spend the middle of the previous week at G3PHO's home where Peter had the chance to look inside the microwave transceiver. Doug has literally carved up an IC202 2m transceiver and rebuilt it, plus 2.3GHz and 10GHz transverters, into one small housing. The dial assembly of the 202 is on the left side of the front panel so that the whole equipment has a low, horizontal profile, unlike the original 202 which stands up vertically, with a very narrow horizontal width. Doug has managed to squeeze a 10GHz system, including a Qualcom 1W PA and a DEM 13cm transceiver (20mW) into the same housing, making for a very portable equipment!

The two hour drive from Sheffield to Blakey Ridge was well worth the effort!

From: Peter Blakeborough, G3PYB [Papine@demon.co.uk]

I operated from Butser Hill (IO90MX) and had a good day, with many stations active, Propagation seemed good but not enhanced. There was some evidence of rain scatter on contacts, Two contacts were made direct on 3cm.

I came on for 2 hours 30min and worked 14 stations. The best two dx were G3PHO/P (IO94MI) at 380km and F6APE at 400km plus. I was very pleased to work G3LTF at the top of his garden at Andover!

It was an excellent short day out with a 90cm offset and 200mw on 10GHz, some QRM on 10368.100MHz so it must have been busy on the band. It's not like that on 76GHz!

From: Bob, G3GNR [engineman@ntlworld.com] Located in Devon, IO70WT

So much more could be done if people try that much harder. It just takes some patience and good ears!

I did really badly in this event and I still cannot understand why. I was on at the start and called and called on 144.175 MHz with no replies.... is my 2m signal that weak? I went away and did something else and then came back and tried hard but it was hopeless! I didn't even work F6DKW, which Paul, G0HNW/P did! That was about 577km from him although, of course, it,s 509km from here! I worked G3PHO/P in IO94 over 449 km, which is not to be sniffed at!

Some stations, but not all, have over the years have improved their portable set-ups .. which again is what I think is what it is all about!!

From: Ted, G3JMY [EDWING3JMY@aol.com]

It was good to contact G3PHO/P, giving me my best DX so far this year - 331 km. Eddie, G0EHV/P would have been slightly further at 337 km but his 250mW was barely heard here. I was late coming on, so missed an hour. I worked 15 stations by 16.00 and then the calls seemed to dry up. G3UKV/P and GW3ATM/P seemed to be the only ones around. I had a try with G3LQR, but that did not work out. He had heard me earlier, 5/5 on rain scatter, but the weather does not seem to stay still !

The 'Ladder' score is now 32 stations, DX 331 km, so a slight improvement.

The wider calling frequency (144.170 to 144.180MHz was a big improvement. Several stations called over the range, without mutual conflict, enabling QSOs to get going more readily.

GENERAL MICROWAVE ACTIVITY NEWS...

Reg, G8VHI (Nuneaton, IO92FM) is fighting the computer revolution and sends in a report by "snailmail" (the only one this month!). He found some nice tropo conditions on 23cm around the 24th August and worked PA5DD, DC0KO (JO31), ON1ALJ (JO10) as well as hear various beacons. The best of the latter was DL0UH in JO41.. These beacons were audible for many hours but DL activity was very low. Roger runs some 40 watts output from an old Microwave Modules transverter/40 watt PA combination. The antenna is a 26 element DJ9BV yagi at 50 feet agl.. Reg is hoping to improve 23cm and then move up the microwave bands. He has an excellent home location with an all-round take off, especially good to the North.

Two of our microwave friends have not been in good health recently:

Octagenarian **Bill, G6XM (Devon)** has sold off 99% of his microwave gear as he is no

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

2000 – SEPTEMBER

Many thanks to all our contibutors this month. We actually have enough material for next month's issue as well. This is a healthy state of affairs but don't let that stop you sending in something for publication!

Our thanks go to Martin, G7MRF, for the useful table of K & S tubing specifications. This tubing is often a good alternative to millimetre waveguide. Dave Wrigley, G6GXK, kindly supplied the filter article ... many thanks David. In the pipeline we have articles on cassegrain reflectors, starting out on 10GHz ATV, phase locking DRO oscillators in sat LNBs

June appears to have been THE month for record breaking ... world records on 10 and 24GHz have been broken by Europeans at last! Details are in this issue.

Activity levels in the UK are quite encouraging, especially on the 5.7GHz band and a growing number of multiband operators is emerging. However the 24GHz band has seen an alarming decline in UK activity. If you have gear for that band **please use it**!

INSIDE THIS ISSUE …..

Forthcoming contests

17th September: 10GHz Cumulative

8th October: All uW bands, including the final 10GHz Cumulative.

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
G8AGN: Barry Chambers 0114 2304202

G3PHO: Email: g3pho@geocities.com
or p.day@virgin.net

G3PHO, Peter Day,
146 Springvale Road,

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

FOR SALE AND WANTED

FOR SALE:
47GHz dish, 18 inch diameter, 37 dB gain @ 39 GHz complete with masthead mountings but no "Drum Skin". Wave guide feed from the rear. **Price: £30.00**
Details G4UVZ 01823 421751

WANTED:
Any information on the Racal-Dana 3100 series Synthesizer. Please contact:
W. Clinton, GW8KZN, 26 Aston Crescent,Newport, Gwent, NP20 5RA
Tel. 01633 764652 or email to:
pamwes@globalnet.co.uk

FOR SALE:
From: John Tye, [g4byv@woodgate73.freeserve.co.uk] QTHR.
I would like to sell my 24GHz station so some one can make use of it:
DC0DA 24GHz Transverter, 50Mw o/p, IC202, strong tripod, external speaker and S meter. 50w 2 metre PA. C/w wavemeter and a beacon [not sure if it still works]
Price:£400 and please collect.

SALE OR EXCHANGE:
Alan Walmsley, G2HIO [alanwalmsley@solstice.screaming.net] has the following for exchange:
Icom IC202, with spare crystals and working nicads, for any item
of microwave gear, operational or not, test equipment (Adret?), or antennas.
Cash in addition, either added to or subtracted by agreement. Suggestions to
G2HIO via email or tel: 01332 834228.
Address correct in the RSGB call Book.

Andrew, GW4JJW, has a web pages on which he is selling off some of his microwave bits that he doesn't need any more. You'll find it at:
www.cyncoed.demon.co.uk

INFORMATION WANTED:
Does anyone have any information (or knows someone who has) on an SMA terminated spco relay, described as "Switch - RF XMSN Line", Part No.100C0073, made by DAICO Industries Inc, Compton, California.

These look to be a small coaxial relay but are not: they seem to consist of two very short sections of coaxial transmission line surrounded by a solenoid coil - no obvious moving parts as in a normal coaxial cavity relay.

I need to know their characteristics (eg. frequency limit, switching voltage, isolation etc.). Can any reader of the Microwave Newsletter help?
Mike, G3PFR [Mikeg3pfr@aol.com]

Bill James, G6XM has the following items FOR SALE:
* Marconi Sanders Wavemeter type 6049/1, 2.6 to 8.2GHz. **£20**
* Ex Govt. wavemeter 7GHz-11.7GHz with calibration book & separate extension chart to 1.3GHz. **£20**
* DK7QK LO (VHF Comms 4/1978) with xtal for 1272MHz. Useful for 24GHz marker. **£15**
* RSGB Microwave Source ("Balloon Board"), c/w 96MHz xtal. 1W o/p at 432MHz. **£15**
* EMI Research Enthrakometer mount WG22 in/out. Wavelength 0.75mm to 1.15mm. Use unknown! **FREE!**

Bill would appreciate buyers collect otherwise postage is extra on all above items, including the free one!
Address: G6XM, 56 Fern Meadow, Oakhampton, Devon EX20 1PB

quite impressive.) On 3cm I was using a 27cm dish borrowed from Harold, G3UYM. Harold had also loaned me the N-to-waveguide transition, the 800mm length of flexible waveguide, a 90 degree waveguide bend and a small mast, all necessary for having the dish-overhead connected to the 'radio box' at a comfortable height.
The next station contacted was G4BRK near Swindon - an easy 5x7 each way on 10GHz. At the end of that contact a local ranger arrived, asked what I was doing then invited me to remove all of my equipment from the 'nature reserve' for which he was responsible! It was two hours before this 'stranger in a foreign land' became operational again at Dunstable Downs.

10GHz Contacts from here:
G4ZXO/P Ditchling Beacon 58(out) + 55(in) (South again!)
G4UET/P Ditchling Beacon 42 + 419
G3UYM/P Therfield 59 + 59
GW3ATM/P near Abergavenny 55 + 54
G0HNW/P near Sheffield 59 + 57
G4PBP IO82WO 59 + 54
G3PHO/P North Yorkshire Moors 52 + 41

This was a new style of operating compared to the arranged, single QSOs that I am used to in VK. Thanks to you all! Propagation conditions, I'm sure, could have been somewhat better, but it was still a lot of fun.

Late in the afternoon the ranger for this new site politely enquired as to what I was doing and was much more accommodating than the previous one in allowing me to keep operating because it would only be 'an hour or so longer' and 'I wasn't in anybody's way'.

From: G4UET, [julian.rolfe@vads.vodafone.co.uk]
August was a record for G4UET/P. Apart from a record breaking (for me) 25 contacts, 2 new countries (thanks to Chris and Martin) my distance record was also broken, increasing to 492Km ... all with 1 watt, a 35cm dish with reduced waveguide double dipole feed.

From: GEOFF, G7RMG,[G7RMG@aol.com]
I had a bit of a disaster in this contest, with 20 kHz drift +/- from the nominal frequency! Also, after putting bigger dish on the tripod I found it needs to be planted firmly. I worked G0API and heard several others plus some rainscatter. After some thought re the drift problem I'm going to check my IF rig, an Icom 202, in the process of elimination . It all works okay at home but when out /p then its another story!

From: Eddie, G0EHV [g0ehv@btinternet.com]
As a comparative "L Driver" on 3 cm narrowband
I found the 'PHO email activity list of use. It gave me confidence to know there would be activity and that it was worth going out. The details of what the other stations were using also gave me an idea of how well I might do with my modest set-up.

I enjoyed the day, operating /P from Rosedale, on the North York Moors (IO94MJ) making only 8 QSOs of which 2 were one way only and I learned quite a bit. Keep looking to the North East of England for myself and Don, G1GEY/P. We'll try to activate IO94 on a regular basis.

Peter, G3PHO/P Blakey Ridge, IO94MI73
Also chose a North York Moors location for this event. It is an excellent site, a large roadside layby with a slightly elevated grass area for setting uo the station. Busy traffic, including lots of motor bikes, made for some interesting modulation during the day! Peter achieved his best ever score from here, 6666 points from 25 contacts. 12 of these exceeded 300km, the best being G3GNR at 449km. It was very gratifying to hear of over 40 stations being active but very frustrating to hear G0HNW/P, some 128km to the SSW working a couple of French stations at over 500km! Nothing from the Continent was reaching North Yorkshire. Many thanks to the 5 French stations and PA5DD for their activity!

It was also a great pleasure to work M/VK4OE/P... a rare callsign for a UK microwave logbook! Doug's nice little self-contained 10GHz transceiver (1 watt o/p to a 27cm dish) did the business on ssb over the 278km path from Dunstable Downs. Doug and his xyl Ruth had

respond to my call.

I got Wim to QSY to 1.3GHz and then 2.3GHz, this was then followed by a pile-up on 2.3GHz with PA0EZ and PA5DD worked in quick succession at 59+, followed by a QSY back to 10GHz and S9+ tropo contacts with both stations.

Following a quick QSO with ON1ALJ back on 1.3GHz the evening concluded with PA0CIS at 59+ on 10GHz, worked direct with no talkback following his spot of GB3MHX on the DXcluster.

So despite a slow start it proved worthwhile in the end, with DG1KJG providing a new square on 10GHz. I finished with 6 QSOs on 1.3GHz, 6 on 2.3GHz and 7 on 10GHz.

From: Roger Kendall G0UPU, Cheltenham, [roger.kendall@btinternet.com]

I was pleased to work G3PHO/P (IO93AD) on both 23cm and 3cm. It was a bit of a struggle on 3cm I had not been able to get on earlier as I was taking part in the 4m trophy contest. My main activities are on the construction side but I try to get on for any contests. I am currently active on 19 bands and 6cm will be my 20th! On the microwave bands the equipment here is:-

23cm - 10W to a 35 ele Tonna although there is about 3dB loss in the feeder.

13cm - 5mW to an offset dish - I hope to increase the power here soon.

3cm - 100mW to a Procom dish.

My QTH is about 110m asl on the north side of the Cotswolds, 7km NE of Cheltenham. Unfortunately there are a lot of hills about and I cannot get my dish permanently mounted so I have to put it up each time I want to use it. At present I cannot go out portable as I have had instability trouble with my DDK oscillator so I am running it from an Adret source which requires mains power.

I am building a 6cm transverter and hope to have that running soon. I also hope to get more power on 3cm and sort out my oscillator problem so that I can get out portable with it. 73 from Roger, G0UPU.

Peter, G3PHO/P set up at **Merryton Low** Triangle in Staffordshire (**IO93AD51**) for the day, with 4 microwave bands and 144MHz gear filling the van quite nicely. Lessons learned on the previous multiband event were put into practise and a less stressful time was had! This was made even more laid back by the poor activity in the morning. 10GHz was very disappointing, with only 13 stations worked during the day (best DX being G8LSD/P, JO01BB14, at 271km. 5.7GHz was a little better for that band, 7 callsigns being worked with GW4KNZ/P(Prescili, IO70W77) at 231km providing a new country and square for the band. It is very gratifying to find new stations coming on this band this year, G3VKV and G6ARC/P coming into that category this time. In fact G3VKV had only just set up his 2 foot dish and DB6NT 200mW TVTR indoors a few minutes before his first ever contact … G3PHO/P!

23cm was very noisy from Merryton, some strange wideband noise coming in from the Weaver Hills to the south. Nevertheless 10 stations were worked, with best DX at G6ARC/P in IO91FH.

To give Peter a 24GHz contact, Martyn, G3UKV, kindly came on for a very short while in the late afternoon, from Haumond Hill, IO82QR. Thanks very much Martyn! It appears that this was the only 24GHz contact made by anyone during the day. Why has activity dropped off on this band?

August 10GHz Cumulative

From: M/VK4OE/P, Doug Friend, on holiday in the UK and /P on microwaves!

It was a mixed bag . When I arrived at Ivinghoe Beacon I still had some fiddly connections and setting up to do. That delayed my start until 0930UTC. Then the first contacts (2m followed by 3cm) was with G8LSD/P, in the worst possible direction for operating from that site - South. I was satisfied with the 4x3 exchange each way, given my limited equipment.

My 144MHz antenna was 2m a two half waves in phase dipole. (The increase in received signal strength as one of the main lobes is brought around to a new station is

June is busting out all over! Two microwave world records brought back to Europe!

GERMANS BREAK WORLD 10GHz RECORD

On June 25, 2000, at 1651 UTC, two German radio amateurs broke the long standing 10GHz distance record formerly held by VK6KZ and VK5NY.

From the upper floor of a hotel in Netanya, Israel, Dieter **DJ4AM** contacted his friend Adalbert **DJ3KM** on the Italian island Lampedusa, in the Mediterranean Sea, a distance of **2079 kilometres,** handsomely exceeding the former world record of 1912km. The contact lasted about an hour. Netanya is about 30 kilometres north of Tel-Aviv.

The equipment used by both German operators was identical and consisted of a transverter designed and built by DL1RQ fed into 60cm diameter dish antennas. The calculated gain was 33dB and the output power was 5 watts. They made lengthy calculations with the aid of maps and GPS to get the correct azimuth bearing .

Dieter spent 21 days in Israel but only managed to make the one contact.

Compiled from a report submitted to the WIA VK2 News Bulletin by Raffy VK2RF

WORLD 24GHz RECORD SMASHED BY ITALIANS

The last newsletter briefly mentioned this record in Activity News. I0LVA's email now tells the whole story…

From: Silvano Ricci, I0LVA

e-mail: mf3170@mclink.it

i0lva@libero.it

In reference to my activity I can inform you that on 18 June,2000, at 12.28 GMT, I made a new world record on 24 GHz with a QRB of 461 Km.

The two way contact was made from **M. Maielletta ,42°06 N - 14°07 ,near Chieti JN72CD to M. Pizzoc 46°03 N - 12° 20'E, near Treviso, JN66EB.**

I used SSB x CW with my dear friend Costante IW3EHQ/3 who was located in JN66EB.

The equipment used is as follows:

I0LVA: Tx 250 mW / N.F 1.5 dB / dish: 90cm with swan neck feed.

Weather:temp. 8 °C at 2000 m a.s.l.

RST Tx: 52 – RST Rx: 519

IW3EHQ/3: Tx 750 mW/ N.F 1.5 dB / dish offset 85 cm.

Weather: temp. 18 °C at 1560 m a.s.l.

I also heard I3SOY/3 with a signal of 51 but Paolo could not copy my signal

The record is the culmination of several other long distance contacts, as listed below. Unfortunately the 486km path on 16 Aug was heard only, i.e. a "one way" !

Date	Mode	Call	Locator	Km
07 June 98	CW	**S51JN/p**	JN65XM	295
28 June 98	SSB	**F6BVA/TK**	JN42QE	304
14 Aug 98	CW	**IT9IPQ/9**	JM78RE	

K & S ROUND COPPER TUBING

K & S Part No	O/D Imperial	O/D Metric	I/D Imperial	I/D Metric
KS117	1/16	1.588	1/32	0.794
KS118	3/32	2.381	1/16	1.588
KS119	1/8	3.175	3/32	2.381
KS120	5/32	3.969	1/8	3.175

K & S ROUND BRASS TUBING

KS125	1/16	1.588	1/32	0.794
KS126	3/32	2.381	1/16	1.588
KS127	1/8	3.175	3/32	2.381
KS128	5/32	3.969	1/8	3.175
KS129	3/16	4.762	5/32	3.969
KS130	7/32	5.556	3/16	4.762
KS131	¼	6.35	7/32	5.556
KS132	9/32	7.144	¼	6.350
KS133	5/16	7.938	9/32	7.144
KS134	11/32	8.731	5/16	7.938
KS135	3/8	9.525	11/32	8.731
KS136	13/32	10.319	3/8	9.525
KS137	7/16	11.112	13/32	10.319
KS138	15/32	11.906	7/16	11.112
KS139	½	12.7	15/32	11.906
KS140	17/32	13.494	½	12.700
KS141	9/16	14.288	17/32	13.494
KS142	19/32	15.081	9/16	14.288
KS143	5/8	15.875	19/32	15.081
KS144	21/32	16.669	5/8	15.875

K & S RECTANGULAR BRASS TUBING

K & S Part No	Height Imperial	Width Imperial	Height Metric	Width Metric
KS262	3/32	3/16	2.381	4.762
KS264	1/8	¼	3.175	6.350
KS266	5/32	5/16	11.906	7.938
KS268	3/16	3/8	4.762	9.525

JULY 2000 UK ALL BAND MICROWAVE CONTEST RESULTS

Raw Points scored per Band

Callsign	Locator	1.3G	2.3G	3.4G	5.7G	10G	24G
G3PHO/P	IO93AD51	1545	0	0	1140	4499	85
G4LDR	IO91EC	1293	522	0	1065	3423	0
G3FYX/P	IO91GI	0	576	129	906	1972	26
G4BRK	IO91DP	1946	353	37	650	2227	0
G3XDY	JO02OB	1405	684	0	0	1350	0
G4KNZ	IO91IN	38	0	0	488	77	24
G4NNS	IO91FF	0	0	0	45	1187	0

FINAL POSITIONS RANKED ON: Normalised points

		1.3G	2.3G	3.4G	5.7G	10G	24G	Total	
G3PHO/P	IO93AD51	794	0	0	1000	1000	1000	3794	
G4LDR	IO91EC		664	763	0	934	761	0	3123
G3FYX/P	IO91GI	0	842	1000	795	438	306	3381	
G4BRK	IO91DP		1000	516	287	570	495	0	2868
G3XDY	JO02OB		722	1000	0	0	300	0	2022
G4KNZ	IO91IN	20	0	0	428	17	282	747	
G4NNS	IO91FF	0	0	0	39	264	0	303	

[g3xdy@btinternet.com]

I was active for some of the multiband contest but didn't hear anything North of the Midlands here. Activity seemed quite low and conditions for much of the day were very average but redeemed by some tropo and rainscatter near the end (when most people had probably gone QRT !).

At 0700z there was a good duct across the North Sea, with strong beacons from PA0 and near DL but by the start, 2 hours later, conditions had dropped back. I had a try with GU0FDZ/P at 0900 on 2.3GHz and 10GHz but no signals heard either way.

PE1PFW provided QSOs on all three bands (1.3/2.3/10), and I then went QRT until after lunch, when I worked Roy, G3FYX/P on 2.3 and 10GHz in a short spell on the bands.

I came back on again at about 1900z, by which time the North Sea duct was well established and signals were getting further afield. The first QSO in this period was with DG1KJG in JO30NT, worked on all three bands at 433km, with 2.3GHz marginal and 1.3GHz the best. Returning to 1.3GHz from 10GHz, I found Sam G4DDK calling CQ from his new QTH, resulting in my only UK QSO on 23cm.

Listening round on 10GHz, I heard the ON4TNR beacon close to 10368.100 via rainscatter and then heard PA0WWM calling CQ ,resulting in a CW contact at 53S. He was beaming 220 degrees and I was beaming 135 degrees, so this was a long way from optimum geometry. PA3DYS was also heard but did not

July 10GHz Cumulative

From: Ted, G3JMY [EDWING3JMY@aol.com]
The July cumulative was interesting for me in that I made a contact which I had supposed was impossible. There is a band of very tall trees (60 to 70 ft) extending from 300 degrees to 010 degrees only 200 yards or so from my home, with no gaps anywhere - at 307 degrees my dish fires directly into them! On this bearing I was heard by Martyn, EI/G3UKV/P, at S9 for a few seconds at 0915. In the afternoon we had a 2-way at readable levels, which lasted for several minutes. The channel was open for some time, with no QSB. There was no evidence of rain anywhere and the trees were in full leaf, so I am quite puzzled by this 'conundrum' as Martyn put it.

I made 19 contacts during the day, with Maurice, F6DKW, as a 'gotaway'. I heard PE1ETW on 2m calling, but lost him in the QRM. Altogether a satisfactory result over a working period of 6 hours.

I heard it said that it would be a benefit if the calling frequency was extended over a band of frequencies, say 5 - 10 kHz wide to allow several stations to call at once. At present one is obliged to wait while the station which has just called CQ listens for a possible contact.
Say, 144.170 - 144.180. What is the general view ? *(see later comments... editor)*

From:Neil, G4BRK, near Swindon. [nwhiting@lucent.com]
I missed the morning due to other committments (orienteering), so started after lunch. Activity didn't seem too high on the calling channel, but I worked ~18 stations and heard several stations approaching the 30 QSO's mark.

Highlights were GW0HNW/P in IO72 - third new 3cm square this year, with excellent signals

I also worked EI2AK, Dermot, for the first time - a bit of a struggle, but very pleasing for a home-to-home QSO over such a distance and difficult terrain with 1W at each end.

EI/G3UKV/P were the expected good signal when I eventually found them on talkback. It took a long time before I found Chris, GU0FDZ/P on 2m but signals were not good enough for a QSO over this difficult path (my end) on 3cm - one of 3 contacts which might have gone if I was back to 10W. I must finish the rebuild!

It was nice to work Geoff, G7RMG/P on his first outing on the band with a new DB6NT transverter. No French or Dutch stations heard - maybe they were more active in the morning.

From: John, G3NWU [G3NWU@aol.com] Hartlepool
I managed to have qso with G0EHZ/P and G1GEY/P in IO94, Ravenscar, North York Moor. I They have recently become QRV on 3cm narrowband and I was their only qso, at 2pm. Nothing else heard on 2mtr and 3cm

From: GEOFF, [G7RMG@aol.com] /portable on Bell Hill, IO80UU
My best contact today was with GW0HNW/p 57 both ways 274 km.

From: Peter, G3PHO/P Winter Hill, IO83RO94 [g3pho@qsl.net]
I had an excellent day out across the "border" in Lancashire, the intention being to work EI/G3UKV/P on both 10GHz and 24GHz. While the first ambition was realised, the second wasn't. An added pleasure was meeting up with David, G6GXK/P who came out to give his 3cm gear and airing. Activity levels seemed high (at least 45 stations known to be active) and 29 stations were in my log by the end of the day, six of which were in excess of 330km. Best DX was G4ALY/P, a distance of 364km. My score for the day was 6191 points which I thought was very good until G3UKV told me they had over 8000 points from the EI location!

A test with the EI group on 24GHz failed after several attempts. It was a long shot at 255km, with a little bit of Anglesey popping up on the profile!

August All Bands Contest

From: John, G3XDY, Ipswich

A useful 10GHz by 10MHz BW filter

by David Wrigley, G6GXK

As many will know, I have had some problems with my 10GHz transmitter. In order to ensure that I was peaking up the right signal I thought that it might be useful to feed the output through a narrow filter before measuring the output power.

There are, of course, many such filter designs (ref. 1) in the Microwave Handbook and there is also the G3KNZ program (ref. 2) which permits you to design your own filter, as the following example shows:

Waveguide Band-pass Filter Design using WG16

Filter type B,
Ripple= 0 dB, Frequency= 10368.1 MHz, BW= 10 MHz
WG16 Internal Dimensions = 22.86 x 10.16 mm
Material=CU, Skin depth= 2.237868E-02 mm, Iris Thickness= 1 mm

Waveguide Filter Dimensions:
Cavity No: 1 = 18.2 mm (less 5% = 17.3mm actual to allow for tuning screws)
Iris Hole size: 0 = 6.4 mm
Iris Hole size: 1 = 6.4 mm

Average Unloaded Q of Cavities = 5500
Insertion Loss = 1.64 dB
Lg/8 Matching screw spacing= 4.7 mm

I was searching for some scrap copper waveguide in order to make just such a waveguide filter, when my eyes fell on a discarded **14GHz** filter which was originally part of a Marconi 14GHz up-converter, many of which were sold off at meetings last year. The filter had been discarded because it was originally thought that it couldn't be retuned to any useful frequency. You know the feeling - it looks so nicely made that one feels instinctively that it will come in useful one day!

A further examination revealed that it was indeed a very useful piece of microwave kit. The filter is a six stage unit built up of separate silver plated cavities interleaved with copper iris plates and the whole thing bolted together by means of four longitudinal bolts. The cavities are basically very rugged sections of WG18 and the cut-off frequency for that is about 9.5GHz. So, it should be OK at 10GHz. The thing to do is to remove some of the iris plates and calculate what the new cavity length is for 10368MHz, but first we can, out of interest or curiosity, check that the original design is what we thought it should be and get some experience using the Steve Davies, G3KNZ filter program running under GWBasic.

Fig 1:

This is the self adhesive label from the original filter unit

Using components of old 14GHz unit

Original design:
WG18 section 15.8 by 7.9mm
Cavity length 12.35mm
Iris Dia 5.7 on outer units, all the rest 5.1mm
Iris thickness 0.3mm
Design frequency marked on front panel, 14275MHz
Several runs were made, adjusting the bandwidth until the iris diameters came out right.

Running the program:
Filter type B,
Ripple= 0 dB, Frequency= 14275 MHz, BW= 50 MHz
WG18 Internal Dimensions = 15.8 x 7.900001 mm
Material=AG,Skin depth= 2.554082E-02 mm, Iris Thickness= .3 mm

Waveguide Filter Dimensions:
Cavity No: 1 = 13.4 mm (Actual cavity = 12.35 , therefore using a tuning allowance of 8% on calculated)
Iris Hole size: 0 = 5 mm (Actual holes mainly 5.1 mm in 6 cavity filter)
Iris Hole size: 1 = 5 mm

Average Unloaded Q of Cavities = 5033
Insertion Loss = .49 dB
Lg/8 Matching screw spacing= 3.5 mm

Revised cavities for 10368.1MHz Design
Filter type B,
Ripple= 0 dB, Frequency= 10368.1 MHz, BW= 10 MHz
WG18 Internal Dimensions = 15.8 x 7.900001 mm (cutoff freq 9.5GHz)
Material=AG, Skin depth= 2.176689E-02 mm, Iris Thickness= .3 mm

Waveguide Filter Dimensions:
Cavity No: 1 = 34.3 mm (less 8% allowance for tuning = 31.5mm)
Iris Hole size: 0 = 6.6 mm (Used 5.7mm)

On Friday, 28-7-2000, GW0IVA/P & GW7MRF/P located at SH370426, after the chosen location for the expedition proved once again to have trees directly in one of the paths to be worked!

GW0HNW/P, located at SH140259, was worked on 24GHz, 59 both ways (28Km) and on 47GHz, 59 both ways on FM. Attempts with the EI expedition failed on both 24/47 from this location due to the path not being LOS.

Moving to another site, SH514583, to work the EI lads proved to be successful and we worked 140Km on 24GHz (report lost) and 47GHz on CW using the new high power set up ... 519 both ways with QSB on the signal.

On Saturday, 29-7-2000, relocating to the end of the Lleyn Peninsular at SH140259, exchanges on 24GHz were made with GW8ACE/P, GW8BKE/P & GW3PYB/P located at SN075323 (94Km), with 59 signals exchanged all ways on FM. On 47GHz GW8ACE/P, GW8BKE/P & GW3PYB/P worked both ways on FM.

GW0HNW/P, located at SN625975 (56Km), was worked on 24/47 at RS59 on both bands on FM. This was after initially lining up 42 degrees off the beam heading (operator error – new kit) and wondering why the signals were so weak!

EI/G3UKV/P, located at IO63UE (111Km) was then worked on **24GHz** at RS59 SSB/FM, again with deep QSB on the path taking signals in to the noise.

EI/G8VZT/P was worked on **47GHz** using the high power on FM, with 59 both ways.

David, GW0IVA/P left early in the afternoon and David (EI/G8VZT) & I kept carriers going out over long periods to monitor the path. After 3:45pm in the afternoon we managed to exchange with the barefoot 100 microwatt transverter, using CW again. Carriers were left running to monitor conditions and after 18:30pm the signal got stronger although QSB was apparent.

Weather conditions for the weekend's activity whilst being warm and sunny in the distance over the sea mist was clearly visible making the horizon/sea not clear if at all not visible. Humidity was down to 30% just before mid morning but went up to 90% by mid afternoon.

Frequency stability has proved to be very good with the entire northern contingent and I think the southern contingent using the German (or variant) DL9FN OXCO.

73 from Martin, G7MRF

News from overseas:

From: Pete, F1VBW [icom.flo@wanadoo.fr]
Now that the activity days have started there have been a few new contacts.
Following recent contacts on 5760MHz, I managed to borrow an HP8555A for some measurements, only to find that the TX filters were actually aligned on the 2nd harmonic of the IF! So my 5w RF was actually on 5904MHz - which the IM5964 didn't mind at all.... On freq power was some -26dBc. So the previous contacts this year represent some km/mW!
73 from Pete F1VBW in JN03WL

From: Jonathan Naylor, HB9DRD, [g4klx@g4klx.demon.co.uk]
At last my Swiss amateur radio licence has come through, I am now HB9DRD. I fancy signing as M0/HB9DRD when I'm in the UK just for a laugh!

I've done a quick comparison of the Swiss licence with the UK one, and from what I can understand there are some interesting differences:
Classes: There are three licence classes, 1 is like our class A, and their 2 is like our class B, the 3 is 2m and 70cms only although no modes are specified.
Power: the Swiss are allowed 1000W output on all bands except for VLF which is limited to 1W ERP. This power limit appears to apply for all licence classes, 1, 2 and 3.
Bands: This is where it get interesting.
VLF (136 kHz) is available with a special permit.
HF appears to be identical.
6m is available with a special permit.
4m does not exist.
2m and 70cm are identical.
23cm is slightly narrower than the UK, it ends at 1300 MHz.
13cm is very different. The standard licence only covers 2308 to 2312 MHz, you need a permit for 2320MHz. Thats why the Swiss all

this path. Signals were very weak and watery, 519 in all cases. The callsign and operator on 47GHz was Dave EI/G8VZT/P, using gear that had only been air tested a day or two before crossing the Irish Sea! It was the culmination of a solid effort of construction over the winter and spring months by all concerned - a complete rebuild since summer 1999 by Dave, Dave and Martyn.

Following our camp move next morning (Saturday, 29/07/00), the fun was joined by John G(W)8ACE/P, Peter G(W)3PYB/P and Chris G(W)8BKE/P on the Preseli Mountains (IO71OW) to the south of us. Contact was quickly established, with the higher power (300mW) of John assisting dish and frequency alignment on 24GHz. The distance this time was 172 Km. Signals varied wildly from inaudible to S5+.

Meanwhile Paul G(W)0HNW/P had moved to a site near Aberdovey (168Km) and was S9 on 24GHz. Martyn 'MRF and Dave 'IVA had moved to the tip of the Lleyn Peninsula, and were also S9 with flutter down to S5 on 24GHz. They hooked up with EI/G8VZT/P on 47GHz quickly, and eventually Martyn managed to QSO on the DB6NT transverter "barefoot" with about 100 microwatts at both ends, using CW. The tests continued for several hours, with signals up and down like a yoyo on both bands.

10GHz was to come into its own the next day, with the third leg of the RSGB 10GHz cumulatives.

Sunday morning (30/07/00) broke with fine weather- even some blue sky and operators in shorts! Our first QSO on 10GHz was with Adrian G4UVZ near Taunton IO80KX at 327 Km. We gave the band a good thrashing all day, with quite a bit of rain scatter enhancement, so that, for example, Tim G3KEU/P and Roy G3FYX/P on Walbury Hill both peaked S9 at times at 388Km. Best DX was G4ZXO/P and G4UET/P, both on Ditchling Beacon on the South Downs at 494Km. We think another "first" was made that day too, at 15:33z when EI/G3UKV/P worked GU0FDZ/P (Chris) on Guernsey, the signal sneaking between the heights of Exmoor and Dartmoor to reach us at about S1-2. Altogether we worked 27 stations from IO63UE11 on Sunday on 10GHz - a very worthwhile outcome, and much more successful than in 1993 when we were beset with TWT PSU problems. The solid state 5 watt PA was a lot easier to drive, and worked faultlessly throughout our stay. Our thanks to everyone for pointing beams our way. We were delighted to give many stations their first EI QSO on the band.

At 16:01z we worked Sam GI8GJX/P at IO74BX on 10GHz, and immediately tried to follow up the QSO with a 24GHz test. We heard Sam's carrier quickly, but it was fluctuating madly and seemed to peak with the dish pointing at the ground! Our re-sited camp unfortunately was cutting off our path northwards, so we dragged the tripod, dish and transceiver across the mountain top and had a solid QSO with Sam at 16:35z for yet another "first", we believe. The distance was 203Km, the best DX achieved with this particular piece of 24GHz equipment. Tribute must be paid to Sam for all his microwave activity, which he achieves with little, if any, other local microwave support in the Province. Signals were up to S9 both ways. The callsign at our end was EI/G3UKV/P.

Finally, the credits. At our end, the whole expedition was a real team effort - including Jim G8UGL, John G4ZJY, Mike G3JKX, Dave G8VZT and myself, Martyn G3UKV. Many others spent scores of hours to get equipment ready for this particular weekend, and drove hundreds of miles. to achieve individual objectives. Nearly every target was met, and numerous QSOs resulted on 10, 24 and 47GHz. Four "firsts" were achieved, we believe, and a great deal of satisfaction was gained. by everyone involved. Apologies to F1GHB and anyone else who tried to contact us on the mobile 'phone number given out; - it turned out to be the One-to-None network from EI land! Thank you to everyone who helped make the expedition so successful.

73, Martyn G3UKV

MILLIMETRE WAVE WEEKEND -

An account of the activities over the periods 28-30th June 2000 by Martin Farmer, G7MRF

Iris Hole size: 1 = 6.6 mm

Average Unloaded Q of Cavities = 4646
Insertion Loss = 1.94 dB
Lg/8 Matching screw spacing= 9 mm

Conclusion

For a 10368MHz filter, the desired cavity is 31.5mm long. Divide this by the current length of a cavity block (12.35) and we get 2.55 blocks. So just over two and a half blocks are required for the new cavity. One was cut in half fairly easily using a junior hacksaw with a sharp new blade and the cavity block held in a vice. The sawing marks were removed from each piece using a broad smooth file. The cavity blocks were then rearranged to form the 10368GHz filter. Tuning up a single cavity is fairly straightforward provided one has a signal source and a detector. I used a Gunn Diode oscillator and diode detector. The Gunn Diode was first set up to 10368MHz using a frequency counter, then the filter was peaked up using a diode detector. I later tried to check the pass band of the filter unit by means of manually sweeping the Gunn Diode oscillator with a frequency counter on the output, but this was difficult due to the very sharp tuning which caused the frequency counter to lose lock either side. What was clear was that the filter had a bandwidth of a few MHz either side of 10368MHz. I found that both tuning screws in the cavity had an effect and had to be adjusted for maximum output.

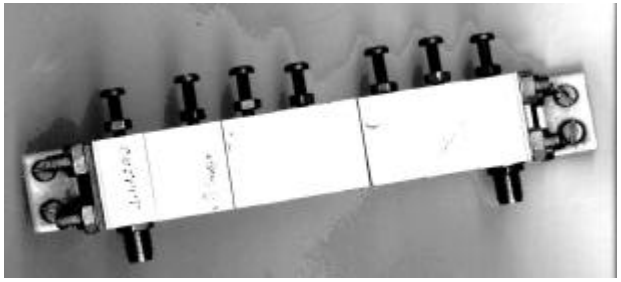


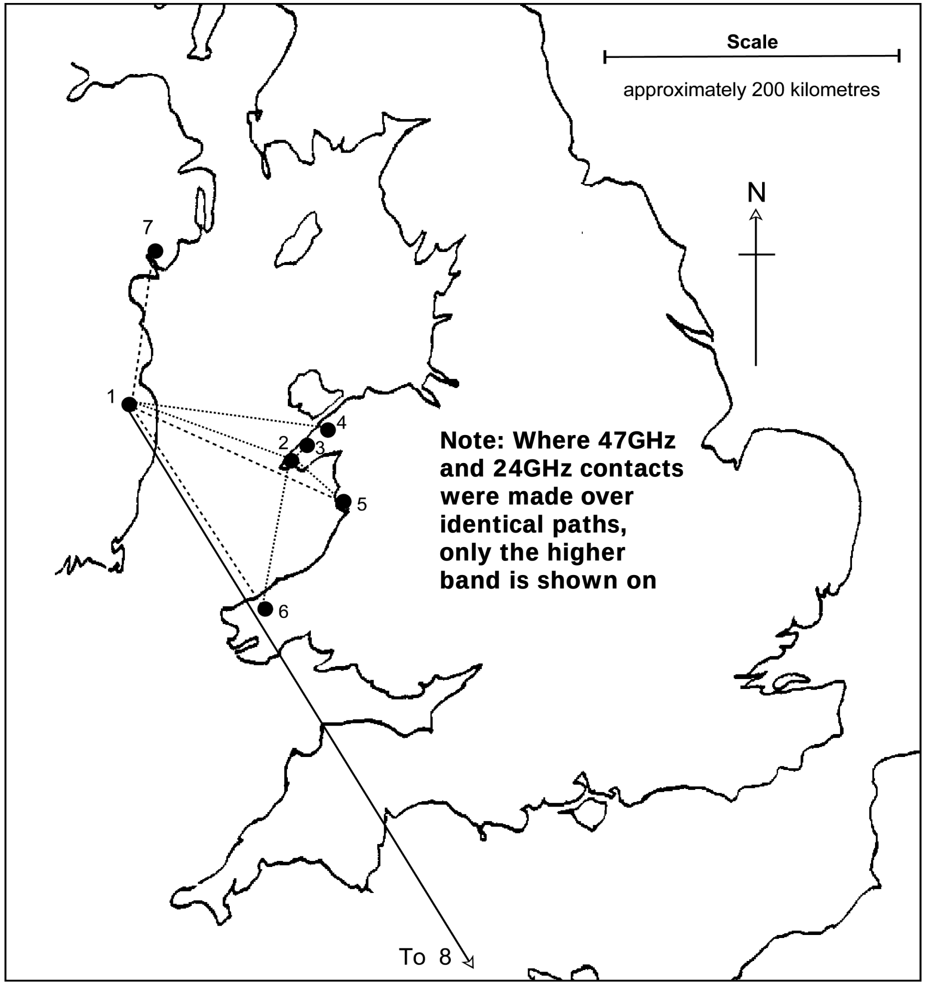
Fig 2: The finished filter, you can figure out the positions of the half blocks by means of the gaps in the tuning screws

Clearly many filters from 10GHz to 18GHz could be constructed from these bits – a sort of universal filter kit and it will no doubt be useful in the future .... not bad for an initially rejected item!

References

Ref 1 Examples of practical Waveguide filters 1995 reprint Microwave Handbook Vol. 3 page 18.18. (G3JVL)
Ref 2 Waveguide filter design program 1993 reprint Microwave Handbook Vol 2 page 12.26 (G4KNZ)

Microwave "Firsts" and Millimetre Wave Contacts 28-30 July 2000



KEY

Portable locations:
1. Kippure, Eire IO63UE11
2. Rhiw Mt. Lleyn Peninsula, IO72PT
3. Lleyn Peninsula, ngr SH370476
4. Ngr SH514583
5. Near Aberdovey, ngr SN625975
6. Mynydd Preseli, IO71OW
7. IO74BX
8. Guernsey, IO89RL

Paths:
10GHz ————
47GHz ....
24GHz - - - - - -

ACTIVITY NEWS FROM THE WORLD ABOVE 1000MHz

We'll start the ball rolling this month with two accounts of a most fascinating weekend of millimetre wave Dxing across the Irish Sea. Please refer to the map opposite, on page 8, when reading first EI/G3UKV/P's account and then that of G7MRF... Martyn and Martin!

EI/G3UKV/P EXPEDITION TO KIPPURE MOUNTAIN, JULY 2000

~ as told by Martyn, G3UKV

The visit to the Wicklow Mountains, Eire, at the end of July was almost a re-run of the Telford Club expedition there in 1993, or so it seemed on our arrival off the ferry. Wind, rain and near-zero visibility on Kippure, at about 2475 feet ASL. However, within half an hour or so, things improved beyond our wildest dreams. Last time, we had almost unbroken bad weather - this time turned out to be different. We could carry three microwave bands with us this time, 10, 24 and 47 GHz, all narrow band ... no wideband ATV this time.

We squeezed five of us and all the gear into just two vehicles, to keep costs down, of course; exotic microwave QSOs don't come cheaply at the best of times!

We had hardly set up our tent and most of the gear, when we were advised we may need to move as aerial riggers were due to arrive for a week's work the next morning, and we were a little too close to the 150 metre high TV/PMR mast for comfort, when an errant spanner, antenna or offcut could easily slice a person on the ground in half, especially as we had, we thought cunningly, camped down-wind of the structure to provide some wind protection. So, move we did, first thing next morning. This job took about three hours, but at least the weather held reasonably fine. However, we decided to go ahead with our initial skeds from the "endangered" site, prior to moving.

Listening on 2 metres, our talkback band, showed the extra effort to bring an 18 ele Cushcraft yagi with us was worthwhile. The Wrotham beacon was a solid S5 throughout our stay, and, for once, there were no complaints of feeble talkback facilities! Unfortunately, there were no microwave beacons audible, so we had no idea how things would work out.

We needn't have worried, since most of day one (Friday 28/07/00) was spent on 24 and 47 GHz, with tests to several stations who made the extra effort to travel to Wales to provide likely links on the bands available. By prior arrangement, we tried to QSO with Martyn G(W)7MRF/P and Dave G(W)0IVA/P on the Lleyn peninsula, but no signals were heard on 24 or 47, even though the path looked good. Was the gear working?

Paul G(W)0HNW/P put his QRO 24GHz horn in our direction, and it was immediately audible, with a 2-way quickly following, at 16:27z, to make the first EI/GW QSO on 24GHz. His site was on the tip of the peninsula, and the distance was 113Km. The callsign at our end was EI/G3UKV/P. Paul then QSYd to 47 GHz, and again was quickly picked up. The honour of the first EI/GW QSO followed at 17:10, between G(W) 0HNW/P and EI/G8VZT/P. Signals varied from S3 to S6 - a pattern we have invariably found on all the higher microwave bands across sea paths over the years.

Meanwhile, Martyn ('MRF) and Dave ('IVA) moved site, so that, at 16:40z, both stations were heard simultaneously from a better site at 141Km distance, still on the Lleyn peninsula. Dave and Martyn were worked at 19:10 and 19:24 respectively over