An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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Hard men these microwavers! John, G8ACE/P, (left) and Mike, G0MJW/P (right) brave the January weather for a few hours in the 10GHz/24GHz winter contest. That's a smart looking pickup mounted system Mike! Photos courtesy of G0RRJ (via G8ACE) and G4NNS).

In this issue ...

Latest News ...

- **RAL microwave Round Table registrations underway .. do yours now!**
- **G3PFR made Life Vice President by RSGB**

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

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From the Editor's Desk

The arrival of winter in January and early February this year has certainly curtailed UK microwave activity. The lack of reports for the Activity news column in this newsletter is almost an all time low, at two! On the admittedly rare occasions when I log onto www. ON4KST.com, I see just the usual microwave skeds being worked but I do know that some DX was worked during a brief spell of good conditions a few weeks ago. However no reports have been received here yet. It is very important to document our activity, particularly on the higher microwave bands. This was shown last year when Murray, G6JYB and myself had to resort to asking for log sheets from our UK 76GHz operators to prove to Ofcom that we did actually use the band!

The winter microwave contests have so far been very poorly supported, even by most of those folk who agreed, at the Martlesham meeting held last November, to their insertion into an already crowded contest calendar!

73 from Peter, G3PHO, Editor

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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.

STOP PRESS !!! RAL UPDATE

We now have an alternative venue on the RAL site as that the usual lecture theatre and test/gathering area has just become unavailable.

The new on-site venue may be a bit cosy but, on the plus side, it is close to the usual car park and includes the ground station so demonstrations of moon noise at 2GHz may be possible.

As the main facilities at RAL are closed down, we will need to self cater for Sunday lunch so I recommend that everyone brings their own sandwiches. We will try to arrange a kettle, milk, coffee, tea and plastic cups but this is likely to be on a self service basis.

73 from Bryan, G4NNS, UKuG Chairman

SUBSCRIPTION ENQUIRIES SHOULD BE SENT TO THE UKuG GROUP SECRETARY AT THE ADDRESS SHOWN AT THE TOP OF THIS PAGE AND NOT TO THE EDITOR OF SCATTERPOINT

Scatterpoint back issues now online for free download

In line with the UK Microwave Group's policy of releasing past UK Microwave newsletters (Scatterpoint) into the public domain, the whole of the 2005 series (ten issues) is now available for anyone to download at the following FTP location:

ftp://ftp.czd.org.uk/ukug/2005

You do not have to me a member of UKuG to download and enjoy these (and ones from years before 2005) but if you wish to read current 2006 and 2007 issues then you need to become a member of the Group. Details of membership can be found at:

www.microwavers.org

In December this year we will place the 2006 editions on the same FTP site.

Peter, G3PHO Scatterpoint Editor

UKuG PROCEEDINGS 2006-7

Due to an unexpected relocation of the RAL Microwave Table meeting from a mid April date to March 25th, the Committee have decided to postpone the publication of this year's Proceedings until the Martlesham Round Table in November. The earlier date for RAL would have meant a very short time slot available for the book's compilation in time for our printers to have it ready in time for the 25th March.

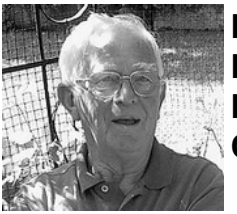
Rest assured... there WILL be a Proceedings this year! Just be sure to attend the Martlesham Round Table to get the first copies and the "Buy it Now Less Postage" price!

Crawley Round Table

I can confirm that CARC propose to hold a Microwave Round Table on Sunday September 16th, 2007 . This is the same weekend as in 2006 so hopefully it should not clash with one of the microwave Cumulatives.

Further details will appear in Scatterpoint during the summer months.

From: DEREK ATTER, G3GRO <derek.atter@blueyonder.co.uk>



FURTHER HONOURS FOR G3PFR

Dr Mike Dixon, G3PFR, who recently stood down as the RSGB Microwave Manager, has been appointed to Life Vice President of the RSGB.

Mike has been an active RSGB volunteer for many years, the last 20 of which he served as the RSGB Microwave Manager. During his time in this post, Mike represented the RSGB at no fewer that five IARU Region 1 conferences and many more meetings and events.

RSGB General Manager Peter Kirby, G0TWW, said: "Mike has been an outstanding servant to the RSGB, he has made a telling and lasting contribution to the work of the Society and to the UK amateur radio community. No-one can be more deserving and it is a fitting tribute to Mike that the Society should honour him in this way."

The award will be presented to Mike at the 2007 RSGB AGM being held in Edinburgh on Saturday 28 April 2007.

[Thanks to the RSGB News Service for this item]

Fixing Marconi 'TFT' Power Heads

Written and researched by Paul M0EYT

As many of you will know, the old Marconi 6460 'TFT' series of power meters are pretty popular with amateur microwavers. You often see them on eBay for a reasonable price but the power heads can be in an unknown condition. I purchased a meter on eBay along with a 100mW head and it works fine over its DC to 12GHz frequency range. Naturally, I've been keeping my eyes open for other power heads but these seem rare, so I've started looking at broken power heads with a view to fixing them. In the following pages I'll describe where I am to date, and what I've been able to fix. "TFT" incidentally is an acronym from General Microwave Corporation meaning "thin film thermoelectric".

In a nutshell, the 6240 and 6421 type heads seem fixable. The higher frequency (18GHz) variants like the 6440N (shown in Fig 1) have so far not been fixed, but this is mostly due to their incredibly small size.

Fig1: A typical Marconi TFT power head as shown on eBay.

It is worth reading www.freepatentsonline.com/3694746.pdf - this is the patent for the power sensors.

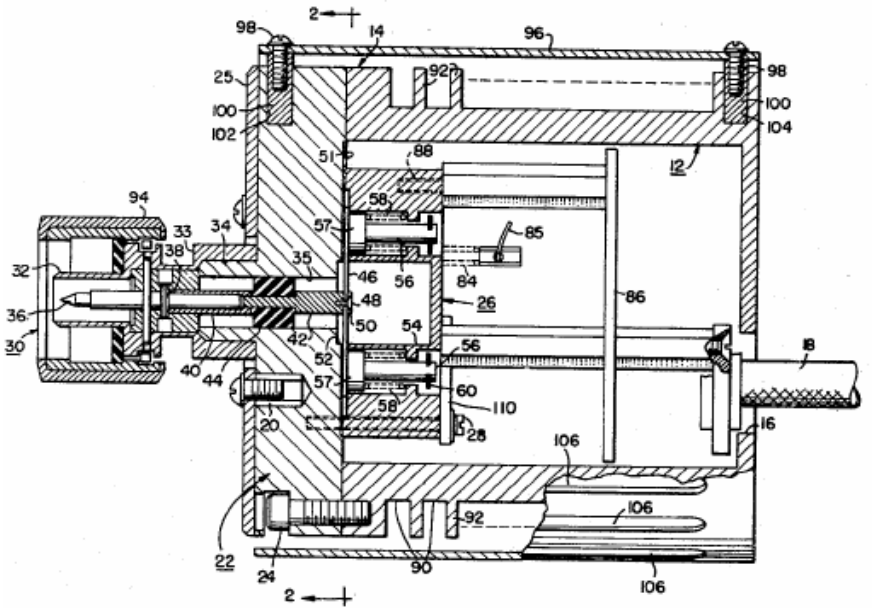


Fig 2: A cross section of the TFT power head (© US Patent office)

What goes wrong?

There is a simple answer to this: QRO! The reason for failure in the majority of power heads is that they are simply given too much RF power which causes the bismuth and nichrome thermocouple structures to break down or evaporate (see **Fig 4**). The actual mechanical construction of the power head is such that a drop or other mechanical shock is unlikely to break the sensor element. The power heads are well constructed with the actual power detection element being sandwiched between two lumps of aluminium – this is for thermal dissipation reasons, as well as physical protection. See **Fig 2** for the mechanical cross section.

Out of the 12 or so power elements that I have examined, not one has shown signs of damage due to physical shocks, such as a drop – from this we can conclude that they are well built.

(**Fig 4**) shows a sensor element from a 100mW power head that has been exposed to too much RF. **Fig 3** (© US Patent office) shows the sensor as described in the US patent first issued in 1970!.

The detector element is fitted such that the centre pin of the N type connector is connected via a capacitor to the centre of the element (#72 in Fig 3). This is done with a tiny screw and washer. In the photo, you can clearly see that the tracks have literally been evaporated due to high power RF. Either side of the centre pin are two large areas of conductive material (70 and 71 in Fig 3), used for the capacitive coupling of the RF to ground, whilst providing a DC return to the meter unit (81 and 82 in Fig 3). Usually, the resistance across the two DC contacts should be somewhere between about 150R and 300R for a working power head (Note: the resistance can also be outside of this range!). The resistance of the sample in the photo below was 'open circuit', therefore not useable as a power detector. A handy check on 'rally' power heads would be to use a multi meter, *(set to 1 or 2K ohms full scale reading, across the plug pins 1 and 3.... Editor)* to check for this value. Take care! The power sensors cannot fail short so, if this condition is seen, it is most probably due to dodgy wiring in the plug or power sensor body.

Fig 5 shows the element from one of the 6440N power sensors. To the bottom is the RF input which is pressed on to some 50 ohm track from the N connector RF input. The input track is 2mm across, which gives you some idea of the small scale that we're working with.

Either side of the input are the DC take off points that feed the meter. This whole assembly is sandwiched in an aluminium block with spring loaded DC contacts. The power sensor is covered by a very thin mica or plastic piece of insulation with holes cut in it to allow the contacts to be made for RF and DC.

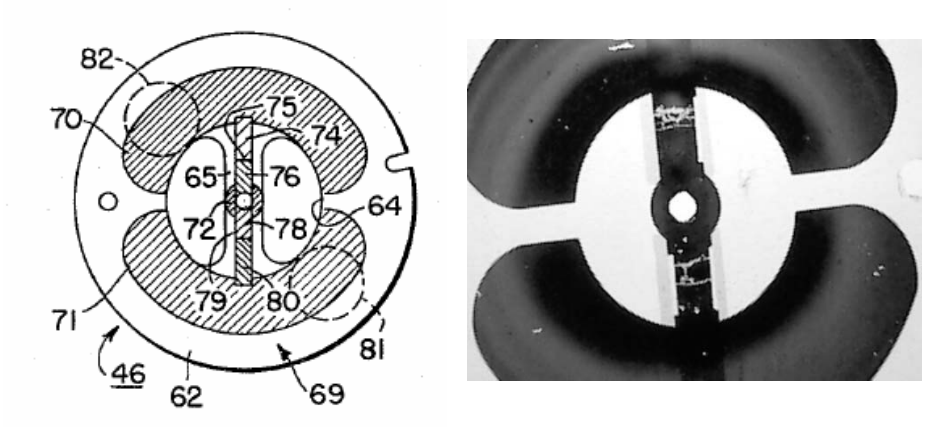


Fig 3 & Fig 4: power sensor element of a TFT head

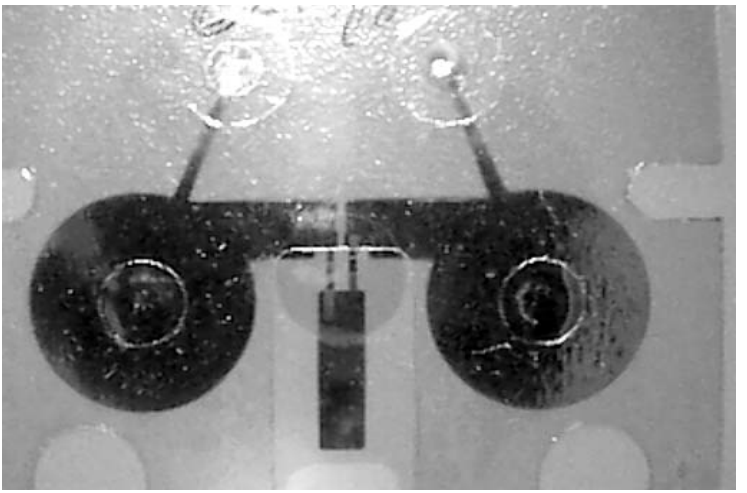


Fig 5: A damaged 6440N type power sensor

The 6440N power heads that I have examined have all suffered from too much RF power resulting in the material being evaporated off the sensor element. The 6440N heads cover LF up to 18GHz and are 10mW power handling capacity.

A higher magnification picture is shown in **Fig 6**, where you can clearly see the tracks of the thermocouples which are completely open circuit; in fact the material has been evaporated. In this case, it may be possible to fix these as they are not right on the actual thermocouple junction. The main problem is that the tracks are 0.25mm wide and as such extremely fiddly to work with.

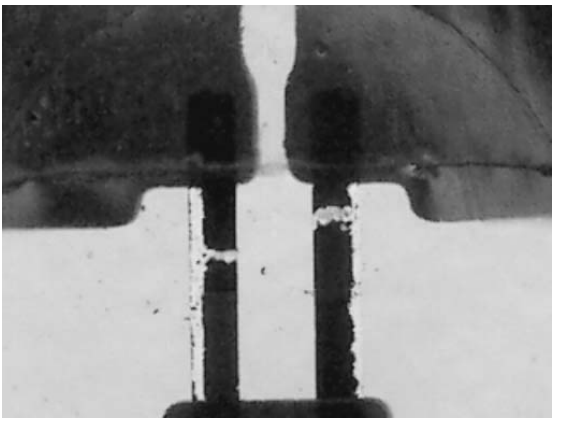


Fig 6: Close up of a damaged 6440N TFT power sensor

Type 6240 and 6421 heads

The 6240 and 6421 heads are 10mW and 100mW power handling. They are easy to spot as they are grey or black cylinders about 50mm diameter, and 60mm long with an N type plug at one end. The majority of ones that I have seen have had failures that are fixable. For some reason the tracks mostly seem to break where they either contact the large surface area capacitive pad or at the RF input pad, and therefore are fixable.

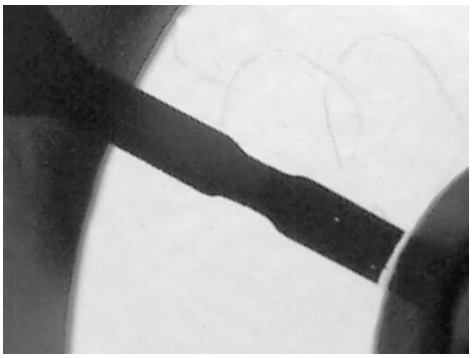


Fig 7

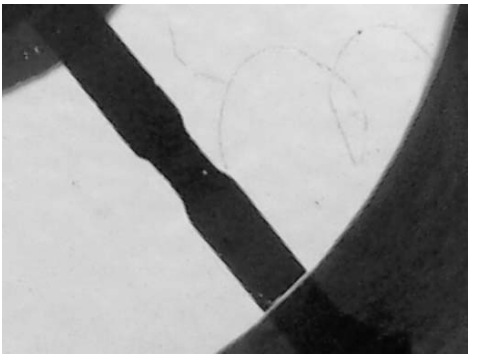


Fig 8

The two pictures above show common failure points – both are clean breaks and easily fixable. In this example, the power sensor is of the 10mW variety. Only a couple of power heads I've seen have had the sensor elements completely vaporised due to a massive amount of RF power but most exhibit the clean break type of failure as described above.

Fixing the heads

A simple way to fix the power heads is to use something like silver loaded glue, or 'magic PCB fixer' available cheaply from eBay – it's basically conductive silver paint. The conductive paint was first tested to establish its resistance when dry; a short line about 5mm long was painted onto a piece of plastic. It was then left to dry over night and the following day; it was tested with an ohm meter. The result was less than 0.1 ohms; therefore it's quite suitable for fixing the power sensor elements. The power sensor element looks like it's made by spraying or otherwise depositing layers of conductive material on thin mica like substrate, the layers are built up resulting in a thermocouple type of device which generates voltage when heated by RF.

The method for fixing the power sensors is first to make an assessment of how damaged the power sensor element is. You have to carefully remove the power sensing element from the housing first – be very careful undoing the centre screw in the 642x type heads – its easy to slip and shove the screwdriver straight through the mica!

Generally, if the break is small and clean, it's possible to fix the head with the conductive silver paint. If most of the power sensing element has evaporated, then there is probably not enough of the thermocouple left to make a useable sensor. If there are just 'cracks' or gaps at the extreme ends of the sensor elements, then it should be possible to fix with silver paint. Ideally this needs to be done under a microscope in order to accurately place the paint.

Incidentally, some of the power sensor elements have a second deposit of mica over the actual thermocouple; this means that this type cannot be fixed.

Once the silver paint has been applied, leave the sensor element in a warm place overnight, somewhere like an airing cupboard is ideal. You can do a quick sanity check with a multi-meter once the paint has been applied, to make sure you have the right resistance across the DC take off pads. For fixing my power sensors, I've used both a stereo microscope and an Intel kids PC microscope belonging to (me) my son...

Results

So far, a 10mW head and a 100mW head have been successfully fixed. At the current rate, successful fixes are achieved around 25% of the time which is not bad if you can get a 'broken' head for under £5. The unrecoverable heads can be used as first class housings for home made noise heads as the RF path is DC decoupled, good to 18GHz, and the case is sturdy. (This will be the subject of another article!)

Work is currently under way to see if it's possible to replace the thin film thermocouples with very small leaded variants, if this is successful, a Scatterpoint article will be generated describing the procedure. Another related line of work is to generate a solid state chopper circuit to replace the noisy mechanical chopper used in the Marconi 6460 meters.

Further Reading

- It's well worth checking out the online patent office, and looking up **3,694,746** which is the original patent filed by General Microwave Corporation. The patent gives an excellent overview of how the power sensors work, along with some detailed diagrams which helps in understanding the thinking behind the design.

- There are a few colour pictures of the power head sensors mentioned in this article and they are online at: http://www.uhf-satcom.com/misc/tft/

Thanks go to Steve G4KNZ, Peter G3LRP, Geoff G7RMG and eBay for providing broken power heads for use in this investigation and to Jules G0NZO for sanity checking the text.

73 from Paul, M0EYT

Modifying a DMC DRO Oscillator for use on 24GHz

…. by Roger Kendall G0UPU

A number of sets of DMC link equipment have recently appeared on the surplus market. These use different IF frequencies for receive and transmit and are difficult to use on 24GHz. The oscillator frequencies vary depending on the band for which they have been produced and some may be useful for use on 24 or 47GHz. I have obtained two of these which were labelled for bands B2 and band B9'. I suspect that the dash indicates that it is a high IF transmit version as the equipment on the two ends of a link need to be one with transmit IF high and the other with receive IF high to match it.

I wanted an oscillator which would give me 23.616GHz to use for 24GHz with a 432MHz IF and the B9' version was the nearest. The original DRO unit is shown in figure 1 and consists of three PCBs and the DRO module itself. The middle board contains an oven controlled crystal oscillator which has a crystal at 104.8921MHz. This is multiplied up 4 times before passing on to the DRO module where the 28th harmonic of this beats with the DRO output to produce an IF somewhere between 50 and 200MHz. Going above 200MHz exceeds the limit of the prescaler chip in the divider and I suspect that there is insufficient output from the harmonic mixer below 50MHz. This IF is divided down to 0.875MHz in the top board with a dual modulus (¸10/11) chip followed by a programmed logic array chip controlled by DIL switch. This is then compared with a 0.875MHz signal derived from a 14MHz crystal oscillator divided by 16. A reversing link on the bottom board enabled the comparator to lock it when the DRO frequency was above or below a multiple of the OCXO frequency.

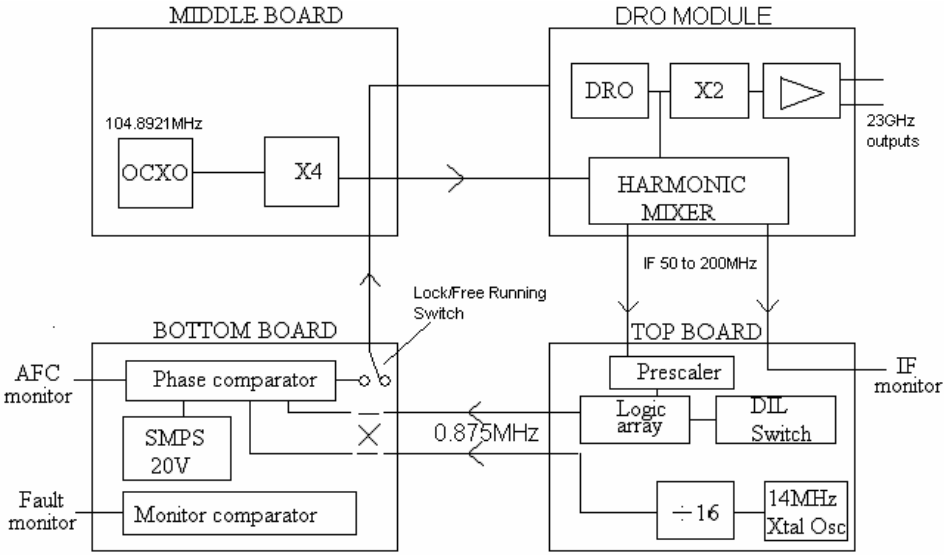


Figure 1 Block diagram of the original DRO unit.

The locked DRO frequency is then given by,

$$f_{DRO} = 2 \times \left(f_{OCXO} \times 112 \pm N \times f_{XTAL} / 16 \right)$$

The DRO in free running mode covered the frequency that I required but I could not get it to lock within 50MHz of this frequency as the IF was too low. In any case it could only be switched in 1.75MHz steps and would not give a carrier that would give me the 432MHz IF exactly. I decided to make a radical change and replace both oscillators by external feeds which could be locked to an off air reference. Just replacing the original xtals was not feasible as they were TO3 types. The frequencies had to be close to those of the original oscillators and ones which could be easily locked to my 5MHz off-air reference. I replaced the OCXO by a feed of 104.5MHz which then produced an IF of 104MHz. If I then used a divider ratio of 120 this gives a comparison frequency of 0.866666MHz so the 14MHz oscillator is replaced by one at 13.86666MHz which is 16 times this frequency.

For convenience I used a VCO at 20.9MHz and multiplied this by 5 to give 104.5MHz. This enabled me to use standard 74HC series logic in the dividers. 20.9MHz divided by 209 gives 100kHz which was compared with 100kHz derived from my 5MHz reference divided by 50. Initially I had decided to lock the 13.8666MHz oscillator as well (¸208 and compare with 5MHz ¸75). Later I decided to leave this as a free running oscillator but have a small voltage controlled adjustment to enable it to be varied to allow for any minor frequency errors of my prime mover rig which is not locked. The 104.5MHz signal level needed to be quite high and I used a MAV11 device to get sufficient drive for the x4 circuit.

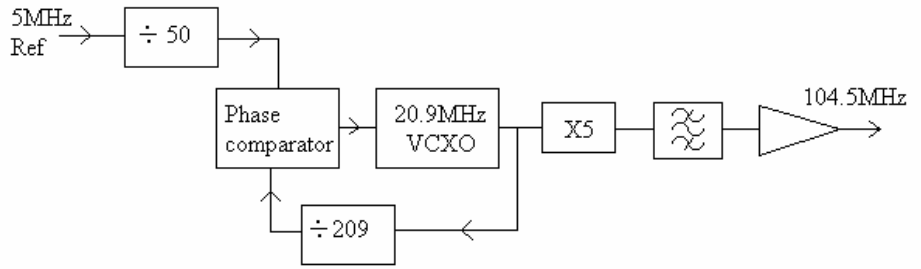


Figure 2: Block diagram of the 104.5MHz oscillator

I had to fit sma connectors to the DRO case to feed in the new signals. To do this I took the DRO module apart. The middle and bottom boards were quite easy as it only involves screws as they plug into the rest of the unit. The top board has the two probes from the microwave block soldered to it and desoldering these was a little tricky. I then worked out the best positions for the sockets and drilled and tapped the case for them. I cut the power feeds to both existing oscillators and the oven, which saves quite a bit of supply current, and fed the appropriate circuits from the sockets. Before remounting the boards I tuned up the filters on the x4 circuit for a maximum output. Once the unit was back together again I tuned the DRO to its correct frequency in its open loop mode before closing the loop. The settings on the DIL switch were found by trial and error.

73 from Roger, G0UPU

For lovers of the IC-202 ...

Like many, I still like the simplicity and RF cleanliness of the old IC-202, despite the limitations of the tuning dial. Most of the specimens still in use are around 30 years old now! Many are still in use as tunable IFs for microwave transverters.

This message is just a short one to describe that I recently decided to replace **ALL** of the electrolytic capacitors in one of my 202s followed by an internal tune-up and, hey presto, all of the problems I had been having with it disappeared.

Thus this note is more along the lines of a recommendation that this capacitor replacement job be considered for every 202 still in use.

The overall task may seem daunting at first, but it is achievable in only a few hours.

Just sharing a positive experience.....

73 from Doug Friend, VK4OE, Brisbane, Australia. <friends@squirrel.com.au>

G4DDK 23cm transverter

The 23cm transverter design published in the Proceedings was an early version. Thanks to Dave Robinson, G4FRE/WW2R, who has now used the transverter extensively for EME, the design has been finalised and an updated schematic and set of component values are available on request from G4DDK. PCB foils are also available at cost.

Sam, G4DDK

Bonnartel have some more items of surplus stock including a 24GHz ODU with details of conversion to amateur allocation for £70. They also have similar units for 38/39GHz and some DMC units for 21,22,23 and 26GHz as new for around £100. These DMC units are 1+1 units ie they have 2x oscillators, 2x up-converters, 2x down converters--of the sort that appear on Ebay for £50 for just 1 item.

Email <anton@bonnartel.com> for more details.

73 from Gordon G0EWN

Relay Coil Suppression

From: JOHN OWEN, MW1FGQ
<johnowenbroadcast@btinternet.com>

Any old diode - Do you have Optimum Release Dynamics? I came across this Application note about relay coil suppression which may be of interest to those switching high power:-

http://relays.tycoelectronics.com/appnotes/app_pdfs/13c3311.pdf

JNT MSF Reference Articles

Several people have requested my original MSF locked frequency reference design. The first version (with a 12MHz reference output) was published in RadCom April/May 1994 and a later version with 5 or 10MHz output appeared in the former RSGB Microwave Newsletter around 1996.

Both can now be found on the fresh new look re-designed website **www.scrbg.org/g4jnt** in the Frequency Locking section.

The Mk2, unless operated at dawn/dusk and when used with a good VCOCXO, can just about compete with the Jupiter based simple GPSDO for short term stability over a few minutes. Long term, it's as good as.

73 from Andy, G4JNT

ps. While you're there (at the webpage), say "Hello" to Basil !

Chairman's Notes for February 2007

... Brian Coleman– G4NNS

Since taking over as Chairman at the Martlesham round table I have been climbing up a steep learning curve. The former chairman and committee are to be thanked for the excellent work they have done. Priorities include the development of the microwave beacon network and extension of the "Elmer" scheme which we are "re branding" as the UKuG Technical Support Team. We have established the Beacon Working Group, which will take on a more formal identity as things develop. In the mean time, anyone needing help or support for existing or new beacon projects should contact the committee via the secretary Ian G8KQW. The MBE21 team, with Grant G8UBN, Chris G4FDZ and others are working on the design of a versatile Microwave Beacon Engine. This will form the basis of most new beacons and will provide various new facilities, modulation schemes, etc. The basic engine will cover the bands from 1.3GHz - 10GHz and will also be useable with multipliers or frequency translation for the higher bands. When this hardware becomes available the Beacon Working Group will be supporting manufacture and roll out of these beacons to extend the coverage of our beacon network. We will be looking for beacon keepers with access to suitable new sites and those who want to add more bands to their existing set up. Meanwhile Murray continues to work with the new Ofcom environment to resolve licensing issues for beacons (amongst many other things).

Re-branding of the Elmer network as the UkuG Technical Support Team is an initiative close to my heart. As one who has benefited from the help from more experienced microwavers for many years, I am keen to make sure that all members, and indeed anyone who wants to join us in this part of the spectrum, feel that they can call on help and advice to encourage them on their way. Of course much of this goes on unreported in any case but I hope that everyone who needs help will feel able to approach their nearest Support Team member who will have experience with microwave projects, as well as access to useful test equipment. (See the UKuG web pages).

Your committee are also working hard to address the positive and negative feedback received as part of last years Members Survey. This, together with further beginners workshops to be held this year, gives us an excellent platform to build on the successful progress we achieved during 2006.

73 from Brian G4NNS, Chairman UK Microwave Group

75/142GHz Access and the New Wireless Telegraphy Act 2006

- by Murray Niman, G6JYB, RSGB Microwave Manager

February-8 2007 saw Ofcom introduce the new 2006 Wireless Telegraphy Act version of the new UK Amateur Licence (the former 1949 WT Act and many others are now history, having been consolidated into the new one). This also provided Ofcom an opportunity to introduce a long awaited amendment in the frequency schedules for Intermediate and Full Licensees of the preservation of 75GHz access (whereas BR68 and the original edition of the 'Lifetime' licence had it expiring in Dec-2006). Also implemented is the removal of the former 142-4GHz band. The CEPT European Common Allocations table is implementing Footnote EU35 which permits Amateurs to remain co-Primary in 75.5-76GHz. After an extended effort, Ofcom's compromise at coordinating this with new wide bandwidth links in 71-76 and 81-86GHz for amateurs is:-

75.500-75.875 GHz - Secondary
75.875-76.000 GHz - **Primary** - (Centre of Activity 75.976 GHz)

Essentially the 125MHz of Primary spectrum coincides with a guardband for the new links. Note that **you must be on the latest licence to be able to operate on this band** as prior versions would now have the 75G band as expired .You can obtain your new licence via the Ofcom OLC website if necessary.

Also notable in the joint submission was that an ITU Amateur Secondary allocation entitlement of 81.0-81.5 GHz was effectively 'traded in' to avoid conflict with the new links. Keeping 125MHz of Primary Spectrum is a major success for UK Amateurs and keeps us clear of car radars. Please make sure it gets used more!

Following the end of the 142GHz band, the 134-136 GHz Primary Allocation is the recommended alternative and we look forward to Sam G4DDK leading the way!

Our European readers are encouraged (as per the 2005 Davos IARU conference) to lobby their own Societies to acquire this Primary Amateur 75GHz allocation. The original submissions are on the www.microwavers.org website or contact Murray G6JYB, RSGB Microwave Manager, for more information.

Beacon Licensing and WT Act 2006

- by Murray Niman, G6JYB, RSGB Microwave Manager

Recent discussions between Ofcom and RSGB now confirm that all GB3 Beacons will be moved to a regularly reviewed NoV basis from their former 'lifetime' clearances. At the time of going to press a Draft NoV format had been agreed between RSGB and Ofcom based on:-

- The NoV will be against the Keepers personal licence (assuming he is on the new 2006 WT Act version)
- A rolling 3-Year Validation period and better notification of Beacon downtimes
- Flowdown authorisation for shutdown operators (inc remote control) assuming they are Full Licensees
- Closer alignment of NoV terms with Repeater keepers and others (Gateways, Packet etc)

The new NoV also clears a key stumbling block that had been holding up the restart of GB3 beacon licensing, and several outstanding applications have just started to be processed accordingly. (**Continued overleaf .....)**

As it varies their personal licences (and those of closedown operators), all those concerned will need to be on the latest WT 2006 Act version of the Amateur Licence for the NoVs to correctly vary it. Ofcom have already started this transition for repeater keepers which includes a survey of closedown contact details. **Beacon keepers and their closedown operators are urged to ensure they register/update their licence to the latest variant** on the Ofcom online licensing site rather than wait for the new process to reach them by default. This will avoid delays and consistency problems.

We hope that a sample copy of the NoV will be released shortly along with other elements of the new Beacon licensing process. The RAL Roundtable will be a good opportunity to hear the latest on this from Murray G6JYB.

MICROWAVE UPDATE 2007 October 18-19-20 Latest information

Located at the Historic Valley Forge, Philadelphia, Pennsylvania, USA

Thursday: Sightseeing or possible surplus tour
Fri & Sat: Conference
Fri night: Flea Market. Vendors on site
Sat night: Banquet. Door prizes and raffles
Hosted by the Pack Rats -- Mt Airy VHF Radio Club

Spouses, friends and family invited;
Hospitality room
Alternative family/spouse programs available

Registration: $79 "early-bird" until 1st September includes Conference, Proceedings and banquet.
$89 from 1-Sept to 1 Oct 10
$99 thereafter.
Extra banquet tickets $39.
Special hotel rate $92 per night

Hotel Reservations: can be made for MUD now by contacting:
petra.vargas@theinnatvalleyforge.com or calling direct to the USA 484-684-1479
M-F 8am-5pm EST. Mention Microwave Update to get the cheap rate.

Full info and registration at: www.microwaveupdate.org

Abstracts, papers and presentations may be sent to W2PED:
pdrexler@hotmail.com or **N2UO**: lu6dw@yahoo.com

Questions to chairpersons K3TUF Phil@k3tuf.com
Or KB3HCL@arrl.net

DO YOU BUY EQUIPMENT FROM OVERSEAS? IF SO THE FOLLOWING MAY BE OF INTEREST ...

UK Customers will be exempt from paying import duty providing:
The supplier marks the Customs form (and/or invoice) as "Transceiver apparatus for radio-telegraphy" and shows the **commodity code** as "8525209900".

Please note: if there is ANY doubt, import duty WILL be charged." (and the Post Office charge another £4 handling on top even though collected !)

Commodity Code No
8525209900 Transceiver apparatus for radio-telephony / radio-telegraphy
85299040000 all accessories for the above apparatus e.g. Band modules, IF-Filters, power supplies, antennas
85179088000 all apparatus to generate Morse like keys, Morse-keyboards.
This is common in the ECC

So if you buy from USA, just ask seller to put the commodity code on the label and you should escape the duty.
If a mistake was made, you can claim it back as well)

73 from Mike M0FCG/ M1KEY

Beacon news ...

GB3CEM (IO82WW) is back on air at a decent power level: it went very low power after a big thunderstorm at the back end of October, having lost two pre-driver stages and the pin modulator.

There are now 2 antennas, the original 80 degree sectoral horn plus an "omnidirectional", dielectrically loaded, slotted waveguide antenna. The horn is currently centred on 120 degrees at 15m above ground, whilst the SWA is at 16m

Currently, the horn is being fed with -1dBW, and the SWA with 150mW. The levels to both antennas should rise by in a couple of months when the new PA, supplied by the SK7MW group is completed. This should result in increased ERPs up to the permitted maximum.

Reports are most welcome to:
g4pbp@blueyonder.co.uk.

73 de Russ G4PBP/G8BHH

GB3AMU (IO81JN94)

Details of GB3AMU are as follows:

Frequency: 24048.940 MHz.
Antenna: Sectoral horn. Direction of maximum radiation 135 degrees.
Included angle between -3dB points is ± 80 degrees.
Power Output : -2.8dBW EiRP.
Location: Cardiff, IO81JN94.
Height: 266m amsl.

73 Keith, GW3TKH

HB9HB ... correction

From Geoff, G3NAQ:

I must correct a mistake in G0EWN's report on p.18 of the latest (Jan 07) 'Scatterpoint'...

The beacon HB9HB (144.448 MHz) is not located anywhere near Locarno (Ticino), but on the Jura at JN37QF (Oberer Genchenberg) at 1395m ASL.

Built by HB9AMH, it runs 10W to a 2-el yagi pointing 315 degreess, ideal for the UK.

I can hear it from my QTH well over 50% of the time, usually S1/S2.

73 from Geoff G3NAQ

New Microwave Power Meter

ID Elektronik have a new VHF-SHF power meter available.

Mine dropped on my desk this morning in the office and instantly had Nick DL/GM4OGI and myself drooling! I've dropped some pics on my pbase site if you're interested.

Rather nice ..... and decent specs too!

No connection with ID apart from being a very happy customer of Ewald's fine engineering !

Check out the following websites:
http://www.pbase.com/dl4plm/23cms&page=2

http://www.id-elektronik.de/en/produkte/power/index.htm

regards from Simon, DL4PLM

HOW TO GET YOUR NEW WT2006 UK LICENCE

1. Find your last licence renewal to get the licence number.
2. Go to the Ofcom site http://www.ofcom.org.uk/licensing/olc/
3. Use "Register or Login" option
4. Choose "New Individual Registration"
5. Complete the form fully
6. Your chosen password must contain at least one each of upper case, lower case and Numeric
7. Remember to keep a note of your challenge question and answer somewhere (it is case sensitive)
8. Ofcom will then send you an email, and follows up with a postal advice of user name.
9. Go back to the Ofcom site and sign in with username and your password
10. Choose Validate as your option
11. Confirm or amend the licence details.
12. Licence details are then marked as validated
13. The choose "create new licence" and follow the instructions using your present callsign and class of licence.
14. Once the PDF document is created you can download and print off your ne 23 page document!
15. You are now operting under the latest amateur licence regulations and there can enjoy the extra privileges it has over your old BR68!
16. Make a diary note to revisit before the indicated date in 2012 to re-validate. You will need to revalidate (not create licences) every five years.

(Thanks to G8APZ for some of these notes)

It's certainly been a poor month for activity news! OK, the recent cold weather in the UK hasn't encouraged much portable work and maybe a few of you do not have a home station located in the main part of the house but surely there are many other readers who have worked something since the last Scatterpoint? Your scribe has to admit that outdoor microwaving has not looked attractive recently and he has been enjoying some excellent DX on, dare we say it, the LF bands (80 and 40m)! So it's onto the few reports we have ...

New VK 24 GHz Record

Russell VK3ZQB & Alan VK3XPD have extended the existing Australian 24GHz distance record from 200.8km to 230.05km.

The contact was made at 1010 UTC on the 27th November, 2006. RS 55 reports exchanged on SSB and, as the contact proceeded, signals increased to 5 x 9 both ways. Russell was operating portable on Mount Warrnambool & Alan was operating portable from Berwich in the Eastern suburbs of Melbourne.

A contact between VK3ZQB & VK5DK was also made on 24GHz over the previous distance record straight after with signals exchanged at 5 x 9 both ways also on SSB.

Signals between Russell & Alan did deteriorate on 24GHz later in the evening. A contact between Alan VK3XPD & VK5DK was attempted on 24GHz over a 400km + path without results, but contacts between VK3XPD, VK3ZQB & VK5DK were made on 10GHz with 5 x 9 signals received at all locations. **73 from Colin VK5DK**

UK Winter 10 & 24GHz Contests

These are new contests and can be seen on the Contest calendar published in last month's Scatterpoint. Unfortunately they have been very, very poorly supported up to the time of writing this column. The weather hasn't helped the portables to get out and, as 24GHz is still essentially a portable affair (unless you are lucky enough to live on a hilltop), activity has been confined to the one or two that can operate from hime. Here are a couple of reports on the January 28th 2007 contest:

From:John, G8ACE/P <hazell@dsl.pipex.com>

I joined G0RRJ at Lane End IO91JA SE of Winchester to work G4NNS and G0MJW located on the Chute Causeway ~40km NW.

A slightly obstructed path (5m plus trees on Cheesefoot Head) gave good signals for noise free FM copy. Reflecting off the PMR site masts across Winchester at 10km distance also provided good FM copy. The Bell Hill beacon, 24048.905MHz was audible at 75km with open waveguide, no dish, so its still working well.

It was bitterly cold with the wind chill and not my idea of microwave enjoyment. I noted the operators who requested the cold weather activity as good for propagation seemed to stay at home in the warm! I would much prefer to have the April/May activity periods restored for standing around a lot outside tripod operations.

One station was worked on 3cm from home. There were two failures.

A photo of me from G0RRJ's pages is attached*. (See front page...editor) .*

My new cassegrain dish from Martlesham last November is shown on this rig and is working well**. 73 from John, G8ACE**

From Brian, G4NNS, IO91FF <brian-coleman@tiscali.co.uk>

I expect you heard from John G8ACE and/ or Dave G0RRJ regarding our little local activity on 24GHz on Sunday. When it emerged that there was not going to be much activity on the day, Mike G0MJW, Dave and myself thought it would be useful to go out and test our newly constructed 24GHz gear. We persuaded John G8ACE to

come along and agreed that we would limit activity to one hour in the hope that bits wouldn't start dropping off in the cold!

John and Dave went to Lane End near Winchester while Mike and I went to the top of my Northerly RF screen, Chute Causeway, 5km from home.

All tests were successful and useful lessons learnt for future events. Attached is a photo of Mike G0MJW/P at the Chute Causeway end of the test. (*See front page, editor*). Mike and I were lucky enough to have bright sunshine at our end but it was windy and quite cold. John and Dave were under a belt of cloud, which we could clearly see to the south from Chute Causeway and they were feeling the cold more than us. I'm not sure that January portable activity will ever catch on, despite global warming but there is a fair bit of fixed station activity. Once home and thawed out I managed to work 5 fixed stations on 10GHz.

Monday night activity here in the south and southwest continues to be observed. I start off with a sked on 10368.125 at 20:02 with Ralph G4ALY. IO91FF to IO70VL is 207Km. Ralph and I then test on 5.7GHz (when Ralph's gear is available) before we QSY to 144.195 for a chat and to see if there is anyone else about. We are often joined by Neil G4LDR who tests as many bands as he has available with Ralph. IO91EC to IO70VL 194Km. Meanwhile I usually check 144.175 for signs of other activity and am often joined by John G8ACE, IO91IB. 'LDR, 'ACE and I often then beam at a mutually visible water tower at IO91JE some 23km from my QTH. During the winter months, with few leaves we are able to hold multi way FM QSOs using this reflector.

We do listen on 144.175 in the hope of hearing other microwave activity so if you can spare some time on a Monday evening please join us.

73 Brian G4NNS

OTHER NEWS

From Nick, DL/GM4OGI

You may have gathered that things have been quiet from my location in GM recently. That is because of mast damage from the storm force winds we had. The antennas seems to have survived this time around.

Also, you might have gathered from Simon DL4PLM's numerous recent postings on the UK Microwave Reflector of the other major news. I am now working over in Germany for the same company as DL4PLM and it may turn out to be a permanent move. I am seriously thinking about a permanent move and one of the reasons I have popped back to GM this weekend is to start the ball rolling on house sales etc (just in case!).

All this means that I have no time for radio for the time being.

I 'm looking at ways to get a huge signal onto the bands from DL on some microwave bands. In the first instance, I hope to help repair DL0DX over the next few weeks. The storms have wreaked havoc across the European continent. I am sure many DL/SP and OK stations have suffered damage. Just looking at the numbers of uprooted trees around Duesselldorf reminds me of Kew Gardens after the 1987 storm in the UK. I'll keep you posted on developments. **73 from Nick, GM4OGI**

A late report from Steve ZL1TPH received via the New Zealand F.U.N newsletter reads... During the October 2006 NZ contest I worked theTaranaki stations of Ted ZL2TAX [310km] and Ray ZL2TAL [295km] on 5.76GHz from MoirsHill, south of Warkworth (North of Auckland...editor) Ray's station is shown in the photo above. Ray was using a DXR700 transverter and 1.2m Wellington VHF group dish with simple dipole feed. Ted was using also a DXR700 transverter and a commercial 1.2m dish with precision feed. Both DXR700's use 1.1232 GHz crystal oscillator injection instead of the internal PLL. We now have a reliable SSB link with these two stations. We encourage more DXR700 conversions to 5.76GHz.

San Bernardino Microwave Society 2GHz and Up Club Contest for 2007

In the spirit of stimulating activity in the microwave bands, the San Bernardino Microwave Society (SBMS), California, USA, is sponsoring a 2GHz and Up Club Contest.

For this year, 2007 the contest period runs from 6 a.m. May 12 to 8 p.m. May 13 your local time.

This is a club competition in which members tally up their scores and add them with other members' scores to make up a club score.

1. Object

Worldwide groups of amateurs (Clubs) work as many amateur stations in as many different locations as possible in the world on bands from 2GHz through to Light.

2. Date and Contest Period

Second weekend in May. The weekend begins at 6 a.m. local Saturday though 8 p.m. Sunday.

3. Exchange

Six-character Maidenhead Locator; example DM04ww (see April 1994 QST, p. 86 or www.arrl/org/locate/gridinfo.html).
Signal report is optional.

4. Miscellaneous

* Scheduling contacts is both permissible and encouraged.
* Stations are encouraged to operate from more than a single location.
* A station may be worked again on each band for additional credit after a change of location. For purposes of the contest, a change of location is defined as a move of at least 16 km (10 miles).
* A transmitter used to contact one or more stations may not be used subsequently under any other call during the contest period with the exception for multi ple licenses in the same family sharing the same equipment (family rule). The intent of this rule is to prohibit "manufactured" contacts.

5. Scoring

Distance points: The distance in km between stations for each successfully completed QSO. One point per kilometer (eg., 10km is 10 points).
QSO points: Count 100 QSO points for each unique call sign worked per band.

In making the distance calculations, a string (or ruler) and map may be used. However, calculations by computer program are preferred. Several such programs are available, including a BASIC program listing in The ARRL World Grid Locator Atlas. For purposes of making calculations, stations are defined as being located in the centre of the 6-character locator sub-square (most computer programs make this assumption).

6. Multipliers

a.. 2GHz to 10GHz times 1
b.. 24GHz = 2 times
c.. 47GHz = 4 times
d.. 76GHz and up = 8 times

7. Bonus points

100 points bonus may be added for each unique call worked per band.

8. Awards

1st place plaque and all club entries will receive a certificate, suitable for framing.

Send entries no later than 60 days after the contest if you wish to be to be considered.

Submit logs via regular mail only to:

Pat Coker, N6RMJ,
40916 179th Street,
Lancaster CA 93535,
USA

For more information, rules and past scores see the SBMS web page at:

http://www.ham-radio.com/sbms

or contact Pat Coker, N6RMJ: <n6rmj@sbcglobal.net>

RAL 2007

UKuG Microwave Round Table

Rutherford Appleton Laboratories
Near Didcot, Oxfordshire

Sunday 25 March 2007

At 10.30am

As some have already spotted, registration for the RAL Round Table is now open via the **UkuG web pages** at **http://www.microwavers.org/.**
Location and access information can be found at: http://www.cclrc.ac.uk/Activity/RALMaps;

For security reasons, it is essential that **everyone wishing to attend registers in good time (latest 16th March).** We hope that lunch will be available at RAL but this will be confirmed on the reflector and UKuG web pages later. **(SEE PAGE 2 STOP PRESS ... editor)**

We are planning an **antenna test session** and **eme test at G4NNS** in the afternoon of **Saturday 24th March** prior to the RAL round table. It is hoped that antenna test facilities will be available for the bands 2.3 to 10GHz measuring return loss and approximate gain. But please email G4NNS with your requirements well in advance. I can also provide directions if required. The EME tests will take place from about 1400 local time and I will try to arrange some skeds on 10GHz. Both tests will have a degree of weather dependency.

For those attending the antenna and/or eme tests and who want accommodation in the area I have reserved some rooms at the Cricketers Arms Tangley which is near both my QTH and the dinner venue see http://www.thecricketers.eu/ for details and quote "Brian Coleman" when booking. We will be holding a dinner locally and will arrange transport between the accommodation and the dinner venue which will be The Red Lion at Clanville (see http://www.theredlion.co.uk/). If you wish to attend the dinner please contact me and I will send you a copy of the menu and reserve a place for you.

The accommodation, dinner venue and G4NNS QTH are about 40 minutes south of RAL.

I believe Geoff G3NAQ is arranging the usual dinner closer to RAL and anyone interested should contact him direct at g3naq@geoffgrayer.force9.co.uk .

73 from Brian G4NNS, UKuG Chairman <brian-coleman@tiscali.co.uk>

Additional information from Mike Willis, G0MJW (Rutherford Appleton Labs)

Please do not turn up early! Unfortunately last year, several people managed to get into the room early rather than waiting by the gate, which really upset out setting up timetable. Once people start coming in we can't leave the gear unattended, which means we can't go and get luxuries like working pens, paper for results or find someone to get the heating back on.

Registration

Please send an email to **ukugevents@microwavers.org** stating the names of each person coming and whether or not you are interested in attending a dinner. **The deadline for registration is 16th March 2007.**

Site Rules

There are no real issues apart from common sense. RT attendees must stick to immediate area of the event and not wander off unaccompanied around the site. The **speed limit is 20mph** except where lower limits are marked, it is strictly enforced. Really strictly, there is CCTV and a Radar gun now. **Parking is only permitted in designated parking bays**. The **site is non-smoking** and food and drinks are not permitted in the lecture theatre. In the event of an emergency first contact a RAL employee if available or dial 2222 from a local telephone. **In the event of a fire alarm**, everyone must gather on the grassed area outside the lecture theatre. If there is a site emergency, stay inside. RAL staff will tell you what to do. Cameras and rigs are OK on site but please do not transmit into an antenna on 13cm as the adjacent band is currently being used on site for receiving deep space comms. **(Continued next page ....)**

RAL Round Table - 25th March
PROGRAMME

1030: Doors open

1030-1200: Informal socialising/surplus swap tables

1230-1330: Lunch

1330-1340: Formal welcome: Brian Coleman G4NNS and Chairman UKuG

1340-1400: Awards:
1. Presentation of Special Award to Mike Dixon G3PFR
2. Presentation of Contest certificates and Trophies: Steve Davies G4KNZ presiding

1400-1430: Lecture 1: Spectrum Update with particular reference to Beacons
- Murray Niman, G6JYB

1430-1500: Lecture 2: 134GHz The next Frontier - Sam Jewell G4DDK

1500-1515: Break

1515-1545: Lecture 3: Organising a multi band microwave contest entry - Robin Lucas G8APZ

1545-1615: Lecture 4: Converting an ex-Government Communications site for EME Use.
- Dave Powis. G4HUP

1615: Event closes

Test Facilities

The test facilities are one of the main reasons for holding the RT at RAL. As usual, what Mike Willis and his team can measure will depend on what equipment and room is actually available on the day. Most people have asked for noise figure, ENR cal, power output and spectrum, so they will concentrate on these. From the feedback, the likely test gear will be limited to:

- Power meter with heads for up to 3W to 18GHz in coax, with WG20 (24GHz) , WG24 (47GHz) at 100mW max.
- A 30 GHz Spectrum Analyser
- A 30 GHz Signal generator
- A Noise figure meter to 18 GHz able to do ENR estimation. If you want a record, bring a floppy disk.
- Variable voltage PSUs to 30V at 2A. A 20A 13.8V PSU will also be available.
- A selection of adapters, Powerpoles - WG24, etc.
- **Remember to bring all the leads and tools you need!**

Internet

In case anyone is interested, there is a visitors wireless LAN on site using IEEE802.11g

Lunch

More info will be posted on the website (**accessed through www.microwavers.org**) when available. ****SEE PAGE 2 OF THIS ISSUE ... STOP PRESS ****