



An Amateur Radio publication for the Microwave enthusiast

MICROWAVE NEWSLETTER

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

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FROM THE EDITOR

2001 – OCTOBER

It's been a hectic month on the microwave scene! This issue brings several technical articles, news of exciting developments on the 24GHz band and reports of activity during the several contests that took place since the last issue of the newsletter. Many thanks to all our contributors.

We had also hoped to report on the GCHQ Microwave Round Table but most of you will know by now that it was postponed for security reasons taken in light of happenings overseas. All is not lost, however, for the annual "Martlesham Round Table" is scheduled to go ahead as planned next month. Try to be there!

Your editor had a wonderful week in California during late September, attending Microwave Update. A few other UK microwavers were there ... the rest of you missed a real treat! However you can hear all about it at Martlesham.

The summer contest season is now over and thoughts turn to winter construction. What have you planned to make this winter? What did you make last year? Did you use it this year? If you have been hibernating for the past year or more then isn't it time you surfaced and became active? How about building for a new band, getting going on AO40 or upgrading your present equipment There's so much to do on microwaves that we can't see how anyone could get bored!

Finally, how about writing up what have been doing, or intend to do, for the newsletter?



In this issue ...

- ◆ 47GHz diode problem solved
- ◆ Want ads
- ◆ 23cm Scottish beacon news
- ◆ New prescaler information
- ◆ G3WDG and G4KGC hear W5LUA/VE4MA QSO on 24GHz EME !
- ◆ More AO40 24GHz news
- ◆ K Band Operation on AO40 by W5LUA
- ◆ Sulphation of lead acid batteries
- ◆ Curing instability in the Adret 5104
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- ◆ 3.4GHz dual dipole feed ..by G3XDY
- ◆ 5.7GHz rainscatter detector
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- ◆ Contest results ..August All Bands

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



G3PHO: Peter Day

0114 2816701



G3PHO: Email: g3pho@geocities.com
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SUBSCRIPTION ENQUIRIES SHOULD BE SENT TO RSGB HEADQUARTERS AT THE ADDRESS SHOWN AT THE TOP OF THIS PAGE AND NOT TO THE EDITOR ..

HAD PROBLEMS FIXING 47GHz MIXER DIODES?

I have been informed by Martin, G7MRF, that there is a possibility that the HSCH9251 diodes supplied by myself may pick up a small amount of glue from the packing material. Please check that this is not the case before mounting the diodes.

This glue can be removed with alcohol prior to mounting of the diodes.

Martin found that one of the four that he mounted was high resistance. He has successfully cleaned a fifth diode.

Paul Longstaff (G6UAJ)



HAVE YOU REGISTERED FOR THE MARTLESHAM MICROWAVE ROUND TABLE YET?

If not, you still have time... contact John Quarmby, G3XDY to register and Jason Flynn, G7OCD, to arrange dinner and accommodation if you wish to stay the two days. Full details were published in the September 2001 edition of this Newsletter.

By the way, you can book online... just visit Sam Jewell G4DDK's website and follow the links:

<http://www.btinternet.com/~jewell>

WANTED

Two electrically operated, 4 port, WG16 waveguide switches. Coil voltage is not important. Any reasonable price paid.

Contact Chris G0FDZ Tel: (020) 8304 9750 or e-mail: chrisfdz@aol.com

NEW SCOTTISH 23cm PERSONAL BEACON

I have put a temporary, personal attended beacon into operation on 1296.004MHz. **Call sign:** GM6BIG.

Location: NGR NS 828 647, near Salsburgh (near Shotts) in central Scotland just of the M8.

Antenna: Single Alford slot, horizontal omni.

Power o/p: 100mW at antenna.

Reception reports please to gm6big@hotmail.com
73 de David Anderson, GM6BIG

Prescalers - more information from David, G6GXX

I have an update to my earlier Prescaler Article (Microwave Newsletter 1998-October). I've now built one using the Hittite chip, which is considerably cheaper. I have also put a MMIC in front to protect it and also to increase sensitivity.

It works extremely well, reading the frequency of a 5mW Gunn Diode from many feet away. To date, it has been used above 10GHz and below 2GHz. You could also put the MMIC in front of your Fujitsu chip. So far I have used Rogers Duroid for the PCB. However in the interests of general use I will also try an FR4 layout and check both these for sensitivity across the range at the Martlesham Microwave Round Table.

For those who have frequency counters below 1.5GHz, I have just recently received information on some 1 to 3GHz prescalers. These will bring the final counter frequency to be low enough for most available counters. I also have an idea to make a direct reading PIC / LCD frequency counter based on the Hittite and Temic prescalers to reduce the final count from 10GHz to 6 or even 3MHz.

Information will appear on my webpages from time to time...
<http://www.microwave.fsnet.co.uk>

G3WDG and G4KGC HEAR VE4MA and W5LUA on 24GHz!

Following on from their recent successes using the 24GHz facility on AO40, Charlie and Petra have now joined VE4MA and W5LUA at the frontier of amateur microwaves 24GHz EME! What follows is a transcript of recent emails sent to the Microwave and EME Newsletters



Having had reasonable success with our 10ft Andrew dish receiving the 24GHz signals from AO-40, we temporarily dismantled the AO-40 equipment and put the transverter back on 24192MHz, in readiness for the 24GHz EME tests organised by Barry VE4MA and Al W5LUA on 9/10 October this year. Unfortunately the tests on the 9th were outside our window but an extra test arranged for the 10th allowed us to listen.

We built a new feed for the dish, based on the VE4MA choke ring feed, but fed with waveguide. The feed is identical to that used for AO-40, except that no polariser was used and the conical horn we have been using to under-illuminate it was replaced with a choke ring. We were using our DB6NT waveguide preamp feeding the homebrew 24GHz transverter based on the DB6NT MK2 transverter, G4DDK004 LO, G3WDG009 2.4 to 12GHz mult, WDG waveguide image filter etc.

The hours before the EME test were spent optimising the position of the feed for best sun noise. The position was quite critical - with the feed a few mm away from optimum the sun noise dropped by a dB!. After an hour or so no further improvement could be obtained and we ended up with 13dB of sun noise (at an elevation of 19 degrees with a thin overcast).

Our dish mount does not allow elevations above 34.5 degrees and we had to wait until 5 minutes before the test to see what level of moon noise could be achieved. The moon appeared right on cue and once it was fully into the beam we measured ~ 1.8dB. This is about the same as we see on 10GHz and tracking thereafter was very easy, just keeping the moon noise peaked!

With G4KGC on the receiver and G3WDG handling the tracking, we were pleased to find VE4MA's signal quite easily, a few seconds into his transmit period. During the 30 minute sked, we copied both stations, VE4MA at "O" level and W5LUA at "M" level, and heard them complete their second QSO of the morning.

We watched their signals on the computer also using the AE4JY AO40rcv software, which has an audio spectrum analyser display with waterfall. The capture shown above is VE4MA's signal, and clearly shows the libration spreading widening the signal (a clear tone would show up as a narrow line).

We have posted the AO40rcv capture and about a minute of audio on our website at:
www.g3wdg.free-online.co.uk

73 from Charlie and Petra

MORE AO40 NEWS G3WDG DESCRIBES HIS 24GHz EQUIPMENT

Editor's note ... since this was written, Charlie has used his 10ft EME dish to receive AO40, with excellent results. The system described below, however, is well within the capabilities of the rest of us who rely on "normal" dishes!

I am using a semi-homebrew system here for 24GHz narrow-band based on the DB6NT Mk 2 transverter, which I obtained from DB6NT as a kit, consisting of a pcb and two diodes. Added to this are a HB waveguide filter, a DB6NT ready-made WG in/out 30dB gain preamp and a HB horn feed. An ex 11GHz sat-tv dish completes the system.

We are really still in the early stages of evaluating the performance of the system. We have upgraded from a 20cm offset dish which we used to receive the first signals from AO-40, to a 60cm, which produces about 5-6dB sun noise. It was just detectable on the 20cm. The first AO-40 test with the 60cm were spoiled to some extent by rain, the effect of which still needs evaluating. At times signals were better than in the first test, with ssb being copied and some partial blocks decoded. We also managed to "transpond", hearing our (L2) uplink carrier coming back on 24GHz.

The question of polarisation has been raised. It was a surprise to me but the polarisation of the K-Band transmitter is linear. So, in the long term with a 3-axis stabilised satellite, there is no need for CP and indeed it would cost you 3dB (which judging by signal levels now is 3dB that can be ill-afforded). However, while the satellite remains in spin-stabilised mode, the use of a linearly polarised receiver of course results in a signal with two very deep fades per rotation. Possible to make QSO's and hear the satellite but no good for tlm reception! I am currently building a scaled W21MU horn which I plan to configure for CP with either a dielectric slab or screws, simply to get rid of the fading.

I wonder what the interest would be in a home-constructible design for a 24GHz receiver? These days it should be possible to do some or all of the more difficult "plumbing" functions on a pcb, provided that some design choices were made at the beginning. If you want a 144MHz IF, for example, then the image filter will need to be waveguide. The choice of a higher IF (1296, or even 2401?) would make printed filters a possibility. If a spec could be developed which was interesting to folks, then perhaps some of the microwave technical fraternity could take up the challenge and design something that could be homebrewed. This would not satisfy the "convert surplus" brigade, but would at least provide some alternative to the present supply situation. SMT construction skills would or course be needed!

As to a draft spec, my proposal would be something like:

Conversion gain:	30dB min
Noise figure:	2dB max (target)
IF	commonly used ham band, high enough to allow printed image filters, could be 1296, 2401 or other
RF input port:	waveguide or coax. Design to include a "reproducible" SMA to WG transition.
Stability:	good enough for ssb reception and tlm collection
LO:	included in the design or possibly a separate unit)

73 from Charlie G3WDG

AO-40 24048 MHz K Band Operation .. by AI Ward, W5LUA

At 0715 GMT on October 1, I was able to receive the 24048 MHz beacon from AO-40. AO-40 was situated at an elevation of about 7 degrees and an azimuth of about 265 degrees. I followed the beacon until about 0752 GMT when the elevation of AO-40 was less than 0.5 degree. The beacon peaked at 7 dB over the noise in a 2.4 kHz bandwidth. There was several dB of fading on the beacon. I am using a MACOM 2 ft dish with horizontal polarity at 65 ft (This is my 24 GHz tropo system). Azimuth control is via an M2 rotator with 0.1 degree readout. I can elevate up to 16 degrees with a small actuator. Even though I was not prepared to accurately measure frequency, it appeared to be approximately 24048.081 MHz initially and continuously decreased to about 24048.055 MHz before setting at my QTH. My noise figure measures 3.0dB with an Agilent Technologies HMMC-5023 LNA mounted at the antenna. My normal sun noise with this system is 3 dB over cold sky.

I use my normal 24192 MHz transverter with some modifications. For 24192 MHz, I use a dual conversion scheme which normally down-converts 24192 MHz down to approximately 1994 MHz and then further down-converts to 144 MHz. The dual conversion scheme offers greater image rejection because of the high first IF frequency. When receiving 24048 MHz, the first IF now becomes approximately 1850 MHz which I then pass on to a second mixer with a 1706 MHz LO which then provides the 144 MHz IF.

While listening to the beacon and passband at 24048 MHz, I ran across JA1UK and I had a short QSO with him. I made the assumption that the normal Mode-S passband was also operational at this time so the JA station was probably not aware that I was receiving him on 24048 MHz.

**AI Ward, W5LUA
EM13QC
October 1, 2001**

Sulphation of Lead-Acid Batteries

Notes by Steve Davies, G4KNZ

I was wondering if anyone had come across this method (below) for removing lead sulphate crystals? Has anyone actually tried it, or got one of the "conditioners" from VDC? Or does it not really work? Read on

When a battery is improperly charged (over/under) or allowed to self-discharge, as occurs during storage/non-use, crystals of lead sulphate (PbSO₄) build up on the battery's storage plates, preventing the battery from ever being fully charged and therefore able to deliver their full power/capacity.

Every element has a magnetic moment at a resonant frequency ie. a point at which the chemical bonds that hold the molecules together to form a crystal can be broken. The resonant frequency of lead sulphate crystals is 3.26MHz.

By creating a waveform with the required 3.26MHz frequency, coupled with a very fast rise time and a high amplitude pulse, the sulphation can be broken down. This approach is used in a battery conditioner from VDC Electronics.

Note: Not every battery is a candidate for re-conditioning - for example, failure may be due to mechanical damage caused by vibration or contamination, which has created is "shorted" cells. But If a 12 volt battery has a resting voltage of at least 10.5V and none of the 6 cells are shorted, de-sulphation of its plates can be accomplished.

Steve Davies. G4KNZ

Curing Cyclic Instability and other problems in the Adret 5104 synthesizer...

by John Hazell, G8ACE

This Adret Synthesiser, new to me, had fully working frequency switches and the reference oscillator was set correctly. **However the red alarm light had a cyclic flash and the output would jump just a few Hertz.** The Adret is not the easiest unit to work on without extender boards. With the initial investigation limited to checking signals on the linking cables, a blank was drawn as the fault appeared to be everywhere. By substitution, the fault was narrowed down to 6883, the 1MHz Spectrum Module. It was found that the PLL controlling the 50MHz oscillator was hard at one end, the varicap volts being at around 11.5v. The 50MHz is locked to the 10MHz reference so this was duly cranked and the PLL came off its stop with the reference 150Hz low. So the loop was capable of working and the instability disappeared. A 'Quick' fix is always desirable to prevent the unit joining those on the 'too difficult' shelf! A 15pF capacitor was inserted in series with the crystal to raise its frequency. The crystal, it is assumed, must have aged somewhat. The value of the C is quite critical. 15pF centred the loop at 6.8v. The 10MHz reference could then be varied -100Hz/+50Hz with the loop remaining in lock. This was considered an adequate fix.

A quick check for the 50MHz loop, therefore, is to vary the reference oscillator over its whole range whilst viewing the Hz digits of the output on a counter. Do this only if you can reset the reference correctly of course. The block diagram of the 6883 module is shown **(A)** on the page opposite,

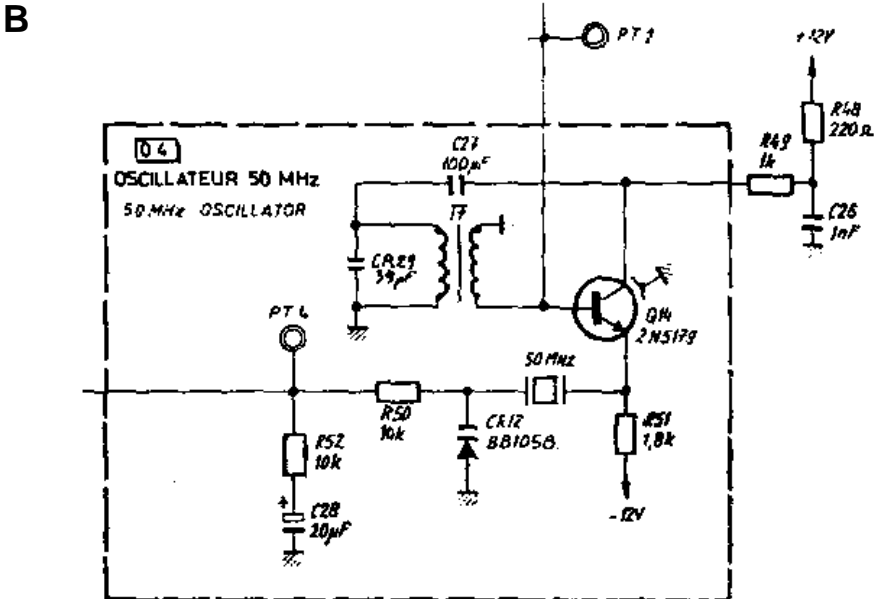
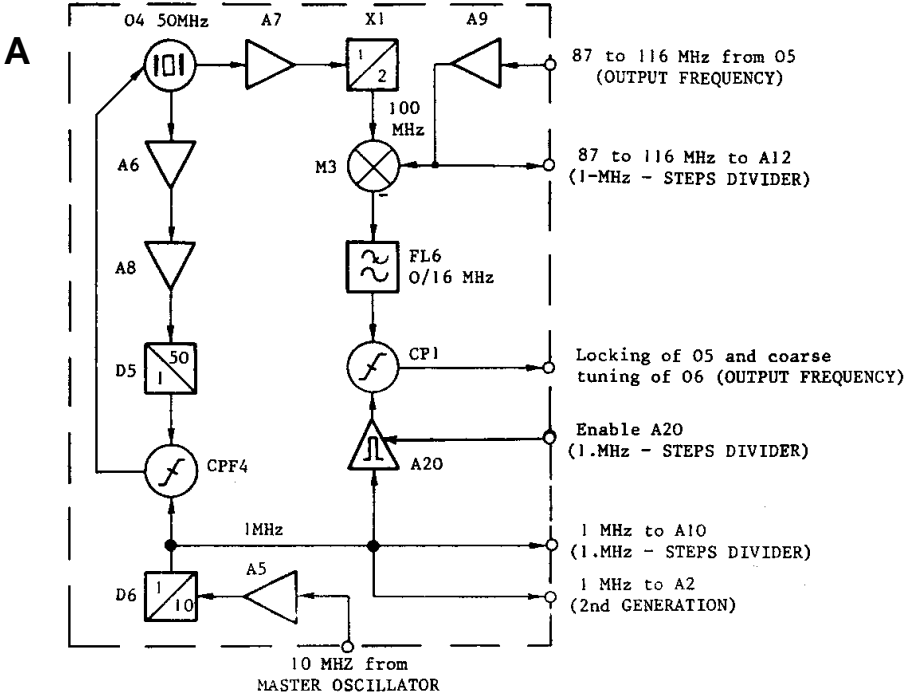
along with the circuit **(B)** for the 50MHz oscillator taken from the Adret manual ... *which is essential if one is to service this unit ... editor.*

Another stock fault is the prescaler chip, a Plessey device. I replaced it with two 10131 chips wired as divide by 10 to cure the following fault. The front switches fail to work, the output being stuck up around 130MHz. Chris, G8BKE has had and fixed this fault recently. I have had it and so has another local, so it's fairly common.

The other little snippet is the genlock input. It's always active waiting for a 5MHz signal. If the internal oscillator is, in my case, within 20Hz, the oscillator simply snaps in. Another unit, newer, needs to be within 4Hz. There's no need to touch the master frequency knob, unless of course you want it to be right without the external signal.

Editor's note ... A number of UK microwavers have purchased these excellent synthesizers and are finding them very useful to establish accurate frequency setting on all our microwave bands. Some operators have manuals or copies of manuals. For those not so fortunate do not despair! It is hoped we can arrange for CD ROM versions of the manual to be available quite soon

Many thanks for the useful notes John...



MICROWAVE FREQUENCY MARKER By Allan, G8LSD

I have made the marker as described by Kerry Banke, K6LZW, in the June 2001 Microwave Newsletter. I had no joy at 10GHz with an 8.5 MHz oscillator but at 24 MHz harmonics are just audible. The good news was when I fed it from an Adret 5104 synthesizer (90 to 120MHz range) I found very pure signals and at very low power.... Excellent!

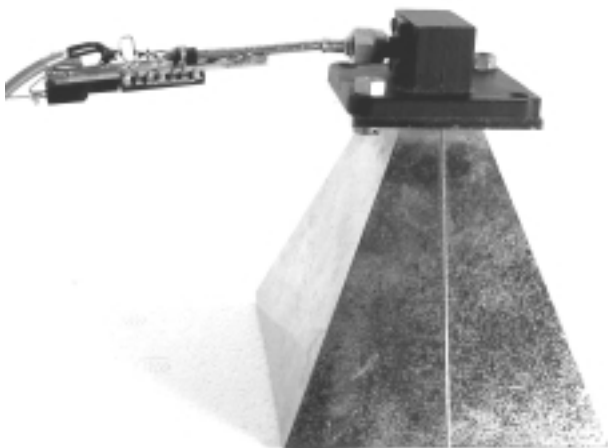
For construction, I used a strip of fibreglass PCB as a ground plane between the pins. The components were SMDs soldered directly to the pins. The cross connections were made outside and over the top of the pins. For output, I tried a short wire, and this was successful. Then I used a short length of thin semi-rigid soldered to the ground plane, the centre conductor being connected to the output pin by a 2pF SMD capacitor. The output now goes to a transition and a small horn. If the Adret is accurate, my offset on 10GHz is about 5kHz.

The short spikes from the 74AC00 are clearly visible on a scope



Above: the pcb marker assembly

Right: The marker mounted on small 10GHz horn for test purposes.



3.4GHz Dual Dipole feed .. By John, G3XDY

A description of a dual dipole feed for 2.3GHz suitable for dishes with an F/D ratio of 0.6-0.7 appeared in a recent edition of Scatterpoint, the UK Microwave Group journal. I have now made a scaled version for 3.4GHz, based on the same principles. It can be mounted alongside an existing 10GHz feed on an offset fed dish to make a multiband antenna with minimal interaction between the feeds. On 3.4GHz the beam squint is about 10 degrees off boresight. This offset has to be taken into account when aligning the dish. The loss due to the offset is about 1dB, so overall gain should be of the order of 24-25dBi for a 60cm dish.

The EIA dual dipole antenna performance as a dish feed is analysed in detail in Paul Wade W1GHZ's excellent online microwave antenna manual at:

<http://www.qsl.net/n1bwt/preface.htm>

The original 432Mhz feed design is documented in the ARRL UHF/Microwave Experimenters Manual. The balun design has been changed to make it more readily realized using UT141/RG402 semi-rigid cable, otherwise the design is scaled directly from the original. The reflector is made from un-etched double sided glass fibre board, with the dipole elements made from 1.4mm diameter copper wire recovered from old cooker mains cable, and the phasing lines made from 1mm diameter copper wire, all soft soldered in place.

I found that the lengths of the dipole elements had to be extended slightly beyond a half wave to get a good match. With 22.5 mm lengths of wire, the return loss was only about 8dB. Extending them to 24mm improved the return loss to 17dB, equivalent to a VSWR of 1.3:1. No doubt this could be improved by further adjustment but the difference in performance would be hard to see.

I measured the return loss using a reflectometer made from 2 pieces of semi-rigid cable, as described on page 10.14 of the Microwave Handbook, but with an interaction length of about 8mm. In addition to adjusting the length of the dipole elements, the match can altered by squeezing the phasing line sections closer or further apart.

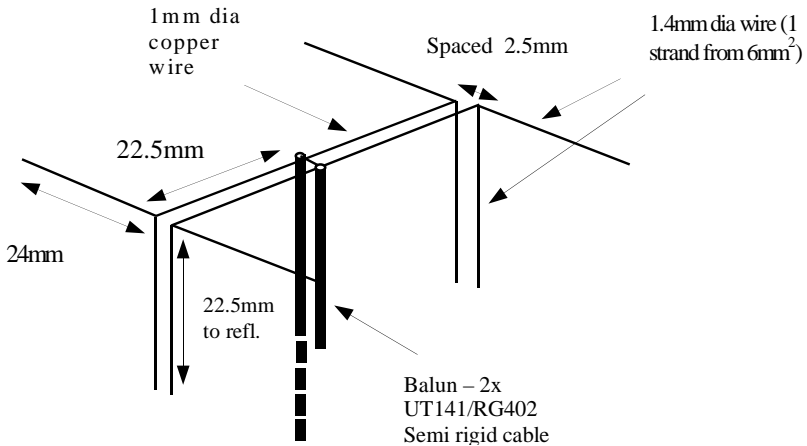
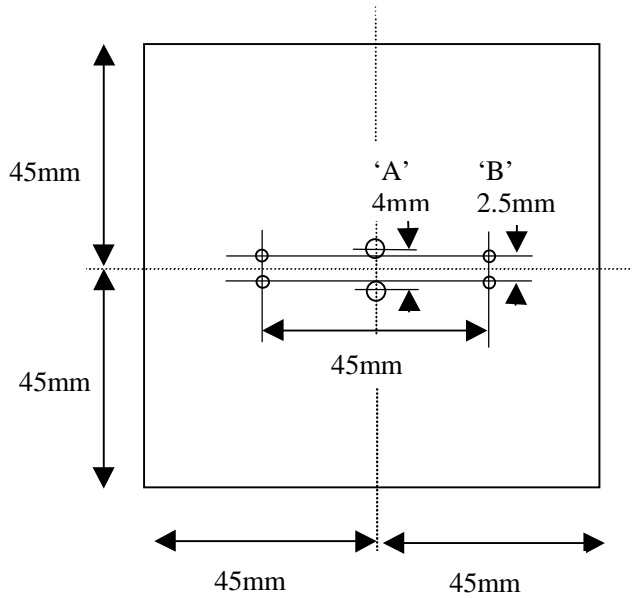
Weatherproofing the feed depends on which way up the dish is mounted. An "upside down" mounting of the dish with the feed support arm at the top means that most of the weather hits the back of the reflector. I just added a piece of perspex about 60mm x 90mm to the upper edge of the reflector to prevent rain falling onto the upper dipole element. With the dish mounted the other way up then something needs to be mounted over the feed elements to stop water bridging the phasing lines and balun. I found a plastic jar that had contained 500g of mixed nuts that should do the job well.

Results have exceeded expectations, with 11 QSOs in the recent UHF contest on one of the least used microwave bands. With the availability of surplus 15W solid state PA s and a new updated transverter design from DB6NT, perhaps we will see a welcome increase in interest in this band.

EIA Dual Dipole dish feed for 3.4GHz

Reflector – 1.6mm double
sided copper clad FR4 board
90mm square

Holes A = 9/64" (3.6mm) dia
Holes B = 1.5mm dia



5760 MHz Rain Scatter Detector

by Rudi Wakolbinger OE5VRL

I have been making QSOs for many years using Rain Scatter (RS) on the microwave bands. Through tests with DL6NCI, DD7MH, HG1YA and many others, I have confirmed that 3cm is not the only band suitable for RS. It is also possible on 6cm (very good), 13cm (just about), and 24GHz (very rarely). 9cm is not available in Austria so my experience of that band is minimal.

To make RS contacts, you must first find a suitable cloud that can act as a scatter point. The finding of these clouds has until now been mainly through listening for beacons. With this method it is only possible to find the direction of the scatter point but not its distance, so it is not possible to determine the actual location of the scatter point.

That brings me to my idea, to receive my own reflected signals and to measure the elapsed time. I have had this idea for years ... it was recently re-activated through an article by LX1DU in DUBUS. I must acknowledge my radio friends for solutions to several technical problems. Above all is my friend Erwin (OE5UXL) and I must not forget Michael (DB6NT) with his excellent modules and amplifiers. I had many QSOs with Ulrich (DG2MF) in which we discussed fundamentals. Ludwig (DC8NV) provided the most significant part, a circulator. Dieter (DL3NQ) gave me many important tips. Ferdi (DC8EC), Erhard (DC4RH), and many other helped with their specialised knowledge to help me realize this project. Based on my experience of RS and the availability of cheap components I decided to operate my Rain Scatter Detector (RSD) on 6cm, 5.7GHz.

I needed a number of units for the system. A pulse generator to produce the transmitted pulse and receiver phase, a transmitter oscillator (120MHz), a 48x multiplier to produce 5760MHz at 100mw, an 5W amplifier, a converter 5760MHz to 144MHz, a 144MHz receiver with a S-meter output and, finally, a circulator. An oscilloscope is used to display the results.

The pulse generator produces a 30 μ s pulse with a frequency of 375Hz. This controls the transmitter that produces a 30 μ s carrier, 375 times a second. There is a single buffer amplifier after the oscillator and three multiplier stages in the transmitter driver. The transmitted signal is amplified by a two-stage amplifier up to the 5W level and through a circulator to the antenna (3m dish). A very good match at the antenna is a basic requirement, otherwise too much reflected power may flow over the circulator to the receiver and result in the destruction of the input transistor. The isolation between the transmitter and receiver ports is 33dB. Approximately 3mW from my transmitter appears at the receiver input. During tests I determined that the input transistor (NE325) could survive this power level.

The antenna radiates the transmitted pulse and when no reflector is available, it disappears. A small amount of the transmitted signal is received via the circulator and this causes the oscilloscope to display a large Y deflection for the duration of the transmitted pulse.

The transmission of the pulse triggers the start for the X time base. Suppose that within 300kms of my antenna is a good reflector, a proportion of the transmitted pulse is reflected and if strong enough, it will appear on the oscilloscope as a deflection on the Y axis at a point in time on the X axis.

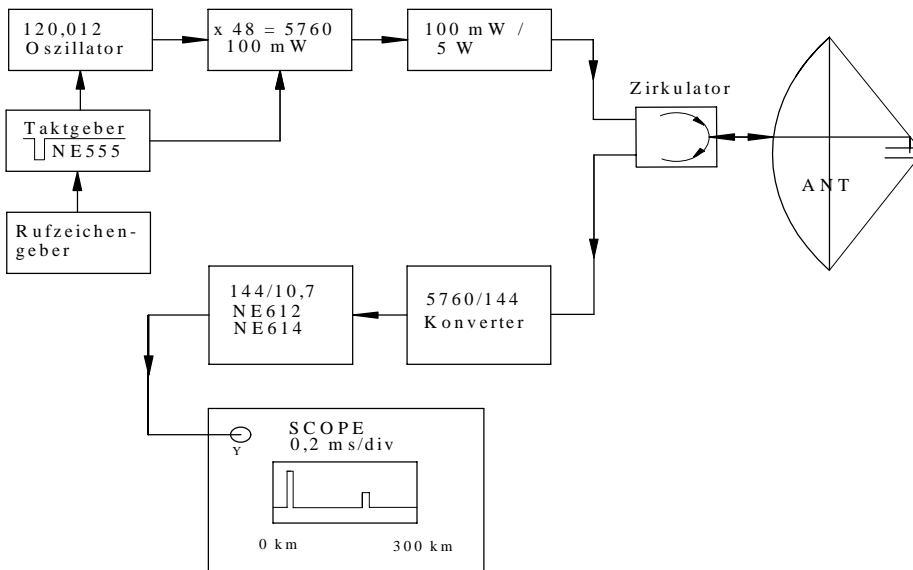
The size of the Y deflection is proportional to the strength of the reflected signal and the distance to the reflector is calculated by measuring the time difference between the pulse being transmitted and the reflection being received. An elapsed time of 1ms = 300kms which is produced by 150km there + 150km return, indicating 150km to the scatter point. I have the X axis time base set to 0.2 ms/div so 300km are easily seen.

To date (beginning March), there have been no thunderstorms and that's why I still do not have much experience of the range of my RSD.

The RSD first went into service in mid February and I easily received a reflection from a hill in the Swabian Mountains on an azimuth of 271 degrees and at a distance of approximately 370ks. In the north direction I can see a number of hills at around 200km distant. My RSD not only detects rain scatter, but also Over Rich Distance Detector ORDD.

Over the summer months I hope to show how close to theory will be the results in practice. This system functions only when using a reasonably large antenna (3m dish). If I had only a 1m dish, then I would need a power of 500W to get the same strength from the reflections. With a 70cm dish I would need 1kW.

vy 73 es gd DX de OE5VRL



WIMO the Saga goes on! (a note from Reg, G8VHI)

Readers are referred to Reg's earlier article, which appeared in the February 2001 issue of this newsletter, for the background to these notes.

Some months ago, I noticed that I had water coming out of the end of my FSJ4-50. Knowing that if you cut the outer in any way water will pour down it, I thought I'd wait until after the 2m Es season was over and then replace. A few weeks back, I ran two 12 meter lengths of feeder up the mast. The joints in the middle were made with 7/16 din connectors. All were then fully sealed using self amalgamating tape, so I thought " Job done" ! Then, during the recent 23/13cm contest, just prior to start up, I checked the beacons only to find them to be very weak!! To my horror, there was yet more water at the bottom. An investigation on my side pointed to a faulty driven element, so a letter was sent off to Wimo in Germany and within the week I had a reply! He was very apprehensive that the driven element was the cause and requested I send it back. One reason he gave as to the cause was changes in pressure (even being ex RAF I never did try / Aeronautical mobile!). Anyway, one week later, a new driven element arrived. Wimo DL were still not admitting the driven element was at fault but, credit due, they did replace it and a very fast service too for no charge. So I hope this is the end to it!



ACTIVITY NEWS FROM THE WORLD ABOVE 1000MHz

Lots of exciting happenings over the past few weeks ... Some reports have been held over until next time ...

NEW UK EME STATION MAKES FIRST QSOs...

Brian Coleman, G4NNS, (Andover), made his first moonbounce contacts on the 10GHz band on Sun day 14th October. Here's his report: Cancellation of GCHQ was not a total loss as I stayed home and worked PA3CSG and W5LUA on EME. I got QRZs from F6KXSX and OK1WAU on random. SM4DHN was very loud I didn't catch a cq so couldn't call him. I also heard 15PPE and F2TU but could not raise them.

Polarisation is an issue and might explain why I can almost always hear quite readable echoes with my miserly 9 watts but others don't hear them I'll have to work on that.

Editor: Fantastic news Brian! Many congratulations on a fine achievement....

NEW NORTH AMERICAN 10GHZ RECORD ...

From: Chip Angle, N6CA [chip@anglelinear.com]
Yup Frank has done it again.....

WB6CWN worked **W1LP/mm (!)** at around 797 miles (1282km) on 20 September, 2001, at 2045z on **10368.100 MHz** to reclaim his record from N6CA who worked Clint at 712 miles a little earlier in the day! Clint is steaming South, off the California coast towards Panama, on his ship. He is running a 20 dBi horn and 1 watt. Frank is running 10 watts to a four foot dish.

Chip runs 2 watts to a 2 foot dish and has some recordings of his contact which will be up on the SMBS web site shortly. It's exciting stuff, working that far on x-band and this coastal ducting is great!

There may more contacts to come. Clint has been hearing the Frazier x-band beacon at over 750 miles as well.

73 Chip N6CA

The September RSGB Millimetre Bands Contest

For a welcome change there was a fair bit of activity and some interesting contacts were made. The following email reports speak for themselves:

From: Harold, G3UYM

[harold.groves@ntlworld.com]

With the increase in power on 24GHz I decided to operate from Dunstable Downs IO91RU to try some of the obstructed 150Km+ paths to IO82 and IO93 but without success. I expected the 150Km path to Alport Height to work as I previously had a 1 way contact with GOHNW/P over this path when Paul was running only 80 mW. It did not go with G3PHO/P this time in spite of half a watt out at each end! However I worked G4BRK/P on Broadway (90Km obstructed path) with S9 signals both ways. It seems that with the higher power on 24GHz it is possible to work the shorter obstructed paths but not the longer ones. It would be interesting to try some of the longer paths during the winter months

From: Neil Whiting [neil@thewhitings.

freeserve.co.uk] I worked 7 stations ... very pleasing and well worth going out for. Missed GO1VA (never heard on talkback) and G8ACE/P, heard on 2m but failed to get a reply. All but the longest QSO were 59 each way. G7MRF/P on Merryton Low was 56/56 at 125km - shows the potency of the higher power levels in use by everybody. I failed with GOHNW/P (IO83RO) but at 180+km this is a long way for an overland path with no enhancement.

I was also pleased to hear the GB3ZME beacon (539 qsb, 85km) and GB3DUN (529 qsb, 93km), both for the first time. I was approached by the farmer on site (usual spot on Broadway). They are still very concerned about foot and mouth (still disinfecting vehicles at the farm entrance) and, although permission was kindly given (as I had set up), I think it might be best to avoid this spot until the UK is free of F&M.

Martin, G7MRF (g7mrf@compuserve.com)

located at the Triangle at Merriton Low IO93AD worked the following stations during the contest at the weekend. Signals from the new 24GHz beacon in Shropshire were very strong indeed and gave a good initial beam heading. A try on 24G with G3PHO/P failed over a short but obstructed path. It went last year on using 60mW! G4BRK/P on Broadway was 56 both ways on 24GHz. G3UKV/P on The Wrekin was 59 both ways on 24GHz. G4KNZ/P on the Lickey Hills was 59 both ways on 24GHz and on 47GHz, 57 both ways. G0HNNW/P Winter Hill was 59 both ways on 24GHz and on the non line of sight path on 47GHz 513/512 using CW. G0IVA/P Nr Sutton Common 59 both ways on 24GHz & 47GHz. G3PHO/P Alport Heights was 59 both ways on 24GHz G8IFT/P Brown Clee was 59 both ways on 24GHz and 57 both ways on 47GHz. The WX was very cold with strong winds humidity hovering around 70-80% during the day with temperatures around 12 degrees C.

Chris. G8BKE, [Ctowns@tesco.net]

From a cold and windy Walbury Hill I worked G8ACE/P at Lane End on 24 and 47GHz ... plus G4BRK /P at Broadway on 24GHz at 79km. An attempt with G3PYB/P on 47GHz (Buster, IO90MX) failed due to local obstructions. A try on 24GHz with G3UKV/P at 164km failed. Later I moved site slightly on Walbury to try again with 'PYB and managed a contact on 47GHz but failed on 76, although I managed a 76GHz contact with G8ACE/P who had moved to Crabwood farm. The SSB signals were 5-5 over the 31km. I had a 1 way S9+ contact with G4LDR on 24GHz. **Again, at least 3 local stations with 24GHz did not appear!** It was a shame too that Cleeve didn't seem to be activated as it's an interesting path from Walbury. This was my first venture out with the new 24GHz amplifier in and a new 23cm IF using a DB6NT transverter. When time permits the 96 & 95.4MHz crystals used in the 24/47 systems will be phase locked to a standard.

Steve, G4KNZ, [Steve.Davies@care4free.net]

operated from Lickey Hills, IO82XJ, and worked 6 stations on 24GHz (G4BRK/P, G0HNNW/P, G0IVA/P, G7MRF/P, G3PHO/P and G3UKV/P) plus 2 stations on 24GHz (G0IVA/P and G7MRF/P). Best DX on 24GHz was G0HNNW/P in IO83RO (Winter Hill), at 143km, and on 47GHz was G0IVA/P at IO83XE (near Sutton Common) at 90km. Operation was from one of the turrets of the stone/cement structure on the summit, at SO987760, about 200 yds walk from the car park. Clear directions are 300 to 080 degrees, also 210 to 220 degrees (approx) plus a gap in the trees to Broadway (162 degrees). Other directions are somewhat obstructed with large trees. The car park has a better view to the S and SW, but then no view N.

Due to taking longer than anticipated at this site, plus some concern about access at Broadway, G4KNZ did not make the planned move, and packed up after searching in vain for somewhere clear towards Dunstable.

Equipment: 24GHz approx 0.5W, and 47GHz approx

20mW, to a 2ft dish

Ian G8IFT sbrs [g8ift@sbrs.org.uk]

worked the following as G8IFT/P from Brown Clee Hill, IO82QL: **24GHz:** G4BRK/P IO92CA, G0HNNW/P IO3RO, G7MRF/P IO93AD, G3PHO/P IO93FB **47GHz:** G0HNNW/P IO83RO, G7MRF/P IO93AD, G8VZT/P IO93AD (X-BAND)

Peter, G3PYB [peter@papine.demon.co.uk]

concentrated on 47 and 76GHz on Butster IO90MX and worked G8ACE/P on 47GHz from Lane end IO91JA at 30km and a one way on 76GHz over the same path. He worked G8BKE/P on Walbury IO91GI on 47GHz at 53km but no contact on 76GHz this time

THE REST OF THE MICROWAVE BANDS ...**From: John, G3XDY [g3xdy@btinternet.com]**

Here is my report on the **October IARU and RSGB Microwave multiband Contests:**

Conditions were very average on the lower bands. For the first time ever I added a set of guy ropes to my tower and was very glad I had for the winds reached gale force on Saturday evening and Sunday afternoon.

1296MHz: DF0CI in JO51 was the best DX at 626km, other good OSOs into Germany were DL3YEE in JO42, DL3YCW/P in JO41 and DF0OL in JO40. It was particularly pleasing to work GM4ZUK/P (IO86) and GM4WLL/P (IO85) as there was a dearth of activity North of the Midlands.

2320MHz: the best was DG1KJG at 433km, with a few other stations around the 400km mark. Activity levels seemed quite good, with 20 OSOs and a one-way crossband with G0RRJ.

I managed to get the **3.4GHz** masthead mounted system finished a week prior to the contest and had a one way with Simon G3LQR that proved the transmitter worked, but he could not get his system to transmit back to me at the time. In the contest I was very happy that my first full OSO on 3.4GHz was with DJ6JJ at over 400km. In total I had 11 OSOs, with DK2MN the best at 416km. DG1KJG also heard me but we did not complete a QSO. G8IFT/P and G8P were the only UK stations worked.

10GHz was enlivened by some good rainscatter at times. Most OSOs were by QSY from 1.3GHz and in almost all cases signals were better on 10GHz than the intermediate bands above 1.3GHz. Best DX out of 25 OSOs was DH8AG at 435km.

The **All Band Microwave/10GHz Cumulative** events on the Sunday were a "damp squib". I put up another 2m talkback antenna for this event but heard relatively little activity. 10GHz tests with G0HNNW at Holmfirth and G4UVZ in Taunton did not result in any signals being heard either way. Having these UK events towards the end of the IARU contest means that stations entering the IARU contest can't comply with the UK contest rules, as serial numbers won't start at 001, and

many stations will have already been worked before the UK contests start, so eliminating them from being worked for the UK events. **In my view the microwave events should be aligned with the start of the IARU contest on Saturday, or moved to another weekend altogether.**

Andrew Hutley [andrew@g6sps.fsnet.co.uk]
Also reports on the October multiband weekend ... We stuck it out until 1300 on Sunday and called it a day having spent virtually the whole time on since Saturday 1500. Any thoughts of sleep were dismissed due to the gale blowing round the tent and the torrential rain that hammered down for hours overnight. Fortunately our generator had a large tank so we didn't have to venture out to fill it for around 5 hours. I gather G8P packed up a bit sooner than us. We spent a long time looking north hoping to find the GMs.

The highlight on 23cm was working a DL in JO60 for the best DX a minute before we closed down.

Peter, G3PHO/P (Houndkirk Moor, IO93EH98)
Found weather conditions appalling for the October multiband contest. Only 21 stations were heard active across the whole 1.2G-47G range. He worked 9 on 23cm, 7 on 6cm, only 12 on 10GHz and 2 on 24GHz. There was excellent rainscatter on 5.7, 10 and 24GHz during the afternoon but very few took advantage of it. G8IFT/P was worked on **24GHz rainscatter** over a 106km path.

SEPTEMBER 10GHz CUMULATIVE

This event coincided with cold, damp weather, poor propagation and low activity. Only 28 stations were known to be active, including 9 portables. **Peter, G3PHO/P (IO93EH)** managed to work 21 of them, the best being G4ZXO/P at IO90WV.

RAIN RADAR WEBSITES

A useful internet site for real time radar maps of Europe, updated every 15 minutes, is at:

<http://www.weeronline.nl/eurorad.htm>

A more detailed view of the Netherlands is at:

<http://www.weeronline.nl/nlnrad.htm>

These maps make finding and tracking suitable beam headings for rainscatter a great deal easier (or you can at least see what all the PAs and DLs are working today!). Many other sites have 1 hour or more delay from real time so this site is much better for spotting thunderstorms that sometimes grow and decay quite quickly. Unfortunately the coverage does not extend to within the UK.

Thanks to John, G3XDY for this information ... editor

12 AUGUST 2001 UK ALL BAND MICROWAVE CONTEST RESULTS

The results table is on the back page of this newsletter, first the individual band table and then an overall table, based upon normalized scores.

Some comments from the adjudicator,

G4KNZ: With the help of email reminders, a total of 8 stations were persuaded to send in logs, of which 6 showed operation on more than one band. Thanks to all those who sent in entries - they help to build up a picture of activity - and even those with more modest scores have worked stations which would otherwise have been missed. All logs received are included in the tables.

There was good activity on 1.3, 5.7 and 10GHz. For example, on 10GHz, some 30 narrowband stations were logged active in a total of 13 squares, plus a further 10 stations running TV on the band.

On 1.3GHz and 5.7GHz, it was a close run competition between G4BRK and G3PHO/P, with G4BRK managing to finish top on both bands.

On 10GHz, the competition was between G3PHO/P and G3ZME/P, with G3PHO/P finishing in the lead, despite G3ZME/P gaining quite a number of points from 10 QSOs with TV stations.

Activity on 2.3GHz, 3.4GHz and 24GHz was disappointing. There were just two entrants on 2.3GHz, and G4BRK picked up an easy 1000 points on this band. There were no entries at all on 3.4GHz! On 24GHz, again there were only two entrants, both working just each other (G3PHO/P and G3ZME/P) - all that remained for the adjudicator here was to equalise the distances claimed, so both stations were first equal. Maybe we can have more competition on these bands next time?

The overall winner was G3PHO, who was active on 4 bands (and leader on 2 bands), with G4BRK just a little way behind, also active on 4 bands in the contest (and leader on 3 bands).

NB: Most of the logs were received electronically, which is easier for the adjudicator (acknowledgements can be sent, if required).

G4KNZ
04/Oct/2001

That's all we have space for ... see you next month.

All-band Microwave Contest - 12/Aug/2001

Adjudicated scores

Individual Band Tables

1.3GHz	Best DX	Located	Distance	QSOs	Score
G4BRK	DG1KJG	JO30NT	621	11	2211
G3PHO/P	GU0FDZ/P	IN89RL	408	15	2066
G3YKI	G4LDR	IO91EC	117	5	327
G0RRJ	GU0FDZ/P	IN89RL	203	3	293
G0UPU	G3PHO/P	IO93AD	130	5	245

2.3GHz	Best DX	Located	Distance	QSOs	Score
G4BRK	PA0WWM	JO22FE	427	6	713
G0RRJ	G4BRK	IO91DP	52	1	52

No entries received for 3.4GHz

5.7GHz	Best DX	Located	Distance	QSOs	Score
G4BRK	G3LRP	IO93HO	219	6	777
G3PHO/P	G4LDR	IO91EC	227	5	645
G3YKI	G4BRK	IO91DP	57	3	105
G0UPU	G3YKI	IO92BD	19	2	38

10GHz	Best DX	Located	Distance	QSOs	Score
G3PHO/P	G4ALY/P	IO70UM	332	22	3830
G3ZME/P	G4EZP	JO01GN	238	28	3221
G4NNS	F1PYR/P	JN19BC	352	16	1682
G4BRK	G4ALY/P	IO70UM	219	16	1654
G0RRJ	G3PHO/P	IO93AD	220	15	1451
G7JTT/P	G3ZME/P	IO82QL	217	5	551
G3YKI	G4EAT	JO01HR	178	6	545
G0UPU	G3ZME/P	IO82QL	70	5	197

24GHz	Best DX	Located	Distance	QSOs	Score
G3ZME/P	G3PHO/P	IO93AD	86	1	86
G3PHO/P	G3ZME/P	IO82QL	86	1	86

Overall results table

	1.3	2.3	3.4	5.7	10	24	Total
G3PHO/P	934			830	1000	1000	3764
G4BRK	1000	1000		1000	432		3432
G3ZME/P					841	1000	1841
G0RRJ	133	72		172	379		584
G3YKI	148				142		462
G4NNS					439		439
G0UPU	111			49	51		211
G7JTT/P					144		144