An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

Published by the UK Microwave Group

2010 OCTOBER

WALBURY IN THE WIND ...

Roger Ray, G8CUB/P, spent a windy day on Walbury Hill, IO91GI, during the recent September 5.7/10/24GHz Cumulative Contest.

The highlight of the day was a 121km contact with Keith, GW3TKH/P, who was on the summit of the Blorenge, IO81LT, in South Wales.

The photo left shows Roger's fine setup ... that mast certainly gets the dish above the trees!

In this issue ...

Latest News ...

- **Microwave bands open to Eu at last!**
- **New UKuG General Secretary needed ... will you offer your services?**
- **Ray, G3DVQ, Silent Key**

MANY THANKS TO OUR CONTRIBUTORS THIS MONTH ...

G3LTF, G6XDI, G3ZEZ , G4HUP, G3UKV and M0ELS

UK Microwave Group Contact Information

Chairman: G4BAO Dr. John C. Worsnop **Email:** chairman@microwavers.org **Located:** Cambridgeshire (JO02CG) **Address:** 20 Lode Avenue, Waterbeach, Cambs, CB25 9PX **Home Tel:** ++44 (0)1223 862480	**General Secretary: G8KMH Lehane Kellett** **Email:** secretary@microwavers.org **Located:** Hampshire (IO91) **Address:** Honey Cottage, Bent Street, Nether Wallop, Hants., SO20 8EJ **Home Tel:** ++44 (0)1264 781786	**Membership Secretary: G8DKK Bryan Harber** **Email:** membership@microwavers.org **Located:** Hertfordshire (IO91VX) **Address:** 45 Brandles Road Letchworth Hertfordshire, SG6 2JA **Home Tel: n/a**	**Treasurer: G4FSG Graham Murchie** **Email:** treasurer@microwavers.org **Located:** Suffolk (JO02) **Address**: 42 Catherine Road, Woodbridge, Suffolk, IP12 4JP **Home Tel:** ++44 (0)7860 356775
Scatterpoint General Editor: G3PHO, Peter Day **Email:** editor@microwavers.org **Located:** South Yorkshire (IO93GJ) **Address:** 146 Springvale Road, Sheffield, S6 3NU, United Kingdom **Home Tel:** ++44 (0)114 2816701 (after 6pm)	**Scatterpoint Activity News Editor: G8APZ Robin Lucas** **Email:** scatterpoint @microwavers.org **Located:** Essex (JO01DO) **Address:** 84 Woodman Road Brentwood Essex, CM14 5AZ **Home Tel:** ++44 (0)1277 211126	**Contest & Awards Manager: G3XDY John Quarmby** **Email:** g3xdy@btinternet.com **Located:** Suffolk (JO02OB) **Address:** 12 Chestnut Close, Rushmere St. Andrew, Ipswich, Suffolk, IP5 1ED **Home Tel:** ++44 (0)1473 717 830	**RSGB Microwave Manager: G6JYB Murray Niman** **Email:** g6jyb@microwavers.org **Located:** Essex (JO01) **Address:** 55 Harrow Way Great Baddow Chelmsford Essex, CM2 7AU **Home Tel:** ++44 (0)1245 474969

From the Editor's Desk

Hello again ...

As I put this issue together, there is a BIG tropo opening on the microwave bands and I have the newsletter to edit so there's no spare time for me to play microwaves .... Murphy's Law strikes again!

The opening started over the weekend of the RSGB Conventiion 9-10th October, at which several of our committee members were on duty either manning the UKuG display stand or giving lectures. The news flashed around the conference centre on Sunday morning that the "bands are open" and you just knew what those who had no RSGB commitments were going to do ... go home early! By the time I got home on Sunday evening I was too wacked to get any gear out of the garage but Monday saw me set up a 10GHz system with a 60cm offset dish in the front bedroom once again, after convincing the XYL that this was THE opening of all time, and I was pleased to hear DB0GHZ on 10368.814Mhz coming through loud and clear. However no amateur contacts were made as my time was limited as I had to be at the local radio club by 7pm, though my local pal G0EWN had by then worked OK1JKT/P a couple of times on the band, repeating the 1037km QSO we had both done some years ago.

G4ALY made a "first" with QSOs to Guernsey and others made several excellent contacts the details of which I do not have. So please send in your operating news to Robin this month and we should have a bumper Activity news section in the next edition of Scatterpoint

73 from Peter, G3PHO

News, views and articles for this newsletter are always welcome. Please send them to G3PHO (preferably by email) to the address shown above. **The CLOSING date is the FIRST day of the month** if you want your material to be published in the next issue. (***This is a change from previous dates)***

UK MICROWAVE GROUP ANNUAL GENERAL MEETING SUNDAY 14th NOVEMBER 2010

Notice is hereby given that the 2010 Annual General Meeting of the UK Microwave Group will be held at 9:45am on Sunday, 14th November 2010 as part of the **Martlesham Microwave Round Table** event which takes place over that weekend.

Sunday morning sees the UKuG AGM at the start of the morning's session. This will include the election of the officers of the committee and the presentation of the Chairman's, Secretary's and Treasurer's Annual Reports. We are looking for enthusiastic volunteers to join our committee and help shape the future of UKuG.

This year Lehane Kellett G8KMH is standing down as UKuG Secretary so we are interested to hear from anyone who would be willing to take on this vital UKuG officer position. If any UKuG member is interested in the office then please submit your name (and the name of your seconder) to the UKuG Chairman G4BAO as soon as possible.

Note: the Secretary's task is made less onerous by the fact that there is a separate post of Membership Secretary, currently held by Bryan Harber G8DKK which deals with all day-to- day membership issues.

On behalf of the UKuG Chairman John Worsnop, G4BAO, the UKuG Committee and the UKuG membership I would like to formally thank Lehane for his dedication and efforts during his years as Secretary.

If you are interested in joining the Committee, or have any agenda or AOB items for the AGM, please contact the UKuG Secretary Lehane Kellett by 29 October2010 by email to:

g8kmh@mm-wave.com

UK MICROWAVE GROUP SUBSCRIPTION INFORMATION

The following subscription rates now apply. **Please make sure that you pay the stated amounts** when you renew your subs next time. If the amount is not correct your subs will be allocated on a pro-rata basis and you could miss out on a newsletter or two!

Your personal renewal date is shown at the foot of your address label if you receive Scatterpoint in paper format. If you are an email subscriber then you will have to make a quick check with the membership secretary if you have forgotten the renewal date. From now please try to renew in good time so that continuity of newsletter issues is maintained. Put a **renewal date reminder** somewhere prominent in your shack (the editor suggests having it tattooed on your forearm!).
Please also note the payment methods and be meticulous with Paypal and cheque details.

Renewal of subscriptions requiring a **paper copy** of Scatterpoint are as follows:

Delivery to:	**UK £**	**US $**	**Eur €**
UK	14.00	-	-
Europe	18.00	36.00	26.00
Rest of World	24.00	48.00	36.00

Payment can be made by:

*** Paypal to ukug@microwavers.org**

or

*** a cheque (drawn on a UK bank) payable to 'UK Microwave Group' and sent to the membership secretary** (or as a last resort, by cash sent to the treasurer!)

The standard membership rate for 2010 is:

UK	**£6.00**
US	**$12.00**
Europe	**€10.00**

This basic sum is for **UKuG membership.** For this you receive Scatterpoint for FREE by email. If you want a paper copy **then the higher rates apply.**

The 14th International EME Conference Report

by Peter Blair, G3LTF

This was another excellent conference, held in Irving Texas, close to the Dallas-Fort Worth airport and it attracted 134 attendees plus 34 partners. Twenty-six papers were presented and another sixteen were published in the Proceedings. These also contain the full set of the original EME notes by Dick Turrin, W2IMU. As in the previous conferences, the topics covered relate to EME operation on 432MHz and above and there were papers on all aspects of the system: moon tracking, building QRO amplifiers both tube and solid state, LNAs, Reflectors and feeds, multi-band receivers and system optimisation using the EMECalc software.

There were four papers covering EME Dxpeditions from the Balkans to Hawaii. Nowadays, these are multi-band operations often using four bands, 70, 23,13 and 9cm with dish sizes of between 3 and 5m. One of these systems, a 10ft, trailer-mounted dish (**see photo left)** used by Paul WA5WCP to activate a number of rare US states on 23 and 13cm, was operating in the car park of the hotel. He contacted, among others, Howard G4CCH, clearly readable above the noise of the generator and the chat in the crammed full shack. The outside temperature was 42 degrees!

There were three papers on the operations from big commercial dishes that had taken place since the last conference. The JAs, led by Mike JH1KRC, used an 18m dish on 2, 70 and 23cm. The W6s activated the 150ft Stanford dish on 23cm and of course the grand-daddy of them all, the 1000ft Arecibo came up again on 70cm. These all made for some impressive, and sometimes slightly scary, pictures and anecdotes. The final group of two papers covered the theory and prediction of libration supported by measurements of signal spreading from 70cm to 3 cm. The results of this work are now being incorporated into some moon tracking programmes so as to allow optimum times to be selected for very difficult skeds on 6cm and above and for digital mode operations.

It's hard to select from such a good set of proceedings but I think the most interesting technical papers were the description by N2UO of his lightweight 6m diameter stress dish, the two papers by Tom, WD5AGO and Sam, G4DDK on their latest work on LNAs from 23 to 9cm, the paper on home-brew TWT PSUs from K5GW and W5LUA and OK1DFC's paper on his new 2.3GHz transverter covering all the frequency allocations.

There were two other notable events at the conference. Firstly the team of Sam, G4DDK and Dave G4HUP, put on an excellent presentation proposing Cambridge for EME2012 and the conference enthusiastically welcomed this. This will be the 15th EME conference and we confidently expect a high number of attendees. It will be a unique opportunity to meet a high proportion of the world EME operators, especially those active on the UHF/microwave bands. The second was the presentation of the RSGB Fraser Shepherd award to Joe K1JT for his work in developing weak signal digital modes for use in EME communication. Older readers may remember contacts with Fraser, GM3EGW *(see page 6 this issue...editor)* who was very active on VHF and UHF in the

50s and 60s and was involved in the early EME work in GM with Harry, GM3FYB. This award is determined by the UK microwave group's recommendation and so, appropriately, it was presented to K1JT by the UKuG trophies manager Dave, **G4HUP (see photo right).**

In addition to the conference paper presentations, there were mouth-watering surplus trade stalls and the traditional noise figure measurements and equipment demonstrations and, of course, the talking, fuelled by ice cold amber liquids, which went on into the small hours!

The NF results are at

http://www.ntms.org/eme/Noise_Figure_Testing.pdf while the conference proceedings are available from the ARRL's on line book store at
http://www.lulu.com/browse/search.php?fListingClass=0&fSearch=eme+conference+2010

This was an excellent conference in all respects and the organiser led by W5LUA, VE4MA, and WA8RJF, together with their supporting team, did a wonderful job. Our thanks go to them all.

73 from Peter Blair, G3LTF

THE PLT PROBLEM ..

Some interesting news...

From: Peter Chadwick G3RZP <g3rzp@yahoo.com>
Date: 29 Sep 2010 To: rsgbtech@yahoogroups.com

ITU-R SG1 on Monday Sept 27, approved a new Recommendation on PLT/BPL for the protection of radio services operating below 80MHz. It defines the acceptable level of noise degradation for the Amateur Service as 0.5dB, above the noise levels as defined in Recommendation ITU-R P372. These levels of degradation were accepted because of the inputs made on behalf of amateurs world wide by the IARU.

Interesting website applets ...

http://www.falstad.com/mathphysics.html

This is a very useful website if you are in the business of training amateurs for the various levels of licence and is also a fun site to visit if you're not!

Here you'll find all kinds of animated demonstrations of waveforms, antenna radiation patterns, waveguide effects, circuits, etc. Take your time to dig around the excellent resources.

Many thanks to Richard G3CWI for bringing it to our notice.

G3DVQ SILENT KEY

We were sorry to learn, via the latest Radcom, that Ray Pounder G3DVQ, a long standing member of UKuG, had passed away earlier this year. Since we had not been notified nearer the time we obviously were not aware of Ray's death. We send belated our condolences to his family and friends.

The Fraser Shepherd Award
… and who was Fraser Shepherd?

Editor's comment ..

It wasn't until Dave, G4HUP, asked the members of the UKuG Committee for information about Fraser Shepherd , so that he could say something to the attendees at the EME Conference described on the previous pages, that we all realised we knew very little about the man in whose name this important award is made. The following text was compiled by G4HUP in the light of information received from people who knew Fraser, who was quite a remarkable man it seems….

This award is presented annually by the Radio Society of Great Britain (RSGB) to a nominee selected by the UK Microwave Group – the presentation normally takes place at the RSGB's Annual General Meeting in the UK. Exceptionally this year, the recipient was Joe Taylor, K1JT, and the formal presentation took place at the recent EME Conference in Dallas, TX.

The award is for research into microwave communications, and the UK Microwave Group committee was in unanimous agreement that Joe's work on weak signal digital modes is not only an outstanding contribution in its own right, but is also an enabler for many other areas of research into microwave propagation. The presentation of the award to Joe at the EME Conference was also highly appropriate given Fraser's connections with the mode.

Fraser Shepherd was a Scottish amateur operator, holding the call GM3EGW, and a member of the Dunfermline Radio Club – he was a first class CW operator, and also technically advanced in his thinking and construction. As such he was a prime mover in the first GM 432MHz EME activity in 1965. Professionally, he was a businessman and hotelier. His sudden death in 1970, at just 45 years old, brought to an untimely end his creativeness, and also precipitated a period of decline in the Dunfermline Radio Club history. See more information on the history of the DRC at: www.kars.org.uk/drc_history.PDF and the first Scottish 432MHz EME video on You Tube is very educational. (search on You Tube 'G3LTF moon bounce').

Fraser Shepherd GM3EGW working Moonbounce from Cassingray

MARTLESHAM MICROWAVE ROUNDTABLE
12-13 November 2010

This annual microwave convention takes place, as usual, in mid November. At the time of going to press for some reason we haven't had a press release from the organisers with lecture details, etc, but the Martlesham Radio Society website is already accepting bookings so you should strike while the iron is hot! **You must register for this event** as there are security checks at the Adastral Park gate as you won't get in unless your name if on their list. **You must register at least SEVEN days** before the event and earlier than that if you want the Saturday Dinner.

You can register for the convention and book the Saturday dinner at:

http://mmrt.homedns.org/start.html

Check this website for latest news of the programme as this edition of Scatterpoint has been published one month before the event.

Accommodation and the Saturday Dinner has been moved from last year's venue to:

Hotel Elizabeth
London Road,
Copdock.
IP8 3JD
Ipswich

http://www.elizabethhotels.co.uk/hotel_IPS_findus.htm

Direct telephone number: 01473 209988

Rooms are available at a price of £55 (single) £61 (double) per night Bed and Breakfast.
Please quote code BK40289 when booking a room. Book now!

To find the hotel follow these directions: From the , exit South of Ipswich sign posted Copdock & Washbrook. Follow signs for Copdock. The hotel is on the left after approx. 1 mile. Note that this hotel is SOUTH of the main A12 road, whereas last year's was north of it.

Those of you who have not been to Martlesham before will certainly enjoy your first visit! There is a lecture programme, microwave fleamarket, dinner (see above) and a chance to meet many of the well known (notorious?) microwavers oif the UK as well as a few from overseas. In addition, there is a selection of first class test gear (and staff to operate it) so that you can check out your latest construction project. You'll need to book a time slot for this on arrival.

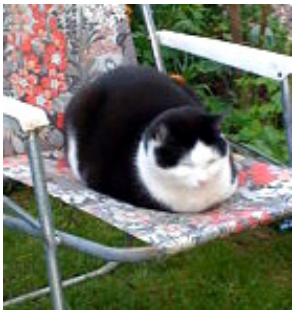
Saturday:
09:30 - Breakfast at the Orwell Truck Stop. Contact G4DDK for details.
11:00 - Front gate opens at Martlesham
11:00 -16:30 - Fleamarket and socialising
16:30 - Gate closes at Martlesham
19:00 - Meet at the bar at Hotel
19:30 - Microwave Dinner at the Hotel

Sunday
09:00 - Front gate opens at Martlesham
10:30 - Test and Measurements workshop opens
11:00 - 1 minute silence (Remembrance Sunday)
11:02 - 11:55 Talk 1 :
12:00 - 12:40 Talk 2 :
12:45 - 13:25 Lunch break
13:30 - 14:10 Talk 3 :
14:15 - 14:55 Talk 4 :
15:00 - 15:10 Refreshment break
15:15 - 15:55 Talk 5 :
16:00 - End of conference
16:30 - Gate closes at Martlesham

New Antennas at G6XDI

… by Chris Packman

My antennas were put up in the late 1990s and had served me very well. However, the 13cm quad loop yagi had lost many elements to the birds (?) and the 21 element Tonna for 70cm had SWR problems and was never used. So I decided to 'bite the bullet' and replace the antennas with some of a more modern design that matched my activities. I ordered a 44 ele DL6WU long yagi by Wimo for 23cm, a 67 ele for 13cm and a 9 ele Tonna for 2M. I decided to abandon operations on 70cm as I hardly ever worked anyone and the antenna was large and heavy. This decision maked enough room to also mount a 35cm ex-BSB dish for 3cm, a band I had wanted to get on for a long time. The antennas duly arrived but I waited a while for a good low wind, clear day to start. Taking down the old stack turned out to be not too bad. On the other hand, dismantling the old Tonna was a pain as all the fixings had rusted solid and had to be hacksawed through.



I started assembling the 13cm yagi but, sadly, the instructions were all in German so guesswork was in order. I went indoors to get a screwdriver and, when I returned, next door's cat was reading the instructions and the German newspapers that the antennas were wrapped in! I made him an offer to translate the instructions for me but he left claiming that I couldn't afford his rates in pilchards. The assembly went well and I soon had the antenna together. I then started the 23cm antenna which was basically a repeat of the 13cm one but a bit bigger. Next door's cat had tried watching from a wall but had now moved next door to my other neighbours to watch through the fence. How could this amount of cardboard and packaging not involve something edible? I soon had it together and put it down the garden with the 13cm antenna. Whilst I assembled the 9 ele Tonna, the cats showed no interest but decided to try to eat the German antennas! This proved boring so they went to sleep between the boom and the support of the antenna. By now I had run out of daylight so I waited for another off day to continue.

On a fine day, I continued with the installation of the new antennas. Next door's cats decided that one person heaving about large quantities of aluminium up a ladder wasn't good and decided to stay away. Getting the antennas up was a struggle but it was achieved fairly quickly. I stowed them at a lower level to await the box containing the 13 and 3cm transverters. The replacement transverters were assembled and tested in their waterproof box and put up on the mast. This time I had a new visitor to deal with, a police helicopter! I don't know what they thought I was doing or why it was so interesting but I ended up with it hovering about 150ft above me for a long time. I gave up in the end, fed up with the attention and noise. I returned a cup of tea later and so did the helicopter! Fortunately, as I tried to add the 35cm 10GHz dish, they got fed up and left me to it. The antennas were then raised to their full height.

Tests on 2m, 23 and 13cms were promising. 2m seemed lively and GB3VHF was very loud. On 23cm, GB3MHL was a slightly better signal than on my old antenna. GB3USK was similar as was GB3FM. A long listen found GB3IOW which I hadn't heard for ages. On 13cm I could hear

GB3MHS which is really good as it is fairly low power and in JO02. The March 144/432MHz contest gave me a chance to test the 2m antenna properly and I worked stations in ON, PA and DL with good reports under flat conditions, which is good. In the September 144MHz contest, I worked GM4ZUK/p in IO86 which was really nice and F4CQY/p in JN28 and four other French stations. These were worked with comparative ease to the old antennas. A microwave cumulative gave me a chance to test 23 and 13cms; reasonable reports were received on 23cm but not as good as I had hoped (this had always been the case with this "new" transverter) and on 13 no one could hear me... Oh well, you can't win them all! Some fiddling around in the 23cm transverter revealed a dodgy BNC .... I'd been running about 0.5W which made the reports more reasonable! 13cm was much more complicated and turned out to be a duff cable between the transverter at the masthead and the shack. G4RGK kindly offered me a sked on 13cm whenever I was ready and we had an easy contact one evening with good signal reports. In the following days I worked G4DDK in JO02 fairly easily which was very encouraging. 3cm is still a mountain to be climbed. I wasn't able to hear the nearest beacon GB3XGH which I had put down to the dish being obstructed by the roof on that beam heading but a test with G0KLX failed miserably with neither of us hearing each other despite being only about 2 miles apart.

I decided to build an interface box to enable me to use my FT817 to drive the 13 and 3cm transverters. Although it sort of worked, I was plagued again with PTT problems during an attempt to use them during the May contest.

After the disappointing results of the contest, I decided that a rebuild was in order to replace the non-working PTT system and provide output monitoring of the two transverters. An interface box was built to extract the PTT signal from my FT817, this was then run via band change switch up a multicore to the transverters.

Photo above: The transverter box under test and actually producing power at 3cm.

This gave me a good sequenced PTT and let me replace my ageing FT290. The DB6NT transverters provide a TX and TX monitor output and both of these were routed down via the multicore. After a bit of wiring I had a TX status display and a TX output display. I had also recently purchased one of G4BAO's LDMOS FET PA's for 23cm so this was built, aligned and put into my 23cm transverter giving me 45W out! In the next Tuesday RSGB UHF AC I got good reports on 23cm which was very encouraging. 13cm was promising with contacts with G4LDR and G4EAT but both reported severe FM on my signal. Investigation later showed that the 2M RF going up the feeder was getting into the multicore and upsetting the transverter. I replaced the earth bond to the screen on the multicore and the TX signal dramatically improved. An outing in the 23 /13cm Trophy contest saw contacts with good reports on 13cm with G5B (IO92), G4KIY (IO92), G4EAT (JO01) and GW3TKH/p (IO81).

The 3cm band is the next target. The antenna has been changed to a Procom and a 4W DB6NT linear added for more output. GB3XGH, my nearest beacon, is off the air at the moment and it's a fairly long haul to the nearest other one so I haven't heard anything yet. Another test with G0KLX is planned soon.....

BENDER FOR UT141 SEMI RIGID MICROWAVE COAX

…. By Gus, G3ZEZ
<gus.kestrel184@talktalk.net

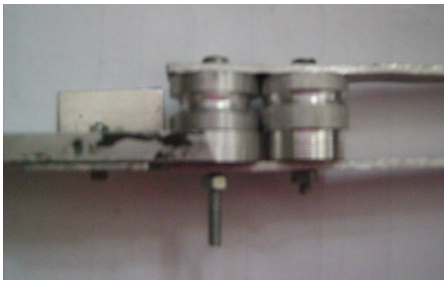
This article describes a bender for semi rigid 141 coax. It's based on a similar tool I use for bending brake pipes on cars. It will bend semi rigid without distorting the outer sheath of the coax.

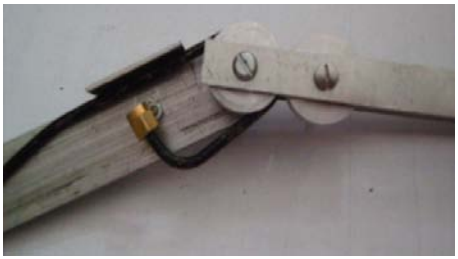
Dimensions of the frame are not critical and can be made of materials to hand. The rollers, which I machined on my lathe, are slightly different to each other. The fixed roller has a groove in it which allows a bend of 0.75 inch diameter which is about the minimum I have seen used.

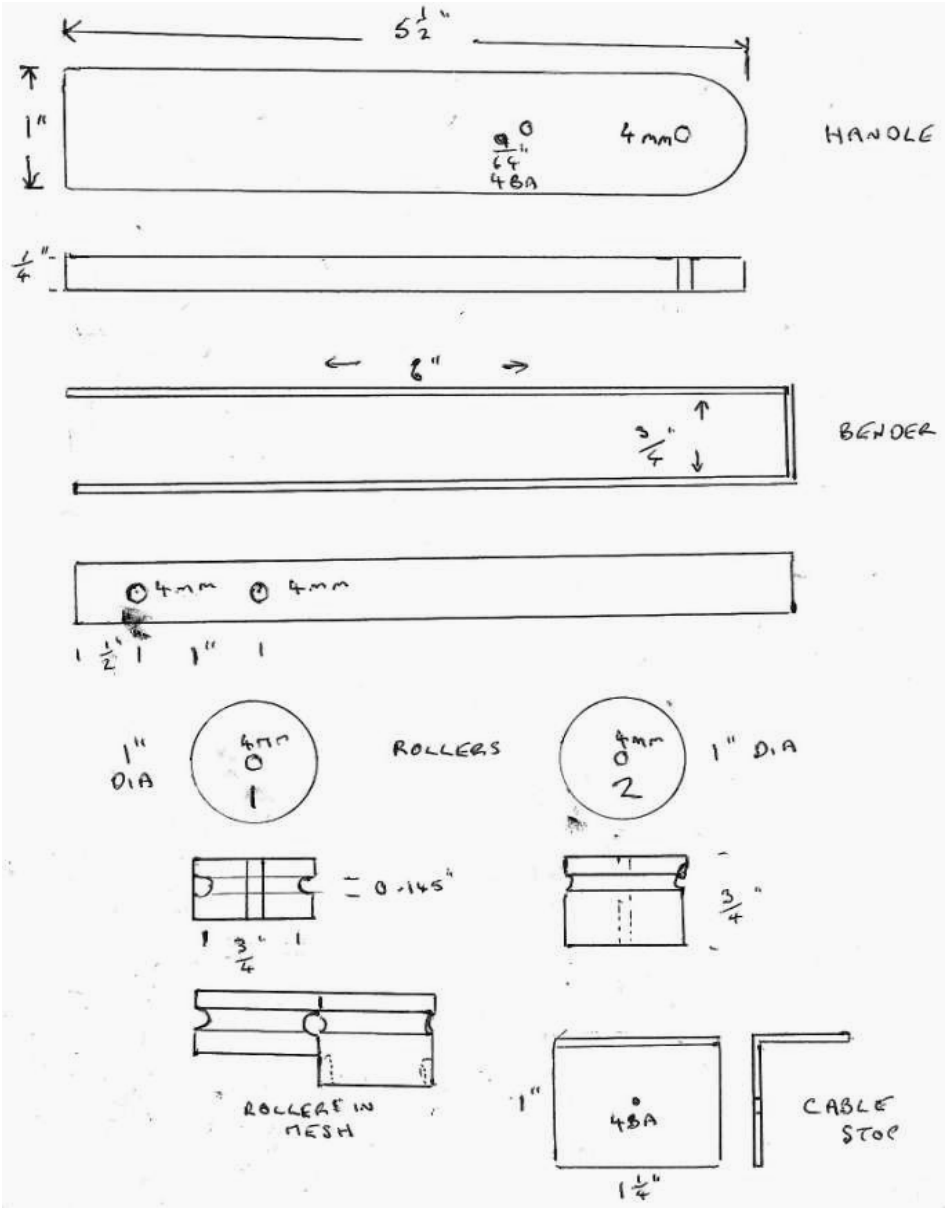
The moving roller is just machined deep enough for the rollers to touch. Hopefully the photos show that. All materials I used were in aluminium. I do have some 1 inch diameter bar left in stock and I could produce a pair rollers for readers for a small fee if required.

The coax is prevented from moving by a bracket while it is being bent and the machine will bend up to 180 degrees as shown in one of the pictures.

The following photos and rough drawing should be enough for readers to make a bender.

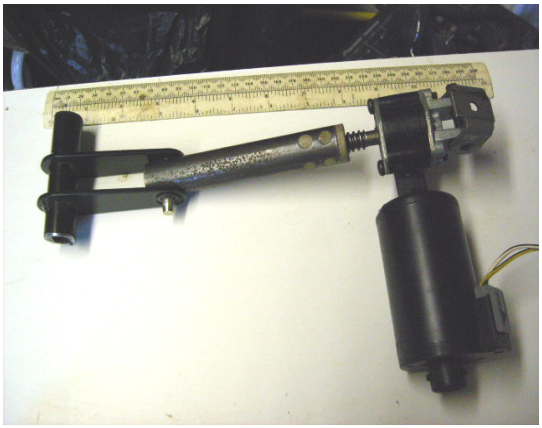




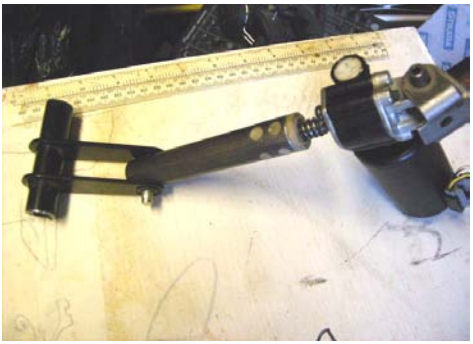

5½"
1"
4mm
4BA
HANDLE
¼"
6"
¾"
BENDER
4mm
4mm
1½"
1"
1" DIA
ROLLERS
1" DIA
0.145"
¾"
¾"
ROLLERS IN MESH
1"
4BA
CABLE STOP
1¼"

USEFUL SURPLUS MOTOR FOR POSSIBLE DISH CONTROL

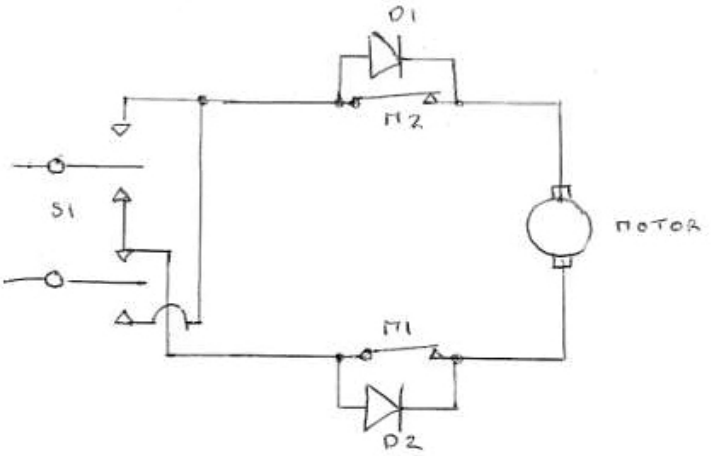
…. By Gus G3ZEZ



The photos here show the Ford seat lift motor that I recently acquired. A 12 inch rule alongside gives an idea of size. A bracket one end and part of the seat is still attached but are only fixed by clevis pins and are removable. All what you see only weighs 1KG so it's quite light. The travel on the lead screw is just about 3 inches but is extremely strong so, with the right mounting, it could easily tilt a dish or whatever. A suitable circuit is shown in sketch format. I've used it in other applications to include limit stops for the lead screw travel. These are usually microswitches mounted on the aerial assembly. Once maximum travel has occurred, then the motor will stop as the switch opens. By reversing the 12volt supply, the motor will return as far as the other limit stop. The diodes bypasses the open switch to reverse. I have not measured the current at full load but I would use about 10 amp diodes.



This motor was removed from a late Ford Escort but it may be in other Fords and found in car breaker yards.



MICRO SWITCHES M1 & M2 RAPID ELECTRONICS TYPE V3 SERIES LOOK SUITABLE.

DIODES D1 & D2 5AMP +

SWITCH S1 CAR ELECTRIC WINDOW TYPE

Photo right:

The nice 1.7m dish used by John, M0ELS to feed his G4HJW "Bernie Box" LNB 10GHz receiver. Notice how the received sunlight lights up the radome on the LNB, indicating that John has accurately located it at the correct focal distance point. More information is on page 15.

ATV NETWORK DAY : 22 AUGUST 2010 (part 2)

Editor's note ...
Last month we published a report y Martyn Vincent, G3UKV, on this interesting ATV/Narrowband microwaves day which saw BATC and UKuG members across the country combining forces to experiment over long ATV paths on all microwave bands from 23cm to 24GHz while at the same time experience a narrowband microwave cumulative contest. This month, we feature a report from the Telford and District
Amateur Rado Society, one of the most active group of microwavers and ATVers in the UK.


Mike's legs (G4NKC !) behind 3cm dish for 10GHz simplex ATV


G3ZME / G8VZT/P ATV stations:
10G repeater antenna on left, 23cm long yagi extreme right. Kevin G8UPF in foreground

The Telford Group (G3ZME/P) arrived on site half an hour earlier than usual for a Sunday microwave cumulative session. It was breezy but dry and often sunny through the day on the Brown Clee. (IO82QL)

Whilst Martyn G3UKV, Jim G8UGL and Kevin G8UPF set up the 5.7, 10 and 24GHz dishes for another NB day, Dave G8VZT and Mike G4NKC prepared the 10G and 24cm ATV stations. The 10GHz ATV repeater (ex GB3DJ), with its shrouded waveguide slot antenna, looked quite impressive on its own mast and the TX was seen on a SDR display as far away as Cheltenham. A Severnside ATV yagi worked reasonably well on 24cm. Dave also had his 10G dish assembly for simplex operation.

QSOs, in order of appearance, were:

G3PYB/P P5 24cm both ways on Merryton Low (IO93AD)
G3VKV P5 3cm both ways in Cheltenham (IO81XV)
G3PYB/P P5 3cm both ways on Merryton
G3SMU 24cm both ways P5 nr Winter Hill (IO83SO)
G3SMU 3cm P1 both ways nr Winter Hill (IO83SO)
G6GVI/P 24cm P5 both ways
G4ALT 24cm P4 - P5 Kidderminster.

After a near-fatal power leads reversal early in the day, and a noisy regulator in a PSU, things went mostly to plan and an enjoyable day was had by all. Activity was lower than hoped for and almost everyone seemed to have transmission or reception problems at times. However, we hope the event will be repeated in 2011.

73 from Martyn, G3UKV


Rats-nest ATV station of G8VZT - all working...

Installing a 1.7m dish on 10GHz … by John, M0ELS

Mulling over things to do as one often does, I decided to construct a 10GHz receive project using a 1.7m fibre dish that I had waiting for such a day, 'receive' being the operative word as I only have one transverter and that's already install inside my portable setup. So ,although I cannot transmit, I can certainly receive with the help of a G4HJW 10GHz - 18MHz down converter, which I had previously purchased from him.

Starting at the beginning, I began to look for some form of tripod material, which I found in some old aluminium hiking sticks rescued from a skip. They are ideal in that the ends have a metal spike protrusion on one end and are length adjustable. Luckily for me, the dish had pre-drilled mounted holes for a tripod and I simply pushed the spike ends through these holes. The feed tray to hold the converter was made from two right angle pieces of aluminium which were welded together using the durafix low heat rods. Some rubber inlay was glued to the sides of the tray to hold the converter during adjustment and later I used Velcro to hold everything together.

Once the assembly was completed, I placed the dish flat on the ground and with the aid of a pole laid across the diameter of the dish, I adjusted the dish with the aid of a spirit level until it was level. I then attached a small nut to a piece of string and glued it to the centre of the feed horn. **(see photo right)** The tripod and converter were adjust to a previous calculated focal point of 722mm and was squared up with another spirit level. As luck would have it, the dish had a small nipple indicating the centre of the dish, which made life a lot easier but I also confirmed this with some arcs off the rim.

The dish was now ready for some tests and with the help of my father-in-law (what would we do without them?), I propped the dish up against a bench in the garden, connected the 12Vdc line and antenna coax, tuned the FT897D radio to 18.100 which equates to 10,368.100MHz. I then ran the Spectraview software and measured around 4dB of sun noise. Unfortunately, the wind picked up and it got difficult to control the dish and prevent it from taking off. Further tests will need to be done to confirm measurements. Notice the sun's illumination at the dish focal point **(see photo left).**

Well it was a fun project which has left me with a bitter after taste. Where am I going to find a mount for the dish.....some more mulling to follow.

73 from John,. M0ELS

By Robin Lucas, G8APZ

CONTEST and ACTIVITY REMINDER

October

19-Oct 1900-2130 1.3/2.3GHz Activity Contest
Arranged by VHFCC (RSGB Contest)
31-Oct 0900-2000 All-band Activity Day

November

16-Nov 2000-2230 1.3/2.3GHz Activity Contest
Arranged by VHFCC (RSGB Contest)
28-Nov 0900-2000 Low band 1.3/2.3/3.4GHz

December

21-Dec 2000-2230 1.3/2.3GHz Activity Contest
Arranged by VHFCC (RSGB Contest)
26-Dec 0900-2000 All-band Activity Day
Non competitive, last Sunday in month

FRENCH JOURNEES d'ACTIVITE (JA)

30/31-Oct Activity weekend - 31st matches UKuG

Duration of all JAs is 1700 Saturday - 1700 Sunday

The October IARU contest is now behind us, and there are no more international microwave contests until next year. The onset of winter is a good time to set plans for next year, and to start building for a new band or two. The 2011 season will soon be here, so think about starting now!

Occasionally, reports sent to this column go missing in cyberspace. Any email you send to this column is always acknowledged, so if you think your email has gone astray, please send it again! We start this month with one such email from **G3ZEZ** which didn't arrive at the first attempt.

CATCHING UP - LATE REPORT

From: Gus Coleman, G3ZEZ, Clacton

Saturday 26th June. The **13cm PI7TGA**, **PI7RTD** and **ON0RUG** beacons were all good signals. I listened on **3cm** and I found the new **PI7RTD** beacon with a good signal. On **23cm DB0JOT** was heard at good strength, but unfortunately no activity heard. Since I am on the coast, I'm not sure if it's just a water path for me which does not extend inland.

On Sunday 27th June, on **3cm**, I worked **PA/ON7BV/p** 59+30, and quite audible on the back of the dish. I tried with **G8CUB** and we heard each other but not well enough to complete a QSO.

Later I worked **PA/ON7BV/p** on **6cm** with even stronger signals than on **3cm**. The final QSO of day was with **G4PBP** on **3cm** for a new contact, but we failed to hear each other on **6cm**.

HIGH BANDS CUMULATIVE

From: Roger Ray, G8CUB, Brentwood

Having started the year badly with **6cm** transverter problems, and having the dish set to 6 degrees elevation by mistake for the first two and a half contests, I decided to make the journey to Walbury hill for the last event.

It was pretty windy and dull most of the day. An early **5.7GHz** contact with Eric **F1GHB/p** (IN88in) got things moving. Eight stations were worked on that band, with **PA/ON7BV/p** (JO11rm) being best DX (just) at 342km. Signals were good both ways at 54/53. A difficult contact with Ralph **G4ALY** was finally completed with a combination of SSB and CW.

10GHz produced good contacts with Peter **G3PHO/p** and separately with Rob **G8DTF/p**, both in IO83ro.

Bart **PA/ON7BV/p** was again best DX, signals being 55/54, and the signal from Pete **GW4HQX/p** was 59++. A total of 11 stations worked.

On **24GHz** the Farnham beacon was a good S7/8. Probably the highlight of the day was a contact with Keith **GW3TKH/p**

(IO81lt) at 121km on **24GHz**. The signal strength meant that CW was required, but we made it OK. Neil **G4LDR** was also worked on **24GHz**, but a trial with Del **G1JRU** failed due to higher ground near the trig-point at Walbury. Certainly overall a better end, than start, to this year's cumulatives.

Roger Ray, G8CUB

From: Keith Winnard, GW3TKH

For this contest we walked the 1km rock strewn path to the top of the Blorenge, IO81LT22.

I missed **G3PHO/p** on **24GHz** on Sunday, and, whereas **10GHz** was going well, **24GHz** was a bit of a struggle.

I worked **G3ZME/p** on Brown Clee, a super FM contact with Dave, **G8VZT** at 79km. The contact with Roger, **G8CUB/p** on Walbury Hill at 120km, was very weak and affected by some severe QSB but it was completed OK.

Pete, **GW4HQX/p** was the **10GHz** operator, with his newly constructed kit producing 200mW to a 42cm dish. He made six contacts, the best DX being **G3PHO/p** on Winter Hill at 202km. A test with **PA/ON7BV/p** produced about 10 seconds of AS but unfortunately no contact.

The weather was ideal but with a bitter north wind at the top. To minimise the weight, we took only small batteries and the first to fail was the FT817 used for talkback. We only managed one more **3cm** contact after that, before packing up at about 16:00 and picking our way back down the track with thoughts of next year, and how to do it better! **73 Keith, GW3TKH**

GW4TKH/p on the Blorenge. Photo:**G4HQX**

From: Bob Price, G8DTF

I went up Winter Hill with my **3cm** gear for the final cumulative of the year and it turned out to be a day of real surprises.

The first couple of contacts were pretty straightforward with **G3ZME/p** (IO82) at 122km and **MW1FGQ** (IO83) at 60km. There was then a failed attempt with **G3VKV**, which was a surprise as Graham is normally workable from Winter Hill.

I then had another failed attempt with **G8JVM** (IO82). I then heard Richard working Peter, **G3PHO/p** who was also on Winter Hill, and I managed a contact with Richard by tail-ending Peter's QSO.

There was a personal beacon audible which I believe was in Telford (**M0VZT**) which was peaking S8 at times.

I then had an attempt with Ralph, **G4ALY** (366km) and to my great surprise we could hear each other very weakly, but not sufficiently strong to work on SSB. (I must buy a morse key!).

I then had two more QSOs, one with Roger **G8CUB/p** who was an excellent signal from IO91 at 260km and another with **G4ZXO/p** (JO00AU) at 350km, again tail-ending one of **G3PHO/p** QSOs.

73, Bob, G8DTF

FRENCH JOURNEE d'ACTIVITE

During the September JA which coincided with the UK cumulative, the weather was largely poor across France. This did not prevent some stations making very good DX however!

Jean-Paul, **F5AYE** and Alain **F5UAM** had to abandon their day out due to the bad weather conditions. They had planned to be at 1500m, but there was snow and it was -4°C at 1300m.

Didier **F1MKC** also had some bad luck. It was impossible for him to reach his site because the barriers and lock had been replaced! **F1FIH/p** had to contend with very strong winds and was only able to be QRV in the afternoon.

It wasn't all gloom though. Dom **F6DRO** reported sunny but cold weather, and described the propagation as "rotten". Despite this, (no doubt helped by the cold WX) he had a very good QSO with **F6DPH/p** in IN95 on **24Ghz**, at 243km. Then the wind, the clouds and the

cold arrived, so Dom packed his gear up.

André **F1PYR/p** had two **24GHz** QSOs. Firstly with Philippe, **F1BZG** at 140 km, and also with **F1DBE/p.**

Guy, **F2CT** didn't think much of the weather either. He was in the Pyrenees at 1100m (IN93d), where it was 5°C, with rain, wind and fog. Towards 10:00 conditions improved slightly and the mist and fog started to clear in the next few hours.

Propagation was somewhat inconsistent along the Atlantic coast and towards the north. For example it was impossible to contact Jean Noel **F6APE** and Pierre **F5NXU** at 470km, but then stations in Brittany, **F5LWX/p** and **F9OE/p** at 609 km were easy QSOs on **10GHz**. There was no problem either with Patrick **F1JGP** on **6cm** and **3cm** in spite of the distance of 604 km.

Only feeble signals with Maurice **F6DKW** at 682km, but ten minutes later, an easy QSO with Marc **F6DWG/P** in JN19AJ at 741km and with reports of 55 on SSB on **6cm** and 529 on **3cm** on tropo without any help from aircraft scatter!

EME ON 9cm

From: Peter Blair, G3LTF, Andover

On July 14th I was on **9cm** and worked **WA6PY** #33 and **W5LUA**.

On 6th August, just before leaving for the EME conference, I worked **OH2DG**, **ES5PC** #34 and **G4NNS**, and the next day, **DF9QX**, **G4NNS**, **W5LUA**, **OK1KIR**, **WA6PY**, **WW2R**, and **LX1DB**.

[# means an initial contact on that band]

ARRL MICROWAVE EME CONTEST

In the ARRL microwave EME contest on 4/5th September, I worked 38 stations on three microwave bands... and the gear worked 100%.

On 4th September on **13cm** I worked **ES5PC**, **SP6OPN**, **OK1CA**, **OK1DFC**, **OH2DG**, **JA8ERE***, **LZ1DX**, **JA4BLC***, **JA8IAD***, **HB9Q**, **PA3DZL**, **SV1BTR**, **G4CCH**, **F2TU**, **DL1YMK**, **OK2DL**, **9A5AA**, **F5JWF**, **DLOSHF**, **LA8LF**, **PA3FXB**, **VE6TA**, **G3LQR**, **SM2CEW**, **SV3AAF**, **WD5AGO***, **K5GW***, **K1JT***, **OZ4MM***, **G4DDK**, and **W5LUA***, [Crossband QSOs to **2304MHz** and **2424MHz** are denoted by *]

On 5th September on **9cm** I worked **ES5PC**, **OK1CA** and **K1JT**, and on **6cm** I worked **OH2DG**, **ES5PC**, **OK1KIR**, **SV3AAF** and **IK2RTI**.

On 6th September I was very pleased to work **G4BAO** #89 on **13cm** with his 1.4m dish, he had a fine signal, 549 copy here. Just before the contest I modified my **G4DDK 13cm** preamp to put in an MGF4919 and the rest of Sam's VLNA2 modifications and saw a 0.6-0.7dB improvement in Sun noise which I think puts the NF below 0.3dB. The equipment on the three bands is as follows:

13cm. 6m dish (HB) Standard **VE4MA** feed, 250W, **G4DDK** VLNA2 preamp~0.3dB

9cm. 6m dish, Super **VE4MA** feed, 25W, **W5LUA** preamp 0.6dB

6cm. 4.5m dish (6m under-illuminated) **RA3AQ** feed, 25W, **W5LUA** preamp 0.6dB

The picture shows the **6cm** feed, transverter and 25W PA mounted at the focus of the 6m dish. The LO at 87MHz, is a **G8ACE** TCXO in the shack, 60m away. **73, Peter, G3LTF**

23cm UKAC SEPTEMBER 2010

Activity appeared to be very good during this contest, with a continuing healthy improvement to the number of stations QRV from Scotland, with at least thirteen **GM** stations active.

Ray, **GM4CXM** made no less than 32 QSOs from Glasgow, with his best DX once again being **OZ1FF** (JO45) on aircraft scatter at 782km. John, **G3XDY** passed his previous best QSO count, with no less than 52 contacts during the evening.

This contest is particularly well supported, and suggests that weekday evening are popular.

WWW.BEACONSPOT.EU

Until recently, beacon spots have been supplied solely by Pascal, **F5LEN**'s DX cluster node, with a delay of up to four minutes, simply because of the method used. Due to the way the cluster works, not every node receives every spot, and so some beacon spots went uncollected.

With a recent enhancement, spots are now also supplied by Alain, **ON4KST** from a number of DXC nodes in Europe and elsewhere. This not only increases the quantity of spots, but they are also supplied in real time.

That should answer the question "I spotted a beacon but the spot isn't on beaconspot", but you MUST remember to add /b to the beacon call. If you spot via beaconspot however, it will format the spot for you, including the /b suffix.

IARU "DC-DAYLIGHT" CONTEST

A rather poor showing from the UK this year, with perhaps only a dozen stations logged on to 'KST. Some who were logged in were not at their screens, nor replied to requests. The 144MHz talkback channel did not appear to be much used either. Comments ranged from "diabolical condx" to "not bad, some good DX".

John, **G3XDY** (JO02ob) was very busy on all of the bands throughout the contest, and had some very good QSOs on **23cm**, several of which were into the Czech Republic to **OK1KIR** (859km) and **OK2A** (827km). On **13cm**, John worked **DK0NA** (JO50ti) at 750km.

Gus, **G3ZEZ** (JO01nt) in Clacton contacted **M1CRO/p** on **24GHz** for his first ever 2 way QSO on the band. Gus has previously heard John, **G4EAT** on a number of occasions, but the difference in power meant no QSO. He now has 500mW on **24GHz** and a small horn.

M1CRO/p (JO01pu) at Walton on the Naze, on the Essex coast experienced heavy rain and high winds on the Friday afternoon when the team started to assemble the masts, and erect the operating tent. The WX improved for much of the contest, but with rain and high winds from time to time.

On **3cm** conditions were surprisingly not that bad. On Sunday morning, an SSB QSO with Norbert, **DC6UW** (JO44vj) was incredibly loud at 634km. Whilst **DC6UW** sent a signal to line up on, the signals were up to 58 with deep rapid fades to 52. Norbert has an impressive setup with a 2m dish at 40m agl. Norbert runs just legal power from water cooled TWTAs mounted directly behind the antenna with the HVPS in the shack. Norbert says the QSO was AS, not tropo, but from the UK end, it seemed to be a combination of tropo and RS.

F6KUP/p (JN29pd), **G4ALY** (IO70vl), and **DF0MU** (JO32pc) were also worked on SSB all at around 413km, and a total of 25 stations went into the **3cm** log.

On **6cm**, **ON7BV/p** was the ODX at 363km whilst on **13cm** the best DX was **F1BZG** in JN07VU at 446km. **23cm** ODX was **DL3JAN** in JO60 at 828km. Unfortunately, although hearing **OK2A** on a number of tries, no QSO resulted, partially due to QRM on the **OK** side, but also due to **M1CRO** being unable to slow the keyer!

From: Dave Ackrill, G0DJA, Bolsover

During the 432MHz to 248GHz IARU contest I managed to improve my 'Best DX' distance on **10GHz** by means of a 2 way CW contact with **M1CRO/p** in JO01pu, a distance of just over 232km, which I didn't think was bad going with just 5 watts to a small horn antenna pointing through the window...

They were undoubtedly using a much better antenna though. It was a rain scatter contact, as one of the heaviest downpours this year had just passed through, so I had been lucky there.

3cm PROGRESS FROM GM

Alan, **GM0USI** has heard his first **G** station on the band. Tony **G4CBW** was 52 with Alan, at a distance of 346km, although it was only one way. Alan's site at IO76xa is obviously not bad, but his 250mW and 65cm dish was not quite enough. He has a 3W PA in the pipeline.

...AND FINALLY

That's all for this month... keep sending your reports, or I'll be writing about steam locos next month! **73, Robin G8APZ**

Please send your activity news for this column to:

scatterpoint@microwavers.org

FOR SALE & WANTED

WANTED:
For copy or buy a graticule for the HP sweeper HP8690 and for the 7GHz to 12.4GHz plug in (HP 8694). I just want to know how it's calibrated on the scale. Just a decent jpeg will probably be enough for me to make my own ...
Please, anyone! If you have one you don't use then tell me the price which you will be happy to receive. I have the 40GHz one and the 2-4GHz one, if anyone needs these as templates (I do not want to sell). If anyone has discovered a web location for these "graticule templates" then please let me know.
G3WRT 01473 311665.
g3wrt@yahoo.co.uk

WANTED:
10-10.5GHz PLL oscillator. i.e. Watkins Johnson, Bradley microwave etc.
Must be working but doesnt have to have a crystal.

FOR SALE:
AR 5000A +3, mint. dc - 3GHz. + manual + packaging.
Icom 7100 also mint. Perfect. + manual.
IC R7000 + remote control, unmarked. + manual but, on this one, the frequency counter decides not to work sometimes. Anyone know the usual cause?
Offers? All demonstrable with sig gen etc. or prepared to send, at your expense, to Icom, etc, for confirmation of specification.

G3WRT 01473 311665.
g3wrt@yahoo.co.uk

From Gordon G4EBF ...

Just to report that I have found a source of Thompson 15335 downconvertors on a market stall at Huddersfield, along with zone 1 new dishes, ovoid shape with all Fittings. These look suitable for the G4HJW "Bernie Box" 10GHz RX project.

gordonj.reason@virgin.net

Those ubiquitous PL259s !

I thought these links might be of use to some readers:

http://www.w5fc.org/files/how-to/PL259.PDF

It's one of those things that is so obvious when it's pointed out, that I wondered if I was the only one who didn't do it this way !! Perhaps I am the only one ..I 'd never seen it before .

Here's another website with some helpful info on PL259s to go with the one above:

http://www.ai4fr.com/main/page_electronic_repair_pl259.html

73 from Steve G1MPW

CONDUCTIVE SILVER GREASE

... a useful tip from John G3XDY

This is the conductive silver grease I used on my 23cm PA devices that provides good electrical and thermal conductivity:

http://uk.rs-online.com/web/search/searchBrowseAction.html?method=retrieveTfg&binCount=1&Ne=4294957561&Ntt=silver+loaded+grease&Ntk=I18NAll&Nr=AND%28avl%3Auk%2CsearchDiscon_uk%3AN%29&Ntx=mode%2BmatchallpartialN=4294954589&Nty=1

A spec sheet can be found at:

http://docs-europe.origin.electrocomponents.com/webdocs/0029/0900766b80029868.pdf

It is about 15x more thermally conductive than standard heatsink compound and about 7x Arctic Silver 5 (I think... - the conversion of the mixed metric/imperial units in the AS5 spec sheet makes my brain fry!).

A little will go quite a long way. I used about 66% of a syringe full on the 8 devices in my 23cm PA, spreading it all over the approx 5 x 5cm heatspreader bases where they contact the main aluminium heatsink. It seems to work very well. The devices stay cool enough to touch, even after being operated at full power for minutes at a time.

The good electrical conductivity is also useful to minimise the impedance in the source connection but be careful not to use too much that it oozes out and shorts the gate or drain leads to ground. You can also apply it under the output side PCB to improve the grounding of the board to the heatsink where large currents are flowing.

It might be a useful for a good thermal/electrical compound for QRO devices.