An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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In this Issue

And the mystery object is?

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Subscription Information

The following subscription rates 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

https://groups.io/g/Scatterpoint/files and/or Dropbox. Also, **free access to the Chip Bank**.

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.

PLEASE QUOTE YOUR CALLSIGN!

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!)

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

Reproducing articles from Scatterpoint

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UKµG Project support

The UK Microwave Group is pleased to encourage and support microwave projects such as Beacons, Synthesiser development, etc. Collectively UKuG has a considerable pool of knowledge and experience available, and now we can financially support worthy projects to a modest degree.

Note that this is essentially a small scale grant scheme, based on 'cash-on-results'. We are unable to provide ongoing financial support for running costs – it is important that such issues are understood at the early stages along with site clearances/licensing, etc.

The application form has a number of guidance tips on it – or just ask us if in doubt! In summary:-

- Please apply in advance of your project
- We effectively reimburse costs - cash on results (eg Beacon on air)
- We regret we are unable to support running costs

Application forms below should be submitted to the UKuG Secretary, after which they are reviewed/ agreed by the committee

www.microwavers. org/proj-support. htm

UKµG Technical support

One of the great things about our hobby is the idea that we give our time freely to help and encourage others, and within the UKuG there are a number of people who are prepared to (within sensible limits!) share their knowledge and, what is more important, test equipment. Our friends in America refer to such amateurs as “Elmers” but that term tends to remind me too much of that rather bumbling nemesis of Bugs Bunny, Elmer Fudd, so let’s call them Tech Support volunteers.

While this is described as a “service to members” it is not a “right of membership!”

Please understand that you, as a user of this service, must expect to fit in with the timetable and lives of the volunteers. Without a doubt, the best way to make people withdraw the service is to hassle them and complain if they cannot fit in with YOUR timetable!

Please remember that a service like our support people can provide would cost lots of money per hour professionally and it’s costing you nothing and will probably include tea and biscuits!

If anyone would like to step forward and volunteer, especially in the regions where we have no representative, please email john@g4bao.com

The current list is available at

www.microwavers. org/tech-support. htm

New Tech support needed in Wales as Chris (now G4DGU) has moved to Cornwall but has volunteered to be TS Elmer for Devon & Cornwall

UKµG Chip Bank – A free service for members

By Mike Scott, G3LYP

Non members can join the UKuG by following the non-members link on the same page and members will be able to email Mike with requests for components. All will be subject to availability, and a listing of a component on the site will not be a guarantee of availability of that component.

The service is run as a free benefit to all members and the UK Microwave Group will pick up the cost of packaging and postage, that is, Jiffy bags, small plastic bags for individual component values, and Large letter 2nd class postage, currently 76p.

Minimum quantity of small components supplied is 10.

The service may be withdrawn at the discretion of the committee if abuse such as reselling of components is suspected. We have asked Mike to check with the Chairman (or designated officer) if any individual is making excessive requests, and we will ensure that the service is only available to members.

There is an order form on the website with an address label which will slightly reduce what I have to do in dealing with orders so please could you use it.

Also, as many of the components are from unknown sources, if you have the facility to check the value, particularly unmarked items such as capacitors, do so, and let me know if any items have been mislabelled.

The catalogue is on the UKµG web site at www.microwavers. org/chipbank. htm

Silent Key: Jim Wakenell, G8UGL

From Martyn Vincent G3UKV

Jim Wakenell, G8UGL passed away peacefully on Sunday afternoon in the Severn Hospice, Telford.

Even though some of us knew what was inevitable several weeks ago, it still comes as a great shock when someone you've known for 40 years plus is struck down with cancer and dies.

Jim was an integral part of G3ZME/P (Telford &DARS) from portable sites around the country, notably the Brown Clee in Shropshire.

Our /P activities will never be quite the same again.

Our thoughts and condolences go out to his wife Hazel and extended family and associates in the UK and Cyprus.

From Paul G8AQA

As you will know Jim Wakenell, G8UGL passed away peacefully on Sunday afternoon in the Severn Hospice, Telford.

The funeral will be at 11:30 Thursday 6th September at Telford Crematorium, Redhill, Telford TF2 9NJ

From Miles G4GSB

This is indeed sad news. I always admired Jim's "No nonsense and take no prisoners" attitude.

A big loss and a big pair of boots to fill.

From Chris Bartram G4DGU

I'm very sorry to hear of Jim's passing. Although I only met him a few times in person, he was one of the recognisable voices of 'ZME for decades, and a thoroughly good guy!

I very much hope that the rumours of a GB3UGL 10GHz beacon in Shropshire come to fruition. As with GB3KBQ, and indeed, GB3RPE, the revival of which is imminent, the reuse of the callsigns of SK radioamateurs can be a memorial to significant contributions to our hobby.

Please pass my condolences on appropriately.

From John Quarmby G3XDY

Very sorry to hear that, sincere condolences to all his family and friends. It was often Jim behind the mike at G3ZME/P when I worked them and it was good to make his acquaintance at the Martlesham Microwave Round Table too. Vale Jim.

From Peter Day G3PHO

Very sad news indeed. I knew Jim through our many contacts on the higher Microwave bands, from the 10GHz wideband days to the recent past.. I also remember working him on 20m when he was visiting Cyprus. He will be greatly missed by all of us but most of all by his pals at the Telford Club where he was a vital part of their microwave contesting and expedition team. My sincere condolences to his family and friends.

From Ken Linney G3UDA

So so sad to hear of Jim's passing. I remember him from way back when the Radio Rally was in Telford Town centre. Such a lovely guy. Sincere condolences to his family

Photo credit: Adam @MU0WLV 25 Jun 2016

Chairman's Thoughts – on EME2018

Sam Jewell G4DDK

Having recently returned from the bi-annual EME Conference, EME2018, held in the Netherlands it is still very fresh in my mind and thoughts.

This biennial event attracts between 150 and 200 enthusiast EME attendees from all over the world. It is usual to take partners and an extensive partner programme is laid on in addition to the main presentations lasting between 1.5 and 2 days, depending in the number of presentations.

The Dutch event featured a trip to see Europort (Rotterdam) and the guide on the boat seemed *au fait* with amateur radio, although he never admitted it!

The second trip (these trips were on the two days prior to the Conference proper) was to the Dwingaloo dish and a guided tour around the adjacent Astron facility, where we saw their extensive development and manufacturing facilities for radio astronomy.

The moon was (just) up for our visit to Dwingaloo and the demo of echoes from the moon on 23cm, with just 120W was very impressive.

This was actually my third visit to the Dwingaloo dish and I shamelessly claim to be one of the group who initially tried a few years ago to persuade the Dutch group that they should host the Conference after the first of these visits. The last time the EME Conference was held in the Netherlands it was held in Thorn. EME enthusiasts still speak fondly of that particular event!

Before arriving at Dwingaloo we were treated to a visit to the 14 Westerbork Synthesis Radio Telescope (WSRT) dishes arranged along a single baseline of over 1km. Some dishes are fixed. Others can be moved. the dishes are each 25m in diameter and can observe from 2.5m to 3.6cm wavelength. No radios or vehicles are allowed in the vicinity of the dishes due to possible interference. Because it was us, that was relaxed and the coach as allowed right up to the dishes.

The presentations were held on Saturday and Sunday morning, with a 'beach BBQ' on Saturday evening in one of the many beach restaurants located on and along the sands at Egmond Aan Zee. I should make special mention of the musical finale performed on guitar and sung by 80 year old Simon, PA0SSB. Simon is widely regarded as the Dutch 'grandfather' of EME. Our own being Peter, G3LTF, of course. Peter was actually presented with a lifetime award for services to EME, at EME2018. Well done Peter.

The programme of EME2018 is covered elsewhere in Scatterpoint, so I will limit myself to saying that it was great event and Jan, PA3FXB and his XYL, Marjan, are to be congratulated on taking on and organising this event on their own. Unlike the Cambridge EME2012 Conference, where we had a small team, led by G4FSG, to organise all aspects, Jan and Marjan did all the organising except for the aforementioned trips, which were organised by a commercial organisation.

Back in UK, G8BHC takes advice from G4DDK on getting started in moonbounce.

"You're going to need a considerably bigger dish"

Photo by G6JYB

Ofcom Consultation

Murray Niman G6JYB

Ofcom WRC-19 Consultation – Please Respond ASAP

Back in June, Ofcom published a consultation on the UK's preparations for the ITU World Radiocommunication Conference 2019 (WRC-19), which will be held next autumn (Oct/Nov-2019). **The deadline for responses is 13th September** and there are a number of items that are of interest to UK Amateurs where UKuG Members are encouraged to respond. The consultation document and a response form are at:-

https://www.ofcom.org.uk/consultations-and-statements/category-1/uk-preparations-wrc-19

RSGB have some additional background at

https://rsgb.org/main/news/special-focus/wrc-19/wrc-19-papers/

Questions and Agenda Items (AIs) of particular note where you are encouraged to reply to Ofcom are:-

Q2 (AI-1.13) – Any result for future 5G mobile-broadband frequencies should ensure that emissions do not affect the amateur Primary allocations at 24.0-24.05 and 47.0-47.2GHz. Both of these amateur allocations have a variety of amateur use including narrowband weak signal long distance contacts, propagation beacons/research and wider bandwidth Amateur Video/TV.

Q4 (AI-1.16) - 5GHz: Amateurs have a significant interest in the 5725-5850 MHz sub-band (including weak signal narrowband usage at around 5760 MHz, data links and amateur satellite reception at around 5840 MHz). Given the complexities involved there appears to be no reason to go beyond the previous Ofcom consultations/changes. Therefore a 'no change' is preferred in this frequency segment. As per Ofcom's own comments, it would instead be better to focus on the new 6GHz band.

Q23 (AI-1.1) – 50 MHz: The 50 MHz (6-metre) band is a key one for amateur radio throughout the UK, Region-1 and beyond. It is important it is now made a formal amateur allocation at ITU level and with the capacity to fully accommodate both current and future applications. Harmonising it across the region is important in helping to raise activity. Ofcom should increase its priority and support proposals for both a Primary amateur segment (similar to the UK one), as well as options to make 52-54 MHz eventually available to provide a long term home for the highly innovative digital data and video modes currently being pioneered in other experimental VHF bands (such as the new Ofcom 'sponsored' 71MHz amateur band nearby)

Q27 (AI-1.15): Frequencies in the band 275-450 GHz were recently made available by Ofcom to UK amateurs by a licence variation. Pioneering work with highly accurate frequency sources is now seeing the first developments occur at 288 GHz. It is therefore important that any agreement for other services such as Fixed/Mobile, still permits other services including amateurs to continue innovative developments, explore propagation etc. The high atmospheric losses and low equipment powers typical of these frequencies all enable easy coexistence and minimise interference.

Q32 (AI-10): A key concern is future agenda items that affect amateur allocations. Ofcom should have a separate consultation as soon as these proposals become clearer in CEPT – and certainly ahead of WRC-19 itself

PLEASE ENSURE YOU DRAFT INDIVIDUAL RESPONSES, not 'template' copies of the above comments

Crawley Round table

This will be held on Saturday 9 September at the Crawley radio club, meeting held at

Hut 18 Tilgate Drive
Crawley West Sussex RH10 5HW
Not Far from Peas Pottage, turn off at end of M23

Doors open 9-30 am

Rolls tea and coffee as always

Morning: Table top sales and nattering. Judging construction competition

Afternoon: A couple of talks

We want to try and get a varied programme of talks so we are open to suggestions and preferably volunteers. Offers to drm108@rsgb.org.uk More info at https://crawleyuwavert.blogspot.co.uk

Denis G0OLX

GMRT 2018 Call for Presentations

Image source: www.gmroundtable.org.uk

The Scottish Round Table will be held on Saturday 3 November 2018.

Details of accommodation, transport and other activities can be found at www.gmroundtable.org.uk

As a departure from previous practice the organisers thought it would be good to have a call for presentations from attendees. In previous years the programme of talks has been assembled by the organisers and was restricted in scope by their knowledge of what people were working on. Do you have a project that would be of interest to the audience? If so why not do a talk about it!

Presentations generally last 30 to 40 minutes and typically would be accompanied by a set of Powerpoint slides. Topics can vary widely but should be microwave related. They could range cover a very wide range of topics such as a review of some commercial kit, modification of surplus gear, test gear, propagation, beacons, software for microwaves, microwave operating, microwave SDRs, antennas, how to get on a new band, microwave construction techniques. The list goes on.

If you are interested please email Brian Flynn, GM8BJF (brian dot flynn at tiscali dot co dot uk) with a title and a very brief outline of your topic.

EME 2018

Martin G8BHC

The beach at Egmond aan Zee

A group of us from East Anglia ventured eastwards in JO02 to attend EME2018 in Egmond aan Zee (JO22ho). Sam G4DDK & Shirley, John G4BAO & Vicki, myself G8BHC & Jen.

I used to work at SHAPE Technical Centre in Den Haag 40 years ago so it was also a bit of a nostalgia trip for me.

I had done a detour from Hoek van Holland to visit an old colleague near Gouda, so we eventually arrived at Egmond aan Zee at lunchtime. We wandered down to the beach to find these folk already testing the local ale.

BAO is looking grumpy because we got served first.

Food featured quite a lot on this trip, not to mention the local beverages…

We met for dinner at a local restaurant that evening and were joined by Paul Wade W1GHZ and his xyl Beth.

On Thursday there was a very bad fire at a local cafe De Klok (opposite where we had dined on the first night). No, it wasn't due to an EMEer running too much QRO but an accident while changing a patio heater gas bottle. Some minor injuries but no-one killed, fortunately.

Handy having the sea nearby as an extra water supply.

The aftermath next day

The back of the restaurant demolished.

Very sad. The place had been refurbished only 2 years ago.

Anyway, enough of the holiday snaps…

The Papers

Saturday

8:45 – 9:00	Opening	Jan van Muilwijk PA3FXB.
9:00 – 9:45	History of EME	Jan Ottens PA0SSB
9:45 – 10:15	A survey of 6cm activity in 2018	Peter Blair G3LTF
Coffee		
10:45 – 11:15	Building a 128 Yagi array for 70cm moonbounce	Bernd Wilde DL7APV
11:15 – 11:45	First ever 3cm EME from Africa	Zdenek Samek OK1DFC
11:45 – 12:15	"UADC4, a dedicated ADC for SDR application" the revival of ZERO IF receivers	Alex Artieda ZS6EME
Lunch		
13:45 – 14:15	The Swaziland moonbounce expedition	PA2CHR/PA3CMC/ZS6JON
14:15 – 14:45	The Iceni 70cm transverter	Sam Jewell G4DDK
14:45 – 15:15	Chapter III – Limits of single polarity antennas in the V/UHF bans	IK1UWL & IK3XTV
Tea/coffee		
15:45 – 16:15	5-band GHz EME from a European suburban garden	John Worsnop G4BAO
16:15 – 16:45	Goonhilly – To the Moon and back – GB6GHY[1]	Neal Underwood G4LDR
16:45 – 17:15	432MHz Polarisation experiments	Jan Kappert PA0PLY

Sunday

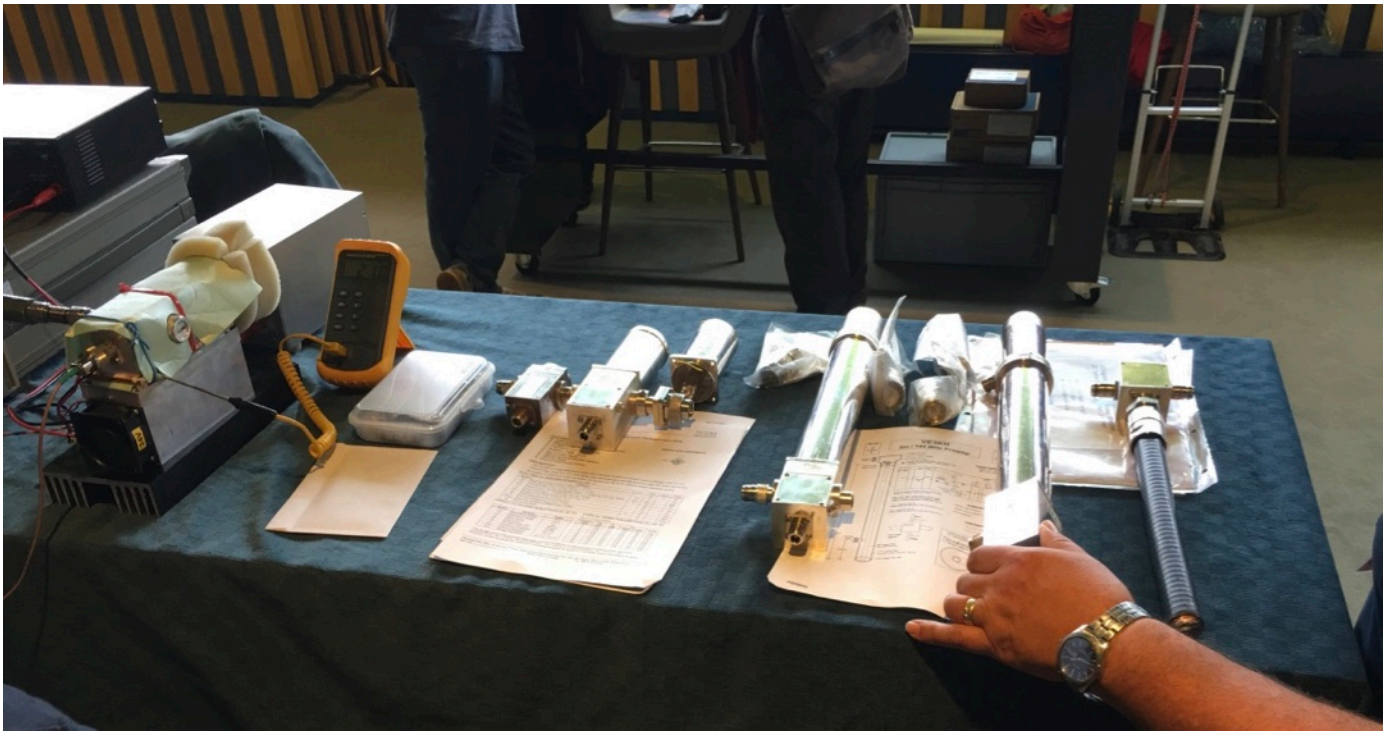
9:00 – 9:30	First YL EME SSB QSO on 70cm	Johanna van Eckert-Schoof DJ5YL
9:30 – 10:00	The Tonna legacy	Guy Gervais F2CT
10:00 – 10:30	Hunting for Pulsars	OE5JFL/I1NDP/I0NAA
Coffee		
11:00 – 11:30	A beginner's journey	PA0HRK
11:30 – 12:00	SSB moonbounce	Al Katz K2UYH
12:00 – 12:30	EME 2020 (bid and vote)	
12:30 – 14:00	Goodbye lunch	

See page 25 for a link to the papers, posters and presentation slides.

Introducing Zdenec OK1DFC

1 A team including G8GTZ, G8GKQ, G4NNS and G4LDR expect to activate the 32m antenna GHY6 at Goonhilly Down on the Lizard Peninsular Cornwall IO70jb UK on 1st and 2nd September as GB6GHY. We will be on the HB9Q logger whilst operational which will be between about 08:00z and 12:00z earlier if possible. We will have 3.4GHz and 5.7GHz with immediate band change. We will however concentrate on 3.4GHz on the 1st and 5.7GHz on the 2nd.

Table-top presentations



Hubert Tiedmann DJ3FI – Cavity low noise amplifiers

Looks like a bit of Steam Punk!

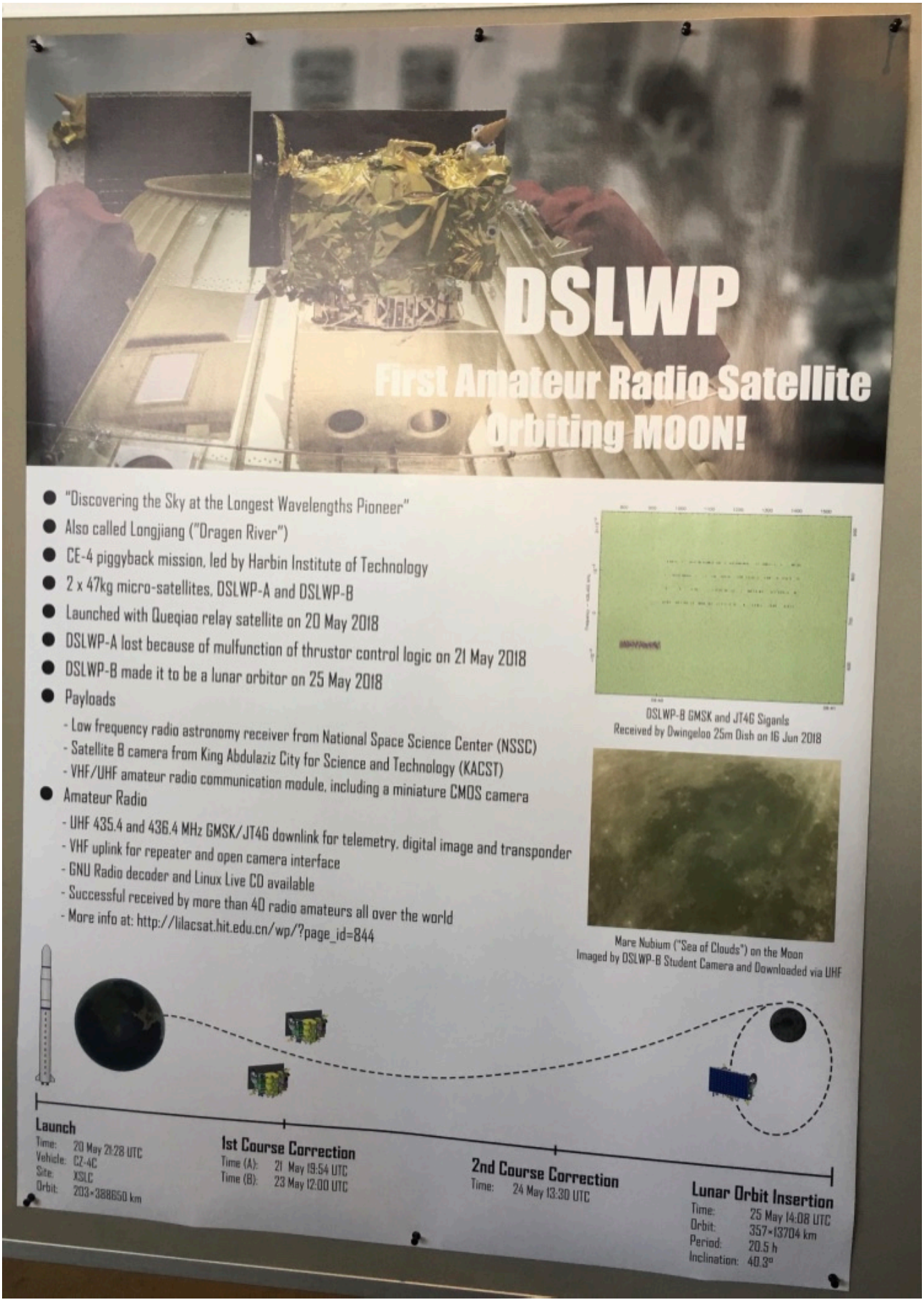
Lou Crocker N2END (centre) demonstrating a microprocessor-controlled antenna rotation system

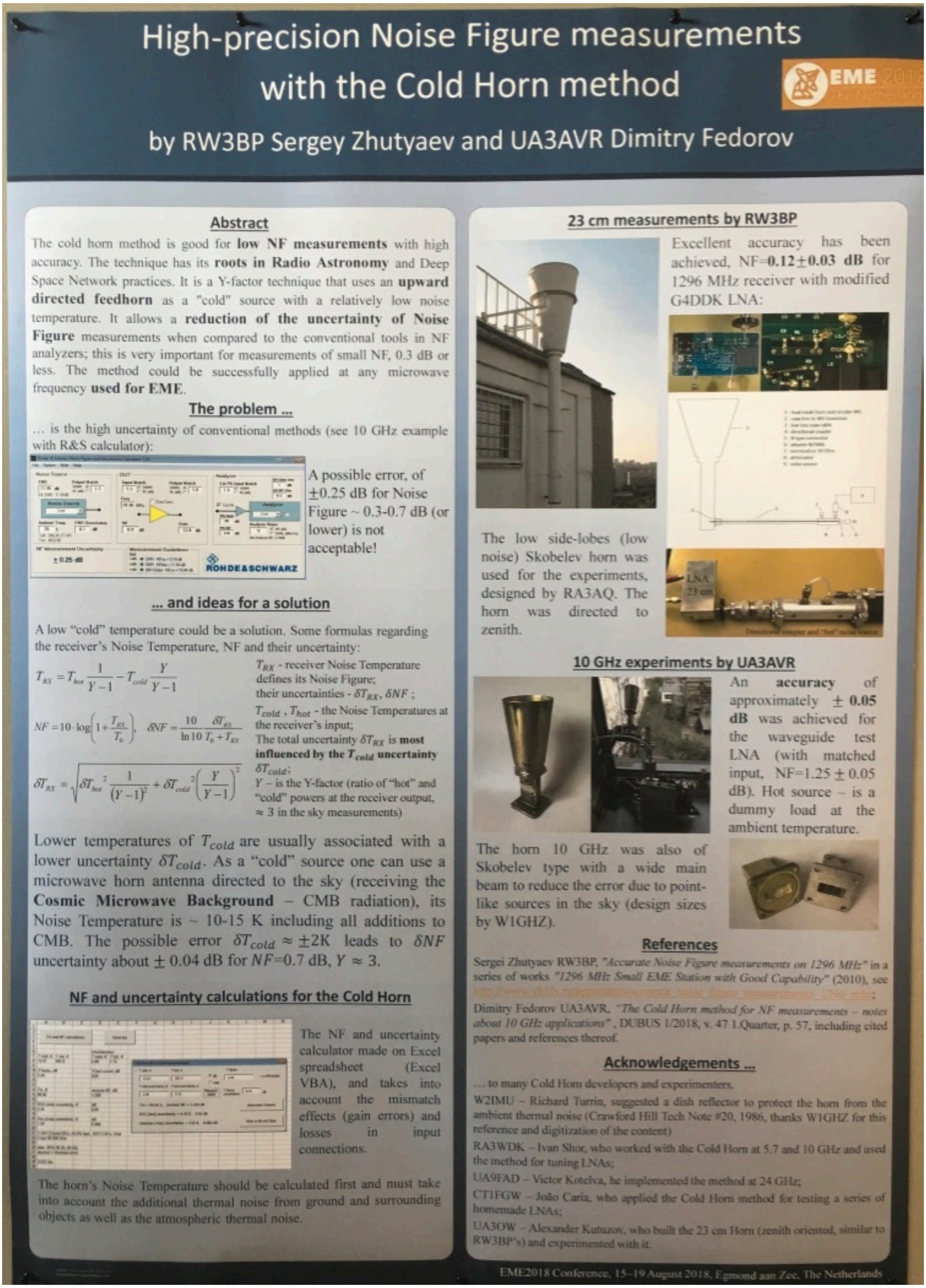
Sam G4DDK doing a roaring trade in LNAs, WA5VJB antennas and Iceni kits

”I have a question…”

Iban Cardona EB3FRN:
10GHz low noise amplifier technique

Poster Presentations




High-precision Noise Figure measurements with the Cold Horn method
EME 2018 The Netherlands
by RW3BP Sergey Zhutyaev and UA3AVR Dimitry Fedorov
Abstract
The cold horn method is good for low NF measurements with high accuracy. The technique has its roots in Radio Astronomy and Deep Space Network practices. It is a Y-factor technique that uses an upward directed feedhorn as a "cold" source with a relatively low noise temperature. It allows a reduction of the uncertainty of Noise Figure measurements when compared to the conventional tools in NF analyzers; this is very important for measurements of small NF, 0.3 dB or less. The method could be successfully applied at any microwave frequency used for EME.
The problem ...
... is the high uncertainty of conventional methods (see 10 GHz example with R&S calculator):
A possible error, of ±0.25 dB for Noise Figure ~ 0.3-0.7 dB (or lower) is not acceptable!
... and ideas for a solution
A low "cold" temperature could be a solution. Some formulas regarding the receiver's Noise Temperature, NF and their uncertainty:
$T_{RX} = T_{hot}\frac{1}{Y-1} - T_{cold}\frac{Y}{Y-1}$
$NF = 10 \cdot \log\left(1+\frac{T_{RX}}{T_0}\right)$, $\delta NF = \frac{10}{\ln 10}\frac{\delta T_{RX}}{T_0+T_{RX}}$
$\delta T_{RX} = \sqrt{\delta T_{hot}^2 \frac{1}{(Y-1)^2} + \delta T_{cold}^2 \left(\frac{Y}{Y-1}\right)^2}$
T_{RX} - receiver Noise Temperature defines its Noise Figure; their uncertainties - δT_{RX}, δNF;
T_{cold}, T_{hot} - the Noise Temperatures at the receiver's input;
The total uncertainty δT_{RX} is most influenced by the T_{cold} uncertainty δT_{cold};
Y – is the Y-factor (ratio of "hot" and "cold" powers at the receiver output, ≈ 3 in the sky measurements)
Lower temperatures of T_{cold} are usually associated with a lower uncertainty δT_{cold}. As a "cold" source one can use a microwave horn antenna directed to the sky (receiving the Cosmic Microwave Background – CMB radiation), its Noise Temperature is ~ 10-15 K including all additions to CMB. The possible error $\delta T_{cold} \approx \pm 2$K leads to δNF uncertainty about ± 0.04 dB for NF=0.7 dB, $Y \approx 3$.
NF and uncertainty calculations for the Cold Horn
The NF and uncertainty calculator made on Excel spreadsheet (Excel VBA), and takes into account the mismatch effects (gain errors) and losses in input connections.
The horn's Noise Temperature should be calculated first and must take into account the additional thermal noise from ground and surrounding objects as well as the atmospheric thermal noise.
23 cm measurements by RW3BP
Excellent accuracy has been achieved, NF=0.12±0.03 dB for 1296 MHz receiver with modified G4DDK LNA:
The low side-lobes (low noise) Skobelev horn was used for the experiments, designed by RA3AQ. The horn was directed to zenith.
LNA 23 cm
10 GHz experiments by UA3AVR
An accuracy of approximately ± 0.05 dB was achieved for the waveguide test LNA (with matched input, NF=1.25±0.05 dB). Hot source – is a dummy load at the ambient temperature.
The horn 10 GHz was also of Skobelev type with a wide main beam to reduce the error due to point-like sources in the sky (design sizes by W1GHZ).
References
Sergei Zhutyaev RW3BP, "Accurate Noise Figure measurements on 1296 MHz" in a series of works "1296 MHz Small EME Station with Good Capability" (2010), see
Dimitry Fedorov UA3AVR, "The Cold Horn method for NF measurements – notes about 10 GHz applications", DUBUS 1/2018, v. 47 1.Quarter, p. 57, including cited papers and references thereof.
Acknowledgements ...
... to many Cold Horn developers and experimenters.
W2IMU – Richard Turrin, suggested a dish reflector to protect the horn from the ambient thermal noise (Crawford Hill Tech Note #20, 1986, thanks W1GHZ for this reference and digitization of the content)
RA3WDK – Ivan Shor, who worked with the Cold Horn at 5.7 and 10 GHz and used the method for tuning LNAs;
UA9FAD – Victor Kotelva, he implemented the method at 24 GHz;
CT1FGW – João Caria, who applied the Cold Horn method for testing a series of homemade LNAs;
UA3OW – Alexander Kutuzov, who built the 23 cm Horn (zenith oriented, similar to RW3BP's) and experimented with it.
EME2018 Conference, 15–19 August 2018, Egmond aan Zee, The Netherlands

10 GHz EME with Small Setup

Miroslav Kasal, OK2AQ

mirek@kasals.com

http://www.urel.feec.vutbr.cz/esl/files/EME/EME.htm

Offset Dish 1.2 m f/d = 0.8

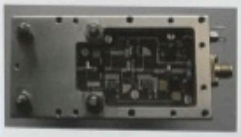
Power 42 W

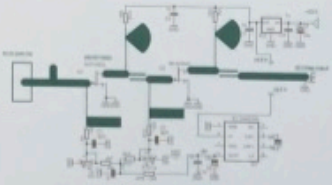
N. F. 0.8 dB

Rotary Lin. Pol.

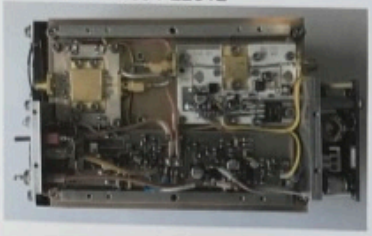
Technology by OK2AQ

LNA - NE3511S02

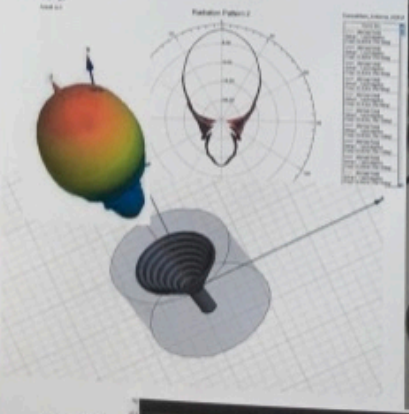




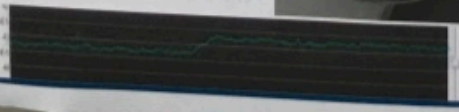
PA 50 W
with GaN Device FL2312



Feed

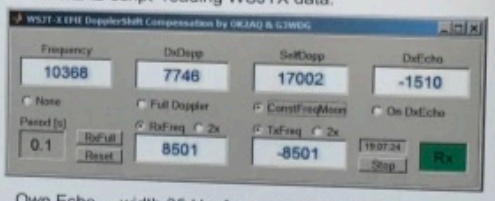


MN/CS

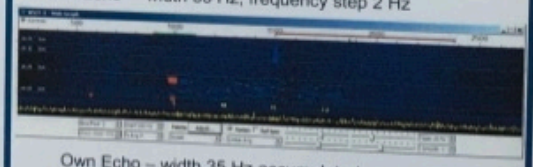


Frequency precision and Doppler shift compensation

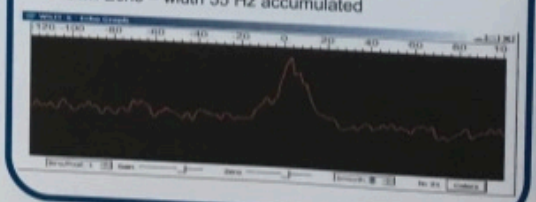
- MW transverter as well as IF transverter 148/18 MHz are controlled by rubidium frequency standard.
- IF transverter local oscillator is DDS programmed by MATLAB script reading WSJTX data:



Own Echo – width 35 Hz, frequency step 2 Hz



Own Echo – width 35 Hz accumulated



Achievement

2017-2018
76 QSOs
23 Initials
4# CW

Acknowledgement

My thanks go to all the station I worked with. I would like to thank Franta OK1CA for support and Charlie G3WDG for cooperation on the Dopp software and PA.

EME 2018

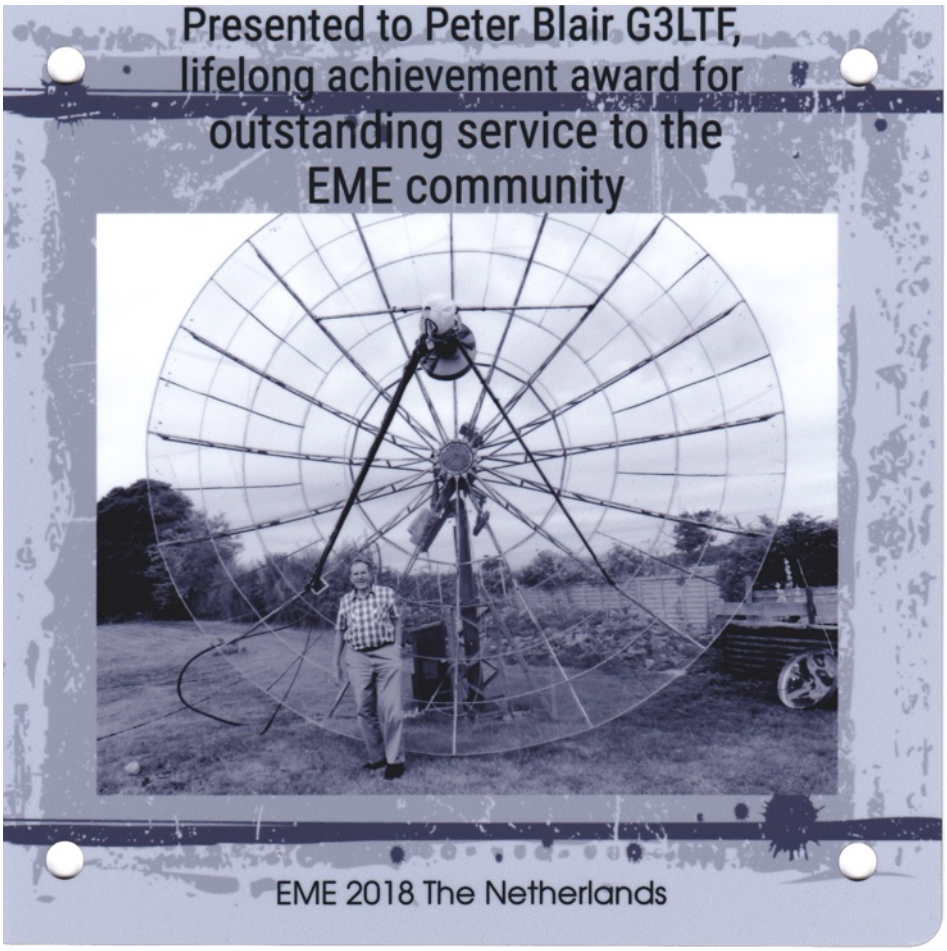
The Beach BBQ on Saturday evening

Jan van Muilwijk PA3FXB, Jan Ottens PA0SS and Dirk Reyners ON5GS lead us in a sing-song.

Special Award

Peter Blair G3LTF did the first moonbounce from the UK.

He was presented with this Lifelong achievement award for service to theEME community



A big ***Dank je wel*** /
to the organisers,
Jan PA3FXB and Marjan

Tot volgende kier **– See you at EME2020 in Prague?**

ANDORRA C37RS

Pic MAIA JN02UN Pic Blanc JN02UM
SHF ACTIVITY REPORT JUNE 27 – JULY 3 2018

F1FIH Michel Laborde, F2CT Guy Gervais

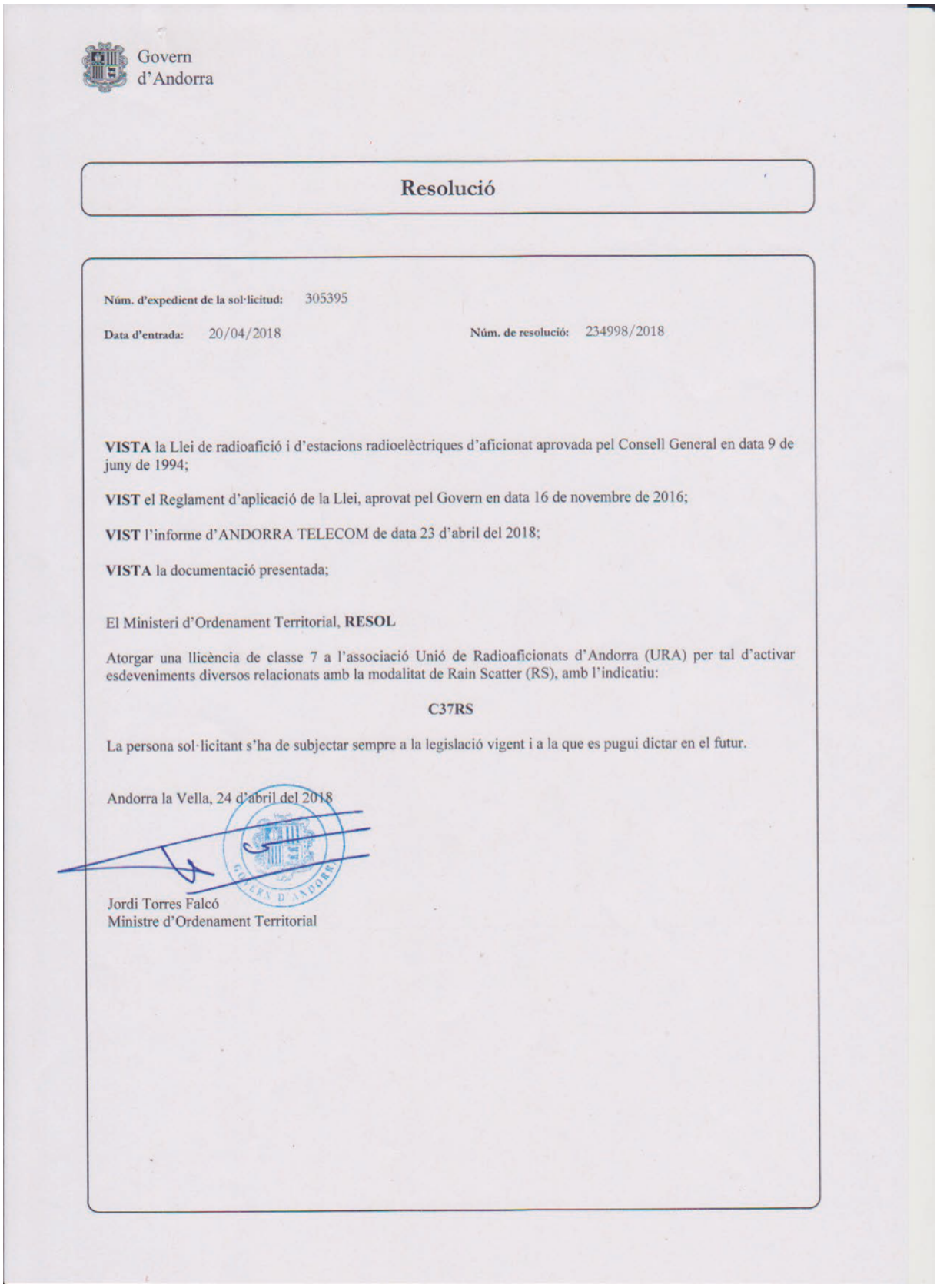
Michel F1FIH and his 4x4 « rover »

Take off qtf 310 350 °

Take off qtf 20 > 60° (DL/HB/I) the best !

Pic Blanc

Welcome to URA



Govern
d'Andorra

Resolució

Núm. d'expedient de la sol·licitud: 305395

Data d'entrada: 20/04/2018 **Núm. de resolució:** 234998/2018

VISTA la Llei de radioafició i d'estacions radioelèctriques d'aficionat aprovada pel Consell General en data 9 de juny de 1994;

VIST el Reglament d'aplicació de la Llei, aprovat pel Govern en data 16 de novembre de 2016;

VIST l'informe d'ANDORRA TELECOM de data 23 d'abril del 2018;

VISTA la documentació presentada;

El Ministeri d'Ordenament Territorial, **RESOL**

Atorgar una llicència de classe 7 a l'associació Unió de Radioaficionats d'Andorra (URA) per tal d'activar esdeveniments diversos relacionats amb la modalitat de Rain Scatter (RS), amb l'indicatiu:

C37RS

La persona sol·licitant s'ha de subjectar sempre a la legislació vigent i a la que es pugui dictar en el futur.

Andorra la Vella, 24 d'abril del 2018

Jordi Torres Falcó
Ministre d'Ordenament Territorial

C37RS special SHF licence attributed by Principat d'Andorra Government
with help from URA (Andorra) and REF (France)

RIGS

2320 MHz : 60 W / 120 cm offset
5760 MHz : 30 W / 120 cm offset
10368 MHz : 15 W / 120 cm offset

SHF results:

The goal was to achieve SHF DX contacts via Aircraft scatter and Rain scatter

Log C37RS

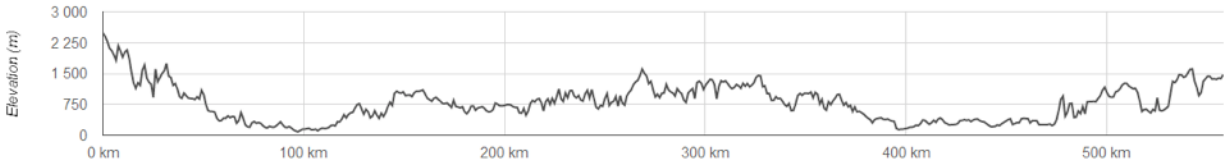
2018-06-30	11:32:48	5G7	CW	F6APE	519 539	IN97PI	571 km
2018-06-30	14:12:56	10G	SSB	F4BXL	59 59	JN03QN	119 km
2018-07-01	09:38:49	2G3	CW	DL3IAE	519 529	JN49DG	907 km
2018-07-01	15:44:05	2G3	SSB	F6CIS	55 55	IN94WL	264 km
2018-07-02	09:47:55	10G	CW	F6DKW	519 519	JN18CS	697 km
2018-07-02	15:02:15	10G	SSB	F5BUU	59 59	JN03PO	126 km
2018-07-02	16:28:44	10G	CW	F4EZJ/P	519 529	JN05EM	351 km
2018-07-02	16:42:03	10G	CW	F5DQK	559 529	JN18GR	694 km
2018-07-02	16:45:47	10G	CW	F6DKW	599 549	JN18CS	697 km
2018-07-02	16:48:46	10G	CW	F6DWG/P	599 599	JN19AJ	765 km
2018-07-02	16:50:28	10G	CW	F1PYR/P	599 599	JN19BC	733 km
2018-07-02	16:52:17	10G	CW	F4EZJ/P	599 599	JN05EM	351 km
2018-07-02	17:01:56	5G7	CW	F5DQK	559 529	JN18GR	694 km
2018-07-02	17:05:15	5G7	CW	F1PYR/P	559 559	JN19BC	733 km
2018-07-02	17:18:39	5G7	CW	F6DWG/P	559 559	JN19AJ	765 km
2018-07-02	17:26:18	10G	CW	F6DRO	599 599	JN03TJ	98 km
2018-07-02	17:33:38	10G	SSB	F6DKW	59 59	JN18CS	697 km
2018-07-02	17:35:56	10G	SSB	F6DWG/P	59 59	JN19AJ	765 km
2018-07-02	17:40:23	10G	CW	F1RJ/P	599 599	JN12MQ	111 km

F2CT CW op

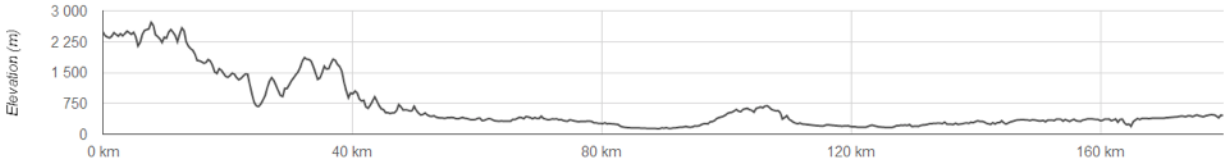
Map of contacts

Profiles analysis from JN02UM

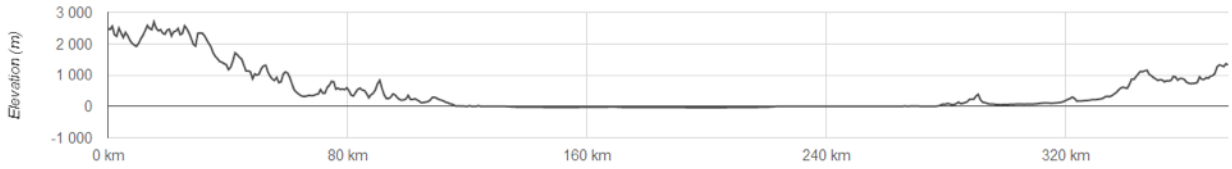
HB9G JN36BK



F5ZTT JN14EB



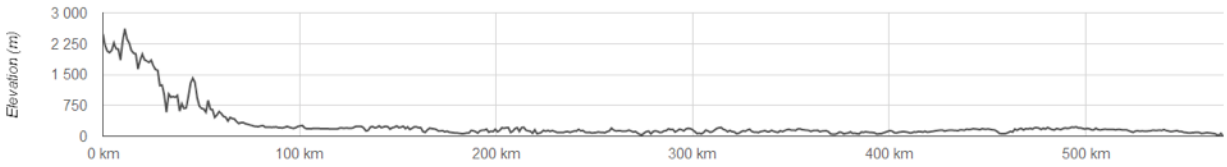
F5ZIR JN24VC



F5ZEP IN94UT

DL3IAE JN49DG

F6APE IN97PI



F4EZJ/P JN05EM

F6DKW JN18CS

F6DWG JN19AJ

Remarks

Best direction was to DL3IAE qtf 32 °

- Tropo conditions were bad
  We spend many time listening french beacons on 3cm band
- F5ZEP/33/IN94UT 10368.333 MHz 529 qtf 328° distance : 302 km
- F5ZTT/81/JN14EB 10368.950 MHz 559 qtf 18° distance : 180 km
- F1ZIR/04/JN24VC 10368.803 MHz 559 qtf 61° distance : 375 km

Best DX :

13cm	DL3IAE	907km	CW	AS
6cm	F6DWG/P	765km	CW	RS
3cm	F6DWG/P	765km	CW	RS

73s C37RS TEAM F1FIH F2CT

Contest results

John Quarmby G3XDY

July 5.7GHz Contest 2018

The terrible weather decimated activity and resulted in just one entry, from Neil G4LDR, who operated with his tower retracted and made just one QSO on this band. It can only get better in August!

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX km	Power
1	G4LDR	IO91EC	1	212	G4ODA	212	15

July 10GHz Contest 2018

Terrible weather with 40mph winds and heavy rain resulted in a very low entry and few contacts. Congratulations to Graham G8HAJ for battling through to take a convincing lead. Let us hope for better weather for the remaining two sessions.

Open Section

Pos	Callsign	Locator	QSOs	Score	ODX Call	ODX km
1	G8HAJ	JO01JR	7	1627	F6DKW	345
2	G4LDR	IO91EC	2	394	G4ODA	212
3	G3YJR	IO93FJ	2	224	G4ODA	118
4	G3UVR	IO83KH	1	210	G4ODA	210

5.7/10GHz Championship Tables

Positions after three events, the best three count to the total.

5.7GHz

Pos	Callsign	27-May-18	24-Jun-18	29-Jul-18	26-Aug-18	30-Sep-18	TOTAL
1	G4LDR	330	824	1000			2154
2=	G1EHF/P	1000					1000
2=	G3ZME/P		1000				1000
4	GW3TKH/P		779				779
5=	2E0MDJ/P		204				204
5=	G0LGS/P		204				204
7	G1DFL/P	65	138				203
8=	M0ICR/P		138				138
8=	M0UGA/P		138				138

10GHz Open

Pos	Callsign	27-May-18	24-Jun-18	29-Jul-18	26-Aug-18	30-Sep-18	TOTAL
1	G8HAJ	298	872	1000			2170
2	G4LDR	876	612	215			1703
3	G4KUX	1000	588				1588
4	G3UVR	353	872				1225
5	G3ZME/P		1000				1000
6	G3YJR	289	164	138			591
7	GW3TKH/P		574				574
8	G4DBN		559				559
9	G3UVR		298	129			427
10	G3PHO		355				355
11	G3VKV	208					208

10GHz Restricted

Pos	Callsign	27-May-17	24-Jun-17	29-Jul-17	26-Aug-17	30-Sep-17	TOTAL
1=	G4SJH/P	1000					1000
1=	2E0MDJ/P		1000				1000
1=	G0LGS/P		1000				1000
4	G1DFL/P	86	453				539
5	G3WJG		282				282
6	M0ICR/P		135				135
7	M0UGA/P		121				121

UKµG Microwave Contest Calendar 2018

Dates 2018	Time UTC	Contest name	Certificates
26-Aug	0600 - 1800	4th 5.7GHz Contest	F, P,L
26-Aug	0600 - 1800	4th 10GHz Contest	F, P,L
16- Sep	0900 - 1700	3rd 24GHz Contest	
16- Sep	0900 - 1700	3rd 47GHz Contest	
16- Sep	0900 – 1700	3rd 76GHz Contest	
30 -Sep	0600 - 1800	5th 5.7GHz Contest	F, P,L
30 -Sep	0600 - 1800	5th 10GHz Contest	F, P,L
21 -Oct	0900 - 1700	4th 24GHz Contest	
21 -Oct	0900 - 1700	4th 47GHz Contest	
21 -Oct	0900 – 1700	4th 76GHz Contest	
18 -Nov	1000 - 1400	5th Low band 1.3/2.3/3.4GHz	F, P,L
Key:	F	Fixed / home station	P Portable
	L	Low-power (<10W on 1.3-3.4GHz, <1W on 5.7/10GHz)	

French microwave activity for 2018

Ralph G4ALY

August	WE 25 & 26	October	WE 27 & 28
September	WE 29 & 30		

Activity News : July 2018

By Neil Underwood G4LDR

Please send your activity news to:

scatterpoint@microwavers. org

Introduction

The long hot summer is finally over, meaning that the German mmWave expedition to the Irish Sea area was unable to take advantage of any enhanced conditions that may have existed before they arrived in early August. Nevertheless a number of 'firsts' were achieved which are detailed below.

Having just returned from EME2018 in The Netherlands, where I presented a paper on our operation from Goonhilly earth station last year using the 32m dish on 9 and 6cm, I now fired up to get my own EME station completed before the winter. I hope to be QRV initially on 23cm with a 3m dish.

Band Reports – cm and mm Bands

From Chris, G4DGU, IO70

Chris has recently moved from mid-Wales to Cornwall and sent in the following report.

Since moving back to IO70, I've been rather more involved in decorating than playing microwaves ... However, I did manage to find time to get-out to IO70QR (Highcliff, near Boscastle) with 10 and 24GHz on the morning of 6th of August to run some tests with the mm-Wave DXpedition in Ireland on 24GHz.

My activity followed a major tropo lift resulting in M0VRL (just a few km away from '70QR, in Delabole) working D4 on 2m. By the time I got the gear assembled and running, GB3SCX on 10G was back at normal troposcatter levels, however there was a feature of the QSOs which deserves comment.

I made two QSOs on 24GHz that morning both with IO62TE: EI/DF9IC/P who was 55 and gave me a 54 report on SSB, at 12.30(local), followed immediately by EI/DG8EB/P with 53 reports both ways at 12.31. There was noticeable, quite fast fading. That suggests signal levels of around 15 - 20dB in 2.5kHz. I was running just under 2W at the antenna while my receiver is capable of detecting ~2dB of ground noise wrt cold sky. The antenna on both 10 and 24 is a 0.8m offset dish with Skobelev/Potter type feeds of my own design. The feed for 24GHz was designed a decade ago for my old 0.8f/D 2.4m EME offset dish. This slightly under illuminates the 0.8m dish.

The signals on 10GHz were very strong.

At a bit over 200km, these were personal 'best DX' contacts on 24GHz. I note (with some incredulity!) that there is apparently no previous claim for a first G/EI QSO on 24GHz. I'd like to claim that, but if by doing so, I manage to flush out a previous claim, that would also make me happy!

One feature I noted on both bands was a 5 or 6degree (west) offset in beam heading: this was consistent on both bands. Discussing this with Terry, M0VRL, it's an effect he has noticed previously on the lower frequencies, and I plan to go back to the met. data to try to understand this.

Before I packed-up, I ran a further test on 10GHz with my friend, Peter, GW4JQP, one of the leading lights of the GB3RPE resurrection at Carmarthen ARC. Peter was on Bettws Mountain, near Ammanford. We made our first ever 10GHz contact. It was only a 125km path, and I was having to beam through a bush, but we completed despite Peter having just 0dBm at his (4ft - I think) antenna - I was running +39dBm at my feed.

It was a good day out, and a welcome respite from house-mangling!

Band Reports – mm Bands – Irish Sea Activity

Here are a series of daily reports from Henning DF9IC detailing the mmWave activity that took in early August.

Wednesday 8th August - We arrived in Ireland on Monday morning, and had a successful sked with Chris G4DGU on 10G and 24G from the south-east of Ireland to Cornwall over 200 km. Today DL4SBK, DC8TM and DF3TS in the Lake District and DG8EB and DF9IC close to Drogheda did some tests starting around noon.

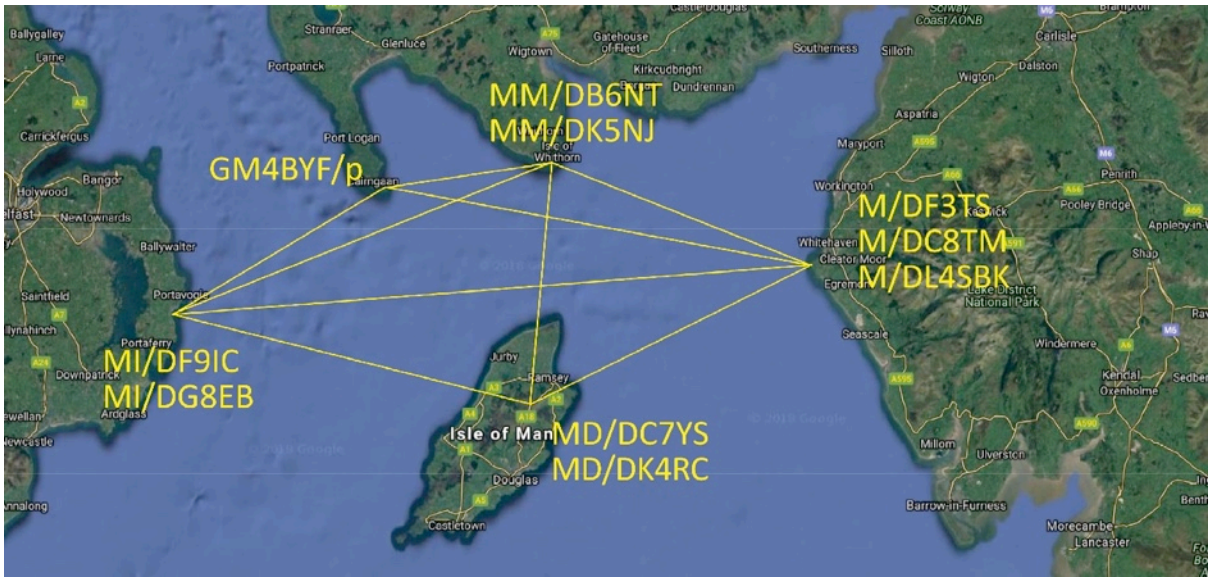
The QTHs were a bit North of Black Combe nearly 400 m asl (IO84IH20IB) and at the Drogheda lighthouse in maybe 10 m asl (IO63VR02GS), with a distance of 201 km. Weather was mixed between sunshine and completely overcast, sometimes windy, and rain in the morning on the English side.

10 GHz worked loud as expected, and was used to adjust the antenna direction and later for talkback. 24 GHz was a bit of a fight, the strongest periods being close to SSB signal strength but much QSB down into the noise and long breaks without any signal. We could complete 2 CW QSOs before it got too weak again. We tested a total of 2 h, starting at 12:30 UTC. TX Power on both sides was 3 W and dishes of 48 and 60 cm.

Tomorrow we will be in the North of the Isle of Man, with us in GI, GM4YBF and the DB6NT team in GM, and the DL4SBK group at St. Bees head. The longest path then is 116 km so 24 GHz should work between all participants if the weather remains stable.

Thursday 9th August - We have been quite lucky with the weather though it was windy for some time, and in the late afternoon rain started in Northern Ireland.

We achieved what reasonably seemed possible. The attached map shows the QTHs of the stations:



GM: IO74TQ13IH and IO74NP62RJ; GI: IO74GK34KR; GD: IO74SG66ST + another QTH; G: IO84EM33IG.

Each one came into contact with each other. Pete GM4BYF had only 10G working, but otherwise we made QSOs from 10G up to 76G, with "full house" everywhere except the longest path between GI and G (116 km NLOS) where already 47G just worked in CW.

In addition to the QSOs in the map there were more stations involved in tests with 10G, of which I do not have detailed knowledge. - It was a nice day, and we all returned home happily.

Tomorrow we may try between EI and GM and EI and GD. I received a mail from Roger G8CUB that he will take part from IO83RO - maybe he can work into GD from there, the rest of us may be a bit too far out for more than 10G.

Friday 10th August - Another day full of activities: in the late morning we have been at the most north-east point of EI, east of Dundalk on a peninsula, which allows the shortest possible path to the Isle of Whithorn, but still 133 km. The weather was mixed, with rain clouds moving from west to east through the path. 24 GHz was easy, but mostly with obvious scattering, weaker signal, and a large beamwidth. We tried 47 GHz twice, but without success between EI and GM.

From the same location we worked the GD team on all bands, while on 76 GHz only crossband was possible due to the licensing restrictions. The 76 GHz signal was quite loud in EI, after 92 km NLOS.

We also did a short test with GM4ISM on 10 GHz, but this QTH is blocked by the mountains in his direction, so nothing heard.

In the late afternoon two activities took place: in the south between DL4SBK&Co who had moved from the Lake District to Wales, and the GD team. This was an easy job, 10G-76G within 30 mins, and in the sun.

The Irish and Scottish teams went to another location more north for an evening test over a short distance. Between The Gobbins (IO74DT) north-east of Belfast and the Killantringan Lighthouse (IO74KU) close to Portpatrick the North Channel has a width of only 36 km, so that the cliffs at the Irish side allow a view down to the Scottish coastline, from 100 m asl. The weather cleared up during the early evening, with just some haze remaining at the coast, but we could easily spot the lighthouse from Ireland.

We started 47 GHz which was booming, at 1 W and 60 cm. 76 GHz was still too strong to adjust the dish even with an extra 30 dB IF attenuator so we had to pull out the connector for more 146 MHz attenuation. Then the real test began: 122 GHz. It needed quite some time and another readjustment before we heard Michaels multiplier TX, but once found we could adjust our dish, and then he did the same based on the tone relayed by the 10 GHz talkback. After the setup was completed QSOs in SSB with 52 reports took place.

A bit later, half an hour before sunset, Michael activated a green LED transmitter which we could spot with the aid of a spyglass. Some more adjustment, and the green laser transmitters were visible on both sides with the bare eye. Finally a switch to red lasers modulated by speech, and we did a QSO on 660 nm, too. It was at the time of sunset when we left our spots for the long drive home.

Saturday 11th August - today we were less lucky with the weather. On the Irish side we tried to go to the Kippure transmitter site in the Wicklow Mountains 750 m asl, but the rain started already on our way north of Dublin, and the mountains reached until the clouds. So we returned without accessing the summit which would have been a 1 h walk.

In the east the morning looked better, Roger G8CUB and the GW team could complete QSOs on all bands up to 76G. GD and GM managed the missing 122 GHz QSO while 660 nm laser had been taken place already on Thursday evening. And finally GW worked into GM on 10 and 24 GHz, over a distance of 156 km.

Tomorrow will be the last day. We will test again 47G from EI to GM, and as much bands as possible between GW to EI and GI. The distance is between 120 and 135 km so we hope for reasonable weather and access to good sites. (*Ed. Unfortunately I did not receive a report on the last days operation*).

MI/DG8EB and MI/DF9IC Operating from south of Belfast on 10, 24, 47 and 76GHz.

EME News

From Neil G4LDR IO91

Activity from 32m antenna GHY6

Since last year's operation from Goonhilly using the 32m dish GHY-6, it was looking unlikely that the opportunity for further EME contacts would be possible. Because of the projected 50% shortfall of deep space communication capacity by 2022 to communicate with existing and future missions to the moon and beyond, GHY6 has received European Space Agency (ESA) funding (£8.4M) for a major upgrade starting this year. In addition it has been announced that Goonhilly Earth Station Ltd. had signed contracts worth £24M to provide communications with the planned commercial missions to the moon planned in the next couple of years. Because the upgrade work has not yet started there is another chance to activate GB6GHY. Operation will take place on the 1st and 2nd September 2018 from 0800Z to approximately 1300Z (when the moon sets). The 9 and 6cm bands will be used. The HB9Q moon logger will be used as the primary method of arranging skeds.

A station with a relatively small antenna should be able to receive the signals from Goonhilly, and if you don't have elevation control you could try listening a little while before moon set. If you do hear us tell us via the logger and try calling us, you never know we may be able to work you.

Brian Coleman G4NNS

G4NNS website has moved

TalkTalk have stopped hosting web sites so I have moved mine to brcg4nns.org and updated it.

I have kept all the EME stuff and the Feed horn design page but have removed the RDDS support pages. If anyone needs this info please let me know.

Beacon News

From Neil, G4LDR, IO91

The new 47GHz Bell beacon that unfortunately went QRT only hours after temporally being set up on the equipment cabin has been repaired and soak tested by John G8ACE. It is ready to back to Bell Hill and should be operational again by mid-September.

On the subject of Bell Hill the land owner is planning to put an access road leading to a new farm house adjacent to the mast. At the time of writing it is not known what effect this will have on the beacons (if any), and the land owner is reported to have said he is happy for the beacons to continue to operate from Bell Hill.

From Brian GM8BJF

Chris Tran's 10 G personal Beacon GM3WOJ in IO77WS located 20 miles north of Inverness is back on the air. It is on 10368.400 MHz. I have simplified the hardware and it now back to being a "steam" beacon, ie it only send its callsign and QRA in FSK CW and carrier. Further details are on my website at

https://gm8bjf.joomla.com/articles/3-the-gm3woj-3cm-personal-beacon-story

In case it is not audible south of the border ;-) you can listen to a live audio stream of the signal as received in IO85JV in Edinburgh courtesy of the wonders on the internet.

http://radscot.ddns.net:8000/ http://radscot.ddns.net:8000/

Click on the M3U button and the that should start your chosen media player.

.....and finally

The deadline for activity reports to be included in the next issue is Saturday 1st September 2018.

Beginners workshop on SDR programming

using the Gnu Radio Companion

John Worsnop G4BAO

On the day before the RSGB Convention, Friday the 12th of October, Kent's Hill Conference Centre Milton Keynes will be hosting a *"Beginners workshop on SDR programming using the Gnu radio companion"*

The course will be for RSGB members and based around "Gnu Radio" a free, graphical, software development toolkit that provides signal processing blocks to implement software-defined radios and signal-processing systems. It is widely used in hobbyist, academic, and commercial environments to support both wireless communications research and real-world radio systems. This is a PROGRAMMING course, so is aimed at people who want to create their own SDR Applications.

The Course Team

The course will be led by Derek Kozel MW0LNA, a Carnegie Mellon University graduate and Software Design Engineer at Ettus research, and Heather Lomond MIET, M0HMO an Embedded Software Engineer, specialising in Linux, audio and memory systems for mobile phones.

Delegate Requirements

As part of the course fee of £60, the course delegates will be provided with an "RTL Dongle" type SDR receiver and all the required software on a memory stick plus lunch and refreshments throughout the day.

Delegates must provide their own (preferably laptop) computer, meeting a minimum specification of, two or more USB ports, preferably one of which is USB 3.0, 4 GB or more of RAM, Wifi, Intel or AMD processor.

Numbers are strictly limited to 20 on the day. You may apply for a place at the workshop by emailing john@bravoao.co.uk requesting an application form. This will describe the course in more detail and in the interests of getting a balanced course intake it will ask you to provide a brief resume of your interests in Amateur radio and how you plan to use the knowledge gained on the day in advancing the SDR aspect of our hobby.

For further information see http://rsgb.org/sdr-workshop

Some links to whet your appetite

Getting Started 1	https://wiki.gnuradio.org/index.php/Guided_Tutorials
Getting Started 2	https://hackaday.com/2015/11/11/getting-started-with-gnu-radio/
The Manual	https://www.gnuradio.org/doc/doxygen/index.html

80m UK Microwavers net

Tuesdays 08:30 local on 3626 kHz (+/- QRM)

73 Martyn Vincent G3UKV

Events calendar

2018

Sept 7–9	63.UKW Tagung Weinheim	www.ukw-tagung.de/
Sept 9	Crawley Round Table	https://crawleyuwavert.blogspot.co.uk
Sept 15–16	BATC Convention (CAT 18), Midlands Air Museum	https://forum.batc.org.uk/viewforum.php?f=115
Sept 23–28	European Microwave Week, Madrid	www.eumweek.com/
Sept 28–29	National Hamfest	www.nationalhamfest.org.uk/
Oct 11–14	Microwave Update, Fairborn, Ohio USA	www.microwaveupdate.org/
Oct 12–14	RSGB Convention & AMSAT Colloquium	http://rsgb.org/convention/
Nov 3	Scottish Round Table	www.gmroundtable.org.uk

2019

March 15	IET Colloquium on Millimetre-wave and Terahertz Engineering & Technology 2019	www.theiet.org/events/2019/248017.cfm
May 17–19	Hamvention, Dayton	www.hamvention.org/
June 21–23	Ham Radio, Friedrichshafen	www.hamradio-friedrichshafen.de/
Sept 15–20	European Microwave Week, Utrecht	www.eumweek.com/

2020

August	EME 2020 in Prague	domain www.eme2020.cz registered but currently not in use [*Googling EME2020 comes up with some unusual items! Ed.*]

EME 2018 lectures & information

From Zdenek Samek OK1DFC

http://www.vhf.cz/text-presentations-lectures-and-posters-from-eme-2018/

We were able to obtain the organiser's consent and therefore publish all available presentations received by participants of this year's **EME conference** on USB stick. Due to free space on the server, we do not publish three films that are part of a lecture on the first transmitting of **DJ5YL** from **PI9CAM** on 432 MHz and movies from **EA9LZ** expedition. All other information are converted to pdf files and available in a **separate category of documents**.

Jan PA3FXB, thank you very much for your approval to publish.

Request: Microwave Site Database

Andy Talbot G4JNT

I've preparing a talk on "Sites, Heights and Locators" for Crawley RT and would like to credit whoever first put together the Microwave Site Database that I used to generate the original Sites.dat file.

I got it in BBC Basic format from Julian G3YGF round about 1990/91 era and know that Ted G4ELM and Peter G3PHO and probably Barry G8AGN were contributors. But who else?

It also went though a number of additions round about 2006 when Mike G0MJW was doing his 'Profile' software - although many of the additions then do appear to have been around the Didcot area :-)

http://g4jnt.com/SiteDatabase.htm

Andy

www.g4jnt.com