An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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Planning and implementing your 23cm EME Station

John Jaminet W3HMS

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Many thanks to all our contributors this month, without whom there would be no Scatterpoint!

Martlesham Microwave Round Table

(including UKµG AGM)

28-29 April 2012

Adastral Park

- Talks
- Dinner
- Stalls
- Testing

Web site for registration is now live.

Hotel

Once again the hotel is the Cameo Hotel (Formerly the Hotel Elizabeth, Copdock) Ipswich. A block of rooms has been reserved for the round table, and can be booked by phoning the hotel on 01473 209988 and quoting booking reference BK48672.

Single occupancy rooms are £55.00 bed & breakfast, double/twin rooms are available at £61.00

(the same prices as 2011).

John Quarmby G3XDY

Details pp6,7

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Editor's corner

It's coming up to AGM time and your input is still required:

- Nominations for Committee membership (p4)
- Nominations for Awards (p5)

Spring & summer are on the way and so are several Microwave Round Tables and conferences, not to mention Microwave Field Day – so while you're still in garage/shack/shed tidying mode [can you sense the guilt?], time to look out the portable gas stove/barbie.

Next month – The Bodger's Guide is back, with a sequencer for that hairy GaAs PA you have in the To Do projects.

73 de Martin G8BHC

Articles for Scatterpoint

News, views and articles for this newsletter are always welcome.

Please send them to

editor@microwavers.org

The CLOSING date is the FIRST day of the month

if you want your material to be published in the next issue.

Please submit your articles in any of the following formats:–

Text: txt, rtf, rtfd, doc, docx, odt, Pages

Spreadsheets: Excel, OpenOffice, Numbers

Images: tiff, png, jpg

Schematics: sch (Eagle preferred)

I can extract text and pictures from pdf files but tables can be a bit of a problem so please send these as separate files in one of the above formats.

Thank you for you co-operation.

Martin G8BHC

UK MICROWAVE GROUP SUBSCRIPTION INFORMATION

The following subscription rates now apply.

UK £6.00 US $12.00 Europe €10.00

This basic sum is for **UKuG membership.** For this you receive Scatterpoint for **FREE** by electronic means (now internet only) via the Yahoo group.

Please make sure that you pay the stated amounts when you renew your subs next time. If the amount is not correct your subs will be allocated on a pro-rata basis and you could miss out on a newsletter or two!

You will have to make a quick check with the membership secretary if you have forgotten the renewal date. 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.

Please also note the payment methods and be meticulous with PayPal and cheque details.

QUOTE YOUR CALLSIGN PLEASE!

Payment can be made by: PayPal to

ukug@microwavers.org

or

* a cheque (drawn on a UK bank) payable to 'UK Microwave Group' and sent to the membership secretary (or, as a last resort, by cash sent to the Treasurer!)

Colour codes

Editorial & Events

Activity & Contests

Technical

Nanowaves (optical)

Commentary

Reproducing articles from Scatterpoint

If you plan to reproduce an article exactly as per Scatterpoint then please contact the Editor – otherwise you need to seek permission from the original source/author.

You may not reproduce articles for profit or other commercial purpose.

UK Microwave Group

Annual General Meeting – Sunday 29 April 2012

Notice is hereby given that the 2012 Annual General Meeting of the UK Microwave Group will be held at 10:00am on Sunday, 29 April 2011 as part of the Martlesham Microwave Round Table event which takes place over that weekend at Adastral Park, Martlesham Heath, IPSWICH.

Sunday morning sees the UKµG AGM at the start of the morning's session. This will include the election of the officers of the committee and the presentation of the Chairman's, Secretary's and Treasurer's Annual Reports.

This year Peter G3PHO, Sam G4DDK and Kevin Avery G3AAF are standing down from the committee so we are interested to hear from anyone who would be willing to join the committee. If any UKuG member is interested then please submit your name (and the name of your seconder) to the UKuG Chairman G4BAO as soon as possible.

On behalf of the UKuG Chairman John Worsnop, G4BAO, the UKuG Committee and the UKuG membership I would like to formally thank Peter, Sam and Kevin for their dedication and efforts during their years on the committee.

If you are interested in joining the committee or have any agenda or AOB items for the AGM, please contact the UKuG Secretary, Martin Richmond-Hardy G8BHC by 29 March 2012 by email to secretary@microwavers.org.

Proposed change to Rule 4.1

Current wording is:

> 4.1 The affairs of the organisation will be run by a committee of up to 10 members. These will be Chairman, Secretary, Treasurer, Editor and up to 6 other members.

Secretary's comments

1. Officers of a committee are generally considered to be Chairman, Secretary & Treasurer.
2. Para 4.1 does not state otherwise.
3. There is no explicit rule about one person holding multiple officer posts.
4. Scatterpoint Editor can be an existing officer, an elected member or a co-opted member.

The Committee propose Para 4.1 be amended to read:

> 4.1 The affairs of the organisation will be run by a committee of up to 10 members. These will be Chairman, Secretary, Treasurer (The Officers) plus Membership Secretary and up to 6 other members.

73 Martin Richmond-Hardy G8BHC

Secretary, UK Microwave Group

Nominations for Awards

By Dave Powis G4HUP

We have one nomination for the Fraser Shepherd Award.

No other nominations have yet been received for any of the Awards.

Further nominations for the Fraser Shepherd Award and nominations for G3EEZ and G3BNL Awards please, to Dave Powis G4HUP **by 31 March**.

Fraser Shepherd Award:	For research into microwave applications to radio communication. In honour of Fraser Shepherd GM3EGW
G3EEZ Award:	For Contributions to Microwave Communications, in honour of Alan Wakeman G3EEZ
G3BNL Award:	For innovation or technical development of microwave equipment or techniques, in honour of Les Sharrock G3BNL

Details of the trophies are to be found here: www.microwavers.org/trophies.htm

Programme

Saturday 28th April 2012

10:00	Truck Stop Breakfast
12:00	Gates open at Martlesham
13:00	Welcome & opening G4FSG
13:15	Microwave Antennas by WA5VYB
14:00	Refreshments
14:30	Trophy Presentations TBD
14:45	Stresses in Cables and Towers by G4HUP
15.30	Making a Start in Microwave EME by G4DDK
16:15	An introduction to Radio Astronomy by G4NNS
16:55	Fleamarket closes
17:00	EME 2012 Committee Meeting
17:30	Gates close at Martlesham
19:30	Meet for Dinner at 20:00 at the Cameo Hotel Ipswich

Sunday 29th April 2012

09:00	Gates open at Martlesham
09:50	Welcome & Opening G4FSG
10:00	UKuG AGM
10:30	Refreshments
11:00	76GHz and Up by G8CUB
11:45	Big Dish - Activities at Bochum by G3RUH
12:30	Lunch break
13:30	21st Century Frequency Converters, Transverters and Radios by G4JNT
14:15	Gallium Nitride Power Amplifiers by G3WDG
15:00	UKuG Contest Forum G3XDY
15:45	Fleamarket closes
16:00	Gates close at Martlesham

Security

Although entrance is free, **registration is required** for passes to access the site at Adastral Park.

Registration is via the web at http://mmrt.homedns.org – follow the "Book" link to register.

Refreshments

Sandwiches/Rolls will be available at lunchtime on both days, with tea, coffee, soft drinks and cakes / biscuits at all breaks.

Accommodation

Overnight accommodation is available at the Cameo Hotel and bookings for the informal dinner on Saturday evening are open.

Full details are on the registration web site under the "Meal" tab.

Testing

Test equipment will be available throughout the day, subject to qualified personnel to operate the test and measurement equipment (yes, staff would like to attend the talks too!).

Noise figure testing on many bands.

Travel

The talks and testing will be held at:

BT Adastral Park,
Martlesham Heath,
Suffolk, IP5 3RE.

This is located a few yards off the A12, just east of Ipswich.

CLICK for map.

The evening meal and accommodation will be at:

Cameo Hotel Copdock, London Road,

Ipswich, Suffolk, IP8 3JD, England.

Direct number 01473 209988 (09:00-17:30 on weekdays)

CLICK for details.

There is a shuttle bus between Ipswich and Stansted every two hours at a reasonable price.

MMRT Dinner Menu

Starters:

Butternut Squash Chilli and Tomato Soup
Ham Hock Terrine with Suffolk Mud Mustard
Sun blushed tomato-Goats Cheese Tart

Mains:

Chicken Supreme wrapped with Pancetta
Belly of Pork rolled with Apricots and Ginger
Poached Supreme of Salmon
Pumpkin, red onion and Chick Pea Tagine

Desserts:

Chocolate and Orange Cheesecake
Raspberry and Amaretto Tart with Toffee Syrup
Seasonal Crumble with Custard
Tea and Coffee with mints

Price: £29 per person

Welcome to a new member who is contemplating writing an article for Scatterpoint.

Hi,

I am recent new member of the UK Microwave Group and still aged under 30!, but have been active on VHF/UHF for over 10 years (mainly SSB/CW).

I have recently been constructing some loop-yagi antennas from scratch for my station to help get me QRV on the lower microwave bands:-

- 2 x 38-ele G3JVL design 1296MHz (23cm)
- 4 x 44-ele G3JVL design 2320MHz (13cm) (to be used in an H frame.)
- 1 x 70-ele G3JVL design 3410MHz (9cm)

The sizes are dictated by the available lengths of 1/2" aluminium tubing and 10 x 10mm square section aluminium that I had to hand.

These are being constructed as alternative antennas to using a homebrew 2m mesh dish, but with less wind-loading. I thought would write about my practical experiences on building and testing the above Loop-yagi antennas as a young beginner on the microwave bands.

I was wondering which UK Microwave Group events stage an antenna measuring range? - This might provide an opportunity for some gain measurements.

Thanks for your help,

Roscoe, M0BTZ
(QTH :- Romsey, Hants)

See his QRZ entry for more information.

We like to hear from new members.

Please introduce yourselves.

EME 2012

Cambridge 17–18 August 2012

The 15th International EME Conference will be held at Churchill College, Cambridge, from 16 to 18 August 2012. This will be the first time this premier event has been held here and the UK Microwave Group are pleased to be its hosts.

Every two years radio amateurs from around the world meet to discuss their latest ideas and findings and present the newest technology at this Conference. It is probably true to say that most of the leading ideas in long distance, weak signal, VHF, UHF and microwave amateur radio were initially developed by the EME community. You are invited to join the fun at Cambridge, to learn, contribute and to maybe start your own journey to the moon and back.

More than 20 high quality papers, together with poster sessions and demonstrations, will be presented at the two day Conference. In addition, a number of tours have been arranged so that families or partners will also be entertained whilst the 'OM' attends the Conference. Of course partners are also welcome to attend the Conference, if they would prefer!

The Conference Dinner will be held in the halls at Churchill College on the Saturday evening. We are proud to have pioneering radio astronomer and Nobel Laureate, Professor Antony Hewish FRS, for our end-of-conference dinner speaker. We will also have another well-known speaker, on Friday evening, when Howard Long, G6LVB, talks about the development of the FUNcube Dongle, the low cost VHF/UHF receiver that has taken the market by storm.

With five months still to go, over 100 radio amateurs from more than 20 countries have already registered to attend the 15th International EME Conference. We would like you to join us as well. By registering before the 1 June you can benefit from the discounted registration fee. All attendees will receive a copy of the printed proceedings and a supplementary DVD containing even more information about EME.

By arranging to use their excellent accommodation and dining facilities and putting together a number of package deals with the college, we have been able to keep the costs down whilst providing a once in a lifetime opportunity to attend the International EME Conference during its visit to the UK.

Details of the conference programme, booking forms and travel details can be found at [eme2012.com](eme2012.com)

See you in Cambridge?

microwaveUpdate 2012

Santa Clara 18 – 21 October 2012

Hosted by: The 50MHz and Up Group of Northern California.

Chairman: Jim Moss (N9JIM) Honorary Chairman: Will Jensby (W0EOM)

Email contact: mud2012@pacbell.net

Registration not yet available. (to be announced) www.microwaveupdate.org

Accommodations:

Biltmore Hotel & Suites www.HotelBiltmore.com

2151 Laurelwood Road, Santa Clara, California 95054 +1-800-255-9925 +1-408-988-8411

microwaveUpdate rates: (until Oct 1, 2012)

Garden Rooms: M,T,W $129/night Garden Rooms: Th,F,Sa $79/night

Tower Suites: Th,F,Sa $99/night

Biltmore Hotel shuttle to/from San JoseInternationalAirport available

High speed wireless internet

Full Hot American Breakfast each morning

Additional information:

ARRL National Convention & Pacificon is the weekend before (12–14 Oct 2012) at the Marriott in Santa Clara.

Nearby attractions:

Silicon Valley, NASA, Intel, Texas Instruments, ComputerHistoryMuseum, Stanford, San Francisco, Fisherman's Wharf, Pier 39, Alcatraz, museums, Monterey 17 mile drive, Monterey Bay Aquarium, Cannery Row

Speakers: We are currently inviting all to submit abstracts and papers

Preliminary Schedule of Events

* Thursday
* Surplus Tour
* Sites Touring
* Hospitality Suite
* Friday
* Registration
* Introduction
* Presentations
* YL / Family Program
* Auctions
* Lunch (included)
* Demonstrations
* Test Lab
* Indoor Swap
* Dinner on your own
* Hospitality Suite
* Saturday
* Registration
* Introduction
* Presentations
* Test Lab
* Auctions
* Demonstrations
* Vendor Displays
* Evening Banquet (included)
* Keynote speaker
* Door Prizes
* Socializing
* Outdoor Flea Market

RAL 10 June 2012

Rutherford Appleton Labs, Didcot, Oxfordshire

By Mike Willis G0MJW

RAL 2012 is coming up soon, June 10th.

Again, I am looking for presentations or 30-45 minutes on an appropriate topic for a round table. Please let me know if you are willing and able to present something.

So far we have Mike, G8CUL who has offered to talk about using microcontrollers and digital sensors for useful tasks and taking advantage of free high level language compiler/debuggers and cheap development kits. For example he will demonstrate how a £20 development board with am accelerometer can be used to give accurate azimuth and elevation readings of an antenna and with a bit more hardware, control the motors.

Mike Willis G0MJW

Perhaps you could consider doing something for UKµG in your area at your local rally? (Assuming you don't do so already!)

We have flyers & posters available for download.

Contact any committee member

BATV Convention and Biennial General Meeting

6–7 October 2012

By Noel Matthews

I am tasked with organising the British Amateur TV club convention and BiAGM this year, which will be held in Basingstoke on the 6 / 7th of October (carefully chosen to only clash with the IARU contest)! For more details http://www.batc.org.uk/club_stuff/convention/index.html

The intention is to make this weekend more than just a rally / BiAGM and to build it in to something that is valued by the ATV / microwave community and we are hoping for visitors from the UK, Europe and even the US. Hopefully we can do this by running a series of talks / lectures on Saturday afternoon & Sunday, by having group demos and displays and by inviting few select traders to have small stands offering RF and video components for sale.

I'm in the process of firming up the lecture program – 1 or 2 familiar names will appear – and will keep you updated.

Best 73

Noel

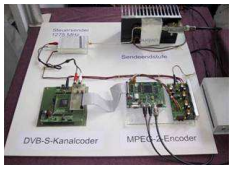
BATC ATV Convention and 2012 Biennial General Meeting

It's that time again and this year we want to make the BiAGM just one part of an exciting and stimulating ATV Convention.

The focus of the ATV Convention will be a lecture program with up to 7 talks on Saturday afternoon and Sunday. The main themes of the talks will be Digital ATV, in particular the Digilite project, and how to get going on 70cms DATV with talks on aerials, pre-amps and power amps for DATV.

There will be a BATC open forum panel discussion and the weekend will also include:

- Live demo / ATV group presentations
- The BATC 2012 BiAGM will be held on Sunday morning
- Specialist traders selling RF and video components
- The BATC shop
- BATC members table top sales
- A "test it and fix it" area where you can bring things to be tested on professional test equipment



Date / timing

The ATV Convention will be held on Saturday 6th (doors open at 12 noon and lectures start at 1:30pm) and Sunday 7th October (start at 10am - close at 4pm) with the BiAGM taking place at 11am on Sunday.

Location

The ATV Convention will be held in Basingstoke, right in the centre of the current hot spot of UK DATV activity.

Basingstoke offers good motorway connections from London & South Coast (M3), from the Midlands & North (A34) and West via M4 and A34. There are direct trains from London / South Coast / Southampton airport / Midlands / Manchester / Newcastle and Heathrow airport is just 45 minutes away.

The Venue

The ATV Convention will be hosted in the new Everest Community Academy which has a 150 seat lecture theatre and a large open lobby area for our use. http://www.everest.hants.sch.uk/

In order to cover the costs for the weekend there will be a small charge for attending the convention, £10 for the 2 days when registering online and £7.50 per day on the door. (20% discount for BATC members)

Please note that attendance to BiAGM only will be free.

Free tea and coffee will be available all weekend and sandwiches, cakes and fruit will be available for purchase at lunchtime.

Hotels / Convention dinner

A special BATC rate of £65 B&B (single) and £75 (double) has been arranged at the Apollo (4*) hotel which is within 1 mile of the convention venue http://www.apollohotels.com/ – please ring hotel reservations directly on 01256 796700 (not available via the web site) and quote BATC to get this rate.

It is intended to hold the ATV Convention dinner on Saturday evening at the Apollo – details to follow, but please indicate your interest when registering on the BATC website.

There are a number of other hotels within 2 / 3 miles of the venue including Travelodge, Premier Inn and Holiday Inn.

Other things to do

It is not intended to arrange an XYL program, however the Vyne National Trust house is just 3 miles away http://www.nationaltrust.org.uk/main/w-thevyne, and the Jane Austen museum is less than 30 minutes away http://www.jane-austens-house-museum.org.uk/

The historic city of Winchester is 20 minutes away by train, Portsmouth historic dockyard and the New Forest are less than 1 hour away by train or car.

Basingstoke has a very good modern shopping centre http://www.festivalplace.co.uk/ the Hampshire Transport Museum http://www3.hants.gov.uk/milestones and a Ten Pin bowling alley and Ice Rink http://www.planet-ice.co.uk/arena/Basingstoke.

Other shopping is also available in Southampton (30 mins), Reading (20 mins) and London is only 50 mins away.

Get involved!

This is your convention where you will be able to meet and exchange ideas with others involved in our exciting hobby.

For more information, visit http://www.batc.org.uk/club_stuff/convention/ where you will be able to see updated information on the event and register your attendance.

If you have any ideas you would like to see included, if you are willing to come and tell others about your experiences in ATV, have something you want to demonstrate or just want to get involved in organising your convention please contact Noel G8GTZ at bgm2012@batc.org.uk

Planning and Implementing Your 23 cm EME Station

(EME QRZ Article)

By John Jaminet W3HMS

Background.

This Power Point Presentation on my 23 cm, 3 meter dish station, was presented at the Microwave Update (MUD) in Enfield, CT on 14 October 2011. The .PPT file will be attached to any EMAIL request for it. The informal title was: "How a senior citizen business major built a 23 cm EME station on a standard city lot."

Operator Resume

John Jaminet, W3HMS, licensed 1951, Advanced Class since 1967, worked 1.8-47,000 MHz. VHF,UHF microwave Rover since 1999, VUCC 10 GHz in 2002, VUCC 1296 MHz in 2010, EME QSO #1 in August 2008, EME QSOs as of 20 Feb 2012 are 297 with 89 initials (different stations)and 24 DX.

Overview

The first question any would -be EMEer has is no doubt "What band". My own views centered on the two most popular bands, 2 meters and 1296 MHz. Two meters has the advantage of having so much gear readily available commercially at popular prices but a size disadvantage in the sense of requiring large Yagis and power if one wants to work CW. If one is happy with only WSJT, then power and a very large array are nice but not needed. Some hams make QSOs with the big stations with a single Yagi and 100 watts or so. 1296 MHz offers high gain relative to 2 meters even with a small dish of 3 meters/10 foot and 120 watts, or even less, for CW with the big stations and WSJT QSOs with stations of 2.3 meters and 80 watts.

My personal choice was 1296 MHz because of a 10 ft dish being in place since 1992 for C Band satellite reception. After the C band was replaced by KU band Dishnet, the 10 ft dish just cried out to be used. Mine is a standard city lot, so a most-desired larger dish was just not feasible.

Thus, I started planning in 2006 for 1296 MHz EME . I simultaneously placed an order for an LNA, transverter , and linear of about 120W and commenced work to change my 3m/10 ft dish to Azimuth (AZ) and Elevation (EL) rotation. One of the drawbacks of dish based EME is the need to convert a dish like mine from polar orbit to AZ/EL. Now some EME stations use a polar orbit mount per an excellent article by Dale, W4OP available from EME Web sites.

EME QSO Types

Like other bands and modes, EME QSOs can be random resultant from a CQ by one of the stations or prearranged by letter, EMAIL, phone, or logger. The logger is a vehicle not often used by earth mode stations as it uses the Internet to let all stations signed on to the logger see what is written by others. Thus some QSOs are scheduled for immediate action literally within seconds as the operator may ask for example, that PA1ABC meet him on 1296.065 in JT65C and that he, PA1ABC, would please transmit first. Now it must be stated that some CW operators dislike WSJT data modes and prefer only CW. Sometimes their comments

could be termed “suboptimal” in terms of winning friends, HI!!.

For myself, I take the view that I will be happy to try and work a station in CW or JT65C in the manner the other station prefers, i.e. with or without being prescheduled. As a small dish user, I do prefer JT65C myself simply because it is much easier than CW. Among my QSOs are about 37 in CW, all were enjoyable and virtually all were difficult. As to moon schedules, programs like NOVA and GM4JJJ Moonsked give predictions for a given path, eg. W3HMS to JA1XYZ. Programs like F1EHN’s and WSJT give tracking info. One key schedule concern is not too technical: is the other guy at work, asleep or able to be on the air! It is nice to see the moon but it is not necessary.

Planning the Dish rotation and position indicators.

Working with Charlie, K3VDB and his son Dan, we determined the mechanical dish work necessary for the AZ rotation and Dan used his welding skills for the gear work to permit drive by a Yaesu G-800S. Although the AZ indicator of the G-800S was broken, we did not intend to use it anyway and settled on a large reverse indicating compass rose made by Frank Ulrich of UBR Industries near Mechanicsburg using a TV camera close focused on the compass rose. I say reverse indicating for the pointer is stationary thus requiring the compass rose to move under the pointer. The TV camera is an all-weather unit with LED night lighting obtained from ATV Research in Dakota City, Nebraska. We asked Mason to focus the camera on a standard ruler at 2 inches to ensure the value could easily be read on a TV monitor in the station. As we planned for other TV cameras for EL, on the moon and power out, we purchased a quad video display also from ATV Research at about $100 using but one RG-6 cable to the station which has worked quite well. Indeed, each picture is clear enough to read the AZ, EL or watts quite easily.

For EL, we chose to use a 2-3 foot satellite TV jack/positioner as we had a suitable motor and control unit from my C band time. For the EL position indicator, we saw a $10 carpenters inclinometer in the local hardware store with a red pointer. I mounted this on the dish support ring. This works very well if two weep holes are installed before the indicator is placed in service and if the camera has Red LEDs to highlight the Red pointer which is easily washed-out with white light. Without the weep holes, permanent

condensation is always apparent. The latter two points were learned the hard way. A new inclinometer was purchased and weep holes were added before installation. The camera with white LEDs continues to plague us as it is often difficult to read the EL at night. There are automatic tracking programs and hardware available and different views on ease of installation; one approach is that taken by W2DRZ and K2TXB as documented on the W2DRZ Web site. Tracking of the moon can be done effectively using my method with video cameras on AZ and EL indicators, by using remote reading AZ and EL indicators, by various other mechanical means and most assuredly by auto-tracking.

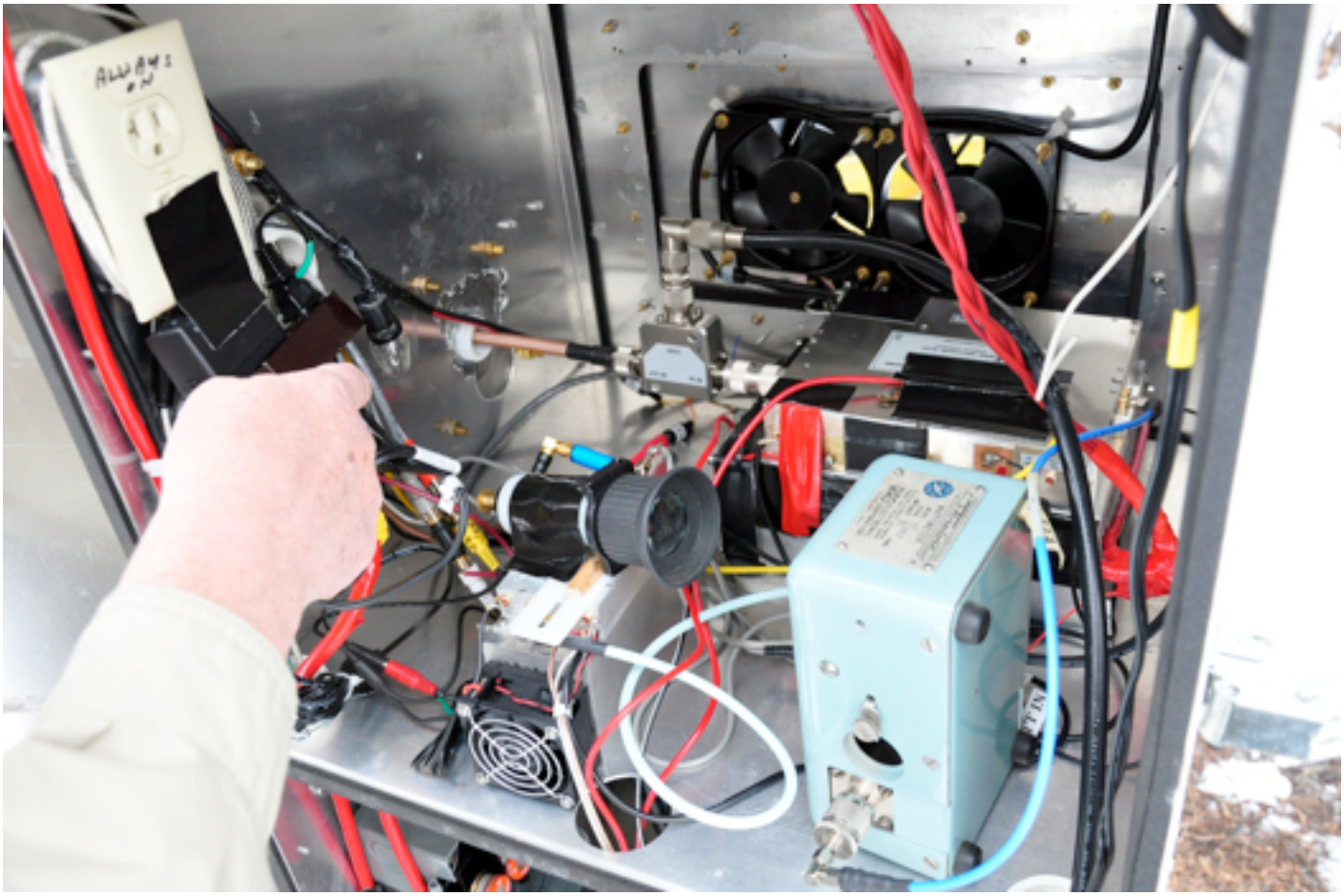
RF Deck Location

Reducing losses is an ambitious and highly desirable goal for power is expensive. I chose to mount all RF equipment in lockable, watertight, metal cabinets under the dish. This meant that AC, control leads, TV cable and IF cables at 28 MHz would be buried in twin PVC pipes between the station and the dish. The best practice here is to calculate the PVC size for your planned cables then double it and lay out the PVC run with mason's line as a means to keep the runs straight.

Although I left a pull-rope in each PVC pipe, it is apparent that pulling additional cables through a PVC is not practical as the pull ropes are no doubt already wound around the existing cables. Mounting the RF gear in outside boxes means much more monitoring is required so you know what is operating and how well it is operating. I monitor, with digital metering, the temperature on the linear, the temperature on the circulator, the 13 VDC power supply, the 500W linear amplifier 27.6 VDC power supply and the RF monitoring diode VDC from the transverter,the intermediate power amp (IPA), and the 500W 1296 MHz power amp. I have a dedicated Bird wattmeter on the RF drive from the IPA to the SSPA and I view this on the 4th TV screen quadrant. I have another Bird wattmeter destined for SSPA output monitoring just as soon as good installation WX is again with us. A word of caution also learned the hard way: equipment boxes are ideally installed on the north side of the dish where the moon does not go so they will not hit the dish when the moon is at moonrise or moon set.

Selecting the feed, LNA, and protective relay

The choice of feed came rather easily as the Septum feed by OK1DFC and others was just on the horizon and Dick, WA3USG, offered me a VE4MA circularly polarized 23 cm feed from his garage attic for about a third of current market price. Then a later improvement was a Super VE4MA scalar ring about one inch larger which yielded around .9 dB more sun noise. For the LNA, a friend at a CSVHFC meeting said to get a WD5AGO feed as Tommy was at that instant at the zillion dollar network analyzer checking the noise figure of his and other LNAs. So, I went immediately there and bought a .27 dB NF, 35 dB gain LNA right from his hand after seeing it measured on the network analyzer. From much reading ,when in the planning phase, I learned the usual EME practice of activating the LNA and relay with 13 VDC on receive and grounding the LNA input via a 50 ohm load or attenuator in transmit and in park (rig off). I also learned the recommended practice of using a superb low loss- relay for this job and using a male N fitting on the dish probe so the relay will mount directly on the N male thus obviating RF loss, space and



money for an adapter/union. Some EMERs prefer SMA relays good to 18 GHz or so for this protection role but that requires your LNA, probe, and relay all use SMAs which mine does not. The high quality SMA relays with 13 VDC coils are $100 plus and a spare is desirable so a clearly defined and planned approach is best. I currently use a very low noise, .19dB NF 36 db gain LNA designed by Sam, G4DDK and built by Howard, G4CCH whom I have worked many times on 23 cm EME in JT and in CW. I have two WD5AGO LNAs as described above on the shelf ready for rapid winter… or preferably summer… installation.

The question of how much power the load/ attenuator needed to dissipate was confirmed by my microwave roving partner, Joe, W3PTV, at about 5 watts so a slightly larger model was readily purchased. I also learned of the desirability of quick and easy replacement of an LNA or relay during a snowy winter contest so we bought spare LNAs and relays and fitted each with the necessary phono -jack VDC connector so as to minimize very cold time on a ladder and avoid the soldering iron!!!

We also made a LNA/relay cover open to the bottom so as to protect the LNA/relay while eliminating water condensation and/or standing water.

Selection of the 1296 MHz equipment

Over 3 years plus of use, I have evolved to using the DB6NT 1296 to 28 MHz transverter disciplined with a 10 MHz oscillator, the DB6NT 8-35 watt Intermediate Power Amplifier (IPA) and the DB6NT 500W power amplifier. Though clearly on the expensive side, the increase in personal safety over using a six ring 7289 amp with 1600 VDC on the plates and water cooling in PA winters is, in a family way of thinking, a clear winner. Though it can be done, the more I worked with water pumps and switches the more I knew I did not wish to mix high-voltage and water. I also learned that high power solid state amplifiers need to be protected against high SWR and/or cable connector failure thus we bought and installed a DB6NT- supplied 500W circulator at about $420. This proved to be a smart move for in November 2010, we had a coax fitting failure and the circulator, though damaged itself, had saved the day. The general consensus among EME/MW reflector members is that by the time you know you have had a failure it is too late as the damage has already been done. In EME, a sequencer is really mandatory to ensure switching of the IF radio, transverter, LNA/relay, and final amplifier is done in the proper order to avoid burning out LNAs and relays. We found the DEMI sequencer ideal for this task and also built a kit as a spare fitted for immediate winter… or any season…. exchange. One point to share is start as young as you can to build your system. Ladder work on a dish feed and in optimizing your system is hard work needing ideally both the skills of an intelligent ham and a monkey!!! Also, please do yourself a favor and use the best parts you can, remembering that winter replacement, though not desirable nor easy, may well have to be done.

Cables

For RF, IF, video and control cables, I came to rely more and more on Joel at RF Connections for responding to my needs and supplying the best cables that my ham pocket book could afford,all fitted with the connectors. In my book, EME, particularly for RF cables, requires very low loss and often high power capability cables to operate in a most hostile environment of heat, cold, water, wind, snow and ice so economy is best practiced elsewhere. I use 17 ft of RG 393 as recommended by Joel of RFC for my 400-500 watt run to the dish probe.

Sun Noise Measurement

To EMErs, sun noise is the only reliable measure of their system to answer the age old query of "how am I doing?" Many EME hams use the standard General Radio instrument but I had none so I used my SDR IQ receiver which works just fine. I use mine in the Continuous Mode with demodulation mode OFF. Next ,I put a very dark filter over the TV camera to protect it. One can also do this on an overcast day to protect the TV camera. Then I move my dish exactly on the sun and record the reading which jumps around quite a lot. I take an average value. Then I go to cold sky where there is as close to nothing in the view as possible, e.g. avoid, trees, houses, other galaxies…any noise emitters. Next, I record the difference between the two readings which is the sun noise in a log for just that purpose noting also the Solar Flux (SF) for future reference.

The IF Radio and Radio-PC Interface

For most I suspect, the IF radio will be the best one in the shack at the time of becoming QRV on the moon. In my case, it was the IC 756P3 and I chose a SL USB PC- to- radio interface as recommended by Dick, WA3USG. This was a great decision as it has performed flawlessly; the second one was purchased to be used on my K3/P3 when I put them into EME service before the next EME contest and a 3rd for non-EME VHF and/or portable use.

CW and JT65C Operations

I also use my JT65C program on a laptop on the operating table even if working CW as it gives me AZ and EL values for pointing the dish plus Doppler for the RIT control. If not a contest, I use the HB9Q Logger to set both immediate skeds or announce I am calling CQ in CW or JT with the frequency and who is first or second. In CW, one can use the timed sequences for calling/listening where a program like MOONSKED or the F1EHN program provides the timer.

What Results Can You Expect?

I have found that even with a 3m dish and 80 watts, I could work the 10 m dish/500 watt guys or so in CW and with even less power in JT65C. I can work many stations even those with a 2.3 meter dish and 50 watts in JT as experience can aid each station in getting decodes down to about -27 to -30 dB. I have found with about 400 + watts and my 3 m. dish I can work virtually all in JT65C and most in CW. 3m dish to 3m dish QSOs at the same power levels are VERY difficult.

Why Do EME in the first Place?

This is much like climbing a mountain… because it is there is a common answer! It is perhaps the greatest ham radio challenge in terms of technical skills, planning skills, time and finances to do it right. There is a tremendous satisfaction in doing it right in making QSOs via the moon. Hearing or seeing your call come down from the moon is indeed priceless!!!

What are my future plans?

I intend to use my K-3 and P-3 with a SL USB interface in lieu of my IC 756P3 as I believe it will perform much better than the latter particularly in CW but also in JT-65-C.

Conclusions

EME offers tremendous challenges but also tremendous rewards for many but we know it Is not for everyone for a host of reasons.

For more info, please write W3HMS@aol.com or call +1 717 697 3633.

73, John Jaminet, W3HMS, CAPT SC USNR RET.

Eyal Gal Modules for 10 & 24GHz – Update

Roger G8CUB

My original articles on these modules in Scatterpoint is now several years old. In the intervening period, there have been periods when modules were unavailable, and others when new variants have come to light.

11GHz Module

Of the 6031 module for 10GHz, there are differences in module thickness, and derivation of transmit supply.

These 10.4 – 11.7GHz modules have a useful cut-off of the transmit response on the LF side and receive filtering is by the use of image rejection mixing / filtering.

The original modules looked at were -01 or -07 variants. These had the thicker bodies, and derived the transmit supply from the +12V.

More recent variants type -12 have the thinner bodies but still use the +12V for TX. The -22 variant has the thinner body, and takes the transmit supply from the +8V. Also the -22 types have come with test sheets showing the measured noise figure to be 1.3 to 1.6dB at 10.4GHz.

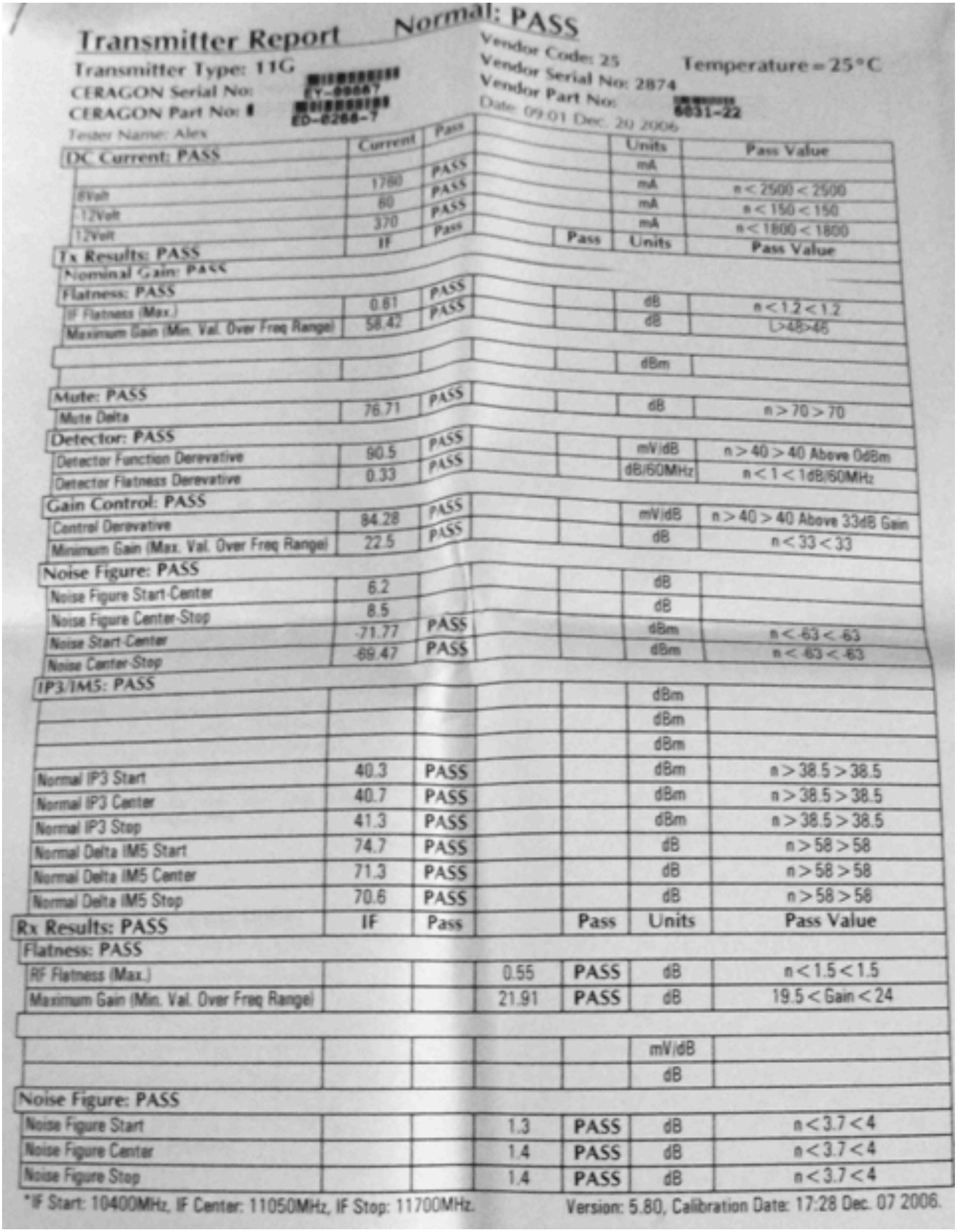
These must be first stage noise figures, as my measurements on the whole module vary between 2.3 & 3.3dB.

On the transmit side the unit is just a high gain amplifier. The 1dB compression point, measured now on quite a lot of modules, varies between 31.3 and 32.3dB, with the saturated output about 0.6dB higher. Although I have seen up to +33.5dBm.

When using the -22 variant modules, the +8V supply needs a capability of at least 2.2A for maximum output, hence it is convenient to use a 3A regulator (78T08 or similar). This regulator needs to have sufficient heatsinking. Typical current on receive is 0.38A, while on transmit current is around 1.8A, peaking to 2.2A.

Also the -12V current requirement is less, around 70mA max. instead of 110mA. Current from the 12V supply is typically 20mA on receive, 780mA on transmit. Note that on 'transmit' i.e. TX un-muted, the receive side is still operational. The only module I have known to have a receive failure, is when the auxiliary antenna contact in the RX position was used to mute the module. Obviously the changeover period caused the problem, when using CW break-in. I have now used the TX aux. contact to control the mute line via a transistor.

-01 Module on the left, -22 module on the right



Transmitter Report — Normal: PASS

Transmitter Type: 11G
CERAGON Serial No: [redacted] EY-00067
CERAGON Part No: [redacted] ED-6268-7
Tester Name: Alex

Vendor Code: 25
Vendor Serial No: 2874
Vendor Part No: [redacted] 6031-22
Date: 09:01 Dec. 20 2006

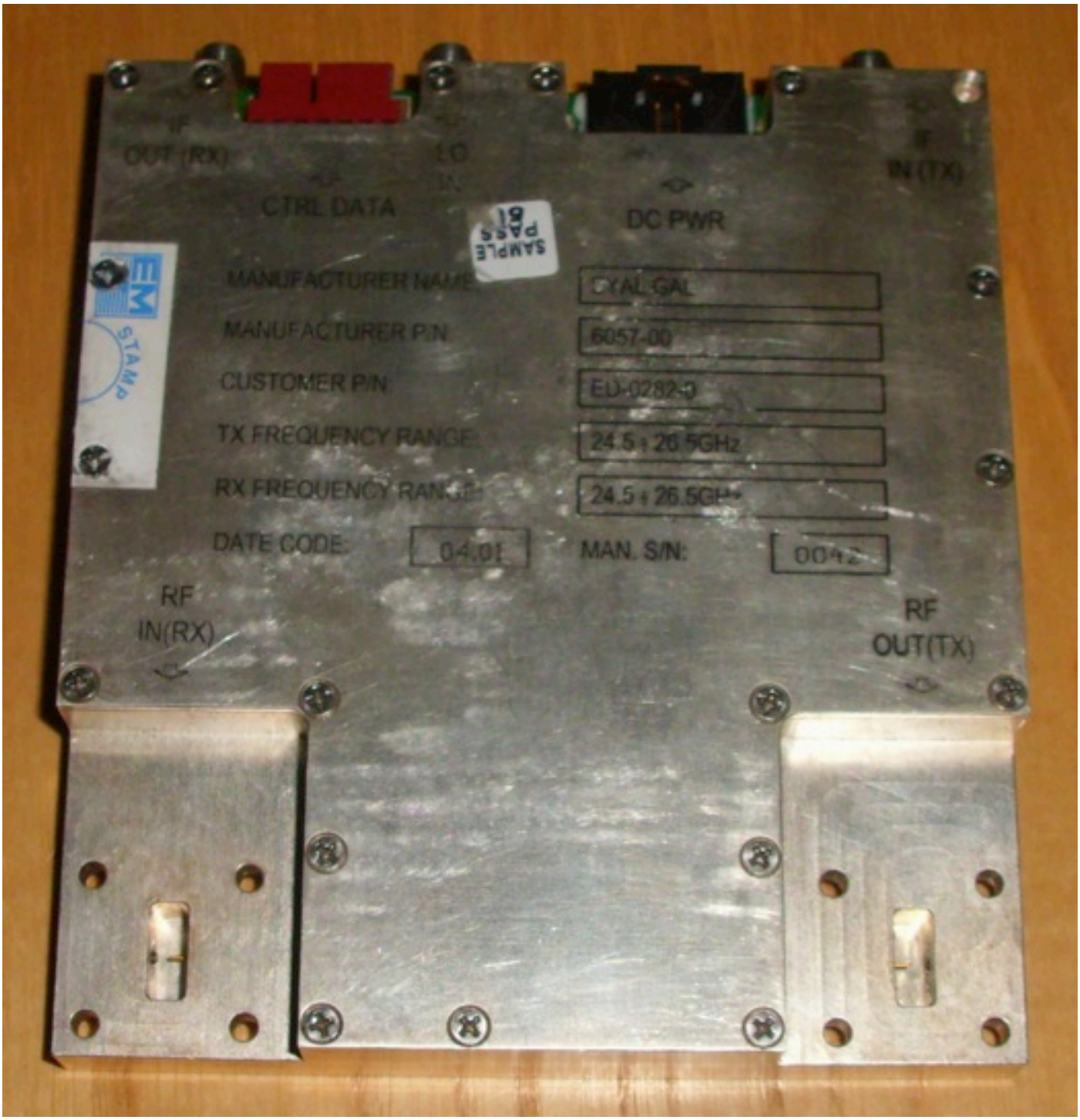
Temperature = 25°C

	Current	Pass			Units	Pass Value
DC Current: PASS					mA	
8Volt	1780	PASS			mA	n < 2500 < 2500
-12Volt	60	PASS			mA	n < 150 < 150
12Volt	370	PASS			mA	n < 1800 < 1800
	IF	Pass		Pass	Units	Pass Value
Tx Results: PASS						
Nominal Gain: PASS						
Flatness: PASS						
RF Flatness (Max.)	0.81	PASS			dB	n < 1.2 < 1.2
Maximum Gain (Min. Val. Over Freq Range)	58.42	PASS			dB	L>48>45
					dBm	
Mute: PASS						
Mute Delta	76.71	PASS			dB	n > 70 > 70
Detector: PASS						
Detector Function Derevative	90.5	PASS			mV/dB	n > 40 > 40 Above 0dBm
Detector Flatness Derevative	0.33	PASS			dB/60MHz	n < 1 < 1dB/60MHz
Gain Control: PASS						
Control Derevative	84.28	PASS			mV/dB	n > 40 > 40 Above 33dB Gain
Minimum Gain (Max. Val. Over Freq Range)	22.5	PASS			dB	n < 33 < 33
Noise Figure: PASS						
Noise Figure Start-Center	6.2				dB	
Noise Figure Center-Stop	8.5				dB	
Noise Start-Center	-71.77	PASS			dBm	n < -63 < -63
Noise Center-Stop	-69.47	PASS			dBm	n < -63 < -63
IP3/IM5: PASS						
					dBm	
					dBm	
					dBm	
Normal IP3 Start	40.3	PASS			dBm	n > 38.5 > 38.5
Normal IP3 Center	40.7	PASS			dBm	n > 38.5 > 38.5
Normal IP3 Stop	41.3	PASS			dBm	n > 38.5 > 38.5
Normal Delta IM5 Start	74.7	PASS			dB	n > 58 > 58
Normal Delta IM5 Center	71.3	PASS			dB	n > 58 > 58
Normal Delta IM5 Stop	70.6	PASS			dB	n > 58 > 58
Rx Results: PASS	IF	Pass		Pass	Units	Pass Value
Flatness: PASS						
RF Flatness (Max.)			0.55	PASS	dB	n < 1.5 < 1.5
Maximum Gain (Min. Val. Over Freq Range)			21.91	PASS	dB	19.5 < Gain < 24
					mV/dB	
					dB	
Noise Figure: PASS						
Noise Figure Start			1.3	PASS	dB	n < 3.7 < 4
Noise Figure Center			1.4	PASS	dB	n < 3.7 < 4
Noise Figure Stop			1.4	PASS	dB	n < 3.7 < 4

*IF Start: 10400MHz, IF Center: 11050MHz, IF Stop: 11700MHz.

Version: 5.80, Calibration Date: 17:28 Dec. 07 2006.

11GHz module original data sheet:
www.eyal-microwave.com/eyal-emi/09042006100536@6031-00.pdf



For 24GHz the original 6058 (21.2-23.6GHz) module I looked at, required an LO on the high side, together with additional TX filtering (when using a 70cm IF). Now there is availability of a 24.5-26.5GHz module. As with the 23GHz version these are a complete mixing system on transmit and receive, with LO at half frequency. Being designed for 26GHz allows an LO on the low side, and can be used with either no or minimal additional filtering. They do have some gain reduction at 24.05GHz. But, fortunately the waveguide connects directly into the front end amplifier via a short length of track, so the noise figure remains good. (my conservative system measurements show better than 4.5dB). They do cut-off rapidly after 24.0GHz though. After measuring a dozen units the RX gains varies between 20 and 27dB @ 24.048GHz. An advantage of this is that the image rejection on receive is >30dB.

While the unwanted product on transmit is <-40dBc, LO being around -32dBc. These measurements were made with an LO injection level of +9dBm.

They work well with the Elcom 11.2-12GHz synthesisers, just needing around 6dB of attenuation. The only disadvantage of using the Elcom, is they are limited to 3.333MHz steps. Therefore using a 70cm IF, the range is either 428-430MHz or 434.666-436.666MHz. A higher IF is practical, but not significantly lower. After using the Elcom synths at 76 & 134GHz, I recommend using the internal 10MHz reference, unless you want to go GPS locked. It is rather good once set on frequency, with quick warm-up.

Transmit measurements show a 1dB compression of around 30.2dBm. The TX gain is high, with some units only requiring -28dBm for full output. Typical supply currents are -12V 120mA, +8V 680mA RX / 1.2A TX, +12V 20mA RX / 0.65A TX.

26GHz module original data sheet:

www.eyal-microwave.com/eyal-emi/09042006100536@6031-00.pdf

I can supply Elcom synthesisers with loader boards and programmed PICs for 24GHz, but unfortunately 24GHz modules have, at the moment, all gone. However, I do have plenty of tested 10GHz modules.

A copy of the original article can be found on: www.rfdesign.co.uk/microwave

Roger G8CUB

Contact: littlemallards(at)Hotmail(dot)com

Microwave Field Day

Sunday 5th August

By John Quarmby G3XDY

Please give publicity for a recently introduced contest aimed at clubs and portable groups which provides a good opportunity to introduce club members to the microwave end of the spectrum. Microwave Field Day was introduced by the UK Microwave Group last year; for 2012 we are looking to get a wider range of clubs involved.

Microwave Field Day takes place this year on Sunday 5th August 2012, from 0900 – 1700z (1000 – 1800 BST), on the 1.3GHz and 10GHz bands (23 and 3cm). There are open and restricted sections, the restricted section has power limits of 10W for 1.3GHz and 1W on 10GHz. Single band entries will be very welcome. Only portable stations can enter the event, but fixed stations are encouraged to come on and give points away and submit check logs

The RSGB runs its 144 and 432MHz Low Power Contests on the same weekend, so a group can enter several events over one weekend for a small incremental effort.

The UK Microwave Group is keen to see more stations getting active on the microwaves and we think this event is a great way to get club members interested. Active microwavers are being encouraged to loan their stations to local clubs to get them started.

Complete rules can be found at:

http://www.microwavers.org/files/2012-mwrules.pdf

John Quarmby G3XDY

The UKAC M5 rule

Result of the Poll

You will all have seen in the last issue of Scatterpoint, the announcement of a poll of the membership to gauge the feeling of the whole Group about the UKAC M5 rule. This was to help our new representative on the RSGB Contest Committee, John, G3XDY express the views of the membership in any future discussion on the topic. The committee, unable to come to a consensus over the M5 rule, agreed to allow each side within the committee to submit their bullet points to help you decide how to vote.

The result is now in, and I have to say that I'm disappointed with the turnout, only some 18.7% of you expressed an opinion, but we live by democracy, so the vote stands and must represent the views of the membership. Consequently, John now has a mandate from the membership and the UKuG will not oppose the status quo with regard to the M5 rule within the RSGB Contest Committee.

Finally, published below is an email to the editor received from Richard Cooper G4WFR of the RSGB Contest Committee, which we reproduce with his permission.

Hopefully we have now put this controversial issue to bed and we will not devote any more committee time to it. We can all now get on with enjoying our hobby!

73 John G4BAO, Chairman

The Poll closed on 15 March.

Do you support the M5 Rule?

- Yes 43 votes 63%
- No 25 votes 36%

Total 68 votes

Turnout 18.7% (364 members registered on the Yahoo group)

No emailed votes have been received.

73 Martin G8BHC, Secretary UKµG

This is a personal message from Richard Cooper G4WFR as a member of the Contest Committee rather than on behalf of the committee.

It was never the CC's intention to upset the stations on the East Coast. That's the last thing I would want to do especially as I lived there for the first 36 years of my life, had a very good 2m & fairly good 70cm station & that I have several friends around there who are still active! It is a shame that some of those who sent regular good scoring logs in for the UKAC's have decided to not send logs at all since the M5 introduction especially with the increase in activity. I received 65 logs for the Feb 23cm contest – who would ever have thought that a midweek contest would generate that kind of activity! Something must be right.

I hope now it is understood that by working outside the UK, you still get points, maybe some will change their minds. After all, why not clock up some nice long haul km points with PA, DL, OZ, ON, SM etc. You are up against for example stations in say IO83 maybe working several mults but much lower km per Q. I think those on the East Coast will be surprised how high up the table they will come. Anyway, for me it's the taking part that counts and if I only entered because I thought I had a chance of winning then I may as well stay home next weekend rather that battling the weather on Dartmoor for the 2m/70cm contest!

73 Richard G4WFR

Activity News

By John Worsnop G4BAO

Please send your activity news to:

scatterpoint@microwavers.org

This column was going to be relatively small until the 13th of March when a large High pressure system formed over the UK and the Microwave bands exploded in to life for the first decent tropo opening of the year.

Microwaves from the Fen Edge

There seemed to be a high level duct that favoured paths from mainland Europe in to the West of the UK, much of the DX in the first few days going “over my head” down here on the Fen Edge. I did make a few QSOs on 9cm, but nothing spectacular. I am still without 23cms which is a big disadvantage. My excuse being that I have been focussing my efforts putting together the 10GHz system for the Camb-Hams DXpedition to Mull IO66 at the beginning of May.

More about this in next month’s Scatterpoint.

Notable tropo reports

Those UK stations that did take advantage of the Tropo opening that lasted from around the 13th to the 15th seemed to be further West than me, or on much higher sites.

On 23cms, **Zdenek OK1DFC, (JN79gw)** running his massive EME dish first worked G3LTF (1136km) at lunchtime on the 13th and early the following day reported the Bristol beacon GB3USK, quickly followed by QSOs with G4CBW (IO83ub) 1212km and F6APE (IN97qi) 1148km. Later that morning he reported the Martlesham beacon GB3MHL, and in the evening worked G4BEL (JOI02bi) 1028km, G0EWN (IO93fk) 1171km and G0MJW (IO91io) 1126km. Conditions continued the following morning when he worked G4CBW again, and G4RGK (IO91on) 1091km.

The longest 23cm QSO reported on DX-Sherlock was on the evening of the 14th between **Gordon G0EWN (IO93fk)** and OE5VRL (JN78dk) at 1236km. Gordon also had a second >1200km QSO with DK3WG (JO72).

On 3cms, **Russ G4PBP (IO82wo)** reports working DB6NT (JO50vj) at 992km, and **DL7QY (JN59bd)** worked G3CBW and G0EWN at 968 and 939km.respectively.

From our correspondents

Roger G8CUB reports on 76GHz activity

On 15th February at around 11.15am, Chris G0FDZ and myself G8CUB, travelled to a site near Hanningfield reservoir JO01GP(33) in Essex. I worked John G4EAT on SSB he was 58, I was 56. His separate beacon was 59+20. Chris worked him on CW, John was 599, Chris's report at G4EAT end was 559. The distance was 8.5km.

On 23rd February I went to Shorne JO01FJ(16) in Kent. John's beacon was heard straight away on 75.978GHz. We completed a CW QSO using our separate beacons. Both of these produce 10mW. John gave me 529, he was 569. We then tried SSB, and exchanged reports of 51 in each direction. Distance was 36km, but we had chosen a day with high dew point at mid-day, with atmospheric losses of around 0.5dB/km according to John.

I wondered why my beacon report was not so good. But have since found that my Gunn source was not locked, and G4EAT was hearing the 'lock' signal of around 0.5mW! G8CUB / G4EAT power is around 0.25mW on SSB. G0FDZ had possibly a bit less. G0FDZ used 40GHz horn, G8CUB used 2 x 77GHz horns (40dB). G4EAT used a 56GHz horn on the beacon, a small dish on the transverter.

Pictures opposite show both transverters pointing at Danbury next to a straw bail.

And The G4EAT beacon / transverter at his shack window.

Both transverters pointing at Danbury

The G4EAT beacon / transverter at his shack window

On the 29th of February I had another QSO with John G4EAT on 76GHz, from the site at Shorne in Kent (36km) as G8CUB/P. Reports that day were 569 / 589 CW, and 52 / 52 SSB despite the still high humidity / dew point. My 569 report showed the injection locked Gunn is now locking!

Rex VK7MO reports on an amazing 24GHz claim!

During the last week in February David VK3HZ and I exchanged three decodes on JT65c over a 421 km path on 24 GHz between Tasmania and the Victoria. While a QSO was not completed this result is promising given that we are both still sorting out our systems and have only been operational on 24 GHz for a few days. It appears that high level ducting at around 3200 metres was involved. The higher level duct being useful in reducing the absorption. It is noted that the spreading of the signal is only a few Hz and thus JT65c is still useful in this situation. A detailed report is here.

Nanowaves

Clive, G4FVP IO94fm reports that he has completed his first 2 way lightwave QSO from Swainby, North Yorkshire with Eddie G0EHV located near Kirk Merrington, County Durham. Clive's gear has been 95% complete for well over a year but it has taken until now to get it operational. Eddie G0EHV/P was a good signal 59 + but was struggling with his RX head so Clive had to use FSK to get through.

No note of the distance involved, but well done Clive! (Ed).

Meanwhile, in the Far East (Cambridgeshire) **Bernie G4HJW** and **Roger G3XBM** continue their Non Line of Sight tests between Little Wilbraham and Burwell and report some success.

EME

In another 10GHz "first" on the 11th March, **John PA7JB (JO22md)** worked Petros SV3AAF (KM17ko) with OOO reports for a first, between SV and PA0 on 10GHz. Not an easy QSO for John with just 18 Watts and a 1.27 dB NF.

Kjeld, OZ1FF (JO45bo) has moved his 1.8 m dish and 10 W up to 24GHz this month, working LX1DB, (6th March) and, OK1KIR (8th March) for two more OZ "firsts" on that band. He was also heard by F2CT on his 2.4m dish, and Kjeld copied W5LUA but I was not able to try a contact as the Moon got shadowed by trees. See the screen dump of W5LUA's signal (next page).

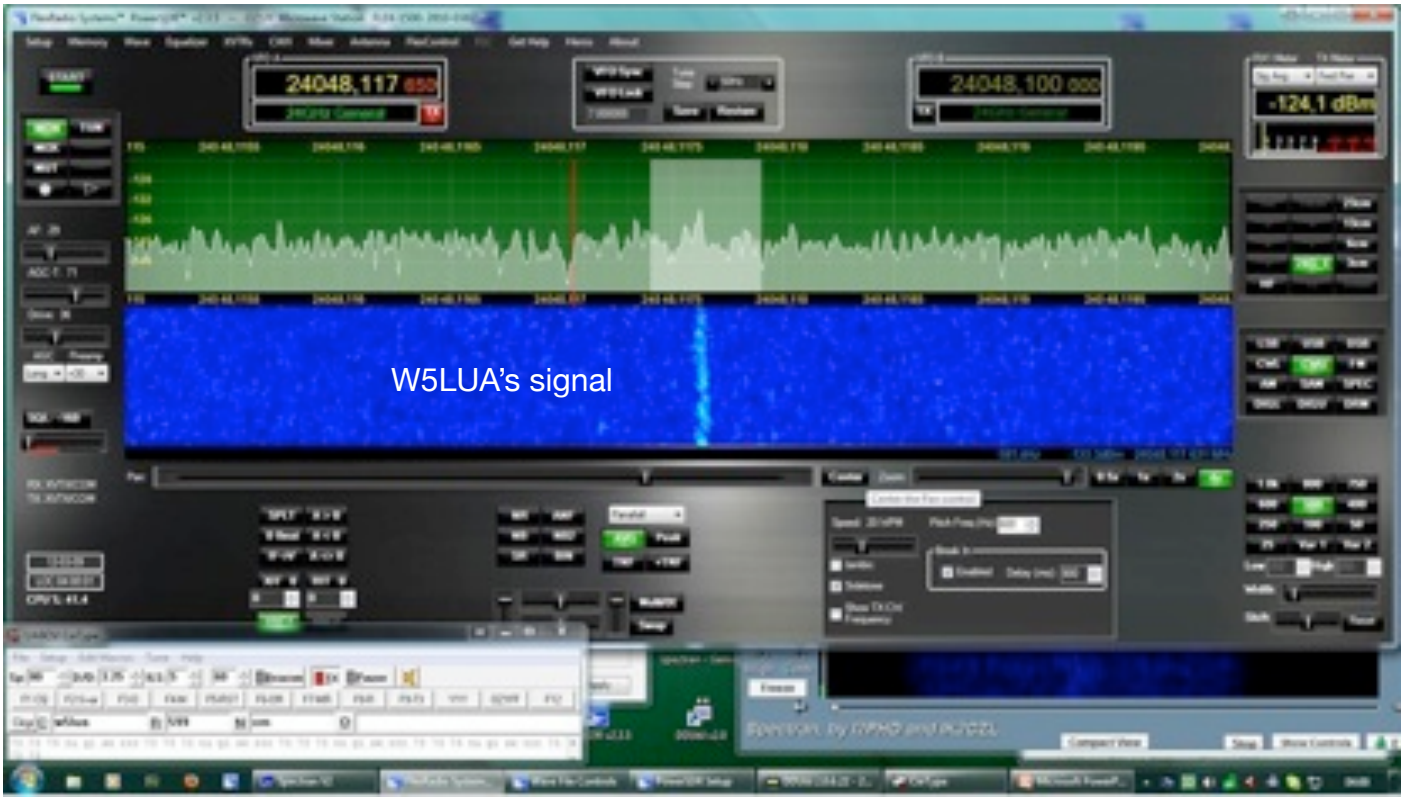
Jac, PA3DZL (JO21hm) is now QRV on 3400MHz EME. His first QSO on the band was with Peter G3LTF then he worked Silvo S59DCD with nice signals for # 2. Jac uses a 3.7m dish with f/d 0.4 and an RA3AQ feed. He has a 0.5dB preamp and around 30W at the feed. Jac intends next to move the 50W PA out to the feed point as well as finely adjusting the feed.

In all, March turned out to be a very interesting month with something to report on the low and high bands. Please keep the reports coming in to me.

73 John G4BAO

OZ1FF's 1.8m dish

The 24GHz feedpoint equipment



UKuG Microwave Contest Calendar 2012

Dates, 2012	Time UTC	Contest name	Note	Certificates
22-Apr	1000 - 1600	Low band 1.3/2.3/3.4GHz	2	F, P,U,R,L
27-May	1000 - 1600	1st 5.7GHz Cumulative		F, P,U,R,L
27-May	1000 - 1600	1st 10GHz Cumulative		F, P,U,R,L
27-May	1000 - 1600	1st 24GHz Cumulative		F, P,U,R
3-Jun	1000 - 1600	Low band 1.3/2.3/3.4GHz	3	F, P,U,R,L
24-Jun	1000 - 1600	2nd 5.7GHz Cumulative		F, P,U,R,L
24-Jun	1000 - 1600	2nd 10GHz Cumulative		F, P,U,R,L
24-Jun	1000 - 1600	2nd 24GHz Cumulative		F, P,U,R
22 -Jul	0900 - 1700	24GHz Trophy / 47 / 76/100-1000 GHz		
22 -Jul	1800 - 2400	>1THz (Lightwave)		
29 -Jul	1000 - 1600	3rd 5.7GHz Cumulative		F, P,U,R,L
29 -Jul	1000 - 1600	3rd 10GHz Cumulative		F, P,U,R,L
29 -Jul	1000 - 1600	3rd 24GHz Cumulative		F, P,U,R
5 -Aug	0900 - 1700	Microwave Field Day		P,L
26 -Aug	1000 - 1600	4th 5.7GHz Cumulative		F, P,U,R,L
26 -Aug	1000 - 1600	4th 10GHz Cumulative		F, P,U,R,L
26 -Aug	1000 - 1600	4th 24GHz Cumulative		F, P,U,R
30 -Sep	1000 - 1600	5th 5.7GHz Cumulative		F, P,U,R,L
30 -Sep	1000 - 1600	5th 10GHz Cumulative		F, P,U,R,L
30 -Sep	1000 - 1600	5th 24GHz Cumulative		F, P,U,R
25 -Nov	1000 - 1400	Low band 1.3/2.3/3.4GHz	4	F, P,U,R,L
Key:	F	Fixed / home station		
	P	Portable		
	L	Low-power (<10W on 1.3-3.4GHz, <1W on 5.7/10GHz)		
	R	Radio talkback		
	U	Unlimited talkback		

73 John G3XDY, UKUG Contest Adjudicator

UKµG Contest Portal: http://microwave.rsgbcc.org/cgi-bin/vhfenter.pl

Events calendar 2012

Mar 31	CJ-2012, Seigy	cj.ref-union.org/
April 21	RSGB AGM	
April 28-29	Martlesham Microwave Round Table and UKμG AGM	mmrt.homedns.org/
May 18-20	Hamvention, Dayton	www.hamvention.org/
Jun-10	RAL Roundtable	Mike Willis
Jun 22-24	Ham Radio, Friedrichshafen	http://www.hamradio-friedrichshafen.de/
Jul 14–15	Finningley Roundtable	
Jul 27 – Aug 12	Olympics Games, London, UK	
Aug 16-19	15th International EME Conference, Cambridge, UK	eme2012.com
Aug 29 – Sep 9	Paralympics, London, UK	
Sep 14–16	Amsat-UK Colloquium, Holiday Inn, Guildford, Surrey	www.uk.amsat.org/Colloquium/
Sep 14–16	57.UKW Tagung, Weinheim	www.ukw-tagung.de/
Sept 23 ?	Crawley Roundtable	
Sept 28–29	National Hamfest, Newark	www.nationalhamfest.org.uk/
Oct 6–7	British Amateur TV club convention and BiAGM, Basingstoke	www.batc.org.uk/club_stuff/convention/
Oct 12–14	RSGB Convention, Horwood House, Milton Keynes	www.rsgb.org/rsgbconvention/
Oct 18–21	MUD 2012, Santa Clara CA	www.microwaveupdate.org/ mud2012@pacbell.net
Oct 28 - Nov 2	European Microwave Week, Amsterdam RAI NB European Microwave Conference 2012 is 29th Oct - 1st Nov	www.eumweek.com/
Nov 3	Scottish Roundtable	www.rayjames.biz/microwavert

Contests & Activity Dates 2012

See page 27 for UkμG Contest calendar

Mar 20	2000–2230 1.3GHz Activity Contest RSGB VHFCC
Mar 27	2000–2230 2.3GHz Activity Contest RSGB VHFCC
April 17	2000–2230 1.3GHz Activity Contest RSGB VHFCC
May 5	10GHz Trophy contest
May 5–6	432MHz–248GHz contest
May 15	2000–2230 1.3GHz Activity Contest RSGB VHFCC
June 19	2000–2230 1.3GHz Activity Contest RSGB VHFCC

EME Activity weekends

2012 REF/DUBUS EME Contest:

Mar 3/4	00–24 UTC 432 & 3.4 GHz : CW/SSB
Mar 31– Apr 1	00–24 UTC 144 MHz & 10 GHz + up : CW/SSB
April 28/ 29	00–24 UTC 2.3 GHz : CW/SSB
May 26 / 27	00–24 UTC 1.2 GHz : CW/SSB
June 23 / 24	00–24 UTC 5.7 GHz : CW/SSB

Don't forget that

Every Monday evening is Microwave Activity Evening

The RSGB 2012 VHF+ Contest Calendar is available at www.rsgbcc.org