An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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

FROM THE EDITOR

2004 – SEPTEMBER

As the British "summer" fades into oblivion, the bands above 1GHz finally opened to Continental Europe and provide the UK microwaver some small compensation for a summer season that has been one of the wettest on record. Thoughts are now turning towards the winter months ahead and what microwave projects can be undertaken (your editor still has several outstanding from two or three years ago!). Please write to this newsletter with details of your microwave projects and experiences. Our readership is worldwide so, surely, we can exchange much interesting information via this modest publication. We have several microwave "newbies" on our mailing list. Articles helpful to them would be especially welcome.

Thanks go to all our contributors this month. There is still a large article by Paul Wade, W1GHZ, held on my hard drive and awaiting publication. I hope to include the first part of this in next month's edition of Scatterpoint.

At a personal level, I'm eagerly looking forward to my annual "pilgrimage" to Microwave Update in mid October. Held this year in Dallas, it promises to be a great event. Meanwhile, UKuG and M.A.R.S are in the middle of planning November's Microwave Round Table at Martlesham. Do check the UkuG website and my own personal webpages for further details as they come in. The lecture programme is 99% settled but the accommodation and registration formalities are not yet complete. Hopefully these will be sorted before the end of this month.

The 26th September sees the annual Crawley Microwave Round Table meeting at the Crawley A.R. Club premises. Again details can be found on the internet.

Until next month, happy microwaving and thanks for supporting the UKMicrowave Group. The changeover from the RSGB Microwave Newsletter has been a real success!

In this issue ...

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

G3PHO: Peter Day ++(0) 114 2816701

G3PHO: Email: microwaves@blueyonder.co.uk

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SUBSCRIPTION ENQUIRIES SHOULD BE SENT TO THE UKuW GROUP SECRETARY AT THE ADDRESS SHOWN ON PAGE 2

About the UK Microwave Group

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UK MICROWAVE GROUP

ANNUAL GENERAL MEETING – PRELIMINARY NOTICE

The Annual General Meeting of UKuG will be held on Sunday, 14th November, 2004, during the Martlesham Round Table at BT Adastral Park, Martlesham, Suffolk. All members who could possibly attend are urged to do so.

A more detailed notice will appear in the October issue of Scatterpoint, together with an agenda for the meeting. If you have anything that you wish to be brought up at the AGM please email or write to the Group Secretary, Martyn Kinder, G0CZD, at the address shown above, within 21 days of receiving this newsletter.

At least one of this year's committee members has indicated that he wishes to stand down as he is now domiciled overseas. If you are interested in becoming a member of the UKuG committee and have some particular expertise to offer, please contact the Group Secretary. You should have someone to second you. Please add their name and callsign to your email or letter.

The present, 2004, Committee comprises the following members:

Peter Day, G3PHO - Chairman
Martyn Kinder, G0CZD- Secretary
Steve Davies, G4KNZ - Treasurer
David Wrigley, G6GXK
Sam Jewell, G4DDK
Simon Lewis, GM4PLM (now DL4PLM)
Jonathan Naylor, G4KLX (now in ON4)
Murray Niman, G6JYB - Webmaster
Mike Wade, G8OGO
Kent Britain, WA5VJB

New amateur satellite transponder project

The following press release has been received from AMSAT UK, via Trevor M5AKA [m5aka@g0mwt.org.uk]:

PRESS RELEASE - Friday July 29th 2004


G3YJO

The Chairman of AMSAT-UK, Professor Sir Martin Sweeting G3YJO, has announced a new amateur transponder project to be launched as part of the ESA SSETI Express satellite.

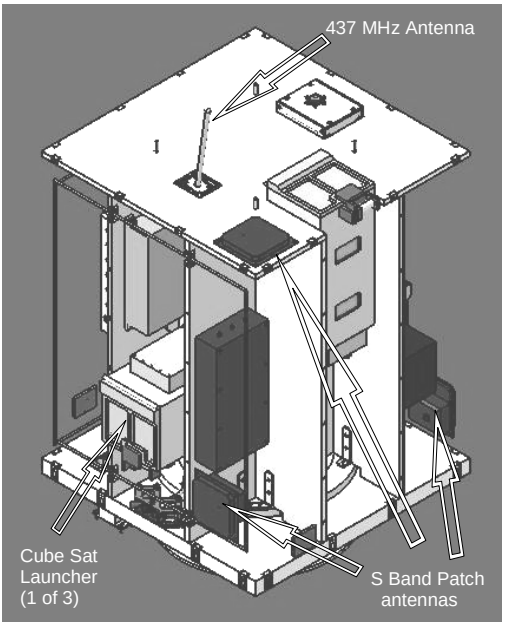
Speaking at the opening of the 2004 AMSAT-UK Colloquium at the University of Surrey in Guildford, he expressed his delight that AMSAT-UK has been able to work with the European Space Agency to provide, at very short notice, an S band (2.4GHz) transmitter.

The SSETI Express project is believed to be the first ever pan-European student satellite with over 100 students from more than nine different countries working on it. The project is being coordinated and managed buy the Education Office of ESA.

It is intended that this transmitter will be available for use as the downlink of a single channel FM U/S transponder. The 437MHz receiver is also being provided to ESA by another radio amateur - Holger Eckart DF2FQ.

These frequencies will enable the many amateurs who already have Oscar 40 equipment to use it in an exciting new way.

After integration of the spacecraft, which is due to start at the ESTEC laboratories in the Netherlands next month (August), SSETI Express is intended to be launched into a sun synchronous 680km orbit from Plestek in Russia in April 2005.



The satellite is in the 80kg class and is being designed and constructed by a number of European University teams which include students and teachers. The onboard experiments include attitude control, a camera and a cold gas propulsion unit.

It is intended that the 2.4GHz downlink transmitter will transmit satellite telemetry and data at 38k4 data rate before being switched over to voice transponder operation after the onboard experiments have been completed.

ESA will shortly be announcing a worldwide competition for radio amateurs who download the data from the satellite and forward it to a website which is under construction. There will be a valuable award for the amateur who provides the largest amount of verified data over the first few weeks/months of operation.

The 2.4GHz downlink exciter, the switched mode power supply and control

interfaces are being developed by an AMSAT-UK team comprising of Sam Jewell G4DDK, David Bowman G0MRF and Jason Flynn G7OLD, with Graham Shirville G3VZV assisting.

The 3 watt 2.4GHz power amplifier is completed and has been provided by Charles Suckling G3WDG and this unit is already space qualified as it is identical to the one flying in the recently launched Oscar 51 spacecraft.

The S band antennas are three flat plate patches that have been developed and produced by the Wroclaw University of Technology in Poland.

Professor Sir Martin Sweeting emphasised that AMSAT-UK is delighted to have been entrusted with such an important task and that development team will have the organisation's full support.

Membership of AMSAT-UK is just £15 a year and all members receive the publication Oscar News. For further information contact the AMSAT-UK secretary Jim Heck, G3WGM :
Tel: 01258 453959
E-mail: g3wgm@amsat.org
Website: www.uk.amsat.org

A rocket being launched from Plestek, the base from which the SSETI Express will be alsobe launched

NEED A MANUAL FOR YOUR TEST EQUIPMENT?

Many of us pick up bargains at amateur radio rallies only to find they have niggling little faults that require the workshop manual before any troubleshooting can be undertaken. If you have an HP spectrum analyser of the HP141 + 8555A plugin variety, or an HP sweeper of the same vintage, or maybe a Tektronics item, you will find the CD produced by Jose, EB5AGV, a real boon. It's packed with service manuals for some 262 Hewlett-Packard, Tektronix and other brands. At a price of 10 Euro or $10US, you can't afford to be without it!

You can visit Jose's website at: http://jvgavila.com/testeq.htm

Or email him at: eb5agv@ctv.es

His postal address is: JOSE V. GAVILA
CALLE 303, 26
46182 LA CANYADA (PATERNA) - VALENCIA
SPAIN

SQUARES/DX AND MICROWAVE ACTIVITY TABLES

It was hoped to have both these lists published in this issue but input to them from readers has been very much down on previous years, such that less than a handful of entries has been received for the 2004 LeagueTable. Take a look at:
www.g3pho.org.uk
and download the list as it is so far. The rules are also on the webpage.

If you have new entries, please email them to G3PHO as soon as possible so that we can print the Table before the year fades out!

Entries are welcome from anywhere in the World!

Tweaking Commercial Ceramic Filters

By WA5VJB Kent Britain

WB0TEM picked up a large number of these 2332 MHz Ceramic Filters. He then pulled a dirty trick by giving me 50 of them! They will work, as-is, at 2304MHz, but the response is falling fast and then you need to try a few to find a good one. Marc was hoping I could figure out a way to re-tweak them. It seems that you can!

Find some solid copper wire that just fits back down the center opening of the ceramic element, something in the #20-#24 range. The same size wire might not fit all the elements. Now tweak away. If you go all the way in, the element will short out, but there is a space near the bottom where you're retuning the filter element. I got these to go down to 2275 MHz, a drop of over 50 MHz with little trouble. Next, a dab of RTV (or my favourite, Liquid Nails) to hold the wires in place. Then trim off the excess wire after the glue dries. Super Glue wicked all though the filter making a mess .... I don't recommend Super Glues!

Antenna Tests at AMSAT Colloquium 2004

By Mike Scott, G3LYP and Sam Jewell, G4DDK

The 19th annual AMSAT Colloquium was held at the University of Surrey from 31st July to 1st August this year. The antenna test range was set up on the University sports ground on the Saturday morning when a variety of 2.4GHz antennas, varying from a minute quadrifilar helix to a number of commercial LAN antennas, were compared for gain against a known reference horn.

The test range consisted of a 10mW source, amplitude modulated by a 1kHz tone, fed to a horn mounted at ground level and placed approximately 100ft away from the reference/test antennas. The signal from the receiving antenna was rectified by a coaxial diode detector and the resultant 1kHz signal fed to a Marconi 6593A SWR Meter. Details of the method used can be found in the "old" version of **Scatterpoint** (The journal of the UK Microwave Group) Vol 1 p.8 and Vol 6 p.11. *(see the UKuG website for pdf copies of these issues … editor)*

Results of the tests are tabulated below:

Callsign	Antenna Type	Measured Gain
Reference	Rectangular horn (W1GHZ design)	15.5dBi (Calculated from the aperture size)
G8JXA	Long Tubular horn. Probe feed	6.5dBi
G3WFM	16 Turn helix (G3RUH design)	13.6dBiC
G0MRF	Rectangular horn	15.0dBi
DH2VA	QF Helix	4.5dBiC (max response position)
G0NZO	K5OE Dual patch – 2.4GHz portion	9.0dBiC
G4DDK	Log Periodic Yagi (Commercial.)	6.5dBi
G4DDK	Maxrad omni white stick WLAN Access point antenna (commonly seen at UK radio rallies)	7.5dBi
G4DDK	Huber Suhner patch type SPA 2400/75/8/V	7.0dBi (H-S 7.5dBi claimed)
G4DDK	Huber Suhner patch Type SPA 2400/27/17/0/V	16.0dBi (H-S 16.5dBi claimed)

All gains are measured with vertical linear source polarisation. Gains are quoted as dBi (isotropic) when measured in linear polarisation only. dBiC indicates that the circular polarisation gain was calculated from the average of the vertical and horizontal gain + 3dB.

The Huber and Suhner patch antenna gains are assumed to be accurate and therefore the range antenna gains measured about 0.5dB low. This is excellent for an improvised range. Some gains have been rounded to the nearest 0.5dB in the table; therefore some antenna gains may be closer to the gain reference provided by the Huber Suhner antennas than shown in the table. Conversely, some may be worse!

Our thanks to all those who provided antennas to be measured. Without you it would be boring. **PLEASE, bring more antennas next year!**

Letter from the Low Countries ~ G4KLX in Belgium

As you may know, I have recently moved to Belgium, hopefully long term. Property is very reasonably priced here, the people are friendly and the food and drink are sensational.

I had arranged to meet up with Christophe ON4IY over ON4KST and e-mail after I arrived. I arrived on the Sunday and the Monday was a Bank Holiday so I had a free day. We met up at 5.30pm and immediately headed into Leuven for food and drink, an excellent Spaghetti Bolognese and Hoegaarden beer. Over dinner he explained about the new regulations in power that limit the field strength that is permissible, a similar problem being faced by the Germans. The system is self regulating but it has the effect of potentially killing off all serious V/U/SHF operation below 10GHz. These restrictions end at 10GHz so at least there is some avenue for hope; also the HF people don't mind since they have lower antenna gains. UBA, the national society appears to have done little to oppose these moves.

Christophe also explained that the Leuven club was now a shadow of its former self compared to when I used to attend in the 1997/98 period. Many of the microwavers are no longer active and they have lost their excellent club house to re-development. Many of the microwavers were young and are now starting out on families and other areas not conducive to radio operation.

After food we headed to Christophe's house and I saw his shack and an impressive selection of test equipment. We found that we both shared a liking for classic Kenwood radios for tunable IFs, great minds think alike. In his case the TM255/455 combination, in mine the older TR751/851 pair.

After a short break we headed for his /P estate car. This is a separate car which is permanently stocked with a complete 6/3cm system along with a very powerful 2m talkback system. Getting into the car was difficult ... I had to squeeze between two antenna poles and a 2m yagi. Christophe then gave me a tour of his favourite local portable sites. The best was on a man made hill between a fire station and the
motorway. The Leuven area is rolling hills and it is difficult to find a good site that really is better than average. This man made hill was good but it does mean carrying the equipment by hand to the top and having to operate in the open.

We then moved onto his preferred portable location which is next to an underground reservoir, and a high power radar on 23cms. This site is particularly good to the north and west, with good views to Antwerp and to Brussels, the fires on the oil refineries in Antwerp were particularly impressive. For talkback we used an old laptop with an extremely dodgy keyboard and an Internet connection via GPRS, simple and effective as it gave us access to both ON4KST and Converse.

Christophe's 6cm/3cm system is particularly simple,consisting of a board, pegged to the ground, with a 12V Kenpro rotator attached and the 6cm/3cm system on a pole into the rotator. The whole thing stands only about 1.5m above the ground with the option to guy the pole with the transverters and dish just below the dish. The dish is a 60cm prime focus and a dual band feed. Apart from the 12V rotator, a rarity, one of the most striking things that Christophe uses is a number of DC-DC inverters. He has an extremely large inverter attached to a pair of large batteries which he uses to feed his powerful 2m system and his microwave transverters and another, smaller one, just next to the transverters to remove any voltage drop over the cable run .... a simple but effective system.

Conditions were not good when we operated. Tropo allowed us to work PA0EZ on 6cm which is an easy path, and we got some rain scatter over the Eiffel allowing us to work F5HRY and DJ5BV, no great DX but signals were strong. Activity was low however. After battling low activity for three hours we packed up and headed back to his house and changed back to his normal car and he kindly dropped me back at my hotel in Brussels. The next day was to be my first in my new job and I didn't want to be too tired '... it gives a bad impression!

That was my introduction into microwave operating in Belgium. I hope to accompany Christophe on one of his trips to JN29 in due course and to re-join the Leuven club and maybe help to improve its commitment to microwave operation again.

2004 ARRL International EME Competition Rules

1. **Object.:** Two-way communications via the earth-moon-earth path on any authorized amateur frequency above 50MHz.

2. **Date and Contest Period:** Three full weekend 48-hour periods (0000 UTC on Saturday through 2359 UTC Sunday). The 2004 dates will be as follows:
   - October 9-10 50 MHz through 1296MHz
   - October 30-31 2304MHz and Up
   - December 4-5 50MHz through 1296MHz

3. Entry Categories:

3.1 Single Operator: One person performs all operating and logging functions, equipment adjustments and antenna alignment.
3.1.1 Multiband: Multiband entries in categories 50MHz through 1296MHz, 2304MHz and Up, and Overall will be recognized in awards offered.
3.1.2 Single Band: Single-band entries on each band will be recognized in awards offered.
3.2 Multi-Operator: Two or more persons participate; includes neighbouring amateurs within one state, but with EME facilities for different bands on different team members' premises, as long as no two are more than 50km (30 miles) apart. Multi-Operator neighbourhood groups may use the same call signs at each location if permissible under national licensing rules and regulations. If not permissible, separate callsigns may be used for the multi-operator neighbourhood entry. When operating under this neighbourhood provision, all logs must be submitted together in a single envelope or email with a single summary sheet showing the combine operation, designating the principal callsign for the entry. All multi-operator callsigns will be shown in the results.
3.3 Commercial Equipment: Stations using equipment that is not amateur (such as a dish antenna for lab equipment owned by an institution or government agency) will have their scores listed separately.
3.4 Only one log may be submitted per callsign

4. **Exchange:** For a valid contact to occur each station must send and received both callsigns and a signal report in any mutually understood format, plus a complete acknowledgment of the calls and report. Partial or incomplete QSOs should be indicated on your log, but not counted for contest credit. Stations may be worked once per band for credit.

5. Scoring:

5.1 QSO Points: Count 100 points for each complete EME contact
5.2 Multiplier: Each US State and Canadian Province, plus each DXCC entity (not US/Canada) worked via EME on each band.
5.3 Final Score: Multiply QSO points by sum of multipliers worked on each band for your final score.

6. Miscellaneous:

6.1 Fixed or portable operation is permitted.
6.2 Contacts may be on CW, SSB, or digital modes. Only one signal per band is permitted. While not required, it is requested that the mode be identified in the log for information only.
6.3 A transmitter, receiver, or antenna used to contact one or more stations under one call sign may not be used subsequently under any other call sign during the contest. An exception is made for family stations where more than one call sign has been issued, and then only if a different operator uses the second callsign.
6.4 There is no specified minimum terrestrial distance for contacts, but all communications must be copied over the moonbounce path, regardless how strong (or weak) a nearby station's terrestrial signal may be.
6.5 Stations are encouraged to send in a log containing all contacts during the contest, regardless of entry category.

7. **Reporting:** Entries must be postmarked no later than January 5, 2005 (30 days after the contest) and must include complete log data as well as a complete summary sheet. Official forms are available on the ARRLWeb or with a SASE request to the Contest Branch. Your summary sheet should show a band-by-band breakdown of QSOs and multipliers, and include details of your stations setup and a photo. **Cabrillo format is not required for electronic submissions in the EME Contest, provided the entry includes the log file and a fully completed standard summary sheet**. Email entries should be submitted to EMEcontest@arrl.org and paper/diskette entries should be submitted to **EME Contest, ARRL, 225 Main Street, Newington, CT 06111, USA**

8. **Awards:**

8.1 Certificates will be issued to the top five stations worldwide in each of the entry categories:

- Single Operator Single Band
- Single Operator 50MHz – 1296MHz
- Single Operator 2304MHz and Up
- Single Operator Multiband Overall
- Multi-operator 50MHz – 1296MHz
- Multi-operator 2304MHz and Up
- Multi-operator Multiband Overall

8.2 Additional awards will be issued where significant achievement or competition is evident. In addition, each station that successfully comple tes at least one EME contact during the contest period will receive a certificate commemorating that achievement.

9. **Other:** See "General Rules for All ARRL Contests" in November 2001 QST.
9.1 In addition to their official entries, participants are invited to submit contest stories and photographs to the ARRL Contest Online Soapbox.

G4JNT DDS KITS ... UPDATE

From: Andy [actalbot@southsurf.com]
Sent: 09 August 2004

Thanks to the Flight Refuelling Hamfest, all remaining samples of the DDS kit have now been sold and I would now like to gauge interest for another batch, which will give an opportunity to make a couple of changes to the PCB to assist cooling.

Is anyone interested in the following options?:

a) Another batch of the short kit containing PCB, DDS chip and programmed PIC for the original price of £60 , or

b) The complete unit ready built and tested, with a packaged crystal oscillator for the clock source. The price of this would be in the region of £100 for a ready to use, computer controlled, DC to (around) 100MHz continuously adjustable VHF source.

c) Options on **b)**, such as a Temperature Compensated Oscillator, output filter etc could be negotiable.

d) With the addition of a rotary encoder or keypad, changes to the PIC software could allow a stand alone signal generator.

Thoughts please to ...
Andy G4JNT

BEACON NEWS

The F1EIT 10GHz beacon , originally located in JN03TI , has moved to a better QTH. The call sign changed as well. Now the beacon is **F6CXO** (waiting for an official call sign later).
The **Location is JN14EB,** 650m asl , F1A modulation, 1W pwr.The **antenna** is a slotted waveguide with 13dB gain. The **frequency** is 10368.950MHz
Best 73 from Dom/F6DRO

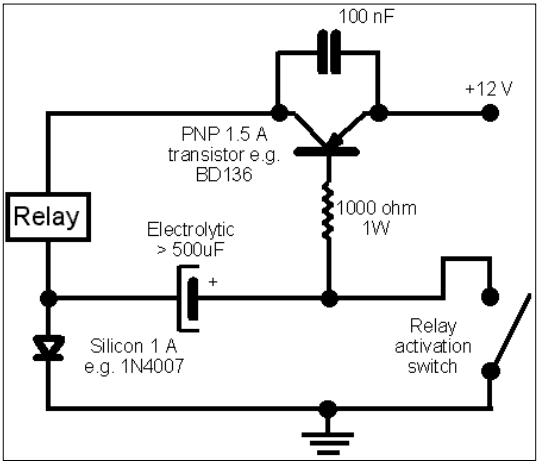
News just in from Hans, PA0EHG

*He has installed the **47GHz beacon** I showed at the Round Table in April now he has finished boxing it. Location is **Schipol** along with the other beacons. I will update you with more info (if its Newsletter copy) as it comes in but this is what Hans said for starters (73 from John, G8ACE):*

Hi John,
Great news, the **47GHz beacon** can be heard by PA3AWJ about 56 to 57 so good signal over a distance of bit more than 45 km. PA3AWJ has antenna 39 mtr ASL and line off sight contact to the tower. He is very happy with this beacon, so good succes.

Best 73 Hans PA0EHG

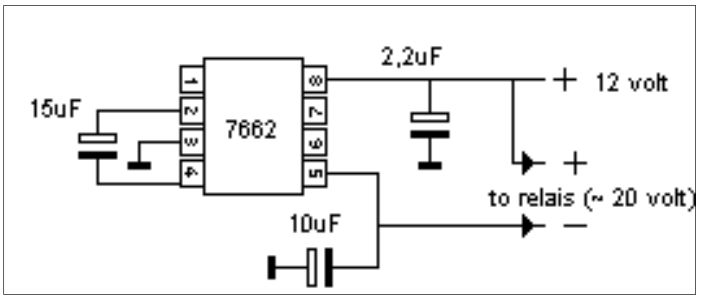
USING 24-28VDC COAXIAL RELAYS WITH 12V SUPPLIES



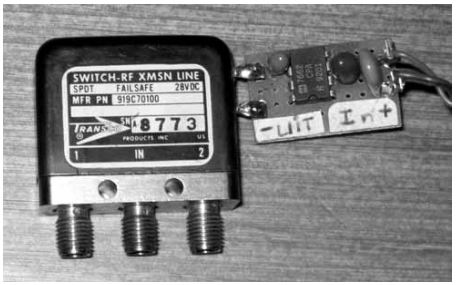
Recently, there's been quite a flurry of postings on the UK Microwave Group reflector concerning relay power supplies. Your scribe has had no problems whatsoever with a simple DC to DC upconverter using an NE555, a couple of diodes and a Darlington transistor pair which supplies a healthy 22 volts DC on load, easily enough to operate the ubiquitous Transco and Dynatech microwave relays. For those who have not had much success with such a circuit, here's one based on the fact that all relays, once activated, need a much lower voltage to remain active. The circuit originates from one by Tony, I0JX.

When the PTT switch is closed, the relay is activated by almost 24 volts, which is the sum of the psu voltage and the charged electrolyitic capacitor. As the capacitor discharges, the voltage across the relay falls to the 12 volt level which is sufficient to hold the relay over.

You can adjust the values of **R** and **C** to suit your relay.



Here's a simple one based upon an IC7662 chip.



With just four components, it is easily assembled and can be attached directly to the relay as shown here on the left.

(Thanks Hans, ON4CDU for this one)

Recent threats to the Amateur Services in the Microwave bands. (Part 2)

Introduction

Part 1 *(last issue of Scatterpoint — editor)* dealt with upcoming possible problems in the 5.6/5.7GHz ("6cm") band, arising from increasing occupancy of the band by commercial users for "WLL" purposes. As before, the comments in bold italics and/or underlining in the following text are my additions. Again, I leave you to draw your own conclusions.

Detailed Spectrum Investigation Reports within CEPT have ***recommended*** that Administrations take into consideration the needs of the Amateur Services which are acknowledged to utilise **"*very weak signal flux*"** (Notes EU1 and EU2, page 159 of the DSI Phase 1 Report, March 1993.) ***This has never happened – "recommendations", like "consultations", it seems, seldom, if ever, work!***

This second part deals with similar perceived problems in the 1.3GHz and 24GHz bands, although from totally different sources and possibly more widespread in their effects.

The 24GHz band:

The automotive industry has had a band allocation at around 79GHz for many years, for use in vehicle (anti-collision) Radar using ultra-wideband (UWB) technology. This has not, so-far, been exploited (with the exception, possibly, of Japan), the excuses given being that "the technology is not sufficiently advanced and is too costly", all of which to me is manifest, commercial "smoke screen", seeking solely to minimise cost and maximise profit at this time. As an alternative ***"Short-term"*** proposal, a consortium of European car manufacturers is seeking to use the 24GHz band – the first of the microwave bands where there is an Amateur Services Primary (Shared) allocation.

So, what are UWB and SRR?

Ultra wideband, or UWB, is a classification for the spectral width of a transmission system, considered as a fractional BW >25% or an absolute BW of more than 1.5GHz, according FCC NPRM.

ETSI TR 102 263 (2003-10) states that "Automotive radar functions covers both Long Range Radar (LRR) and Short Range Radar (SRR). Adaptive cruise control (ACC) today uses LRR operating between ***76 and 77 GHz*** with a maximum bandwidth of 1 GHz ***(further implications for the Amateur Services?)***. It uses distance scanning, which requires an operating range of approx. 150m and is used at vehicle velocities not below 30 km/h. One or multiple narrow lobes control or scan the driving path in front of the car to determine the distance to the vehicle driving ahead for maintaining a constant minimum safety distance. The mean power levels (EIRP) are 50dBm for class 1 and 23.5dBm for class 2 . Peak levels are 55dBm. (see EN 301 091-1)"

Technical characteristics of the SRRs:

"SRR units operating at 79 GHz (i.e. in the band 77-81 GHz) require an operating range from 0 to approximately 30 metres and are used for a number of applications to enhance the active and passive safety for all kind of road users. Applications which enhance passive safety include obstacle detection, collision warning, lane departure warning, lane change aid, blind spot detection, parking aid and airbag arming. The combination of these functions is referred to in the literature as an electronic "safety belt" for cars".

"The 79 GHz SRR is a combination of two functions. It allows on the one hand a precise speed measurement with help of a CW Doppler emission. This speed measurement mode is combined with wideband signals to provide precise radial range information of objects with a high range separation (resolution) in order of approximately 5-10 cm. To obtain the required resolution the SRR needs a large bandwidth of 4 GHz for the range measurement."

"According to a defined mean PSD EIRP mask. Emissions outside the necessary bandwidth are considered as spurious emissions.SRR functionality may be integrated with LRR function into one device."

The EU scenario:

Recently, a consortium of European motor manufacturers proposes to use the 21 – 26GHz band, "where suitable technology is available". This resulted in considerable technical interchange between the RSGB, IARU Region 1 and the various Working Groups of CEPT. The following extract is from 48th WG FM Meeting at Kusadasi, Turkey, 26 – 30 January 2004.

"A permanent frequency band at 77-81GHz range (79GHz) for Short Range Radar (SRR) applications in Europe. An ECC Decision has been developed and is now subject to the ECC process for public "consultation". The 79GHz band should be made available within EU member states and other CEPT countries by January 2005 in order to encourage industry development of components and technology for this frequency band"

"Possible temporary use of 21.5-26.5GHz (24GHz) frequency band with limited number of equipment in the market place in Europe and only applicable for a limited time frame". ***"Temporary" appears to be 2006 to 2020 and possibly beyond, depending on the natural (vehicle life) wastage!***

"Technical conditions on SRR implementation should be established ***in order to ensure protection of the existing services in the 21.5-26.5 GHz band".*** The report suggests a power level limited to -41.3dBm/MHz with attenuation for 23.6-24GHz at 30° above the horizontal plane as already included in the FCC Regulations.

"Furthermore, regulatory means should be found to limit the placing on the market of 24 GHz equipment to a defined period in time, in accordance with the results of the sharing studies as agreed by the SE WG. It has been suggested in the report to limit the percentage of vehicles equipped with SRR devices to 8.3% on each national market. Additionally each automotive manufacturing group should take measures with respect to its production intended for the European market to ensure that until 2014 its vehicles equipped with 24 GHz SRR will not exceed 10 percent of its share of the vehicle parc (sic) at national levels. Not all manufacturing groups will implement 24 GHz SRR from the outset, or at all, so there is confidence that the absolute 8.3% limit would not be exceeded". ***? More smoke-screen?***

"To provide certainty of the applicability of the possible temporary solution a reporting programme for 24 GHz equipment placed on the market in Europe must be arranged together with a commitment from car manufacturers to publish market figures and to accept the maximum penetration limits required by the Administrations".

What seems to have been totally ignored is the fact that there are likely to be ***up to eight SRR devices fitted to each vehicle*** and the cumulative effects of these and high density traffic in the boresight of a high gain amateur antenna system and its associated very low-noise receiver systems may lift the noise floor to such an extent that very low signal-flux signals will no longer be usable.

The 1.3GHz "23cm" band

Here the threat is totally different and the effect is worldwide, insofar as the "vehicle" carrying the threat is a chain of 30+, 50W, MEO satellites providing the European equivalent to the well established American NavTex Global Positioning System, or GPS. The Indian, Russian and Chinese governments have expressed a "co-operative interest" in this proposed new system. ***You bet they are, and it ain't for civilian reasons!***

The current American system uses frequencies in the range 1164MHz to 1214MHz or 1560MHz to 1595MHz, and there have been strong international objections from the US to the use of the same, or similar, frequencies for the proposed, parallel, European system known as "Galileo". The principal difference is that the US system is a high precision military network combined with a subsidiary, less precise, "civilian" network, whereas Galileo is ***"purely civilian". I would be very surprised that such a beast exists!***

Accordingly, the Galileo consortium has suggested ***alternative frequencies within the 1.3GHz band, at 1260 to 1300MHz*** – yes, you've guessed it – "our" shared 23cm band, which is the first microwave band where there is an Amateur Satellite Service (earth-to-space) allocation at 1260–1270MHz. A bid to establish an Amateur Satellite Service space-to-earth link in this band at WRC 2003 appears to have failed.

The argument is that the Galileo network of satellites is unlikely to interfere with amateur activities, insofar as the majority of amateur activity in this band is perceived as "terrestrial". Two things have been overlooked (or ignored) – the first is the satellite service's E to S allocation (what effect will a strong amateur signals have on Galileo?) and the second is that the best eme DX coverage is at low moon elevation angles where the antenna is pointing just above the horizon, which may almost certainly mean that one or more of the Galileo satellites will be in the beam, both on transmit and receive.

It is not clear yet what the final (frequency) outcome will be, as the arguments between the USA and EU authorities are still going on, but the contract to build the GSTB V2A (Galileo System Test Bed, V2A) satellite has been awarded to Surrey Satellite Technology Ltd. (SSTL) and will be launched by Soyuz with a target date in early 2006.

Conclusions

Proposed "high density" (commercial) uses for the 1.3GHz, 5.6/5.7GHz and 24GHz bands are likely to interfere with amateur very weak signal flux activities from around 2005 onwards.

By very weak signal flux activities, I mean extreme terrestrial tropo. DX and DX worked either by eme or satellites. It should be noted that the only other currently practicable earth-to-space and space-to-earth allocations are in the 5650 to 5670MHz and 5830 to 5850MHz segments, respectively. As we saw last time, these Amateur Satellite Service allocations may well be "spoiled" by WLL activities! The implications for the Amateur Satellite Service are, thus, probably worse than for the Amateur Service.

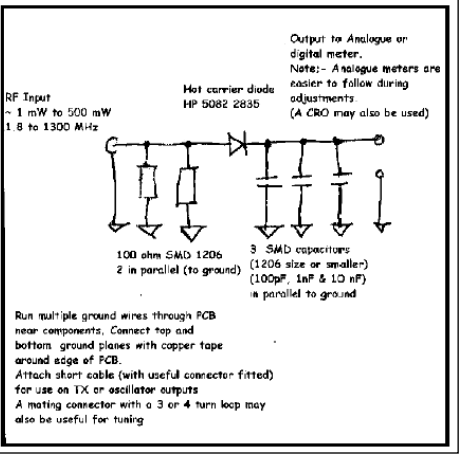
Any sensible proposals for increasing serious microwave usage (which might justify trying to get some Amateur Primary Exclusive segments) would be welcomed by the Spectrum Forum. Can I also remind you that the IARU Region 1 Triennial Conference is due in September next year and the call for "official" papers (Proposals, Recommendations or information) is due in early September this year. Please consider carefully what ***you*** want to have presented at that Conference and submit a draft to me o/b/o the Spectrum Forum. I am willing, as always, to knock any drafts into the format and wording acceptable to IARU.

Meanwhile, I can only reiterate what has been said a hundred times before – "Use or Lose"!
I shall be keeping my ears close to the ground for further information to pass on via "ScatterPoint".

G3PFR, RSGB Microwave Manager.

A SIMPLE BUT HANDY DIODE DETECTOR

Component list for diode detector
Hot carrier Schottky diode HP5082-2835 (or similar)
100 ohm SMD 1206 resistors. (2 off)
100 pF SMD 1206
1nF SMD 1206
10nF SMD 1206
Offcut of double sided PCB 1.6mm
(Run wires through PCB near the resistors and capacitors)
Parts are commonly available via the VHF Groups/ RS/ Farnell/ scrap pcbs and other sources. Contact the scribe if you have difficulty locating suitable components.
The detector can be connected to the output of an oscillator/TX via a short coax cable and connector or used with a multi-turn loop to detect oscillator/ multiplier operation. The detector works from ~1 mW to 500 mW (maximum dissipation of the 1206 resistors. The detector may be used from 1.8 MHz up to 1300 MHz. Adding a further capacitor will lower the LF limit. If required a chart can be drawn to convert the volts to power in mW, using the formula.
P (in mW) = $1000 \times [(V + 0.25)^2 / 100]$



Our thanks to Kevin, ZL1UJG and the New Zealand "FUN" VHF/UHF/SHF newsletter for this item

In spite of torrential rain for much of the "summer", it's been a most interesting couple of months since the last report in this column. At last, in Early September, we had a decent tropo opening to the mainland of Europe and the contest scene has had also seen encouraging support with some 33 or so stations operating on 3cm and 11 on 6cm during the July cumulative contest.

July Activity:

Neil, G4LDR (IO91EC) tried to work G0FDZ /P on the Scilly Islands on the 25th and 26th of the month, several times, but as expected it ust too far from under the normal conditionsprevailing. It was even difficult for G4ALY who is 200 km nearer!

In the JulyCumulative Contest Neil worked 22 on 3cm, best DX being F6DKW . On 6cm he managed 9 including F6APE at 420 km. It was almost impossible to get much further north than a line joining Bristol to Ipswich and real struggle with G3UKV/P on Brown Clee where reports were exchanged more by guesswork than anything else. Neil did, howeve,r manage to work G3LRP for the first time in more than a year.

Neil found some activity on the higher bands down south with 3 two way contacts on 24GHz and he also heard G4ZXO/P from Ditchling Beacon (at 110km) which makes ZXO/P the most distant 24 GHz station he hase heard from home. His output power seems to have dropped right off (mW not Ws) from the reports from the locals worked G8ACE/P, G1JRU and G0MJW/P (a new 24GHz station for this year).

From Keith, GW3TKH, we have a report on the **GB5FI** expedition to **Flatholm Island,** just off the South Wales coast, at the end of July: He was setup by 1430 on Thursday 22/07/04 at Castle Point, IO81KJ and monitored beacons to get some idea of conditions. The only microwave beacon audible was GB3CCX at S9+5. (98km)

Friday 23/07/04: At 0830 GB3CCX was S9+5, GB3KBQ was S1 on a bearing of 033deg, not audible on direct heading 176deg! With 2m beacons strong from GM, PA & F, he worked a couple of border Gs and a PD to test the talkback equipment. GB3CCX was S9+30 at 1800.

Saturday 24/07/04: GB3CCX was S9+20 all day. GB3KBQ was S1 all day.

Sunday 25/07/04: They moved station 100m south and about 10m higher for better take off in all directions but very exposed. GB3CCX was S9 at 0630. SW wind increasing. GB3CCX was S1-2 at 0930. 3cm contacts were made with: GW8AWM/P, G3JMY & G3ATM/P and a one-way with G8LSD/P. Attempted but not heard on 3cm: G4EAT, M0EYT/P, G4ALY. Heard fleetingly, G3PHO/P. GB3CCX was <S1 at 1230.by which time the wind was a steady force 6, making it very difficult to operate due to the tent collapsing down to the height of the gear! So the kit packed up and removed to safety at 1530, before it was all lost over the cliff.

No contacts on were made 6cm. Conditions, both rf and wx, were worse than last year in July.

Peter, G3PHO/P operated from **Corsenside Common, IO85VE44** (near to Otterburn) in Northumberland, the very wet weather in the morning preventing him from reaching a farm site in IO95. Propagation conditions could not have been much worse, with the 2m talkback being badly affected by a superb aurora! This gave S9++ signals on 144MHz from Finland and Russia, with the beam to the NE, but extremely poor terrestrial links to the microwave stations down south. The 6cm and 3cm bands also had poor conditions and few contacts were made. Only 6 fortunate microwavers were able to get IO85 from Peter on 3cm, G8LSD/P (IO90TV), G1SLE (IO93IF), G4EAT (JO01HR), G3XDY (JO02OB), G3UKV/P (IO82QL) and G0EWN/P (IO93FK). Even fewer managed the path on 5.7GHz ... G3XDY (JO02OB), G4PBP (IO82WO), G8ACE/P (IO91JA), G3PYB/P (IO90LS), the latter being the day's best DX at 487km.

Dave, G0RRJ (IO91FE), reports that hehas received a DB6NT 8 watt PA for 6cm, and has ordered a coax relay from G1MFG.He was hoping to have this installed on the mast mounted transverter during August. He heard F6APE on 6cm on Sunday 18th July and understands that Jean Noel has about 4 watts so Dave is hopeful they can work each other when the PA is going.The path is 430Km. Dave had a problem his 13cm antenna and has replaced it with a 45ele loop yagi. He's worked PA0EZ and PA0WWM regularly this year.

Andre, F1PYR (Paris area) went south for a weekend in July and worked some remarkable microwave dx. From an 800m mountain summit south of Toulon. On **10GHz**, he worked EA9F6DPH/P over the excellent DX of 1158 km and

again on 5.7GHz "comme au telephone", followed by 13cm with 10 watts and a horn cornet in front of an 85cm offset. He had two QSOs on 24GHz at over 300km (!) but arrived too late on the Sunday to make a contact on 47GHz.

John, G3XDY (JO02OB) sends his usual detailed and mouthwatering report (your editor is looking for a house in Suffolk after reading the following!): On 17th July there was a good rainscatter opening on 3cm, with DH8AG, DJ5BV, DL8YE, DL3IAS, and DF6NA worked, the latter the best at 663km from JN49XS.

During the 1.3/2.3GHz cumulative on the 20th July SK7MW (JO65MJ) was worked on 23cm by aircraft scatter with 529 reports both ways.

In the 5.7/10G Cumulative on the 25th July G3PHO/P was inaudible on the direct heading on 10GHz, a test on 5.7GHz revealed signals peaking several degrees south of the direct path and a return to 10GHz resulted in a good QSO for a new square (IO85) on both bands. G3ATM/P was also a new one on 10GHz from IO71. Other good QSOs on 10GHz were DJ5BV (JO30) at 435km, PA0BAT (JO31) , and M0EYT/P (IO80). On 5.7GHz the best QSOs were PA0BAT, ON4IY/P in JO20, and G4ALY in IO70.

On the 29th sea ducting gave good signals from OZ1FF (JO45) on 23/13/3cm. After QSOs on 23/13cm a test with OZ2OE on 6cm gave signals both ways but not enough for a QSO. Ole also has 9cm but a relay fault meant that his 100W TX was driving into an open circuit (I hear the SSPA survived OK!), so that will have to wait for another time. SM6ESG (JO67) was worked on 23/13/6cm, and SM6AFV (JO67) on the same bands plus 3cm for the best 3cm DX this year of 955km.

August/Early September Activity:

G3XDY (JO02OB) continues his earlier report into the August period: The 5th August saw some further sea ducting to OZ5BZ on 23/3cm, and on the 6th conditions lifted further to allow a QSO on 23cm with SM0LCB/7 in JO86 at 1100km for a new square. On the 8th SK7MW was worked on 23 and 13cm tropo, and F8BRK (IN99) on 23/3cm.

Coming right up to date, the 2nd September marked the start of a **huge tropo opening** that has lasted over a week. I have attached an extract from my log to give an idea of what was workable from here on the microwave bands. (*a remarkable list ... editor*). I heard many other stations as well as those worked, there was just not enough time to work everyone. signals from GM in particular were huge for several days on end. GM4LBV was a new square and country on 3cm. GM8CBQ (Aberdeen) was running 10W to a 14/14 slot fed yagi indoors!! GM6VXB mentioned that he has gear for 13cm but had dismantled part of his antenna system in preparation for the winter storms. All in all during this opeing, some 39b stations wereworked on 23cm, including several at over 900km (eg SM6HYG at 947km).

On 13cm some 16 stations were worked, the best being SM4DHN (JP60VA) at 1176km. The QSOs with SM4DHN were the best DX in the opening on 23/13/6cm. We tried over a 20 minute period on 10GHz but no signals were heard in either direction.

Two 9cm QSos were made, the only Continental Eu station being DB5KN (JO31NB) at 424km).

6cm brought two contacts also, the best being, once again, SM4DHN at 1176km.

3cm 11 stations were worked in OZ, DL, G, GM, with the best being OZ8AFC (JO45WV) at 708km. Like your scribe, John found activity from some areas (eg PA land) rather disappointing, especially as beacons from those area were S9+++ for hour after hour.

Peter, G3PHO/P operated in the August 5.7GHz/10GHz Cumulative from the "old faithful" location on BlakeyRidge, North YorkMoors (IO94MI73). Activity levels seemed high with at least 36 operators known to be active on 10GHz and around a dozen or so on 5.7GHz. Peter made 22 contacts on 10GHz for an average score of 290km points per QSO, the best being F6DKW at 657km. This was a hard fought QSO spread over some of the afternoon and only successful because of the tenacity of Maurice who ***really*** needed the IO94 square! CW via aircraft scatter was the propagation mode employed... a little bit like meteor scatter on 2 metres, such were the short bursts of signal! It was also nice to work G1MPW/P and G6KIE/P who were in JO03AD, a rare square indeed on 3cm.

5.7GHz brought in a disappointing 9 contacts with best DX being, as usual, G3PYB/P (IO90LU) at 389km).

During the **tropo opening of the first week of September**, Peter (whose home location is so poor that he has never been motivated to install a fixed microwave station there) once again had to fill the master bedroom with microwave gear inlcduing a tripodmounted 60cm offset) and work the DX through the double glazed window! The strength of DB0GHZ (JO34) on 10GHz was phenomenal ... end stopping for hours on end. Tests with Klaus, DL3YEE, mysteriously failed during this excellent period, as did a test with OZ1FF, whose direction took Peter's 3cm RF straight through the next door neighbour's roof! Later, the DB0 beacon faded down to be replaced by an S9++ PI7EHG on 10368.194MHz, a little lower than its nominal frequency. A quick "spot" on www.on4kst.com got PA0EZ to take a listen and a "rock crusher" from Arie was instantly heard and worked. This was followed the next evening by a QSO with PA5DD and PA0EZ once again, though signal levels were many S units down on the previous day. G4EAT (JO01HR) was also worked, on CW, via reflection off a PMR tower some 9 or 10 miles away!

Throughout this opening it was obvious that **GM4OGI and GM4LBV** were doing very well indeed, OGI in particular having several excellent contacts on 3cm with OZ and SM.

John, G4EAT(JO01HR) sends in a very detailed report on the September opening to the Continent. Between the 3rd and 9th September he had 28 contacts on the 23 and 3cm bands. There are 10 QSOs in the list that break the 1000km barrier! The best of these was **OK2BFH** (JN99FN) on 1296MHz at 1278km for new and 100th Square on the band *(many congrats John ... editor).*

10GHz provided a fine contact with SM6HYG (JO58RG) at 1003km for a new Square & best DX.

7 new squares (grids) were worked on 23cm and 3 on 3cm.

Dave, G0RRJ (IO91FE) had a good August as his report shows:
23cm activity (100w 55ele & masthead LNA): I worked F5SGT/P (IN87), F6BEE (JN08), F6FHP (IN94), DJ5BV (JO30), EI5FK (IO51), F6DKW (JN18), GW4DGU (IO71), DG1KJG (JO30), & ON4DPX (JO10). During the French contest in August I worked F5HRY (JN18), F1BZG (JN07), F5IGK (JN09) & F8BRK (IN99).

13cm activity (15w at antenna loft mounted transverter & 45 ele loop yagi):I worked F1PYR/P (JN19) and G4ALY (IO70).

6cm Activity (upgraded to 4W - Masthead mounted transverter 36cm dish): With the help of G4NNS, I installed my new 5760GHz PA into my masthead transverter, the transverter output is low and as a result my amplifier is running 3dB down at 4watts. Initial results were encouraging working G4ALY with 42/52 SSB reports being exchanged. Before the August contest I worked F5HRY 319/419 using 30 second TX periods for a new country, G3XDY (JO02). In the August contest I worked G3PHO/P (IO94), G4NNS (IO91), G4PBP plus others.

3cm activity (1w masthead mounted transverter & 60cm dish): F6DKW (JN18) who was 59 is ssb, F1PYR/P (JN19), F8BRK (IN99), F5HRY (JN18), F5IGK (JN09 new loc #25) G4EAT (JO01), G4ALY (IO70) & G3LRP (IO93). In the August contest I worked GW8AWM/P, GW3ATM/P (IO81), M0GHZ (IO81), G4BRK (IO91) & G4NNS (IO91).

Chris Bartram, GW4DGU, reports as follows from his IO71 home in “deepest Wales”: I'm active on 1.3 and 10GHz. On 1.3, I currently have about 15W, but I'm in the process of developing a 400W SSPA using LDMOSFETs. The antenna is a 42ele 21.6dBi long yagi on a 4m boom and is both home designed and made. It currently has to go on my portable mast, but I hope to get it onto my temporary trailer-mount tower befor too long. The preamp uses a Fujitsu HEMT and I won't admit to the manufacturer of the transverter I'm currently using!!! I have a new one half-designed, but I'm putting my efforts into getting on the air with a station which will be heard from down here.

On 3cm, I run either 2W or 10W to either an old 45cm PW dish with 'penny' feed or a 90cm offset with a W2IMU feed. I also have a 2.4m off set dish which I will mount for EME once I have sorted-out planning permission. My transverter dates from the early 80's, and uses a waveguide mixer of my design! The preamp is another home designed and made Fujitsu HEMT masterpiece.

I'm still getting myself back on the air after my long QRT and it's taking longer than I'd ever thought it would, partly due to my obstinate desire to design and build most of the interesting parts of my station, and my clients desire to see results when they pay me money!

I'm not too interested in the 'middle bands', although regular EME activity on 3.4 or 5.6GHz might tempt me. I have been thinking of ways of generating energy in the THz region, and I might try something practical in the near future.

For talkback I have 'legal limit' on both 144 and 432 with systems which have been used sucessfully off the Moon on both bands.

I work with RF, and have a business offering RF/Microwave design and consultancy services. I currently stop at about 12GHz, although I'm looking at the possibility of acquiring kit for up to 30GHz. I'd be happy to help anyone having problems getting gear working but I'm not interested in becoming involved in the Amateur Radio business again!!

Steve G1MPW and Dave G6KIE worked from Old Bolingbroke S . Lincs JO03AD. They found the site easier to access since the farmer had harvested his crop and they were able to drive across the stubble rather than the rough track to get into the field. Both 2m and 10GHz were a bit disappointing however and it was heavy going all day despite numerous CQ calls on 2m. A total of 12 stations were worked with the best Dx being M0EYT/P at 300 Kms. A big hill in Lincoln is only 80 m a.s.l. -- would have been higher if we had worked from my home QTH !

MILLIMETRE BAND NEWS

The September 5th24/47GHz contest saw eight active operators. GW3PHO/P was on the Blorenge(IO71LS) while Hackpen Hill (IO91CL) had G3PYB/P, G8ACE/P and G9MJW/P. Tog Hill (IO81) near Bristol was the temporary “home” for G8BKE/P and G3FYX/P. G0JMI (IO90) and G1JRU(IO90HU) were also active.

Peter, GW3PHO/P, work all the stations on Hackpen with “rock crushing” 24GHz signals both ways and all but G0MJW/P were worked on 47GHz nbFM.The 95km path was LOS but the heat haze could have upset the path on 47GHz as deep QSO was evident. Peter also worked the lads on Tog Hill on both bands. Meanwhile **G0JMI and G1JRU** worked each other on 24GHz.

More 24GHz activity is needed! Where are the rest of you these days?