
Other income	27.60			badges, donations etc
RAL		202.00		RAL dinner
Newsletter printing & postage		1123.37		
EME2012 loan		6000.00		
Beacons		1128.53		
Beacon support costs		0.00		
Other expenses		317.34		Trophies, web, certificates
Sub-totals	3331.41	8771.24	5387.02	
Closing balance 31/Dec/2010			5387.02	

P. G. Murchie G4FSG
Treasurer



ACTIVITY NEWS FROM THE WORLD ABOVE 1000MHz

By Robin Lucas, G8APZ

After the bumper issue last month, in which I had material for no less than six pages, this time round, I have very little input. As hard as I try to spread it across four pages, it just cannot be done, so this time it's only two pages.

November and December has been exceedingly cold across Europe. In parts of the UK and Scotland, temperatures as low as -20C have been recorded. It is therefore surprising that no **24GHz** activity has been reported, since sub zero temperatures and dry atmosphere tends to be favourable on **24GHz**. At least if anyone has done any tests, they've kept quiet about it!

Guy **F2CT** made some long DX QSOs on **24GHz** which I reported in the Nov/Dec 2010 issue. I'm sorry to say I got the date of the QSOs wrong, they were in fact made on October 26th 2010.

NOVEMBER 23cm UKAC

From: Ray James, GM4CXM, Glasgow

The November session of the UK Activity Contest on **23cm** produced an excellent activity turnout despite the flat conditions experienced in Scotland that those reporting from further south did not appear to suffer from.

Tuesday was one of those evenings when you really had to grind out results for a positive outcome. The only disappointment was knowing that several lower ERP stations were calling, and this was one night that those whispers in the noise did not turn into fully readable signals.

As usual, aircraft reflection produced the longest distant contacts. The aircraft position websites identified a dearth of flights at optimum heights from the start and it was almost an hour before one

favourable Ryanair flight enabled Kjeld, **OZ1FF** and myself to work each other.

PAOEHG will be a familiar call to many within troposcatter range of Holland and now I find is another (rare?) operator who has realised the advantage of using aircraft in order to make a contact. It took a couple of false alarms (aircraft changing course!) before we enjoyed the benefit of a Schipol to Memphis flight crossing our mid-point and resounding signals being heard both ways.

UK flights were predominantly down the west side of England and this produced more difficult contacts to the likes of **G4EAT** and **G3XDY** but much easier reception of stations in IO82, 81 and 91. **G4NBS** in JO02 was a strong exception to this.

Ray managed 24 contacts during the session, with six of them over 500km and two over 700km. Best DX was **OZ1FF** in JO45 at 782km.

RAINSCATTER

From: Martyn Vincent, G3UKV

Monday (December 27th) showed a double belt of rain crossing the UK from SW to ENE, just as the post-Christmas thaw was beginning to assert itself.

During a QSO with Graham **G3VKV** in Cheltenham, audible beacons on **10GHz** were about normal, both here (nr. Telford IO82) and in Cheltenham. However, an alignment test signal (8W to 70cm dish) was exceptionally strong at Graham's QTH, and for the next half-hour or so (21:30 onwards) signals stayed consistently above S9 for a RS SSB QSO.

Graham was running just over 1 watt, but was S9+++ and said my 8W was end stopping at his end. It's a 100km very obstructed path, by the way, and usually signals on this path are barely above the noise threshold.

The propagation was more like chordal hop than scatter propagation, given its strength and low level of RS multipath distortion. It was an entertaining QSO too, running the **TK5EP** near-real-time

rainfall program, and plotting the rain front against dish headings, rainfall intensity and signal strength throughout the QSO. See:

<http://tk5ep.free.fr/rsmmap/rsmmap.php#>

We QSYed to the calling frequency and left gaps between overs, as well as tuning around, but there were no other takers for this excellent rain-scatter opportunity. All was quiet on the 'KST front too.

BEACON NEWS

Denis, **GOOLX** has now received the Notice of Variation for the new **24GHz** beacon **GB3SEE** which will be on **24,048.960 MHz**. It will share the same site as the **10GHz** unit which is off the air currently for an upgrade.

When they come back on (this is weather dependent) they will both be GPS locked and sending JT4G.

LETTING OFF STEAM

Earlier this year, when I was short of material, I suggested that I may well include something about steam locos next time! Well, the time has come for me to insert such a piece.

I have chosen to feature a 'Bulleid Pacific' express passenger steam locomotive, a member of the 'West Country' Class.

It was originally numbered 21C146 when it was built in Brighton for the Southern Railway. In 1948, when the railway system in Britain was nationalised, renumbering took place, and it became 34046 under British Railways. It was officially named BRAUNTON in January 1949, and eventually withdrawn from service in late 1965.

In 1966 the locomotive was sold for scrap to Woodham's Scrapyard at Barry, in South Wales.



There she stayed, slowly decaying, suffering from vandalism and thefts of her parts. The photo shows her in the early part of her sojourn at Barry. By 1988 she was in a very sorry state, completely lacking paint and rusting, but she was purchased by a group in Brighton who made a failed attempt to restore her.

In 1996, the wreck was bought by the West Somerset Railway Association, and then sold to a private individual who funded the restoration. It was moved to the Association's engineering base on the West Somerset Railway (WSR). Where original parts were missing or beyond repair, new parts were manufactured from the original engineering drawings. A long period of restoration followed with over one hundred volunteers and paid labour taking part.

In July 2007, the locomotive was steamed for the first time since 1965, and after successfully passing the insurance examinations, BRAUNTON commenced running-in trials on the WSR during August 2007. Work on the locomotive continued throughout the winter and an official launch took place in September 2008, when 34046 BRAUNTON entered service on the WSR.

A new tender is being built to replace the one on loan (from 35027 Port Line) and 34046 is now being fitted for mainline certification.



Photo:
G8APZ

In March, 2010, she was working on the WSR, and is pictured here at Watchet Station.

...AND FINALLY

I like to see a good ending to a story!

73, Robin, G8APZ

Please send your activity news for this column to:

scatterpoint@microwavers.org

UK MICROWAVE ACTIVITY EVENINGS

The UKuG committee have been discussing ways in which the Monday night activity evenings can be improved and would appreciate your input or suggestions.

Under consideration is an option of promoting a revolving band or bands of the week. This would not inhibit anyone using any microwave band of choice but only specific bands would be promoted each week.

1st Monday: 23cm
2nd Monday: 13cm
3rd Monday: 9/6/3cm
4th Monday: 24G and above
5th Monday: Lightwave

Time: 20.00 – 21.00 local being the promoted period but individual operators will obviously chose whenever they wish to be active.

The committee would also appreciate feedback whether operators would prefer an alternative to Mondays any other evening or during mornings or afternoons at the weekend?

Please send your comments to Ray James GM4CXM QTHR or email:
gm4cxm@yahoo.co.uk

BEACON NEWS

G6GXX reported in mid January:

GB3MAN 24GHz beacon is now spot on at 24048.850 MHz. Omni antenna + 0.5W TX. Current weather conditions very wet and misty - beacon received here loud and clear at S6 - at 4.5Km - indoor antenna. Reports welcomed via beacon spot.

OTHER G6GXX UPDATES

GB3XGH 10GHz beacon fully GPS locked and as always spot on.

GB3MAN 5.7GHz dual output beacon is now in an advanced stage of construction.

GB3MAN 3.4GHz beacon. Baseband DDS and

freq generation using IONICA parts now complete and functioning as fully GPS locked source. Only parts outstanding are antenna and PSU for PA. Also Application for NoV required.

GB3MAN 47GHz beacon - no further progress.

Hopefully this year should be good for progress.

73 David G6GXX

UK MICROWAVE GROUP EXTRAORDINARY GENERAL MEETING

SUNDAY 17th APRIL 2011

Notice is hereby given that an Extraordinary General Meeting of the UK Microwave Group will be held at 9:45am on Sunday, 17 April 2011 as part of the Martlesham Microwave Round Table event which takes place over that weekend.

The motion is:

"That the Annual General Meeting be deferred to the April 2012 meeting of the Martlesham Microwave Round Table and occur annually thereafter."

Reason: MMRT has moved from its November slot to April. Although this year's MMRT is only a 1-day event, being close to the recent November 2010 MMRT, it will return to its 2-day format in 2012 incorporating the AGM.

**73 Martin Richmond-Hardy,
G8BHC, Secretary,
UK Microwave Group**

November 2010 Low Band Contest Results

Overall

Pos	Callsign	1.3GHz	2.3GHz	3.4GHz	Total
1	M0GHZ	429	1000	1000	2429
2	G8AIM	179	888	487	1554
3	G4DDK	379	0	821	1200
4	G4BRK	338	840	0	1178
5	GM4CXM	1000	0	0	1000
6	G4BAO	395	0	487	882

1.3GHz

Pos	Callsign	Locator	QSOs	Best DX	Points
1	GM4CXM	IO75TW	15	G3TCU	5988
2	M0GHZ	IO81VK	11	GM4CXM	2571
3	G4BAO	JO02CG	12	GM4CXM	2365
4	G4DDK	JO02PA	10	GM4CXM	2268
5	G4BRK	IO91HP	9	GM4CXM	2023
6	G8AIM	IO92FH	7	GM4CXM	1073

2.3GHz

Pos	Callsign	Locator	QSOs	Best DX	Points
1	M0GHZ	IO81VK	3	G3XDY	294
2	G8AIM	IO92FH	3	M0GHZ	261
3	G4BRK	IO91HO	2	G3XDY	24

3.4GHz

Pos	Callsign	Locator	QSOs	Best DX	Points
1	M0GHZ	IO81VK	4	G4DDK	700
2	G4DDK	JO02PA	4	M0GHZ	575
3	G8AIM	IO92FH	3	G4DDK	351
4	G4BAO	JO02CG	3	M0GHZ	341

Entry levels held steady for this event, with more callsigns appearing in the logs for 1.3GHz and 3.4GHz this year compared with the December 2009 event.

Ray, GM4CXM, was the winner by a large margin on 1.3GHz and provided the best DX for all the other entrants on this band. David, M0GHZ, was runner up on 1.3GHz and won 2.3GHz in a close contest and also 3.4GHz to take the overall winner's spot. George, G8AIM, was runner-up overall and on 2.3GHz while Sam G4DDK was runner up on 3.4GHz. All of those mentioned will receive certificates.

John G3XDY, UKuG Contest Adjudicator

Editor's note ...

The short article below is repeated here after it was first published in last month's Scatterpoint. Unfortunately the photographs in it did not reproduce in the printed version received by some 90 subscribers yet the same version in PDF format was perfect!

NORWEGIAN 23cm BEACON



I was recently onsite to service a repeater and took a couple of pictures to illustrate the siting for the 23cm beacon previously mentioned in Scatterpoint by Kai, LA3QMA.

The photograph above shows the tower where it is intended to install the beacon.

The title photo shows the view the beacon has to the west, over the North Sea ... ie towards the UK.

Next time I'm up there, I'll take pictures of the take off to the SE, S, and SW.

73 from **Peter Ebsworth, Forland, Sotra**

To all KST chatroom users

I have just released a new version of KST2Me, the telnet software to access the KST chat room (*excellent when using mobile internet as it only uses a few 10KB of download capacity a day .. Editor*).

The screen layout handling has been seriously improved (dots per inch, Windows system font size). Please give it a try and report back. You can download it from:

<http://www.rudius.net/oz2m/software/kst2me/index.htm>

73 from Bo, OZ2M

NEXT MONTH'S SCATTERPOINT

As the editor will be in the British Virgin Islands, operating as VP2V/G3PHO over the period 8-21st March, 2011, there will be NO MARCH SCATTERPOINT. Instead, the February edition will come out around the end of February, dated as February-March 2011.

To make up the year's publications to the normal 10 issues a year, the usual July-August edition will be issued as two separate editions, July and August.

Meanwhile, those readers with HF equipment might care to look for Peter under his VP2V callsign between 10-19 March on all bands 80m-10m CW and SSB and, in particular, during the RSGB Commonwealth Contest on the weekend of 12-13th March CW of course! Check the DX Cluster where his call should be well spotted.