



An Amateur Radio publication for the Microwave enthusiast

MICROWAVE NEWSLETTER

Published by the Radio Society of Great Britain and edited by G3PHO and G8AGN.

Lambda House, Cranborne Road, Potters Bar, Hertfordshire EN6 3JE

FROM THE EDITOR

2003 – JUNE

This month contains both good and bad news. While we can rejoice in the arrival of the summer and good microwave activity levels, we are also saddened to learn of the passing of yet another prominent UK microwaver, Glen Ross, G8MWR. A short tribute to him appears in these pages.

Thanks to all the contributors to this month's edition. It's heartening to receive such a large

amount of detailed activity news from you and it's with some regret that we often have to edit it down to the space available here. In this regard please read the note at the foot of the back page.

Technical articles continue to come in but we are in need of more, especially for the next issue. One or two page items on any microwave related subject are most welcome. Our thanks this month go to Mike, G0JMI, for his Flyswatter diagrams and to John, G3OKA, for yet another article. John is presently our most prolific contributor for 2003!

The summer contest season seems to have received a good level of support from UK and Continental operators. Don't forget, though, that the microwave bands are usable at other times! More and more UK operators are logging on to the ON4KST microwave Internet chat room. This is an excellent substitute for VHF talkback when 144MHz or 432MHz conditions are poor. Indeed many operators are using little else these days. If you haven't tried the chat room yet then go to www.on4kst.com and sign up. You'll meet up with several well known callsigns from the UK, PA, ON, F and DL, and have a link to the Convers net at the same time. However to make full use of this system you really need to have an internet account where you pay a fixed fee for unlimited access or otherwise the "pay by the minute" account holders could face a big telephone bill!



In this issue ...

- Glen Ross ~ Silent key
- The HP432A Power Meter ~ a look at an "old faithful" ~ by G3OKA
- Got an FT857? Read on ...
- PIC Keyer Offer ~ G4NNS
- Flyswatter antenna - constructional diagrams by Mike, G0JMI
- The Big 24GHz QSY Question
- Activity News
- March Multiband Contest - amended results table.

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



G3PHO: Peter Day

0114 2816701



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



G3PHO: Email: microwaves@blueyonder.co.uk

SUBSCRIPTION ENQUIRIES SHOULD BE SENT TO RSGB HEADQUARTERS AT THE ADDRESS SHOWN AT THE TOP OF THIS PAGE AND NOT TO THE EDITOR ..



10GHz SOLID STATE POWER AMPLIFIER

Made by Mikon, sma in/out, unused, with maker's test certificate. PSU required: +11 to +14V @ 9.5A, .47dBm output. See Feb 200 Microwave Newsletter for details.

Price £380 including postage

**Contact Martin Farmer, G7MRF.
Tel: 01782 637467 or email:
g7mrf@fast-4.biz**

LOOKING FOR COAXIAL RELAYS, SWITCHES AND TEST GEAR?

Then contact **Brian J. McMahon**, Newtown Abbey, Northern Ireland. Tel: **02890 837661** or email: **brianmcmahon@dsl.pipex.com**

Brian has new and used **Teledyne 24V/18GHz coaxial** relays for sale. (At the recent Elvaston Rally they were only £12 and £6 respectively ... real bargains!)

WANTED ...

1 WATT SOLID STATE AMP FOR 10GHz

Eg Qualcomm or similar (to be driven by DB6NT/WDG transverter).

**Please contact John, G3NWU, with details:
Tel: 01429 298948**

WANTED .. I'm looking for an old 432 - 28MHz receive converter, possibly like the old Microwave Modules MMC432/28, to use as a downconverter from my 432MHz transverter output to my existing 30MHz noise measurement receiver. I want to measure moon and sun noise accurately without lugging one of my spectrum analysers out to the dish. I could build a converter of course, but I don't have a lot of time: 10 acres and a full-time job don't leave a lot of time for play! Someone must have one sitting in a box somewhere. I'm happy to pay a reasonable price.
Chris Bartram , GW4DGU <gw4dgu@blaenffos.org>

SILENT KEY SALE ... G0FYM (Near Barnsley, South Yorkshire)

Roy Oxley, G0FYM, was an avid collector of equipment and spares! He would come back from rallies laden with bargains, many of which were microwave ones and which he would store away in his South Yorkshire home. Sadly he recently passed away and his brother Ian, G1CMT, is now charged with the job of clearing this veritable "Aladdin's Cave" ! There are rooms and rooms of interesting items of equipment.

Among these items are two brand new **MAcom 10GHz "White Boxes"**, the base station versions that include a 1 watt PA and an RF preamp (3dB NF). While these need some mods to bring them down from 10.5GHz to the amateur band, they are a good way of getting started on 3cm narrowband. Full mods (an Acrobat pdf file) can be obtained by emailing the Newsletter Editor.

Ian is very anxious to fulfil Roy's wishes that the microwave gear goes to "good homes" ... i.e. to other microwavers. He has no intention of selling to dealers!

If you need something microwave, the chances are that you'll find it at Roy's place so why not ring brother Ian on: (mobile) 078998075 or (home) 01977 643358. The price will be very reasonable if you are bonafide microwaver (mention the Newsletter editor when you ring him!).

Editor's note: please don't be a "time waster" ... Ian has enough to do without having those around.

FOR SALE .. By G8VHI

- IC451 multimode 70cms rig **£175**,
- Very old MM 23cms transverter, working but needs TLC **£25**
- Single 2C39pa for 23cms spares or repair **£10**
- ft225rd with mutek front end not working but worth "summat" for parts **offers**
- single brick 23cms pa ... **offers**
- 7/16th din connectors for 1/2 and 5/8th cable **£5** each,
- 2 X 19ele Tonnas for 432, old type, **£10 the pair**
- all items please collect

Wanted or swap for 23cms masthead amp and or 13cms gear WHY.

I am qthr here in Nuneaton. e-mail g8vhi@qsl.net or write to me at home.

Now got new ts2000 time for clear out!

WANTED ... by John TYE, G4BYV

My Baycom Serial Modem seems to have given up. Has anyone got one to spare. Phil, G6IIM, of NWPUG is no longer able to supply them.
Please email me at:

g4byv@woodgate73.freemove.co.uk

FOR SALE & WANTED

By : Kevin Ravenhill, G1HDQ [knr@fireflyuk.net]

(1) **Yaesu FT290R Mk1**. Casing a bit worn/scratched but the rig is otherwise 100%. This is an early model with a previously "deaf" front-end, however this has been reworked and carefully set up by a professional RF engineer (me!), and is a good deal better than it used to be. Other mods: Now has 10 x 1800mAh new AA NiMH cells internally, with modified charging arrangements. Supplied with 18V plug-top SMPSU (RF-quiet!) which "duz everything" - charges the batteries, powers the rig and provides +12V regulated out the back for accessories. Rig will also run off the usual external 12V supply. Original front telescopic aerial now replaced with battery charging indicator. Original rear SO239 aerial socket now replaced with BNC. With mic/manual/circuit/mod details etc. **£100**.

(2) **Kenwood TR751E 25W 2m multimode**. VGC, no mods apart from the usual unreliable display & meter backlight lamps having been replaced with green LEDs. Unboxed but with power cable, mic and manual. **£225**.

Would prefer buyer to inspect/collect both items from the Axminster area, otherwise carriage extra. For further details telephone 01460 220338 or e-mail knr@fireflyuk.net.

I am looking to acquire an IC202 crystal for the 144.8-145.0 segment. Another one for the 144.4-144.6 segment would also be quite useful....

Please email (address above)

FREE MICROWAVE EQUIPMENT!

I have a stack load of satellite equipment here in Aberdeen which is about to be skipped. I hate to see such gear destroyed needlessly.

It is free to anyone who can collect it.

Most of it is obsolete Inmarsat equipment operating in the 1.5GHz band.

There are tracking dishes in domes approx 1m diameter. Whoever collects this gear will need a trailer or a large van!

Dean Last, GM4THP

**Email: dlast@caprock.co.uk
Telephone: 01224 617702**

G8MWR ~SILENT KEY

UK readers will be especially saddened to hear of the recent passing, on May 21st 2003, of a popular and influential microwaver, Glen Ross G8MWR. Many of you may owe your present interest in microwaves to Glen who, from the 1970s into the 90s, did much to encourage newcomers to this absorbing facet of Amateur Radio.

A short posting on an Internet microwave reflector alerted us to the news:

*From: "G6FEO" <G6FEO@boltblue.com>
To: <waveguide@yahoogroups.com>
Cc: "Ian G0EDT Hopwood" <g0edt@arri.net>
Sent: Thursday, May 22, 2003 8:27 AM
Subject: Sad News*

*Dear All,
I was informed by Ian Hopwood, G0EDT, of the sad news that Glen Ross G8MWR died yesterday.
When I get any more information I will pass it to the group.*

*regards,
David.*

Glen believed in the "KISS" principle .. ie, keep things simple! He formed the **Microwave Society** and issued regular newsletters, "Waveguide", from his Coventry home. He claimed to have over 600 members at one time, the great majority of them on 10GHz wideband FM. To encourage them, he offered all the necessary Gunn spares, Solfan modules, horns, FM IF pcbs and the like at nominal cost, as well as sound advice in plenty, for free.

His hard work and enthusiasm bore much fruit, as activity levels during the 10GHz cumulatives of the 1980s showed. However, with the advent of narrowband techniques at the end of the 80s and into the early 1990s, the emphasis went off wideband FM in the UK and many of Glen's society members dropped by the wayside, often claiming that the narrowbanders had turned their backs on the beginner. Well over 100 of these callsigns appear in the writer's list of "Where are they Now?", a sad reflection on what should have been a great opportunity to recruit and retain a thriving narrowband population in the UK. Glen's view, shared by this writer, that simple wideband techniques are still the portal for newcomers to microwavers, was sadly not shared by several of the narrowband "elite" at the time.

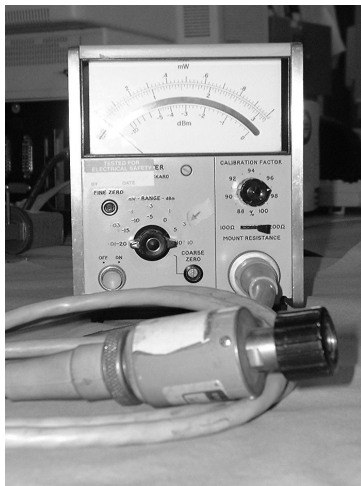
In latter years Glen had been hampered by ill health which finally caught up with him this Spring. His tall figure had been missed at rallies for a few years but he had continued to encourage microwaving in the UK by setting up a couple of Internet reflectors. These have become the arena for technical and other discussions, attracting contributions from all corners of the globe.

Thanks Glen for all you've done ... great job!

Glen's funeral was held at Coventry Crematorium on Friday 30th May

73 Peter, G3PHO

The HP432A Microwave Power Meter



A legend in its own lifetime

Introduction

There can be few items of Instrumentation that have been in production for over thirty years. The HP432A Power Meter was designed in the late 1960s, entered production in the early 1970s and will cease to be available after September 2003. Entirely discrete analogue design, devoid of a digital display and built onto antique style circuit boards, these units continue to be used in numerous situations and applications throughout the world. They often appear on the second user market at a fraction of their original cost (currently c£10,000) and are a tempting purchase.

Model options relate to the location of the thermistor input connector and the provision of the battery pack. Option 001 has the rechargeable battery pack, option 002 has a thermistor input on the rear panel wired in parallel with the connector on the front panel whilst option 003 has the thermistor input only on the rear panel.

Thermistor cables are available in 10ft, 20ft, 50ft, 100ft and 200ft lengths and are suitable for use with any type of thermistor be it 100 ohm or 200ohm. The thermistors themselves are available in Coaxial or Waveguide Mounts and have a frequency range of 0.01 to 40 GHz. The most common heads are the Coaxial "N" type. They resemble a pepper pot, and whilst HP list only two models other manufacturers have produced alternatives. Most second user HP432As seem to be equipped with the 0.01 to 10 GHz head (HP478) and these are relatively inexpensive. The 0.01 to 18 GHz head (HP8478) is rather scarce and usually priced at a premium. Alternative 8 GHz heads are plentiful and are often priced at a few pounds each.

A calibration table should be found on the side of the head. With an HP unit this takes the form of an aluminium label with calibration points marked with a centre punch. For an accurate power reading at a specific frequency the HP432A calibration switch is set to the value marked on the label. Unless this requirement is critical such precision can be ignored and a median calibration setting used for the entire frequency range.

Coaxial heads have an internal resistance of 200 ohms. More exotic heads designed for direct connection to wave guide have an internal resistance of 100 ohms hence the two range options on the HP432 front panel.

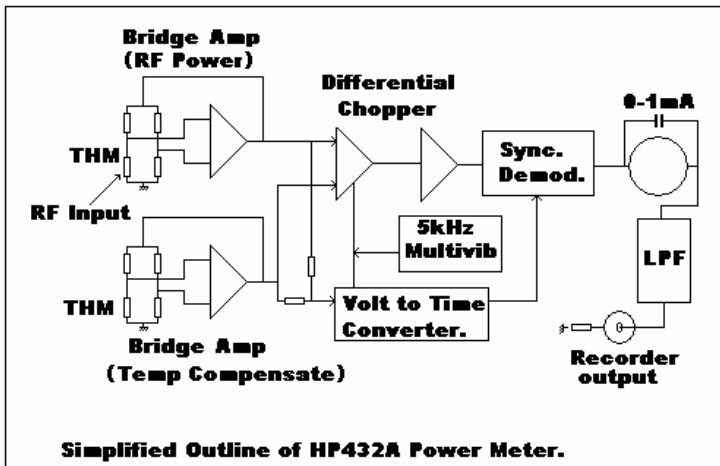
The Package

For the Power Meter to be regarded as a usable system it needs to consist of three items, the meter itself, a head cable and a thermistor head. The battery is not essential, it is optional, and an Option 001 meter will function without this item. Head Cables are quite specific and, whilst it would pose few problems to make a suitable four core cable, locating a source of the connectors poses a serious difficulty. Fortunately these cables are available on the surplus market for a few pounds each. Low frequency thermistor heads (e.g. < 8GHz) are also readily available but intending purchasers are warned against buying heads that have been "repaired" or show obvious signs of tampering. They are notoriously difficult to repair.

When purchased from a professional second user source, the package should include the workshop manual. These same sources are sometimes willing to make photocopies or supply originals but at a significant price. Without the manual these units are impossible to repair.

Circuitry

Input power warms the RF Power Thermistor creating a voltage (V_{rf}) proportional to the temperature change of the Thermistor, room temperature is sensed in an identical manner to create a compensation voltage (V_{comp}). The change due to the RF input is therefore the difference between these two voltages ($V_{rf} - V_{comp}$). Amplifying small dc signals poses serious base line stability problems and the classical solution was to convert the dc signal to ac, amplify, and then rectify back to dc. The term for this technique was a "Chopper Amplifier". Today there are Integrated Circuits that perform this role, e.g. 7650, and certain Operational Amplifiers are available to compete with their specification. In the HP432A this is performed using discrete components. Unfortunately ($V_{rf} - V_{comp}$) does not provide a "Power" measurement, it is necessary to include an "R" term as in the basic equation $P=V^2/R$, it is also necessary to remove the V_{comp} term. To achieve this the two values are summed ($V_{rf} + V_{comp}$) and the resultant value modifies the width of the 5 kHz signal to the synchronous demodulator.



The demodulator output is therefore a pulse train of height proportional to the difference, and width proportional to the sum of V_{rf} and V_{comp} . The capacitor across the meter is an essential part of the integrating circuit that causes the meter to display $(V_{comp})^2 - (V_{rf})^2$. The Low Pass Filter is an integral part of an Auto Zero Circuit and the user output "Recorder Output" is a dc level devoid of the pulse train into the meter circuit.

Maintenance

Experience with a number of HP432A over the past fifteen years has clearly demonstrated that they are very reliable. There has never been a catastrophic failure and they are extremely easy to repair. Whilst HP insist that of the sixty semiconductors used in the design over half are selected devices, it has been found that they can be generally replaced with off the shelf items of similar specification and some quite simple device testing to form matched pairs. One or two differential pairs are exotic devices and might prove difficult to locate they can, with a little ingenuity, be substituted.

The majority of failures have been due to ageing of switch contacts and judicious application of switch cleaner has affected a ready cure. A single case of a "sticky meter" was traced to the meter scale flaking and depositing flecks of white paint into the movement. Despite numerous attempts to halt the decay the problem continued. Eventually the meter scale was photocopied, the original paint removed entirely and the photocopy glued in place ... an invisible repair!

Damaged heads must be regarded as irreparable.

Applications

The HP432A has seven ranges, the most sensitive being 10 microwatts. The open end of a Coaxial Thermistor mount is an N type male connector. Numerous attachments can be fashioned onto N type sockets so that the HP432A functions as a very sensitive signal detector. In this manner wave guide modes have been determined by fashioning a dipole and rotating it to detect TE or TM modes within a guide that was excited from a signal generator. A closed loop will function as a general "sniffer" for detecting signals in a multiplicity of circuits. Low power circuits, for example amplifiers, can be connected directly to the thermistor head; it then functions in a dual role as load and detector.

For measuring real power, the least sensitive range of 10 milliwatts might appear somewhat limiting until it is realised that Coaxial Attenuators are plentiful and very inexpensive. Typically -10db, -20db or -40db with frequency ranges up to 18 GHz, when used in conjunction with directional couplers it is possible to measure immense amounts of power. In one application we use a -30 db bi-directional coupler / -30db attenuators / HP478 heads to measure the forward and reflected power in a system using a Klystron Amplifier that delivers 750 watts at 8.2 GHz.

Integrating an HP432A into a computerised system is made difficult because of the absence of remote range selection. In reality, this has not been found to be a real obstacle. However, the inherent drift that requires repeated "Zero Resets" can be automated. The reset circuit is simply a biased toggle switch and a pair of relay contacts wired directly in parallel with the switch and driven from PC interface card is a simple solution. The switch is readily accessible and there is adequate space to mount a small relay on a custom PCB within the enclosure.

On the rear panel of the HP432A is a "Recorder" output. This has a maximum amplitude of 1.000 volts for full scale deflection of the panel meter, irrespective of sensitivity range. Connecting this to the input of an ADC within a PC through a long lead is prone to problems, mostly related to earth loop induced 50 Hz. The Recorder shield is not grounded at the panel; it is bushed. Ideally the connection to this should be differential but the connector is not two pin! Similarly digitising a remote single ended 1 volt signal with a 10 bit ADC invites problems of noise and hence loss of resolution. A working solution has been to pass the HP432A output through a passive 50 Hz notch filter, amplify the signal using a differential chopper amplifier to 10 volts and connect this signal to the single ended ADC input through the long lead. The difference is impressive!

There is a delay between the application of the input signal to the head and the moment when the output is a true representation. This is not fixed but depends on the step amplitude of the input signal. For the Analogue display this is of little importance. However, when using a PC, it is all too easy to forget that there is a significant delay (in PC processing terms). In general a full range step input change of 10mW requires 1 second of delay but this can be reduced to 100 ms with virtually no loss of accuracy. Where the input is fluctuating it is possible to reduce this delay even further but experience has shown that 20ms is probably the lower limit and the thermal lag of the head then becomes noticeable.

Conclusion

Many of my HP432As are well over twenty years old. They have proven to be incredibly reliable and have been used in many, many roles and applications. They are simple to configure, easy to use and give unambiguous readings. Down time figures would indicate that they have been by far the most reliable items of equipment I have ever purchased.

The new price of an HP432A is daunting; their availability on the second user market at one hundredth of that price is certainly attractive and, when seen at surplus sales at one thousandth of that original price, they represent the steal of all time.

John A. Share, Oliver Lodge Building, University of Liverpool.
jashare@liverpool.ac.uk.

PIC KEYS OFFER

As part of my education program I have been learning about PIC chips (like so many of us). I have used a keyer project as my first real exercise. I know this smacks of re-inventing the wheel but at least I have ended up with a useful gadget at the end of the exercise. The outline specification is:- Variable speed Iambic keyer with two memories, one in RAM (volatile) and one in EEPROM non volatile, both programmable via the key. Memories are 6 words (paris being the standard word). This is enough for a 3 x cq + 3 x callsign + 1 x Locator unless you have a very long callsign.

I know there must be loads of keyer projects about so cannot judge whether this would be of interest to the microwave community. It is possible that my local club will take it up as a club project. If you think it might be of interest for the newsletter let me know and I'll copy the write up to you when I do it. Also, the software (or rather firmware source code) could go on your web site. For those with no facility to program the chip (PIC16F84 or 84A) I can program them for anyone supplying a chip (available from Maplin, etc) and pre paid return post and packaging.

For anyone not interested in CW but wanting a beacon or a means of replying to a CW call at least initially, I can make entirely pre programmed versions with cq and qrz calls ending in ... pse SSB SSB K K. I have supplied two of these to a couple of our more reluctant CW users who appeared to have missed out on the rainscatter in early June. These versions can have longer messages stored as part of the program.

73 Brian G4NNS [Brian.Coleman@compuserve.com]

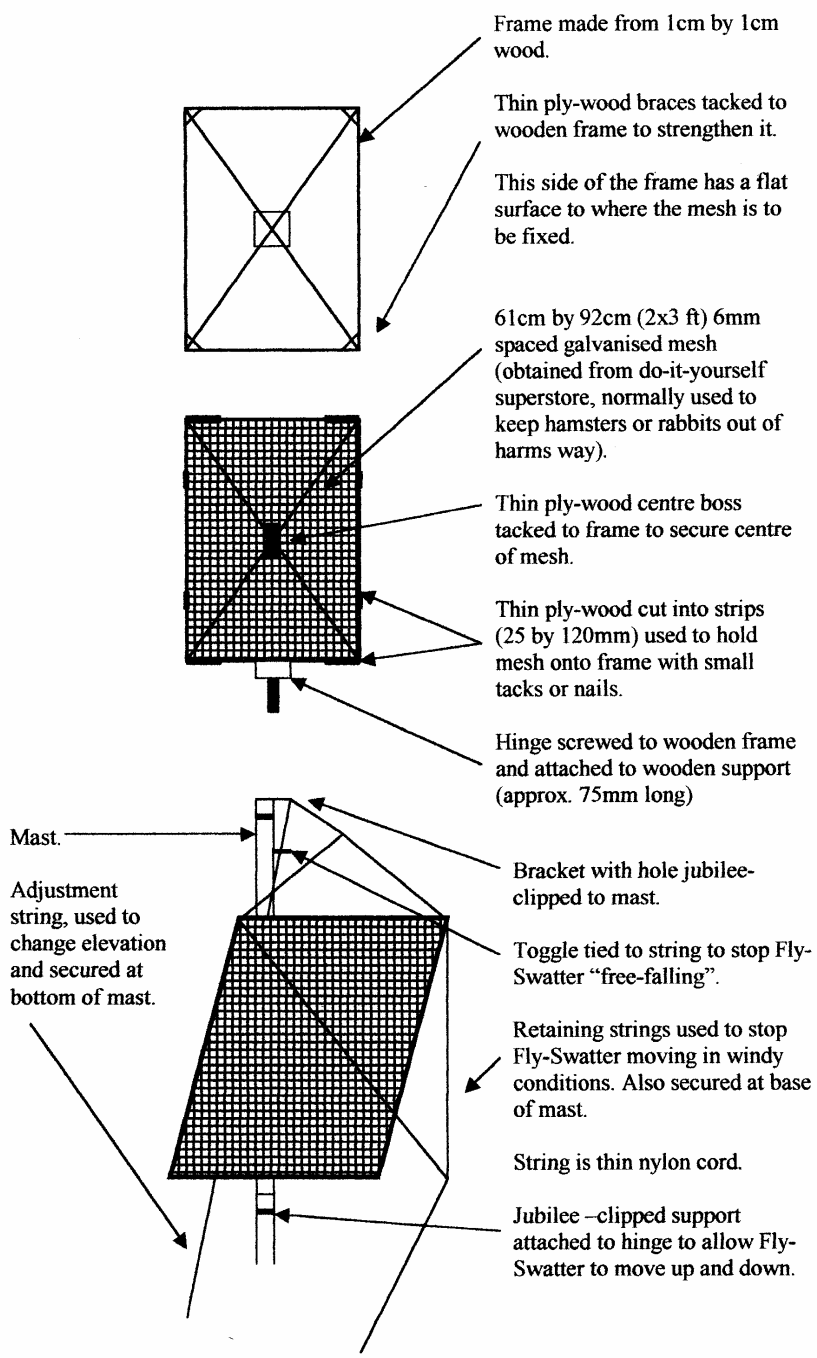
GOT AN FT857? READ ON

I thought Newsletter readers might like to know that the new FT857, (of which I have recently taken delivery), has a facility not mentioned in the June 2003 RadCom review which is of interest to microwavers. You can very easily make the display have direct frequency readout during transverter operation. The available readout can be anywhere between 0,000,00-9999,999,00 (Khz)

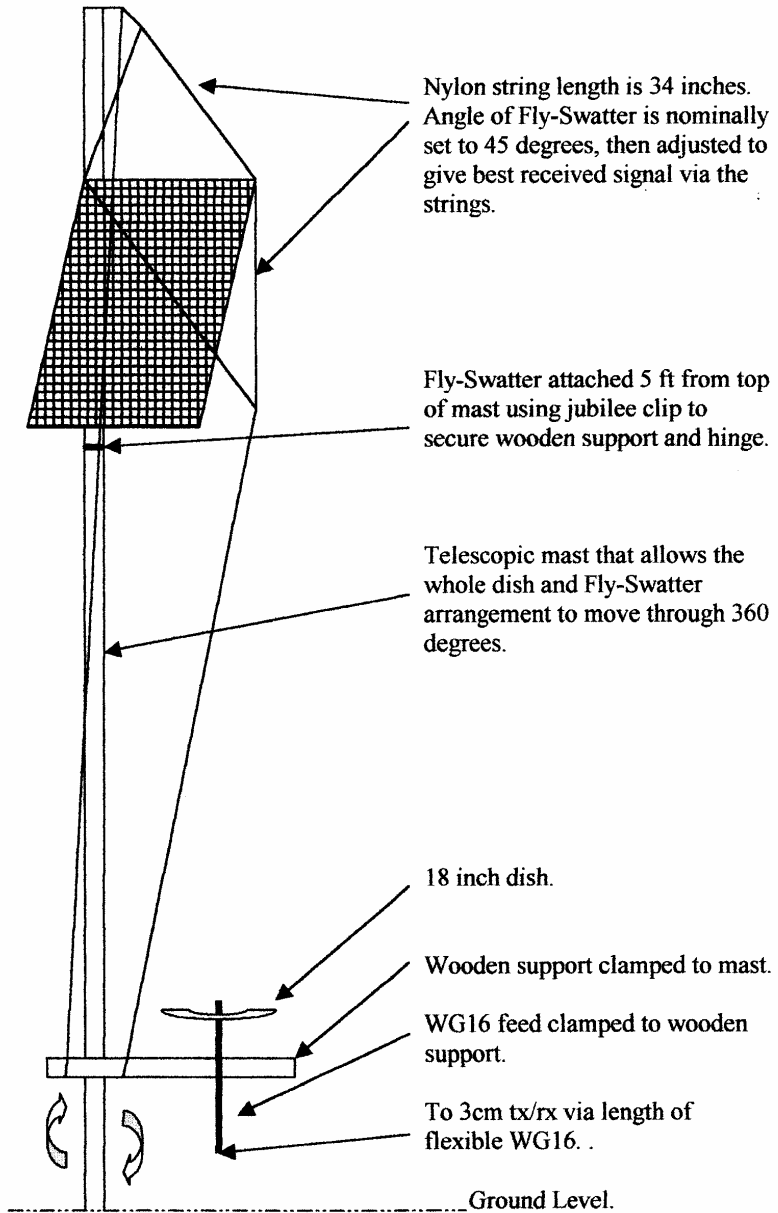
There are two menus available which means you can calibrate the FT 857 for two microwave bands, separately.

73 FROM Mike, G3JKX. IO82TQ. [mstreet@g3jkx.freemove.co.uk]

Construction of Fly-Swatter used by G0JMI on 3cm.



Realisation of Fly-Swatter and Aerial Feeding Arrangements.



TO MOVE OR NOT TO MOVE ... THAT IS THE QUESTION ... THE DEBATE ON THE 24GHZ QSY CONTINUES

Emails on this thorny subject continue to come into the editorial PC. The following are merely précis of longer discussions but the point is slowly being made, we think ...

From Grant Hodson, G8UBN

I am currently putting together some equipment for 24GHz, and I think that the new frequency proposals are very sensible, and could help to generate more interest in this band. By co-locating the satellite and Dx portions of the band, terrestrial 'Dx'ers would be able to point their dishes skyward and have the possibility of QSOs with anybody else on AO40. Also, the few stations that are currently have equipment for the AO40 24GHz downlink may wish to experiment with 24GHz terrestrial Dx - even 'one-way' QSOs are better than nothing. And no need to switch LOs or use wideband receivers to access both parts of the band.

It will undoubtedly cause some disruption for those that have to buy a new crystal for their transverter, but this is a small price to pay for a one-off move that could ultimately prove beneficial to all users of the band.

I have a signal generator, frequency counter and power meter that will cover the 24GHz band; I will be willing to take these to any of the UK microwave round tables to help anybody re-tune their equipment to 24048GHz if required.

From: Kevin Ravenhill , G1HDQ

I read G3UKV'S comments about the 24GHz situation in the April Microwave Newsletter and decided I had to throw in my tuppence worth:

I am in the process of building (or was, until this debate started) narrowband gear for 24GHz and I am now left in the situation of having to decide which of the two band segments to go for. Being near the South coast of the UK I am well-placed to work the Continentals who will undoubtedly be moving to 24.048GHz. However, I naturally also want to be able to work UK stations. If the latter decide to remain in the 24.192 segment I see no point in bothering with 24GHz - at least this year - as I will effectively need 2 sets of gear to cover all possibilities. A similar situation, perhaps, to having to use 144MHz talkback for the UK but 432MHz for the rest of Europe. Do we never learn?

So, my view is, assuming there is to be a frequency change, that there should be a concerted effort by everyone to harmonise this as quickly as possible and with the minimum of fuss.

Until this issue is resolved there are unlikely to be many (any?) new operators coming onto 24GHz (myself included). UK activity is low enough already without this additional uncertainty, and having different UK and continental band segments is hardly likely to help this.

An additional concern is that 24GHz is currently under threat from various commercial interests looking to grab what they see as a very attractive frequency. My impression as an industry "insider" is that this situation WILL get worse quite soon - a portion of the band including the 24.192 segment is likely to become widely exploited. In the worst case it could even end up being withdrawn for amateur use, as happened with the middle section of 10GHz. I'm not saying this will definitely happen but, with the ever-increasing commercial pressure on spectrum and the move towards spectrum pricing, it is a possibility. So, within the next couple of years we could have the decision taken out of our hands and be forced to move anyway. This may be unpalatable but it is an unfortunate fact of life these days in "UK PLC".

Perhaps there should be a quick poll of current UK 24GHz ops (or at least the active ones) to find out whether the majority favour a move to 24.048 in line with, and at the same time as, the rest of Europe?

From Peter, G3PHO

I've now decided to "bite the bullet" and move down to 24.048GHz. from January 1st. We must look long term and Grant's views shown above certainly carry some weight with me. At the cost of a new crystal and an hour (hopefully) of retuning my filters I think it will be to everyone's advantage. I hear that GB3SCK is to be moved down in frequency so I will be putting the new Alport beacon (1O93FB) on to 24.048 also. This beacon is still in the construction stage and hopefully will be on before the end of the year.

So, it looks like we have all got the rest of this year to play on .192. and a few winter months to change everything over to .048. Get ordering those new crystals now!

P.s. ... rumours have it that the Continental Europeans are not too happy about the move either but we've had no direct contact with anyone over there. So, what say, F, DL, OZ, PA, etc?

More on this thorny subject next month!



ACTIVITY NEWS FROM THE WORLD ABOVE 1000MHz

There's lots of activity news this month. Thanks a lot folks! It looks like this year could see a return to the golden microwave days of yesteryear! First we have a couple of reports held over from last month due to lack of space in the newsletter ...

From Peter Balir, G3LTF

[100633.1656@compuserve.com] During the DUBUS eme contest on 15/16th March I worked 9 stations:

OE9XXI, HB9SV, F2TU, SM3AKW, OZ4MM, ZS6AXT, G3LQR, OK1CA, GW3XYW. On the 18th I worked N8OU. Gear is a 6m dish with 50W at the feed (150W in the shack!) and 50deg K system temperature. On April, 12/13th I was active in the 23cm section and worked 44 stations.

I was on terrestrial microwaves in the early May weekend 432 and Up contest. Conditions were pretty ordinary. The best I worked on any band was DLOGTH on 432 at 857km, but NG on 1296. Best on 1296 was DFOHF/P at 521km, PA6NL at 391 km and GD0EMG at 387km on an aircraft reflection. On 2320 I worked PA6NL, RS58, and struggled to work G4RFR in the next square IO80UU. There is something bad about the 74km path from here to Bell Hill! I am rebuilding my 3cm tropo system (1W /60cmdish) to put it up on the mast but couldn't get it finished in time for this one.

A report for the same contest weekend

comes from John, G8ACE: With a week long holiday planned in Bude, Cornwall, I was able to operate on 3cm on May 3rd from the high ground above Tintagel. This is an excellent site, with GB3CCX audible as usual at around 240km distant. The weather was a little unkind, with high winds and rain after lunch on Saturday afternoon. The rain stopped however once the antennas were rigged but the high winds required the tripod to stand astride the field gate with the pan and tilt head roped down to the field gate top crossbar. For 2m talkback the linear was taken along providing around 90w from battery power into an eight element

IMPORTANT CONTEST RULES AMENDMENT...

Due an unfortunate error (made by your humble editor!) the following section was inadvertently omitted from the official RSGB Microwave Committee Contest Rules published in RadCom and in the January 2003 Newsletter. There was no intention to deliberately abolish the squares multiplier in the 10 and 5.7GHz cumulatives .. it just happened! After some lengthy discussion with the Committee Chairman it was agreed to reinstate the multiplier so please add the following paragraph to your 2003 rules for both the 5.7GHz and the 10GHz Cumulatives:

"The final, total kilometre score for the best three cumulative sessions will be multiplied by the total number of different Locator Squares ("grids"), for example IO92, IO81, etc) contacted over the entire cumulatives (ie up to the six events maximum). To claim this bonus it is therefore essential to submit logs for all events entered, not just the best three. Please include a separate check list of the squares worked with your cover sheet."

To help the adjudicator check the logs, the list of squares worked should show the contest date and serial number for the first contact with each square.

The update rules can also be found at
www.g3pho.org.uk

yagi. This seems to be an absolute minimum power level to try and awaken stations who might not otherwise beam down to the far west. Seven stations were worked on 3cm with only one of those being a one way (G3PHO in IO93) and a result of my mean 250mW Tx power level. There was no total failure only on 3cm. Apart from the wind it was a pleasant afternoon. My thanks to those who beamed the Cornwall way. 73 John, G8ACE.

From: Neil Whiting G4BRK, (IO91DP)

**[neil.whiting@oxsemi.com] comes
another report on the early May**

contest.. I found conditions poor but I was very pleased with activity and results on lower bands - 34 contacts on 23cm I think is the best total ever for me. Best DX was DJ6JJ at 602km. 13cm gave 12 contacts, no great DX. PA5DD was best at 444km. 9cm activity was good with 7 contacts, the best being PA6NL at 403km. 6cm poor all round, best G3XDY, just couldn't make another 200km to cross the N Sea. 3cm saw very poor activity and condx. The best was PA6NL again but I couldn't make it with PA0WWW (it usually goes). Only 12 QSO's!! I failed with G8ACE/P, G4ALY - where was everybody else. On 24GHz I struggled a contact with G8IFT/P (50km) - glad to get one!

MAY 5.7/10GHz CUMULATIVES

The end of May saw the first of the new 5.7GHz and 10GHz Cumulatives. The pre-contest email activity lists promised some good sport on these bands. For some operators that materialised but for others it was a little disappointing.

The two Peters, **G3PHO/P** and **G3PYB/P** combined efforts and spent a whole weekend on the North York Moors. While their XYLs went walking, the microwavers had a whole day out on **Blakey Ridge, IO94MI73**. An interesting day saw changing conditions, with some good rainscatter at times. The rain kept off the microwave site but very dark clouds and rain could be seen to the south. G3PHO/P used his 12 watt 6cm PA for the first time and found it a really worthwhile improvement over the previous 1 watt system, so much so that an hour long EME-style operation with **F1PYR/P (JN19CS)** finally resulted in a full contact over the 553km path, a best DX for 5.7GHz and a new Loc square for both operators. Frustratingly, Peter heard F5HRY tail-end Andre but in spite of many minutes calling him, no reply was forthcoming and a potential 668km QSO was lost! The 12dB advantage Peter had over G3PYB/P on this band meant that the latter couldn't hear the RST2/319 cw signals coming from France. The same applied to G4ALY whose 519 signal gave Peter a 485km contact. 8 contacts were made on 6cm and more were expected on 10GHz but a disappointing 16.5 was the final result. He had no 10GHz contacts with the Continent and several UK stations were never even heard on 2m, G4ZXO/P being one. They were out /P but conditions on 2m were as bad as you could get. As a result the mobile phone was buzzing all day!

Useful comparisons were made between the 10GHz systems of the two operators. G3PHO/P was using 5 watts to a 1.2m prime focus dish and commercial scalar feed designed for that dish, while G3PYB/P was running 3 or 4 watts to a 60cm offset dish with a homebrew feedhorn. One would expect G3PHO's system to consistently outperform that of G3PYB but this was not so in every case. On the long haul contacts (eg G0API at 403km and G4RFR/P at 397km)) there was a "two S unit" report difference in favour of the bigger dish but on the higher angle, rainscatter contacts, such as G4IEV/P at 250km, the smaller system of G3PYB received much stronger reports (eg from S8 to S9+10dB in one case!). This appeared due to G3PYB's facility of being able to tilt his offset dish up at angles approaching 20 degrees, whereas G3PHO's tripod allowed only a plus or minus 5 degrees vertical adjustment. The moral of the story is that rainscatter can be better on a smaller dish that has a broad beamwidth which appears to capture more of the scattered signal than a sharper system of higher gain. Has anyone else noticed this?

It was great to find **Jonathan, G4KLX/P** once again on the UK microwave stage after being HB9DRD

for a while. Jonathan's **5.7/10GHz cumulative** edited report follows: at **Alport (IO93FB44)** the wind was rather strong and it was to cause the biggest problem of the day. The equipment was set up quickly. My 2m mast was mounted in a car wheel mount, the sort where you drive the car onto the base and that holds the mast, no guys needed. The microwave equipment is free standing using a high quality tripod. Alan G2HIO met me at Alport and he brought along his receive only system ... a 48cms dish and DB6NT equipment.

I heard G8OHM/P on 3cm with a rock crushing signal and after he'd worked one station I called him. He replied to another station. I supposed that the other station was stronger with him than me, a little surprising though. I called him again and he replied that he could hear a very distorted station calling. I'd not looked inside my microwave gear since sometime last year and I didn't expect any problems like this. I tried again, same problem, he told me to call him on 2m and to work it through. On 2m he said that my signal was FMing a little, a clue! My radios starting closing down, probably low voltage from the car's battery. I turned the car engine on and everything was cured, the voltage was too low. I'm not so sure how to fix it cheaply without buying car batteries or similar. I do have a sealed lead acid battery which could power the microwave transverter and driver for a while.

Then my dish fell over! The wind had got up. Some of the support structure was bent. Alan and I lifted it up and I reset the tripod to have extra wide legs for stability at the expense of dish height. In many directions this wasn't a big issue, but when working north and south east it did not have a clear view anymore. Another problem to solve ... find a completely new dish mounting system that allows for winds without damage and more accurate azimuth setting while I'm at it.

All in all I worked 12 stations on 3cm and 6 stations on 6cm, the best being G4RFR/P in IO80UU, 251kms (3cm) and G0API in IO80XS, 257kms (3cm).

The one thing that I really missed compared to Europe was the lack of beacons. GB3CEM was off air and no other beacons were audible, so setting up the azimuth and frequency offsets were left until later. Having OCXOs will help, and that is the long term plan but beacons are just so useful. Maybe people could be encouraged to provide more private beacons if licencing is an issue for official ones. Once I'd got things calibrated better, I was able to find GB3CCX.

The amount of activity was very impressive and equal or better to the activity I have heard in Germany in contests, but outside of contests when there is rain scatter around, where are they all ?

Another comparison between EU and the UK is that we run more power on average than there. I would say that 2.5W is more standard as a power over there. The equipment I used in the contest was: Talkback: 6ele Yagi, about 8 feet off the ground. Microwaves: DB6NT transverters and PAs, 10W on 3cm, 5W on 6cm, both feeding a 90cm dish.

From: Paul J. Marsh MOEYT
[pjmarsh@frars.org.uk] May Cumulative Report

Bell Hill (IO80UU) was activated by the G4RFR group 10GHz'ers Paul, MOEYT and John, M5AHQ/G6AZV. 24 stations were worked, with the ODX being G3PHO/P and G3PYB/P at 400km, both with reasonable signal reports. Other good contacts were G3LRP at 312Km and Sam G4DDK at 280Km.

It was really good to see so many people on the band and an absolute pleasure to make so many contacts - none of which we really struggled with. It was interesting to note that on several 10GHz freqs we could hear QRM (!) from other stations, probably via scatter of some sort.

Our gear is slowly improving. On 10GHz we are now using a db6nt with a 5 watt PA feeding a 1m offset dish. The db6nt has had the fantastic G8ACE oco added to make it a first class system. Interestingly, on the May UHF contest, I zeroed the Taunton beacon and noted the freq and again checked today and it's within 100Hz so both the beacon and my oco are doing the business. Also a change in the prime mover was made, from an old FT290R to a new FT897 with excellent results. The DSP noise reduction and CW filters were really helping lots. Pictures from the event are on the FRARS web site at <http://www.frars.org.uk/cgi-bin/render.pl?pageid=1227>

I was a little disappointed at the lack of activity from the Continent - we only worked 3 stations on 2m, one PA and two F's but no go on 10GHz.

From: Dave, G0RRJ (Andover) IO91FE,
[g0rrj@btopenworld.com]

In the contest I (24th May) I worked the following stations G8IMR - IO90IV, G4NNS - IO91FF, G4BRK - IO91DP, G4FRF/P - IO80UU, G3FYX - IO81RM, G3JMY - IO81RM, G8ACE/P - IO91JA, G0API - IO80XS, G4ZXO/P - IO90WV, G3PHO/P IO94MX (just, best ODX & new square #19), G3UKV/P - IO82NN, G8BKE/P - IO80WP, G4ALY - IO70VL, G3LRP - IO93HO, G4EAT - JO01HR, G0JMI - IO91MD, G4LDR/P - IO82QJ, & G1JRU - IO90HU. I heard but did not work F5HRY, F6DKW & G8OHH.. I am run 1W and a 60cm dish.

I really struggle with the 144MHz talkback. If I run more than 25 watts then I am into TVI big time and it is more trouble than its worth. I often work stations on 3cm easier than on 144MHz. In some cases I can't even hear them on 144MHz. I would recommend <http://www.on4kst.com/chat/start.php>. It is great for arranging skeds between fixed stations.

Recently I made some modifications to my antennas. My 55 element 1296MHz beam is now 1m higher. My 2320MHz beam is now 60cm higher. On 2320MHz I've reduced the feeder to about 6 Meters (2M LDF450 & 4M HJ4-50) which corresponds to an approximate feeder loss of 0.8dB. Earlier this year I finished the rebuild of my 13cm system, a DB6NT transverter, sequencer & 19W PA. Using Converters, I've set up daily skeds over the last 10 days and worked

Wim PA0WWM every day for 10 days at a distance of 428Km. I think Wim runs approx 30Watts into a 1.3 Meter dish. I also worked Andy GD0TEP on the 28th May for a new country on 13cm and this was far from lift conditions. I would like to hear from anyone who is interested in a 13cm test. Anyone in IO83 on 13cm? Over the past few weeks I have worked G4BRK, G4EAT, PA5DD, G8AIM on G4LDR 2320MHz.

On Sunday 31st May saw good rain scatter on 3cm. I worked F6DKW, F1PYR/P, F6DWG/P, F6APE and F1PYR from his home QTH. I also heard the F6DWG/B for long periods via rain. This was the first time I heard the beacon. It runs 4W, ideal for rain scatter indication. G4BRK & G4EAT were also very strong.

From: G1MPW. Steve Cooke

[scooke@tiscali.co.uk] Dave G6KIE + myself G1MPW were out portable on Sunday down on **Tolsford Hill 7K NW of Folkestone JO01NC**. It's the second time we have used what should be an excellent site but the results both times have been very disappointing! This time thunder and lightning forced an early shutdown and the odd spot of gear failure didn't help much either. Only managed four contacts -- the best to G8OHH/P in IO82QL at 298 km.

From: G8BKE/P Chris Towns

[mailto:ctowns@tesco.net] Operating from Povington in the Purbecks, activity was slow initially with conditions on 5.6 and 10GHz seemingly quite poor. However the mid afternoon saw more stations appearing and by the time I packed up round about 6pm 19, 10GHz and 6, 5.6GHz stations had been worked. No long distance DX, but a good turn-out by local and semi-local stations especially from home, helped to swell the numbers. Lets hope it continues for the rest of the year!

From: Neil, G4LDR (IO91EC)

[g4ldr@btinternet.com] The May 10 and 5.7 GHz cumulative saw me operating portable on 10GHz (a very rare occurrence). Spending the Bank Holiday weekend orienteering in Shropshire enabled me to operate /P Titterstone Clea after my run and soaking from the heavy showers on Sunday morning. I became operational at 1400 and immediately had a large pileup (this was direct on 10GHz) and I don't think I resorted to calling on 2 metres until after my 10th qso! I had 18 contacts during my couple of hours operation but no real DX. It seems that all the activity is in the south of the country or in the West Midlands. I'd hoped to work some of the more northern stations I can't work from home but there appeared to be no activity north of Birmingham, apart from G3LRP.

A problem occurred earlier in the year with my 10GHz TWT. Tests revealed that the vintage power supply had developed a fault and the cable had become damaged, exposing the conductor (carrying the helix supply) to the rain and mud .. the latter probably caused the former. Luckily a while ago I

acquired a more modern solid state switched mode TWT supply which runs off 24 volts. A trip to the local DIY store to purchase a 50m cable drum (complete with mains plug and sockets as its cheaper than buying just the cable), and a dry day to get everything set up again enabled me to become operational again 30 minutes after the 432MHz to 24 GHz May contest began. I had seven bands operating during the contest but only had contacts on six of them as my only attempt to work on 24GHz with G4BRK failed. Not a brilliant weekend with activity lower than previous years.

The regular Monday evening activity continues down in the south and west. Despite having no 10GHz for a few months, I managed to keep going with the other bands, mainly 5.7 GHz and for G1JRU with 24 GHz (are there any other stations that can have fully quietening FM QSOs between fixed stations on 24 GHz). We are 35km apart.

From John, G4EAT (JO01HR)

g4eat@yahoo.co.uk] The 1st 10GHz Cumulative on 25th May got off to a slow start with below average conditions making usual easy French contacts harder than normal. However activity level was very high and had 21 contacts in 12 locators. This was three more than for the 10GHz Trophy.

From Ralph, G4ALY (I070VL)

10/5.7GHz Cumulative Report: Ten Stations worked on 3cm:-G4NNS, G8BKE, G3LRP, G8ACE/P, GORRJ, G3FYX, G4ZXO/P, G4IEV/P, G4RFR/P G0API/P Six stations worked on 6cm :- G4NNS, G4BKE, F1APE (One way) G3LRP, G3WYJ/P, G3PHO/P Stations failed to complete: G4BRK, F6DKW, G4DDK, G3UKV/P G4LDR/P

From: G8AYY/P, Paul

[p.gaskin@tiscali.co.uk]: I operated from **Merryton Low (I093AD)** on 10GHz but only worked G8OHM/P on Brown Clea at 85km and G3UKV/P on the Long Mynd at 90km. G3PHO/P (Blakey Ridge) and G4KLX/P (Alport Height) in QSO were both heard by rain scatter on the same dish heading ! Due to the poor weather I did not put up my 144MHz 6 element Yagi at 4m for talkback and found that 40W SSB to a mobile whip was ineffective and no 2m contacts were made although a comment was heard from the Swindon area at over 160km about one of my transmissions. Perhaps I should get myself a mobile phone ? I use a 145MHz IF for 10GHz but may change this as I had IF break through on 10368.1MHz from a station operating on the input channel of the Buxton repeater GB3HH ! IF breakthrough has not been a major problem over the 9 years that I have been operating on 10GHz SSB however.

76GHz IS STILL ALIVE IN THE UK ..

From: Chris Towns, G8BKE [ctowns@tesco.net]

Sent: 03 June 2003 09:26

Last week myself and Roy, G3FYX tried again for a contact on

76GHz between Roy's home QTH in Bristol with myself /P at Tog Hill, 11km away. Although only a short distance, a contact over this path has eluded us on two previous attempts over the past couple of years. We believe that although the path is line of sight it is not the classic "bath-tub shape", as there is a ridge of ground at the mid point which may poke into the Fresnel zone making signals very poor on 76GHz. This time we eventually managed a two-way on CW using 1mW sources, DB6NT transverters for receiving and 18" dishes with penny feeds. For comparison a contact was made on 47GHz with considerably less power and the signals were easy copy on FM! The 24GHz GB3AMU beacon was also copied with ease from Tog Hill.
73 de Chris G8BKE

ACTIVITY NEWS CONTINUED OVERLEAF

BEACON NEWS ...

DL beacon within "earshot" of the UK

G4KLX writes: "The beacon **DB0GHZ** has been moved from JO43UP to Heligoland in JO34WE. If you look at the map you'll see that Heligoland is a sea path to a large part of the east coasts of England and Scotland. Considering how often that GB3MHX is heard in Denmark by sea path, I think this could be a very useful beacon for us."

The beacon keeper, DK1ZD emailed the following information:

The antenna is a slotted waveguide with 10db gain, 55m asl.
ERP is 45W omni
ORF is 10368.809MHz.

Nick, GM4OGI, sent us very similar information but gave the frequency as 10368.810MHz. He also noted that it radiates east/west which is just right for the UK operators to check for super-refraction/sea duct openings to the near Continent.

THE WOLVERHAMPTON 10GHz BEACON GB3CEM

is now back on air on 10368.880MHz in I082WO 15W eirp / 80deg sectoral horn centred on 125deg True.

Reports are most welcome on strength and frequency to **g8bhh.demon.co.uk**

Reports are particularly important as the beacon keeper, G4PBP is about to put the slotted waveguide antenna back on. This will have slightly less gain but a better polar diagram.

If anyone out there has a surplus PA for 3cms (2-10W) to donate or sell, Russ, G4PBP can make up the gain difference between the antennas. Please email him at the address shown above.

LOW BAND MICROWAVE CONTEST -30 March 2003 AMENDED RESULTS

Here (left) are the corrected results summary for the March All-band microwave contest.

Two additional entries are included: G8ACE/P and G3UKV/P, which went missing for different reasons when results were submitted. Thanks to John and Martyn for their entries. The full results will shortly be posted on the "World Above 1000MHz" website at

www.g3pho.org.uk

	1.3	2.3	3.4	Total
G3XDY	1000	1000	1000	3000
G4BRK	507	400	281	1188
G3PHO/P	296	0	580	876
G4WYJ/P	381	297	0	678
G8ACE/P	173	206	241	620
G3UKV/P	143	0	382	525
G0UPU	40	12	78	130
G4SJH/P	0	52	0	52

The contest adjudicator, Steve Davies, G4KNZ, wishes to comment on the confirmation of contest entries: From now on he will confirm receipt of email entries and if people do not receive confirmation, they are welcome to check with him. If he is away or travelling for a few days, there is usually an auto-reply set up. Also, if an email address is given, Steve confirm any paper entries as well.

G4KNZ's email address is steve.davies@nokia.com (an old address with a "nmp" in the middle no longer works, as one person found out!)

FORTHCOMING UK MICROWAVE CONTESTS

JUNE 22nd: 2nd 5.7GHz and 10GHz CUMULATIVE
JULY 13th: 2nd 24GHz CUMULATIVE
JULY 27th: 3rd 5.7GHz and 10GHz CUMULATIVE
AUG 10th: 3rd (& final) 24GHz CUMULATIVE (Logs due in by 26 Aug)

Note: All contests start at 0900GMT and finish at 2100GMT

Activity news continued ...

REPORTS WANTED

The Activity News has had to be curtailed somewhat this month (due to too many reports for the space available ... a good sign!) and we still have some reports, concerning a rather interesting rainscatter and tropo opening at the beginning of June, left over until next month. We hope to write up a short article on this event, together with a look at the weather conditions at the time, so if you haven't already sent in your report could you please do so by the end of the first week in July?

To date we have reports in from G4EAT, G3LRP, G4ALY, G8DKK, G3FYX and G3XDY. Our thanks go to them ... we **will** use their reports!

ALL TIME SQUARES/DX TABLE and 2003 MICROWAVE LEAGUE TABLE

Entries for these two activity ladders are very low indeed for this time of the year. To date we have only three on the 2003 League Table and just one or two changes to the all-time ladder, not enough to warrant taking up two pages of the Newsletter this month. The tables are kept as current as possible on the Internet at www.g3pho.org.uk so check there for the latest state of play. **However, we would like the tables to appear in the Newsletter a little more often so please send in your entries to make this a possibility!**