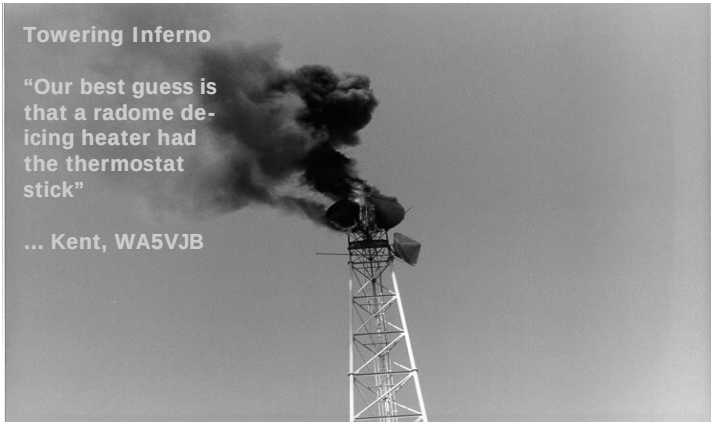
An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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

2005 March



In this issue ...

- ***Latest News ...***

- **RAL registration deadline brought forward to 31 March 2005**
- **World lightwave record broken by two Tasmanians**
- **OFCOM listens to the UKuG ! (p.15)**

MANY THANKS TO ALL OUR CONTRIBUTORS THIS MONTH ... WITHOUT YOU THERE WOULD BE NO SCATTERPOINT!

UK Microwave Group Contact Information

Peter Day, G3PHO
Chairman and Scatterpoint Editor

Email: microwaves@blueyonder.co.uk
Located: Sheffield (IO93GJ)
Address: 146 Springvale Road, SHEFFIELD, S6 3NU, United Kingdom
Home Tel: ++44 (0)114-2816701

Martyn Kinder, G0CZD
Secretary

Email: ukug@czd.org.uk
Located: Crewe (IO83)
Address: 12 Jessop Way, Haslington, CREWE, Cheshire, CW1 5FU, United Kingdom
Home Tel: ++ (0)1270-505930

Steve Davies, G4KNZ
Treasurer

Email: steve.davies@nokia.com
Located: Bracknell (IO91PJ)
Address: 17 Haywood, Haversham Park,, BRACKNELL, RG12 7WG, United Kingdom
Home Tel:++44 (0)1344-484744

From the Editor's Desk

Many thanks to all our contributors this time, Chris, GW4DGU, Bill W3IY, Gordon G0EWN, Chris Long (from VK), Kent Britain (funny jokes!) and those of you who have reported microwave activity. "Activity, what's that ?" ... you may well ask! Well, it's what may help to preserve some of our microwave allocations. How about doing some?

By the time you receive this month's edition the RAL microwave Roundtable will be just a few weeks away. The UKuG Committee should be there in force and we are looking forward to meeting as many Group members as possible. More details can be found on page 14.

RAL should see the debut of UKuG's first attempt at book publication. The "Proceedings of the UK Microwave Group 2004-5" has been assembled by Steve, G4KNZ and will be at the printers as you read this column. He's done a grand job and we are sure you will enjoy reading it. The first print run will be just 100 copies so it will be first come first served... more details next month.

G3PHO: Email: microwaves@blueyonder.co.uk

G3PHO: Peter Day ++(0) 114 2816701

G3PHO, Peter Day,
146 Springvale Road,
Sheffield, S6 3NU, UK

News, views and articles for this newsletter are always welcome. Please send them to G3PHO (preferably by email) to the address shown lower left. 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 the next issue.

A warm welcome to the following new members of the UK Microwave Group ...

These microwave enthusiasts have recently joined us ..

K1NCO
M0FWZ
PA3CEG
G8ADM
G3GRO
F9HX
G0EBB
F1PYR
G8BEH
G4YTL
G8XIR
WB6FFC
G8MII
G7ACD

SUBSCRIPTION ENQUIRIES SHOULD BE SENT TO THE UKuG GROUP SECRETARY AT THE ADDRESS SHOWN AT THE TOP OF THIS PAGE

UK MICROWAVE COMMITTEE NEWS

OCFOM

If you have visited the UKuG website at **www.microwavers.org** recently, you will have noticed that our submissions to OFCOM have had some effect! Due to the hard work and enthusiasm of Committee member Murray Niman, G6JYB, the UKuG has really made itself known to the "powers that be".

Ofcom seem to have taken on board some of our recent submissions, particularly with reference to the 76-79GHz SSR/LRR problems described in the January 2005 Scatterpoint., They are now supportive of our plea to retain the "old" part of the 76GHz band (75.5-76GHz) that was to be lost after 2006. Those of you who have gear for this band may have already re-crystalled for the region above 76GHz but you would be well advised to move back down again, unless you wish to proceed in the new section and risk interference (probably quite minimal!). Unfortunately we haven't got very far with the 24GHz SSR/LRR problem and it looks as if we may have such devices competing with us in the 24.000-24.050GHz section of our band for several years, at least until the 77-79GHz radar is perfected.

A much more immediate issue is that of UWB, Ultra Wideband. The closing date for submissions to Ofcom on this issue may have come and gone by the time you read this page. Ultra wideband presents a more widespread threat than the anti-collision radar systems on the millimetre bands in that far more microwavers (in fact all of us!) could have problems from increased noise floors and QRM when various versions of UWB come into your area. Once again, Murray has done the necessary for the Group on this issue and submissions have also gone into Ofcom from a number of radio clubs and individuals. These will eventually be published in the Ofcom website (as are 24/76GHz paper has already been) at:

www.ofcom.org.gov

If you are attended in the roundtable meeting at RAL in April, you have the chance to hear more on these issues in the Open Forum. Meanwhile keep checking both the UKuG website and the Ofcom one. There's a large amount of information available and while this "radiopolitik" may not be to everyone's taste, it is important to be aware of what is coming and to express your views directly to Ofcom and/or to UKuG.

Trophies

UKuG Committee member Dave Powys, G4HUP, has been liaising with RSGB re the various trophies that were administered by the now defunct RSGB Microwave Committee. He has managed to track down the following trophies which UKuG hope to take on board and award more regularly in future:

The G3RPE Cup (10GHz Cumulative winner)

The G3VVB Trophy (for best home constructed microwave related equipment displayed at a microwave meeting)

The G3BNL Trophy award for innovation or technical development of microwave equipment or techniques.

The Fraser Shepherd Award for research into microwave applications.

We hope to be able to present a couple of these at this year's RAL meeting, along with the **G3KEU Trophy** (5.7GHz Cumulative) and certificate to winners and runners up in last year's contests.

The G3JMB Trophy (10GHz Cumuolative Restricted power section) was presented to Allan Wyatt, G8LSD at Martlesham last year,

A new Contest Certificate has been designed and should be at the printers by the time you read this page.

Proceedings of UKuG .. our first attempt at producing a useful book is almost complete, due to the hard work of Steve, G4KNZ. In a very short space of time he has assembled all the presentations made at last year's roundtable meetings at RAL and Martlesham and added a few extra articles. He's come up with what we believe will be a well-received publication. We hope this is the first of many! Please support us in this venture.

10GHz EME from GW4DGU

Chris Bartram GW4DGU
<gw4dgu@blaenffos.org>

After 23 years in gestation, but tempered by a large number of changes to my life, my 1982(!) project to make an EME QSO on 10GHz has finally borne fruit! GW4DGU (IO71sv) worked WA7CJO (DM33xl) between 2300 and 2330utc on 20 February 2005. The transmitted frequency in each case was 10368.100MHz. 10GHz is the third band on which I've had an EME QSO since becoming GW4DGU in 2002, and also the third band on which I've operated EME with a completely solid-state station.

'O' reports were exchanged but I could have given Jim an honest RST555 report! He was completely solid copy on a loudspeaker, let alone headphones. I guess he'd be a readable signal on a 4ft dish. Certainly I'd have had no problems copying him on SSB. The T5 aspect of the report comes from the effects of the myriad reflecting areas across the Moon's surface being in relative motion to both the receiver and transmitter. This causes the phase and amplitude of the received signal to vary randomly. At 144MHz this effect, known as libration fading, has a typical period of 1 or 2 seconds. At 10.4GHz (144MHz x 72) the effect is to broaden the signal with low frequency noise modulation. The effect sounds a bit like an auroral signal on 50 or 70MHz.

Jim was running **300W** to a **4.9m** dish! My station was a little more modest. Just +40.2dBm (~10.5W) at the feed of a 2.4m offset dish. The power was generated by a Mikom SSPA. This was the only part of the microwave system that wasn't self-designed and built. I justified buying the SSPA because it was cheaper than buying the semiconductors, and, given their cost, I couldn't see anyone giving me samples.

Unlike many earlier 10GHz EME systems, my system is entirely built in coax. At power levels below about 50W, and given the presence of Moon noise, there is no real justification for using waveguide. I use a NAIS 26.5GHz rated coaxial changeover relay. This has about 0.2dB insertion loss, and something in excess of 60dB isolation at 10GHz.

The preamp uses a FHX05 HEMT giving 1.1 - 1.2 dB NF. This drives a two stage HEMT amplifier (using a FHX05 driving an FHX06 - and I still have a few of these devices left!!) and finally a second two-stage amplifier designed in about 1991 using plastic packaged Avantek GaAsFets.

The reason for the large amount of gain is

that I drive a 25m length of LDF250 coax (IL~18dB) back to the transverter, which sits in the shack. I've never liked the concept of the masthead-mounted transverter. The total noise temperature of the preamp, coax antenna relay, and feedhorn driving my transverter via the long cable is in the region of 120 - 150K measured using cold sky to ground. I'm seeing about 0.8dB moon noise, which is consistent with the antenna gain (~45dBi) and system noise temperature. I can, and will, improve on this in time, but unlike the lower frequency bands, potential improvements to receiver sensitivity are limited by Moon noise.

The transverter still employs aspects of 1982 technology! It has a waveguide image recovery mixer using post-coupled filters converting 10368 to 432MHz. A waveguide SRD multiplier driven with a couple of watts at 368MHz provides the LO source. Slightly more modern (1991 vintage) 2-stage GaAsFET amplifiers form

an RF stage and also generate the +17dBm on transmit which is fed-up a second length of LDF250 to the dish. The LO is not locked to my Rb standard, but uses a (very well aged!) free-running FET Driscoll oscillator. It can usually be trusted to stay within 100Hz or so during a typical 30min QSO.

A 1MHz bandwidth 30MHz receiver - built originally as part of a noise-figure measuring system - is used to track the Moon. There's something very reassuring about seeing Moon noise and being absolutely certain that the dish is pointing in the right direction.

My antenna is a 2.4m ex-VSAT dish. This came with a fixed mount which I've slightly modified. I use TV-type jackscrew actuators to steer the antenna in both azimuth and elevation. Positional feedback uses incremental shaft-encoders. The azimuth encoder is coupled directly to the azimuth motion, and the elevation encoder has a pendulum (actually an M16 x 150 bolt!) attached to make a simple inclinometer. I use IN3HER's 'Rotosys32' software. Raimund set-out to employ the shaft encoders and electronics from an old serial computer mouse to make a dual-axis position indictator with a resolution and accuracy of about ±2º. I currently use a pair of incremental shaft encoders found cheaply on Ebay together with a PIC programmed to emulate the (obsolete) mouse employed by Raimund. Positional data from the dish is sent back to the shack over an approximation to a RS485 link.

I did try to locate the right mouse, but even with the assistance of fellow microwave moonbouncer Stuart, GW3XYW, who at one stage seemed to locate every unwanted mouse in West Glamorgan (!) I only found one which was suitable, and that after I'd struggled with PIC assembler and almost won! As it currently stands, the tracking gives a resolution of 0.7º in both planes, limited by the shaft encoders (and a minor software bug) . With a beamwidth of ~1º, that's good enough to find the Moon, but is too coarse to allow consistent tracking, so once I've located the Moon, nudge the antenna around with the up/down and left-right buttons. I need to get better encoders and to sort-out the little SW bug so as to get the resolution below 0.1degree. I also need to remove some backlash in the azimuth drive, but that's already in hand. In the longer term I may migrate to absolute shaft encoders.

If anyone is interested, I have Gerber files for both my ersatz 'mouse' and interface/motor switching PCBs available. I'd be happy to share the PIC code, as well, if anyone is either foolish or clever enough to want to play with it.

IN3HER's software has an adequately accurate Moon (and other object) tracking and doppler frequency offset (for echoes) routine built-in. For calculating mutual doppler shifts with a second station I usually use K1JT's WSJT suite.

As my dish has 0.935 f/D, I can't use any of the standard feeds. W2IMU's 1.8WL aperture dual-mode feed is the nearest, and W1GHZ's book suggests that the efficiency of my dish with that horn should still be OK. I was a bit nervous of the design as it appears to operate outside the size limits suggested for the larger WG in the literature . A quick prototype nearly put me off. I could detect currents in the periphery of the horn as changes of return-loss when touched. Looking more carefully at the way in which I'd made the prototype, I realised that the flare was asymmetric. A second attempt, taking a lot more care, showed no sign of edge currents, and appeared to have just a single lobe of about the predicted width.

The current feed is OK but as a next step I want to try to combine a W2IMU dual-mode launch structure with a Potter-like flared horn, if I can get my head around the maths! This should let me achieve the best efficiency possible from the dish.

What next? Although I can **just** detect my echoes by ear with the current system, it's clear

that I need to increase the performance by a few dB. In the longer term, I may try to extend the dish to a 'semi-offset' reflector of 3m+ diameter. That would also allow me to use a more 'normal' feed. However, most of the gain to be found is in the area of transmitter performance, and my first update will be to increase transmitter power. Unless someone unexpectedly makes me a gift of four or five suitable 25W IMFETS, I will have to swallow my pride and travel the tube route. I have a TWT which is capable of +46 to +47dBm and a PSU which lets me drive it to within a dB or so of that. So, when the I have a Moon window next, I'll be about 5dB louder. That's a lot in EME terms. I've started putting together a 'proper' PSU. That's a reasonably big, but not too frightening, project (apart from the kVs floating about!). I'm also looking for a rather bigger tube or amplifier.

I hope to relocate the dish later in the year. Not only will that allow me to to see the Moon at lower declinations - which are currently coinciding with perigee, the time of closest approach, but it may be possible to arrange to look at some of my eastern horizon...

Many congratulation Chris! You've joined that select group of UK microwave operators who have had 10GHz QSOs via the Moon ..
... editor

CAN ANYONE HELP?

From: Chris, G0FDZ
<chris@chrisfdz.fsnet.co.uk>

I've been having considerable trouble with the 4 port waveguide switch on my 24GHz system, which has been giving problems by frequently seizing up.

Does anyone have a WG20 four port switch (manual or electrically operated) that they wish to sell ? I'm happy to pay any reasonable price.

Thanks and regards to all,

Chris, G0FDZ

REFLOCK REVISITED

From: "Luis Cupido, CT1DMK, <cupido@mail.ua.pt>

Hi Folks,

A new version of the **reflock**, considerably enhanced, is available on my webpages (and on VE1ALQ's pages). It is fully backward compatible with any of the reflock versions plus it can work also with the new Versatile CPLD code.

Input is greatly enhanced, i.e. there's no longer the problem with the 74F04 and no fancy comparator chip either ... just two transistors, bigger voltage regulator and straightforward configuration.

Results are excellent.

This was a joint effort by me and Darrel, VE1ALQ. Basic information is on my web pages:

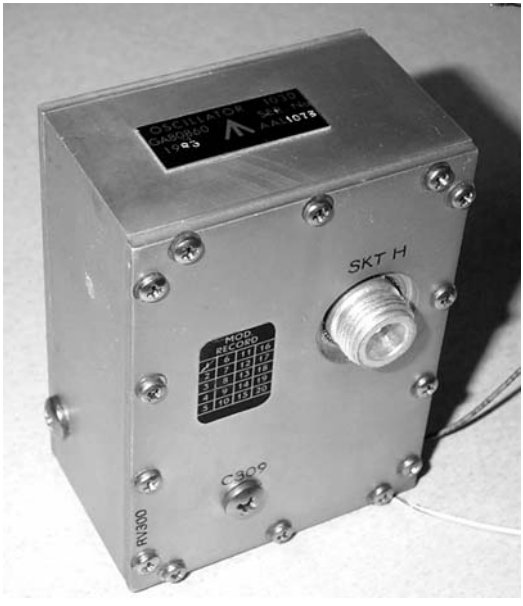
http://w3ref.cfn.ist.utl.pt/cupido and with all bits and pieces on:
http://www.ve1alq.com

73 from Luis Cupido, CT1DMK

A Useful Oscillator unit

by Gordon Fiander, G0EWN

Some of you may have noticed some extremely well constructed units for sale at various recent UK rallies. They are normally being touted by dealers as 'ovened oscillator units' with output at 1030MHz and are selling for around £2.50. I bought a couple at an Autumn rally at Wakefield.



On checking the units at home, the following became apparent. First the units are extremely well built; the milled brass enclosure alone being well worth the cost! (See photo). However, the units are not 'ovened'. Inside, a crystal oscillator (on 85.83333MHz) is followed by an amplifier stage, which in turn drives a diode multiplier feeding a tuned output line. The output line is tuned to pick off the 12th harmonic, in this case giving about 18dBm out on 1030MHz.

I used the bench supply set at +13.8V to test the units--both drew about 40mA. Having ascertained the units worked OK I fitted a 5th overtone crystal on 86.4MHz to one unit. The unit worked fine without need to retune, giving an output on 1036.8MHz; the 10th harmonic of this falling in the 10GHz band. The note was quite stable after a short period from turn on , even when listening on 10GHz, and the crystal could be easily adjusted to give a signal at the band edge or around the calling frequency on 10GHz. I intend to fit a DB6NT heater for even better stability and hope to be able to use as a marker to check RX (frequency?) when out portable.

The units need a stable supply as small voltage changes affect output frequency. I hope to change the second unit I have by fitting a crystal on 90.666 to give output at 1088MHz for a LO for another project; it might also work with 96MHz to provide an 1152MHz source and as such are a good buy.

Note that you will need a hot iron to desolder the existing crystal as silver solder appears to have been used throughout. Also if the supply drops below +11V the oscillator stops (it may have originally had +20v supply?). I have made a simple diode marker generator to go with the unit and can hear the signal throughout the shack. When the dish is pointed at the unit the signal is 59++

MICROWAVE UPDATE 2005

Sponsored by the San Bernardino Microwave Society (SBMS) and the Western States Weak Signal Society (WSWSS)

FOR IMMEDIATE RELEASE

For more information, contact:
Patrick Coker, N6RMJ
E-mail: n6rmj@arrl.net

CERRITOS, Calif., February 21, 2005 - Microwave Update (MUD), the paramount conference on Amateur Radio experimentation above 1,000MHz, will take place on Thursday, October 27 to Sunday, October 30, 2005 at the Sheraton Cerritos Hotel, (less than 10 miles north of Disneyland).

Sponsored jointly by the San Bernardino Microwave Society (SBMS) and the Western States Weak Signal Society (WSWSS), MUD 2005 will include technical programs, a banquet and the opportunity to network with fellow microwave radio enthusiasts.

Special hotel rates are available to MUD 2005 attendees. Be sure to mention the Microwave Update 2005 when making hotel reservations.

MUD 2005 is a great opportunity to get your ideas and papers published!

You don't have to give a talk to get your paper included in the proceedings. Electronic submissions in Word, WordPerfect or text format will be accepted by e-mail or CD-ROM. The common drawing formats are also accepted with your paper(s).

The cut-off date for inclusion in the Proceedings is September 5, 2005. If you are interested in writing and/or presenting a paper for the 2005 MUD, contact Chip Angle, N6CA, PO Box 35, Lomita, CA 90717-0035, or e-mail: **n6ca@ham-radio.com** with an abstract or just a general idea. This will help the conference planning and scheduling team.

If you would like to display and sell microwave-radio and electronics items, contact Dennis Kidder, WA6NIA, via e-mail at **wa6nia@arrl.net**. Let Dennis know if you are a commercial vendor or a non-commercial individual.

Donations for prizes are greatly appreciated. If you would like to donate a prize, contact Dave Glawson, WA6CGR, via e-mail: wa6cgr@ham-radio.com.

For more information on MUD 2005, go to: http://www.ham-radio.com/sbms/mud-2005/ or http://www.microwaveupdate.org

About the SBMS

The San Bernardino Microwave Society (SBMS), founded in 1955, is a non-profit technical organization and Amateur Radio club and dedicated to the advancement of communications above 1,000MHz. Affiliated with the ARRL, the SBMS membership includes over 90 Amateurs from Hawaii and Alaska to the East Coast and beyond. Meetings are held the first Thursday of each month in Corona, California. For more SBMS information, go to **http://www.ham-radio.com/sbms/**

About the WSWSS

The Western States Weak Signal Society (WSWSS) promotes the use of weak-signal Amateur Radio communications above 50MHz. The WSWSS participates in all band planning activities and supports ARRL band plans for weak signal segments of the VHF bands. WSWSS membership covers the Western states as far East as Texas. For more WSWSS information, go to **http://www.wswss.org/**

This month's laugh ...

"If somebody has a bad heart, they can plug this jack in at night as they go to bed and it will monitor their heart throughout the night. And the next morning, when they wake up dead, there'll be a record." -- Mark S. Fowler, FCC Chairman

(Thanks go to Kent Britain, WA5VJB, for this little gem!)

Amateur Optical Communications break the 100 mile barrier in Australia

by Chris Long (for Mike VK7MJ, Joe VK7JG and Jason Reilly VK7ZJA)

On Saturday 19 February 2005, Mike, VK7MJ and I set an Australian optical comms DX record between Mount Barrow and Mount Wellington in Tasmania, a distance of 104 miles, or 167km, and we did it without the use of laser sources!

We are principally interested in developing **NON-laser** systems for long range use as, going by the strict letter of the law, they require no licensing and therefore are usable by a much broader section of the community than are laser-based systems. Some aspects of our optical design are novel, such as the usage of a secondary plano-convex lens between light source and fresnel to optically vary the effective size of the source, in order to fill the fresnel's rather fuzzy prime focus area without increasing beam dispersal excessively.

Aiming is via rifle sights, and the optical unit operates by bonding two co-lined fresnels to a single protective cover-glass sheet. Full duplex operation is provided.

We'd welcome any correspondence on the subject...!

Here's our report of the actual record breaking event ....

Between 1100 and 1200 GMT on Saturday the 19th of February 2005, two way full duplex voice communication was established at 475 THz [630nm] over a distance of 167.7 km [104 miles], between stations on the summits of Mount Wellington [1260m asl] near Hobart in Southern Tasmania and South Barrow [1370m asl], near Launceston in Northern Tasmania. The tests were delayed by convective cap cloud and fog forming on the on the summit of mount Wellington at sunset. When the cloud cleared at 2140 local time, we had a beautiful crystal clear moonlit night over the centre of Tasmania, with light winds generating the occasional small drifting cloud puffs near Hobart.

The light sources used were amplitude modulated, 630nm, 1 watt Luxeon LEDs, operating at 200mA quiescent current and collimated through 20cm by 25 cm fresnels. The receivers each used a BPW34 PIN photodiode into a low noise, FET-input transimpedance preamp. The beam intensities of 300-700W/steradian were clearly visible with the naked eye at 104 miles!

Full details, photos of equipment, audio grabs of the contact and photos of past equipment are at:

http://reast.asn.au/optical.php

Signals going north were reported as 4/7 with some scintillation and slow fading by Joe VK7JG, Jason VK7ZJA and Chris Long on Mt Barrow. The signals received at Mt Wellington by Mike VK7MJ and Justin VK7TW were very noisy as a result of a 10dB increase in the receiver noise that turned out to be the result of an unstable audio amplifier, rather than RF blocking from the television transmitters, or moonlight interference as first thought. Reducing the receiver gain improved the readability to about 3/3 and a two-way duplex voice contact was completed.

Slow morse signals from a mechanically chopped optical transmitter using a 55W QI lamp and a 200mm lens were received at 5/8 on Mt Barrow.

The Hobart signals remained readable at Mt Barrow through light mist clouds drifting past Mt Wellington from about 1150 GMT but the QSO was terminated at 12:00GMT by heavy cloud reforming above the Derwent Valley between Mt Wellington and Bridgewater.

This is certainly a record for Australian optical communications and possibly a world record for non-laser amateur communications...*(we agree ... editor)*

Jason Reilly has posted a brief report and some pictures from Mt Barrow on his website at:

http://members.optushome.com.au/~jason.reilly/

Congratulations to all concerned from all of us in the UK Chris. You've broken DB6NT's world record by at least 60km! ....editor

(See also this month's Activity News section)

TRANSVERTER INTERFACING
and other useful tips by Bill, W3IY

Transverter interfacing

Lot's of guys run into trouble when they try to get ready for the higher bands. Many modern-day rigs do not have built-in transverter ports, so the interfacing job can be challenging. I certainly don't know enough about most popular transceivers to be of great help but here's what I did with my IC-706MKII.

I use it as an IF on 144 MHz to interface with transverters for 903-10368MHz. My transverters all want 2-3W of RF drive on transmit and I haven't blown any up yet!. The major task of interfacing a transverter with the IC706 is that of making sure you have a method of reducing the RF output on 2 metres to a level compatible with your transverter. Most popular transverters can live with 2-3 watts of drive (*eg the DB6NT series ... editor*) and the nice units from Down East Microwave can be ordered for nearly any level you would want to use. For the 2W level, I built a simple negative power supply board using the 7660 voltage inverter IC. The 706 has an external ALC input, which will limit the transmit power level when it receives a negative voltage between -5VDC and 0 VDC. I just used some perforated PC board material from Radio Slack, and took a 7805 regulator to drop the vehicle voltage down to +5VDC. Then this voltage is fed to the 7660, which turns the +5V into -5VDC, at low current. The ALC input doesn't load down this supply very much, so even though the 7660 only puts out 20mA, max, things will be OK.

For data on the 7660, take a look at **http://dbserv.maxim-ic.com/quick_view2.cfm?qv_pk=1017**. They even have schematics on there, if you browse around.

Take the output from the 7660 to a 10-turn pot and run the wiper into the ALC input. Of course, you should also add some .01uF bypass capacitors, and some RF chokes, or ferrite beads, to keep things cool from RFI. I set my IC706 for a low level using the built-in power reduction feature, and then keyed up the rig on CW and set the pot for 2.5W output on 144.100MHz. If you are thinking about this carefully, you may ask “Why not just use the IC706 built-in power control?”. Well, the answer is that it produces spikes in the RF output amplitude, which can blow up your favourite transverter. I think the reason is that, internally, the 706 filters this line with a capacitor which slows down the response time. It only takes a few uSec to zap your expensive transverter however.

I recently experimented with my FT-100 to see what was required to interface it to my DEM 222 transverter, using a 28 MHz IF. I found that, even with the RF power on HF turned all the way down, there was a 20W RF power spike which occurred whenever I pressed the mic PTT switch. It only lasted 5 milliSeconds or thereabouts, but it's enough to toast a receiver mixer stage (I didn't do this, fortunately). Many guys have blown transverters by failing to realize the existence of this RF power spike. After the initial spike, the RF level was a well-behaved 3W, which was about what my transverter requires. I believe the addition of negative voltage to the FT-100 ALC input will fix this problem, enabling me to use the FT-100 with the DEM xvtr. There's a good chance that the transverter would survive this spike, if I could be sure that it was switched into the transmit mode, before the spike arrived. This requires some sequencing, using a foot-switch or a delay-generator to prevent the 28 MHz transceiver from being keyed until after the transverter is keyed into transmit. We're working on a way to do this, and still use the FT-100 microphone PTT switch. More information will be made available after some testing.

Another successful approach that can prevent RF power spikes from damaging your transverters is to disconnect the DC power from your IF exciter power amplifier. This is a proven approach for the IC706 transceiver, and it's probably applicable to the FT-100 and other radios as well. This idea is from K6LEW who spends lots of effort helping some of the K8GP rovers configure things for the

contests. Owen says that it's necessary to go inside of the IC706 to do this, but that it isn't difficult to find the right place to disconnect DC power. About 100mW is still available from the RF output connector, as the RF leaks past the disabled PA stage. The beauty of this approach is that it's easy to restore normal operation when driving transverters is no longer desired (preserving resale value of the IC706). The drawback is that is disables the transceiver from being used for full power operation on the IF frequency (unless switching is added).

Another area which is dangerously ignored by many VHF and above operators is that of sequencing. Lot's of guys have gotten away without doing it but most have already, or will soon be, paying a price for this shortcut. All vhf systems that I am aware of should use sequencers! Think about it ... if you try to key up your transverter, T/R switch, power amplifier, etc, from the exciter, the RF will already be coming out of the radio before the external gear has had time to switch. Yeah, I know about the QST product reviews that show a variable delay in the CW RF output but I don't think any of these rigs provide a delay in the RF output for SSB. (The IC551D that I had many moons ago actually did have a bucket-brigade delay line inside which did perform this job ... but it was mind boggling to monitor yourself in headphones with this delay happening). RF Relays can take up to 100mSec or more to fully close, and hot-switching most RF relays will damage them (now you know where many of those "bargain" RF switches at hamfests come from!). Anyway, what I am trying to say is, that to be safe, you really need an external foot-switch or toggle switch of some sort to trigger your VHF-microwave station into the transmit mode ... you can't reliably use the microphone PTT contacts, unless you run them through another box of some sort. If you have any information about radios which implement an RF delay on both CW and SSB, please email me at **wseab@ieee.org** . I know this sounds inconvenient but I think it's the correct way to do stuff.

If you really want to be crafty, you can build a microphone interface unit which will accept the mic PTT contacts, and then drive the sequencer, which then drives your exciter to place it into the transmit mode. I like have a separate toggle switch for CW but many operators stick with the microphone PTT switch to trigger the station. Most high-performance stations still use a foot-switch, to my knowledge. Anyway, you need to take your PTT source and trigger a sequencer from it. The sequencer should then **1)** first close the antenna T/R switch (and the IF relays, if your transverter uses them at the RF in/IF out), **2),** the sequencer should key any power amplifiers being used, and **3)** key up the exciter... in my case the IC706. Most radios that I know of have a keying input line for remote transmit activation. How long should the time delay be for these steps? It depends on your specific equipment, but typically, 50 milliseconds is long enough between each of the above steps. DEM makes excellent sequencers, although they are a bit large. DB6NT has a nice series with various current output levels up to >10A DC current. These latter units have less flexible voltage levels, and they use P-channel MOSFETs to switch large currents. The real beauty of the DB6NT sequencers is that they are a little larger than a postage stamp! Very nice to add inside a power amp or something.

DC Switching

Speaking of P-Channel MOSFETs, these puppies are awesome! Using them, you can implement a small high-side DC switch, using a ground-to-transmit-high-Z input. All you need is about a 22K pullup resistor between the +V input (the source), and the gate lead (control input). When you ground the gate, high-current DC is available at the drain lead. Use a fuse because, if you don't, the low Rds-ON of a good P-channel FET can produce a nice pyrotechnic display and smoke your equipment! Anything that provides a ground will trigger the largest P-channel FET. Don't forget to use steering diodes, though, if you plan to switch multiple things from one set of PTT contacts. Also, many modern rigs have a very limited keying output signal which can only sink a small amount of current...perfect for P-channel MOSFETs.

The best FET I have found is the IRF4905 device from International Rectifier. These bad-boys will switch 70Amperes!! ...and they are still very high-Z input ... what's not to like? They are avail-

able from Digi-Key (albeit at highly inflated prices). For a good deal on these FETs, go to an electronic supplier like Newark, Future, or Avnet where you can get them with a credit card for about $1.00 each! These things are the control element-of-choice for solving many switching problems. The Rds-on is lower than most pieces of wire!! It's like a true solid-state relay for positive supply currents. Have fun and get those transceivers talking on the microwaves. We're waiting to work you!

Dual-Band Feeds

Dual-band feeds are really handy for roving. W5LUA, W5ZN, and others have done a great job describing these feeds in one of the Microwave Update proceedings. It's wonderful to get 2 dishes for the hassle of just one.

However,If you want to put some horsepower into that feed, BEWARE! The DEM 5.7/10GHz feed has pretty good isolation between the 5.7GHz port and the 10GHz port, when you are transmitting on 5.7GHz, but on 10 GHz, there is a lot of leakage into the 5.7GHz rig. If you are running more than 100mW, I strongly suggest that you consider a simple modification to your hardware. I am using +12V on both band's T/R relays, and I ground one side to close the relay for transmit. (this is a common way that folks use). Here's what you can do...if you also are doing a ground-to-key on your RF switches. Run a wire from the ground-to-xmit terminal of the 5.7 GHz relay through a diode, with the cathode away from the relay. Run this line to the control line feeding the 10 GHz relay. Then, do the same thing from the control terminal of the 10 GHz relay, through the diode, and over to the control circuitry of the 5.7 GHz hardware. Now, Whenever you transmit on either band, you will throw both RF relays into transmit, but you will only key-up the band that you are transmitting on.

I find that I can leave the GaAsFET preamps fired up without any problems, but some guys like to switch them off during transmit. I don't think it matters, as long as you keep the preamp inputs down to 0dBm or less. (some have reported +20dBm as the threshold of pain...but you could damage the NF with less). This is a really big problem for me on 2304/3456. I have a dual-band-feed for these bands, and the isolation from 3.4GHz to the 2.3 GHz port is very low...like 12 dB or so. If I light off my 40W on 3456 into this puppy, I get more than 2W of juice into the 2304 preamp. Ouch!!%&*#(@__+!! Fortunately, I haven't done this but I plan to install it before fielding my 2.3/3.4GHz dish assembly again.

Good luck and protect your precious preamps!! Allegedly, the newer dual-band feeds from Directive Systems (& Down East Microwave) are better tuned to optimize isolation, but you could still get reflected RF power from nearby antennas or ground-clutter that could cause problems.

73, de W3IY/R

Pictured left is W3IY's portable ("rover") station. Yes, these people actually often drive with the antenna arrays set up like this!

You can read more about his exploits and equipment, plus more very useful notes on operating, by visiting his website at:

http://users.adelphia.net/~w3iy/

Many thanks for the fine article Bill ..

From the Wall Street Journal 1 February 2005

TECHNOLOGY

H-P Team Claims a Milestone Toward Successor to Transistor

By Don Clark

A team of **Hewlett-Packard** Co. researchers is claiming a milestone in developing a successor to the transistor, the fundamental building block of the computer industry.

The scientists say they have constructed unusually small junctions of platinum wires that can perform switching functions now handled by transistors. Coupled with past research based on the same technology, the researchers believe the approach can be adapted for all the chores needed to build future computers.

H-P is one of many organizations that have discussed alternatives to conventional semiconductors. **International Business Machines** Corp., for example, has created ultrasmall circuits out of tiny tubes of carbon and by creating precise patterns of carbon molecules on a copper surface.

The race is being driven by looming limitations of the photographic techniques that now are used to create transistors on silicon wafers. Chip companies routinely double the number of transistors per square inch of silicon every year or two, but are expected to reach a roadblock in the next decade as dimensions shrink beyond the capabilities of photographic tools. Such an impasse could impede additional improvements in the performance of computers and other products.

Advanced chip factories now churn out circuitry with dimensions of 90 nanometers, or billionths of a meter. Manufacturers are confident about three succeeding generations of technology—reaching 32 nanometers in size—but beyond that must ponder new materials and much more costly manufacturing techniques.

"We are looking at the limit right there, staring us in the face," said R. Stanley Williams, head of the quantum research group at H-P's corporate laboratories.

The Palo Alto, Calif., company's researchers in 1988 first described their "crossbar" technology, which creates circuits at the junction where one tiny wire crosses another at right angles. That approach—developed in collaboration with James R. Heath, then at the University of California at Los Angeles—was shown to be capable of storing data, like a memory chip, and later adapted for other chores called logic functions.

What was missing was the ability to do what computer scientists call a "not" function, which is essential for general computing, and the ability to restore electrical signals in a way that allow circuits to be chained together effectively.

H-P scientists Philip Kuekes, Duncan Stewart and Mr. Williams, in a paper to be published today in the Journal of Applied Physics, show evidence that the crossbar approach can carry out both those tasks, by applying a sequence of voltages where the tiny wires intersect. The team has been working with wires that are about 30 nanometers across, though the actual junctions that handle the jobs of transistors are much smaller.

USEFUL COAXIAL CABLE INFORMATION RESOURCE

A recent posting on the Internet microwave reflector referred to a very useful download available from:

www.timesmicrowave.com/cable_catalog/index.shtm

It's a free 80 page PDF format catalogue of coax cable products but also contains a virtual reference book of datasheets for cable losses, VSWR, power ratings and the like..... well worth the 4MB download.

The website also has an online calculator where you can input the length and type of coax you wish to use and it will immediately work out the losses in dB and maximum RF power capability. OK, I know you can do it for yourself but the calculator is a nice one anyway!

CAN YOU WRITE?

If so you might be able to become an author for the UK Microwave Group! You will already know that this newsletter relies entirely on articles and news items submitted by its readers. We need a steady stream of them please! We never have too many.

However the Group has plans to eventually publish helpful **information booklets or monographs** that are practical in nature (rather than theoretical) with modern, reliable designs to help both newcomers and old timers alike. The booklets could be, for example, the size of Scatterpoint, with about as many pages.

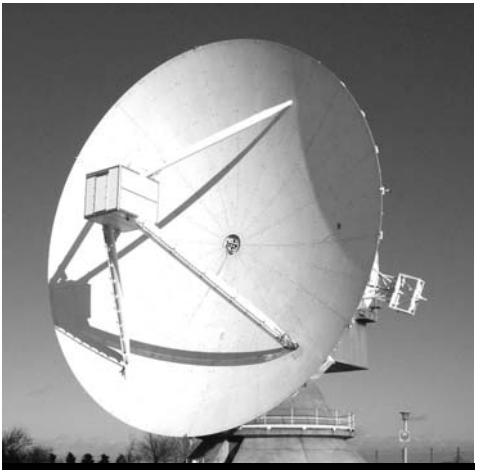
A few titles quickly come to mind ...

- Microwaves and Amateur Satellites
- Test Gear for the microwave amateur
- Getting started on < ??GHz>
- Building for the millimetre bands
- Construction techniques for microwavers
- Digital techniques and amateur microwaves
- Assembling and operating a portable microwave station
- Stable oscillators
- Modifying surplus microwave equipment for amateur band use
- Building microwave beacons
- Operating microwaves at home

These headings could even be used to produce special theme editions of Scatterpoint or even a series of "How to ...." booklets. All you need are ideas and sound advice to pass along, plus, if possible, the means to put it down in electronic format. We (the UKuG Committee) will put the final draft together for you and then publish it for the benefit of the whole Group.

Please think about it .... give us the meat to put on the bones!

R.A.L MICROWAVE ROUND TABLE
Sunday 17 April 2005



The Chilbolton 25m dish ... good to 30GHz!
([photo courtesy of G0MJW)

The date for this event is now confirmed and registration of attendance is well under way. If you have not yet registered, you should do so before the **31st March**, at the latest, by visiting the following website:

http://www.mike-willis.com/RAL2005.html

There you will find an email address to contact **Mike Willis, G0MJW,** at RAL. If you don't have Internet access then please contact the Scatterpoint editor at the phone number shown on page 2 of this issue. **The deadline has been moved forward in order to allow the catering staff at RAL to be well informed of expected numbers**.

On the website you an also indicate what kind of **testing facilities** you may need.

A dinner has been arranged by Geoff Grayer, G3NAQ, for the Saturday night, i.e. the night before the meeting. Details of that and overnight accommodation possibilities can also be found at Mike's website.

Catering facilities at RAL on Sunday may now actually be available, contrary to what was stated in last month's Scatterpoint. This is by no means certain, so check Mike's website the day before, just make sure that you don't need to bring your own "tucker" !

A interesting programme of talks has now been arranged:

Building large dishes for 432MHz-3.4GHz - by Peter Blair, G3LTF

A 1296MHz Transverter - by Sam Jewell, G4DDK

Galileo and it's Impact on 23cm amateur operations - by Peter Blair, G3LTF

Future Trends in Microwave Transverter Design - by Grant Hodgson, G8UBN (G.H. Engineering)

In addition, towards the end of the afternoon, there will be the results from the **Antenna Test Range** held at the G4NNS QTH the previous day.

Just after lunch will be the **presentation of trophies and certificates** connected with last year's UKuG microwave contests.

The day will close with an **Open Forum** at which Murray, G6JYB, will give a brief outline of the UKuG's Committee responses to the recent avalanche of Ofcom documents!

Let's see many of you there but not before 10.30 am ! (see last month's Scatterpoint)

More thoughts on Ultra Wideband

▪▪▪ from some notes by Murray, G6JYB

There has been some chat on the UK Microwaves Internet reflector regarding submissions to Ofcom re the Ultra Wideband situation. The following notes are taken from email correspondence between Murray, G6JYB, and Peter, G3PHO, plus a few others! They are put forward here to (a) highlight the importance of the issues involved and (b) to encourage you to read and respond to Ofcom documents yourself.

Murray will be distributing material soon on the **OFDM** (Intel) vs **DCS** (Motorola) UWB systems debate in addition to what is on **www.microwavers.org** at present.

It seems inevitable that the 3 to 5GHz low band UWB stuff would appear first from both Intel and Motorola.

However the Intel backed OFDM does allow much more scope for tailoring notches to protect spot bands if manual or eventually automatic adaptive sensing was encouraged/built into to the software coder/driver.

During the Ofcom Framework review, Murray recalled that Amsat-UK and the Chelmsford Club web-site said UWB should be restricted to highband stuff in the 6-9.5GHz range but all the early chipsets are naturally for the lower band frequencies and not high band (which may not appear for quite a while).

When one looks at measured Motorola DCS, its roll off continues well into 10GHz with almost no scope for tailoring or selective notches other than around 5.7GHz !

You can browse the Intel et al material at **http://www.multibandofdm.org/presentations.html** and, in particular, the Intel +co Spectral Sculpting Paper.

In general, if we are faced with a new system choice, OFDM always seems more robust for users and offers the scope for tailoring to protect amateurs. (Note that new BPL systems may use OFDM as well) So Murray suggests we should perhaps we lobby on the UWB consultation for

a) Tighter ETSI mask to protect <3GHz better (which Ofcom would probably support)

b) Ask for OFDM only, as it has better scope not to interfere, and...

c) we ask that software facilities for more specific adaptive Spectral notching are built in within OFDM Eurozone drivers to deal with more local interference hotspots.

d) Highlight that OFDM and DCS remain incompatible with each other, which would confuse the consumer. Thus it's reasonable for some intervention on standards in any case

e) OFDM may also be more compatible with 4G and Wimax

f) Ask Ofcom to fully resource their position to get European consensus on the above

g) Remind Ofcom that such systems raise the noise floor across a huge swathe of spectrum for weak signal flux users and needs concerted research ... Ofcom should really get around to a study on this (they have still not done anything as promised for Astronomy/ CRAF)

h) Highlight that licensing should be on a tertiary unprotected non-interference basis (similar to the car radar terms).

i) Encourage development of low cost test equipment for spectral monitoring/interference investigations and use of unique device identifiers in the UWB datastreams to aid this.

Many thanks for the interesting information Murray. Those of us not in the "comms" business can get quite confused at times and it's nice to have someone "in the know" explain the situation as they see it. ... editor

News on Car Radars and Amateur Microwave Bands

Ofcom have updated their site with responses and the official decision ... see the bottom of the page at: **http://www.ofcom.org.uk/consult/condocs/radar/**

UKuG and similar submissions by Amateurs has resulted in the following response being included in the Ofcom decision on 79GHz automotive short-range radar:-

'Ofcom is aware of Footnote EU35 of the European Frequency Tables and will take all necessary steps to permit Amateur and Amateur Satellite Services to use 75.5-76GHz after 2006'.

When implemented this will permit many UK operators to remain on their current frequencies.

On 17 Jan, 2005 the EU endorsed the use of 24GHz (actually 21.65-26.65GHz) as an interim band for Car SRR. Noting Amateur and other concerns, Ofcom 'will consult with interested parties' in due course.
Copies of the EU decisions are downloadable from the **www.microwavers.org** *operating page.*

Ofcom's official reply document on 79GHz **extensively quoted the UK Microwave Group** submission, which is pleasing.

Note that the 76.5-77GHz extension needs to go thru a number of stages before it formally amends BR68.

Regards to all, Murray, G6JYB

Another very lean month for operating news! A casual look on www.on4kst.com shows there's even been a drop off in activity there! Has TV really been THAT good this winter? Come on folks... please send in your news! You must have done something over the past couple of months!

Doug, GW3ATM in IO71, continues to use his Flyswatter antenna on 10GHz to good effect. He makes most of his contacts via rainscatter. Do to domestic duties recently he's not been as active as he'd like but, as the warmer weather comes along, he may be able to get out to his local portable site on the Blorenge for some of the Cumulatives.

Peter, G3LRP in Wakefield **(IO93HO)** has a nightly sked with **Ralph, G4ALY, in Cornwall (IO70VL)** on both 10GHz and 5.7GHz. It's quite remarkable how well these contacts go considering the path length is almost 400km with much of it over high ground (especially at the G4ALY end). On many occasions the cw QSO relies on aircraft scatter, with "semi EME" type protocols being used. On other occasions good rainscatter can lift signals quite a way up the S meter and allow ssb to be used. We think there's no one else in the UK doing a daily sked over a long path like this but we'd like others to try.

Peter was alarmed a week or two ago to find the whole of the 5.7GHz blanket QRMd by what appears to be some form of digital transmission. It comes in from the south and goes off somewhere else if Peter sends CW dashes on one of its peak signals! Does anyone know of any wireless broadband system just south of Wakefield? there is one at Alport height, near Matlock in Derbyshire but this is some 60km from Peter and it's unlikely to be that.

Ralph, G4ALY (IO70VL) is brushing up on his French as he is attending the Seigy VHF/UHF/Microwave meeting to be held in early April (see last month's Scatterpoint for details of this event). After hundreds of contacts with G3LRP on 10GHz (see above) he's finally going to meet up with him at RAL. That should be very nice experience for both of them.

New 23cm stations

During the past couple of weeks leading up to this issue being assembled,we have heard that 23cm has had a boost in that three new callsigns have been heard: **Heath, GW3HWR**, in **Swansea**, S. Wales, recently announced his presence on the band and has tried with G3XDY and a few others. He's not well located though and has trouble receiving beacons as his recent emails to the reflector describe .. "At last, I've lashed up a station for 1296MHz. I've been talking about it for long enough! I have a Tonna 35-el at about 10m, lots of lossy feeder and an IC-910. Next move will be a preamp for the RX and, when I'm satisfied with the RX, a bit more power than the 10 watts I'm starting with. GB3BSL, the Bristol beacon on 432.934MHz pounds in here but I can only hear GB3USK on 23cm via reflections".

Two **Sheffield** stations have made their first steps into microwaves recently via **23cm .... Graham, G3YJR**, is now on the band and has made himself known on www.ON4KST.com. Just a couple of miles away from him is **Andy, M0GAV,** who feeds a 28 element yagi with 10W via 15m of Ecoflex coax from an IC736. He has a 44 element Wimo yagi to erect quite soon. He's well sited for contacts to the south and south east so please, you people south of Watford Gap, turn your beams up to Sheffield ... you may be rewarded with more than one QSO! From time to time Andy logs into www.on4kst.com.

That's all the activity news to hand this month.... an all time low, so let's hope for much more next time.

This photo (left) appeared on the front cover of a **1968** RadCom and shows a group of young looking men doing microwaves ... a far cry from the 21st century scenario of white haired, wrinkly old Senior Citizens doing much the same thing!

It looks like klystron 10GHz gear was in use. Note that car roof mounted dish with what looks like a small, neat cassegrain feed.

That's not Charlie Suckling, G3WDG, at the back of the dish is it .. or is he older than that?!

TWO FLASHES FROM THE PAST..

do you recognise people in these two photos?
If so please let the editor know!

We know that the fellow on the stool is the late Tim Leighfield, **G3KEU**, but the young man in the foreground must be a good 23 years older by now as the photo was taken in **1982** on the top of **Walbury Hill** in **IO191GI**. This picture was given to your editor some time back but he's forgotten who gave it and believes the person is the young lad. The white shirted man on the left is also nameless .... so far! These were obviously the days of the PW dish!

Most Wanted VUSHF DX
http://www.rudius.net/
oz2m/mw

Invitation
You are hereby invited to participate in the **Most Wanted VUSHF DX Survey 2005**, an extension to the renowned **(M)ost-(W)anted-(S)quare-Inquiry** managed by Guy, DL8EBW

Deadline:
31st March 2005

Which squares and DXCCs?
It is your own decision to include all, or only a few, of the squares and DXCCs or just unconfirmed contacts, etc.

Please observe your station's limitations and operating preferences.

On some bands meteor scatter is possible on other bands it is rain scatter, etc. Thus the following maximum distances apply:

70MHz	**2000**	**500**
432MHz	**800**	**800**
1.3GHz	**700**	**700**
2.3GHz	**600**	**600**
3.4GHz	**400**	**400**
5.7GHz	**600**	**300**
10GHz	**700**	**300**

Documentation
The ONLY WAY is through MWD formatted file (s):

http://www.rudius.net/oz2m/mw/mwd_format.htm.

MWD capable programs:

http://www.rudius.net/oz2m/mw/mwd_programs.htm.

Entry
Entries are ONLY received via e-mail and as ATTACHED and UNCOMPRESSED file(s).

Please submit your entry to mw2005@post.cybercity.dk.

Comments in the mail(s) are not read! An automated acknowledgement will be returned.

PS: Entries for 50 MHz to **Alex, IW0GPN, iw0gpn_X_tiscali.it** and 144MHz **to Guy, DL8EBW, mws_X_dl8ebw.de.**

73 from Bo, OZ2M, **www.rudius.net/oz2m**

QST de W6IFE

The San Bernardino Microwave Society and the Owens Valley Radio Observatory in California, USA, are working together to use their 40m dish near Bishop, Ca. for educational projects and for EME on 23cm and 10ghz. The project has been in development for about a year and has come to a point where we can make an official announcement:

We are intending to be on the air for the Fall and Spring EME contests and at other times with educational projects. This will be an ongoing project between OVRO and SBMS.

We will be running about 10 watts output and 70dB gain at 10GHz 20 and 100 watts output and 53dB gain on 23cm. It is hoped that stations running a 3-4' dish and 20 watts will be workable on 10GHz on CW.

At this point we are in need of the following donations or long term loans:

A 10 watt amplifier for 10GHz and the 100 watt amplifier for 3cm. Please let us know if you can help.

73 and I hope to work you via the moon,

Doug Millar K6JEY
SBMS Project Director

email: dougnhelen@moonlink.net

Shown above is the DX record breaking red lightwave equipment of VK7MJ as mentioned in the article on page 9. Note the two Fresnel lenses for duplex TX and RX. Aiming is via rifle sights, and the optical unit operates by bonding two co-lined fresnels to a single protective cover-glass sheet. The DX world record breaking contact, described on page 9 of this issue, has already provoked a heated debate on the Internet laser reflector! Traditionally the ARRL have insisted on lightwave contacts by amateurs only being recognised if they are done with **coherent** light sources, which many interpret lasers, but not LEDs, to be. The use of the high power red LEDs (Luxeon "lumileds") goes against this ARRL edict but lots of people on the reflector are not deterred by that as it mainly to contest QSOs. What you do outside of contests is your business.

All this begs the question as to just how coherent **are** the small laser diodes commonly used and how long does this coherence lasts once the lightwave has been propagated toward the receiver at the other end of the link? The debate about this on the laser reflector has been very informative and still goes on as this is being typed!

Perhaps what should matter is how is the modulated light being received ... is it by the naked eye or is it the result of electronic detection and subsequent demodulation to produce speech or cw, or whatever, at a loudspeaker or headphones? If it's the latter then it's radio isn't it? If it's the former (ie by the naked eye) then it's not and would have to be called semaphore!

Not only that, the LED source is a **diode** ... ie a semiconductor, not a filament in a tungsten lamp! Surely this is enough to validate it as legitimate electronic lightwave source.

The work of the VK7s has shown that long distances can be achieved at these wavelengths (around 630nm). The high power LEDs (which run off only 3V DC!) are quite cheaply available in the USA and UK (Maplin UK stock half watt ones for just a few pounds). There's the potential for microwavers to move up to a new part of spectrum, free of UWB, SSR, OFCOM and the rest .

There is already a very keen lightwave group based in SE England and other group of three in the Sheffield area. Maybe 2005 will see some new activity in other parts of the country.

The "Proceedings of the UKuG 2004-5", to be published very soon, includes all the information you need to get started.

"See you" on the 630nm band soon!

FOR SALE

Roger Barrow (G8ILD)
Email roger.g8ild@virgin.net
Tel 0161-430-2010

All prices are plus postage, unless buyer collects (Near Stockport).

Mixer Anzac MD170, SMA female connectors, 0.5 -18GHz, I.F 2-5GHz, LO+13dBm. **Price:£5-00**

Mixer Watkins Johnson M76hc, SMA female connectors. **Price: £5-00**

Epsilon coupler 10dB Model CPL10, SMA female connectors. **Price: £5-00**

Mixer HP HMXR-5001, SMA female connectors. **Price: £7-50**

Sivers lab relay PM7560, (Manual), SMA female connectors, SPCO, 18GHz. **Price: £5-00**

Radial relay, 24V SMA female connectors DC-18GHz, SPCO. **Price: £7-50**

Mini Circuits Amp ZHL4240, SMA female connectors 700MHz to 4.2GHz. Gain 40dB min -1db =+28dBm. Min NF 8dB. Min IP3= +38dBbm. In very good order. **Price: £40-00** Cost new $1395.

SMA female sockets square flange in stainless steel. Stock quantity 10. **Price: 50 pence each**

Low noise FET 2N6680 by HP (HFET1101), stock 20. **Price £1-50 each**

Low noise FETS NEC NE67383, stock 10. **Price £2-00 each**

Please email or telephone Roger as shown above

HELP NEEDED!

From: Hervé BIRAUD <f5hry@wanadoo.fr>

I recently found a pair of very nice brand new **Marconi microwave sensors (ref 6910 and 6920),** and bought the corresponding **power ref 6950.**

I am just missing the cable between the 6950 and the sensors which ref is 6950-039 in its shortest version. No way can I find one here in France ...

Does anyone either have a cable to sell or know some specific dealers in G that might have it?

Vy 73 from Hervé,

The photograph to the left shows the impressive "rover" (portable) station of **Lloyd Ellsworth, NE8I,** who lives in the state of Michigan, USA. The vehicle pictured here is equipped with antennas for all bands from 50MHz to 3.4GHz. His 5.7 and 10GHz gear are inside the van. Lloyd does not stop there as he also has equipment for the other microwave bands, right up to 47GHz! He and friends often venture out into the winter sub-zero temperatures around the shores of Lake Michigan ... all the cause of making good microwave contacts on 24 and 47GHz.