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

2001 – FEBRUARY

Our thanks go to everyone who has contributed material for this month's issue. This Newsletter is read in all "four corners of the globe" and it is especially gratifying to receive favourable comments on it from our friends outside the UK. The quality of the content depends on you, the reader. Your humble editor merely has the job of putting your items together into a meaningful booklet! Much is going on in microwave shacks this winter ... please let us know what you have been doing. Share your trials and tribulations with the rest of us!

The millimetre bands continue to be under the spotlight this month, with two new records reported and 800 milliwatt PAs on 24GHz. News of 2.3, 3.4 and 5.7GHz seems to be scarce these days so please don't neglect those bands. If you are not on 5.7GHz yet then make it a resolution for this year to build something for it .... it's a super band!

At the time of this issue going to press, there was a large anticyclone over the UK. Let's hope it brings that long awaited tropo opening to the Continent!

IN THIS ISSUE ...

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 ..

MICROWAVE ROUND TABLE MEETING
RUTHERFORD APPLETON LABORATORY
DIDCOT, NEAR OXFORD, UK.

The annual meeting at RAL is schedule for **Sunday, 8th April 2001,** opening at 10am and finishing around 5pm.

The programme of lectures and demonstrations for this popular event is presently being arranged, In addition there will be the usual array of microwave test gear and the Bring and Buy. The latter depends entirely on what you, the visitor, brings to sell. There will be no dealers at this meeting so bring your own stuff to trade … microwave junk not computer junk please!

No details of catering are available at the time of going to press but the next issue of the Newsletter will hopefully include them.

For those of you who have not been to RAL before, take the A34 road south of Oxford to link with the A4185 at Chilton. RAL is located on the left hand side of the A4185 just a few hundred metres from the A34 junction at Chilton.

Please note that this meeting clashes with the two day RSGB event at Bletchley (formerly the Sandown VHF Convention). If you wish you could visit Bletchley and the Saturday and get your "shot" of microwaves at RAL on the Sunday! There are numerous B&Bs and hotels in the area for an overnight stay.

MICROWAVE CONTESTS 2001
IMPORTANT RULE CHANGE

The Microwave Contest Adjudicator is now Steve Davies, G4KNZ. He has also taken on responsibility for the organisation of the contest programme. All log entries, discussion and suggestions should be forwarded to him via email or by post.

His email address is: steve.davies@nokia.com

Please note his new postal address:
17 Haywood, Haversham Park, Bracknell, Berks. RG12 7WG,

Steve's telephone number remains unchanged at: 01344-484744

SK6UHF coming and going at different times. Despite the high pressure being around for several days, conditions peaked for a relatively short period through Sunday afternoon/evening, and then moved further East to favour PA and DL, who were heard working some mouth watering DX such as OH0(Aaland Island) and mainland Finland on 1.3GHz. There was absolutely no sign of any signal from OH here.

PI7QHN seems to have QSY'd down the band by about 5kHz to 1296.913, and is
now right underneath a birdie from GB3MHL in my RX.

I heard nothing on 10GHz and SM6ESG said he had tried several QSOs with no success.

I think I may have been the station calling CQ on CW for RS on 10GHz noted by John G8ACE in the last day or so of last year. I make no apologies for calling on CW - it gets through where SSB won't, and any phone only station just needs to make themselves known by calling QRZ and I will gladly come on SSB/ FM for a QSO. Its also easier to leave the auto keyer running for longish periods rather than calling CQ in person.

I have just completed construction of a DF9LN OCXO for my 10GHz station, which should go a long way to overcoming the problems I experienced last year with thermal drift in the LO as the system warmed up on transmit. It is currently being "run in" on the bench and should be installed before the end of February, weather permitting.

From: Neil, G4BRK (nr. Swindon) <nwhiting@lucent.com>
Sent: 05 February 2001
I noticed at the weekend that the winds recently have bent my dish mast, so 13/9/6/3cm now point down a couple of degrees. This probably explains why the 3cm beacons are no longer frequently heard, and why G3LRP is heard more weakly than G3KEU gets him down here! I am looking for some stronger mast again!

That's it for this month. Overleaf is the

PERSONAL BEACONS: A GENTLE REMINDER

A number of personal beacons have, from time to time, appeared on the microwave bands. These have varied from transmitters switched into beacon mode during one-off tests to more regular transmissions, often on a day to day basis. If you do have such a facility please remember that it must only be switched on while you are present at the location (i.e your home). If you leave the premises you must ensure that the beacon is switched off.

Increasing pressure on our microwave allocations is coming from a variety of non-amateur services. We must ensure that our own "house" is in order if we are to put forward a strong case to retain what we have. Irregular operating practices plus poorly filtered transmissions and the like, only serve to weaken our position.

Final edition of the 2000 Microwave League Table. The other ladders (10GHz and All Time Squares/DX will be published next time. The Microwave League 2001 is now open. Please send in your scores to the editor. The rules are the same as before and can be found, along with the latest positions, on the Internet at: **http://www.g3pho.free-online.co.uk/**

get!).
I have also built new keying units, so when GB3SCS & GB3SCF's new site is found then the equipment will be ready.

Following on from that report comes a related email from **John, G0API (Dorset):**
I have just submitted for a site change for the QRT beacons in the GB3SC series
(2.3/3.4/5.6/10/24 GHz). Up to now, I've not publicised the "potential" move other than to committee members involved locally as negotiations with the site owner and funding to cover the "substantial "annual rental have taken several months to get this far. Previous offers of co-site with repeaters in this general area all came to nought so we decided late last year to go for an empty site.

The current submission is for a site in Dorset which offers an excellent omni-directional coverage. The beacons will be mounted on an existing triagonal mast. The height ASL is in region of 850ft so it's approximately half as high again as the previous Purbeck site. Obviously it's early days yet so I would not expect anything to happen for at least 6 months. I will advise if any field tests are due.

At G0API I have also been quite busy over winter months developing the 10GHz masthead transverter to work in ATV mode. This has now finished and I can flick between nb working or ATV from the shack. I've added a DRO based 10mW source (ex-Amstrad LNB LO), modulated via 70ft of coax from the shack. This feeds the 10W TWT via and SMA c/o relay. Receive is also SMA relay switched after 2 low noise pre-amp stages into a Bob Platts converted LNB. I can now use the Astra satellites for AZ/EL and system performance checks (when the Sun has set) by looking at the broadcast TV downlinks on the spectrum analyser, at around 1.9GHz i.f. (i.e. the bottom end of Astra channels). So far I have sent signals to John , M1BAI, over a 5.75 km path with "quite strong"
signal reports. I have found that I have to wind down every pot I can twiddle on the shack TWT psu to reduce the signal below P5 (not surprising as the previous 60mW masthead test was P5). With the 10W output John was able to see a very weak signal with my telescopic mast in its retracted height , which means the 60cm antenna was below local ground level in the line of shoot. There must have been some massive scatter going on!

I am also in process of building a couple of shortened G3PHO dual mode feed horns, principally for M1BAI so he can substitute his LNB for a 10mW barefoot DRO stage Tx - then I might get some offsite signals to play with. Full duplex TV (10/1.3GHz) is an interesting mode - I think I soak tested the new system the other day after about 75mins key down on 10GHz at 10W!

From John, G3XDY [g3xdy@btinternet.com] comes an email sent on 22 January 2001:
We had some good tropo here in East Anglia on the evening of Sunday 14 Jan. Stations worked from here were:
1.3GHz: OZ1FF JO55, OZ6HY JO45, OZ2OE JO45, SM4DHN JP60VA, 1177km 559/559, SK7MW JO65,
SM6ESG JO67
2.3GHz: SM4DHN JP60VA 1177km 539/539,
SM6ESG JO67CC 902km 519/519
On the beacon front I only heard OZ7IGY on 1296MHz, and none on 2.3GHz, but the 432MHz beacons provided a good guide with SK4UHF and

INFORMATION WANTED

I believe that G4JNT developed a low power 1296 Transverter and wrote an article describing its construction. However I have been unable to find a copy of it in my collection of RadComs or Microwave Newsletters, I would appreciate it if anyone could identify the publication where it appeared as I'm looking to use 1296MHz as an intermediate IF in a project.
Please contact Raymond, G8KPS: Tel: 0118 932 6465 or email brooksr@houndgreen.freeserve.co.uk

Cheap RAM Radar Absorbing Material

If you have every purchased any commercial RAM, that ferrite loaded Silicon material, you'll know how expensive it can be. I got a good suggestion from Bob Ripley at Austin Radio Labs on where to get large amounts of RAM about 20 dB cheaper!
We have all seen those magnetic signs on the side of a truck, "Fred's Plumbing". Bob buys sheets of the magnetic material from the sign company and cuts it into small absorbers.
Cut wedge shaped sections and make waveguide dummy loads. Use smaller pieces to make waveguide attenuators. You have an oscillating amp? Then put a piece in the lid to de-Q the cavity. Use a large piece to make a 'Black Body' standard for antenna temperature measurements. Or just buy a few dozen signs and Stealthize your Morris!
(Bob usually cuts it into squares and mounts it like a heat sink on noisy computer chips to get the units through EMI/EMC compliance.)

A040 NEWS FROM G3WDG

It is likely, with the news that AO-40 is transmitting again, that a number of people may be trying to receive its signals at around 2401.320MHz.
While the attitude of the spacecraft is still not yet stabilised, for most of the time the satellite antennas are not pointing towards us, so the signals can be quite weak.
I have been listening to AO-40 for a few weeks now, and, thanks to encouragement and information from James Miller G3RUH, I did not give up when initially nothing was heard. The beacon signal is
strongest in the portion of the orbit from perigee (closest approach) up to about 2 hours or so afterwards. During this time it can be heard on a small antenna (eg 60cm dish or 15 turn helix). At other portions of the orbit the signal can be quite weak or even inaudible on the 10ft dish here, so it would certainly not be heard on a small antenna.
For those stations not yet equipped with tracking software, I have found **WINORBIT** to be quite easy to use, and updating the Kepler elements from **AMSAT's website** at <**www.amsat.org**> also to be quite straightforward.
Decoding the telemetry is another matter. I'm experimenting with some programs using the PC's sound card and hope to report some progress soon.
If A0-40 works out, I think it could be the biggest

WANTED

23cm linear and antenna: using Mitsubishi PA block and 12V operation, or W.H.Y?
Please contact Geoff Day, G4DED, QTHR or tel 01295 259766

Microwave Oscillator Stability

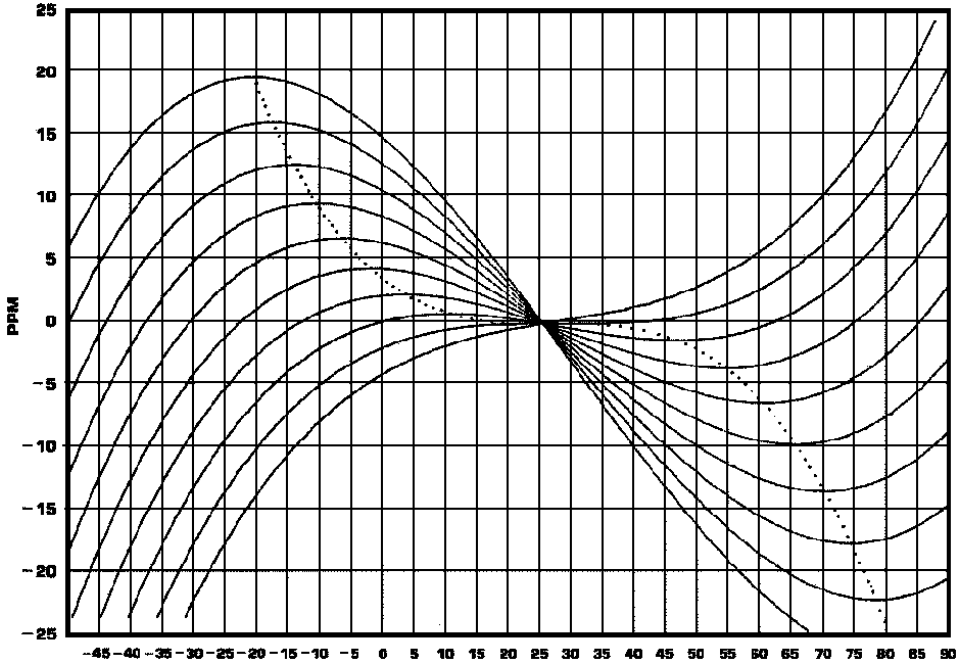
What to consider in achieving 'Best' performance
By John Hazell, G8ACE

It will soon be time to dust off the portable gear as we hopefully enter the sunny season. For some of us the issue of frequency stability and accurate frequency setting will return. Some of the considerations governing the stability of a quartz oscillator source are discussed below.

Temperature dependence

Almost without exception, crystals are marked with their operating frequency. However, **operating temperature** is vitally important for stability and, for most crystals, this information is either missing or hidden within a manufacturer's code. The family of curves in the graph below show the turnover points for AT cut Crystals. The angle of cut governs the turnover or best operating temperature and this angle will typically lie between 34° 58' and 35° 13' .

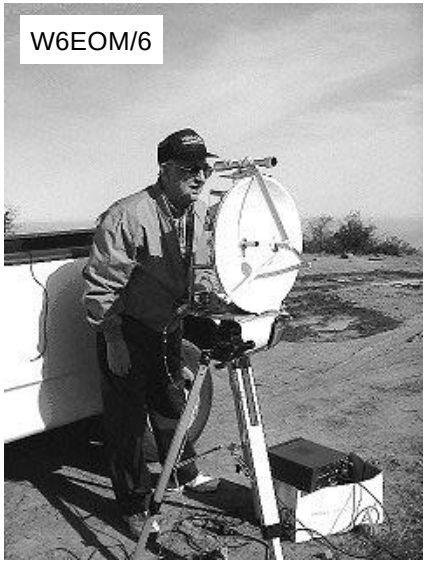
The ideal condition is to operate the crystal on the flat part of its characteristic. Typically a crystal cut between 35° 0' and 35° 2' would be used at ambient temperature.
Over the wider temperature range of O°C to 60°C it might exhibit a stability of 5ppm or 100kHz variation at 10GHz. The need to control the temperature becomes obvious and to do this the



ACTIVITY NEWS FROM THE WORLD ABOVE 1000MHz

MORE MILLIMETRE WAVE RECORDS
World 76GHz record to Americans ..

In addition to the G3PYB/G8ACE 76GHz record reported on the previous page, there have been some remarkable developments in the USA. Our last issue carried news of the new World 145GHz record made by W2SZ/4 and WA4RTS/4 on New Year's Day. Just a month later the **World 76GHz record** was extended to 145km at 12.20 local time when Will Jensby, W0EOM/6, worked Bob, KF6KVG/6. Bob was near Loma Prieta mountain, California, at the QTH of Dave, W6NL, grid sq CM97BC. Will was on Mt. Vaca, grid CM88WJ, accompanied by Gary, AD6FP. Mid - grid to mid-grid distance is 145 km, **a new World and N. A. record.**



The weather was calm, mild, and hazy. Signal margins were 1 to two S units with fades. Bob had a 12 inch dish with 1mw. Will had an 18 inch dish and 5mw output power. He and his 76GHz can be seen in the photograph (lower left). More photographs of the gear and operators can be found on the Web at: http://home.pacbell.net/val_gary/ad6fp.html . Many thanks to AD6FB for the photograph on this page.

NEWS FROM THE UK

Mike, G0JMI, Hampshire, emails the following report:
I'm currently waiting for good rain fall to start 5.7GHz tests with Del, G1JRU via rain scatter. I've already worked G4LDR some time ago from home on SSB via rain scatter on 5.7GHZ on which band I run 2.5W.

Also, I've rebuilt GB3SCS (13cm - 2320.9 MHz) following the farmer deciding not to allow the beacons on Nine Barrow Down, Dorset in October 1999. I intend to operate the beacon as G0JMI callsign from home and will switch it on when requested (phone call, etc). The aerial is going to be a log-periodic for 1.3GHz-5.7GHz, mounted on the house. Current power is only 50mw, but I now have a suitable GaAsFET for a 100mw PA.

I then intend to rebuild GB3SCF (9cm - 3400.91 MHz) and run that as G0JMI from home into same aerial (hence the reason for the log-periodic). It may be operational in a couple of months (depending on how much free time I

AMATEUR MILLIMETRE WAVE RECORDS SMASHED !

The last couple of months have seen some remarkable progress made on the 24/47/76 and 145GHz bands, both in the UK and overseas. After the new world 145GHz record set by Americans on New Year's Day (see page 15 in last month's Newsletter), further reports have come in of more exciting millimetre wave achievements ..... here's one of them. There's more in the Activity News pages.

UK 76GHz DISTANCE RECORD INCREASED TO 52km:
Peter Blakeborough, G3PYB, has emailed the following report ...

Temperature 12 degrees C, RH 36% , Pressure 1001 millibars, two hilltops plus a woolly hat, warm gloves and a Life Boat jumper. What does it all mean?
.... just some of the ingredients for an attempt at the UK 76GHz record, and they worked! G8ACE ventured to a site near Walbury Hill (IO91GI) and G3PYB used a location just south of Buster Hill (IO90MX) for the Sunday 28th January 2001 test. John G8ACE used a 47GHz source on a small horn to pilot the path to Butser, with G3PYB using a 45cm offset dish and a DB6NT transverter only. Alignment of the dishes was completed in minutes with enough signal for smooth noise in an FM bandwidth.

Both stations then sighted across the dish face to optically set up the separate dishes for 76GHz. John's 76GHz 8mW source mounted on a 30cm cassegrain fed dish was found only 1deg off beam and in only a few minutes. G3PYB's dish was also a 30cm cassegrain type with a DB6NT transverter running in Rx mode.

After careful alignment G3PYB obtained a 5/8 signal over the 52km path and could take FM for the report from John G8ACE.

Both stations had separate TX and RX /transverter equipment. The reverse test was rapidly completed with John giving a 5/7 report, both stations having some signal margin in hand.. Our final test was to try the 52km path on transverter to transverter. G3PYB found John's 40 microwatt signal immediately. The near-to-threshold, CW would just be OK but the SSB signal was not positively identified. John could not copy Peter's transverter-only signal, which is believed to be less than 40 microwatts output.

It would have been very difficult to find the transverter-only signal without the benefit of the relatively high power IMPATT multipliers on the TX side.

Thanks must go to John for his help in aligning the DB6NT mixer and multiplier sections. Frequency stability was excellent using stabilized ovens. However, the small hole in the 100MHz source was enough to cause a 2 to 3kHz rapid frequency change in sympathy with the wind! This was resolved by wrapping the whole rig in a Filey Life boat jumper!!

73 to all microwavers, from Peter Blakeborough G3PYB

Editorial Comment ... We are sure all readers will congratulate Peter and John for their achievement. They are part of a group along the South Coast who, along with

crystal must be held above ambient in a Crystal Oven or Murata-style heater clip. Superior results can be obtained by using a crystal whose angle of cut results in a turnover point matching the heater. Finally, the oscillator circuitry may contain components whose characteristics vary with temperature and hence the frequency will still vary. One solution here is to also temperature stabilise this circuitry.

An ovened oscillator system, set to 1°C of the crystal turnover temperature, would generally provide a high degree of stability. An ovened homebrew 10MHz reference set to 1° of turnover returns better than 1 part in 10^8/°C stability after six months ageing, or 100Hz/°C at 10GHz.

Ageing rate

A new crystal will typically age at 0.5ppm/month (5kHz shift at 10GHz) with the figure declining substantially after the first few months of continuous operation. Cleanliness in processing, the type of mount and the seal type all affect ageing. The norm is for the frequency to increase in glass enclosures and decrease in metal.

Re-stabilisation

Once a crystal oscillator has been switched off it will take some time to return to a given ageing rate.

Frequency retracing

Again, once the oscillator is switched off, say at the end of an event, and re-powered some weeks later, there will be a frequency offset, even after warm up.
This may help to explain frequency calibration errors between events.

Considerations

Microwave operators will know that the two most important factors in finding that distant signal are dish alignment and accurate frequency readout. The advantages of oven control on the oscillator are well worth while but, for full advantage, try doing some or all the following:

- In the case of a home constructed oven, measure crystal frequency against thermistor voltage in determining the turnover point of the crystal. Use this voltage as the set point for the oven comparitor. Make sure the crystal turnover temperature is above the oven self-heating value so the oven is in control for all ambient operating temperatures.
- Age the oscillator for as long as possible and this generally means months, at least, to see stabilisation of the frequency.
- Avoid switching the unit off. Perhaps diode steering in the power connection arrangements is worth considering so that the oscillator can be moved from mains to battery power without breaking the supply.
- Adequately insulate the crystal oven. When large ambient temperature changes are encountered, an additional outer oven may be required.
- Short term stability ... some crystals exhibit large frequency fluctuations. One cause of this appears to be stress in the connections to the quartz. Heat treatment has been shown to improve this problem.
- Power supply voltage/frequency dependence, shock, vibration and humidity are all other factors to be considered.

The SHF 2367 23cm Aerial from Wimo Germany ~ a review by Reg Woolley, G8VHI

After a number of years of little or no activity due to work and home location moves, I am now slowly trying to haul myself into the 21st century and get myself a decent signal on the bands. In 1999, I managed to buy, at a flea market, a DEM 40 watt , 23cm amplifier for £75, complete with relays! So, this year I looked at other ways to increase my ERP. My old antenna was a much battered 26 element DL6WU yagi from the now-defunct Eagle Antennas.

I narrowed my field of choice down to three: 4 x 23ele Tonna, 55ele Tonna or a 67 element SHF. Having sat down and looked hard at the options, I came to the conclusion that a single 67 element yagi would, looking at the gain figures, give me almost the same as 4 x 23 Tonna but with the advantage of not having to put all those elements into those little plastic standoffs! Also, the SHF Aerial costs £100 pounds whereas the 4 Tonnas stacking frame, etc, works out at around £300 … so the SHF won the day!

The SHF 67 element is a classic DL6WU construction. Aluminium elements are pre-mounted through the boom and held in place with M3 stainless steel grub screws. Manufactures claim, in their adverts, minimum time to put together and ability to withstand the worst of weather, etc.

Having lived and worked in Germany for 7 years, I contacted a friend there who was able to purchase and get the aerial to me for £100. This is in fact a bit below the cost of dealing with the UK agent! On its arrival my first impression was a box 2.65M long which, when picked it up, was as light a feather. On opening it I found the antenna to be in very few bits: 2 boom sections with pre-mounted elements attached , trombone support, folded dipole with semi-rigid coaxial balun, back reflectors on a short boom and a bag of various M3 and M6 hardware

My first task was to sort out the driven element. This had suffered, along with 1 element on the boom, from the journey over. This task did not take too long. I then fitted the driven element to the boom and proceeded to try to fit the rear reflectors using the little U bracket arrangement supplied However the holes in the u bracket did not line up with the pre-tapped holes in the boom so after a half hour or so I sorted the problem out by slightly elongating the holes. This had to be a compromise as the grub screws are only M3 and I did not want to make the holes too big (in a later conversation on 23 with G4BRK, Neil told me he had ***exactly*** the same fault with his 67ele!). The main booms are joined together in the same sort of fashion as 21ele Tonnas, using little plates and two M6 nuts/bolts. Then came the trombone … this also used M6 nuts and bolts 1 bolt at each end.

Having put it together, I was a bit take aback by how flimsy it seemed. The boom is only 15mm square section Aluminium and, at a boom length of 5.1 metres, seemed a bit unstable! Also the aerial is only held to the mast at the trombone and not at the aerial itself as well … more on my reservations later.

I have now had the aerial up for around 4 weeks during the autumn of 2000. I was active only for 1 hour in the first 23cm cumulative and 2 hours in the second but the antenna seems to produce the goods. Checking GB3MHL, it seems to perform a

HIGH POWER 47GHz GUNN DIODES

Birketts of Lincoln are presently stocking 200milliwatt Gunn diodes for the millimetre bands. There are two types, one with a threaded terminal for efficient heatsinking and another with the more common push-fit terminal. At the power levels involved good heatsinking (with possibly a collet diode mount) is essential. While most operators on 47GHz are using narrowband these days, there may be some who might experiment with simple SEO Gunn systems using these devices.

At only £2 each you can't go wrong!

Contact J. Birkett, 25 The Strait, Lincoln, LN2 1JF.
Or telephone him on: ++44 01522

ERRATA:
A Switching Regulator for Light Duty Applications

A couple of errors crept into this article, published last month, January 2001:

In the **bold text** on page 5, R2 is 1K2, R1 is 23K and CT should read 470pF.

The diagram and formulae are correct.

Since the article by G8ACE was published, G3PHO made an exact copy of the prototype except for the inductor and got similar results to John's original unit. However, 220uF low ESR electrolytics, soldered across the input and output feedthroughs, were found to be essential in suppressing the relatively high level of wideband noise produced by the regulator chip. This originally seemed to extend well above 30MHz and was clearly visible on a spectrum analyser covering the 0-100MHz area. The electrolytics completely removed it! Several inductors were tried, including a Maplin 100uH bobbin type. In the end, a home-made toroidal version was employed.

DID YOU KNOW THAT …

French Microwave Beacon Information

Can be found on the Internet at:
http://www.ref.tm.fr/balises/cartehyper.html
Many thanks to Eric, F1GHB for the information

European Frequency Allocations

can also be found on the European RadioCommuncations Office website at:
http://www.ero.dk/

IARU Region 1 is very well served by the

THOSE 24GHz AMPLIFIERS

Contrary to the opinion of one or two folk, there was no "secret list" that favoured those who obtained the 800mW 24GHz amplifiers from the USA. What happened was that Will, W0EOM, posted a notice on the US internet amateur microwave reflectors. This was read by the Newsletter editor and the information forwarded to all active UK 24GHz operators in his email address book. Only three on that list were not informed since they were already known to have that sort of power capability on the band!

As a result there are now over 30 such amplifiers in the UK. Let us hope that all are put to use and heard in the mid-April Millimetre Band

A jig to shape and bend the driven element to the correct size is easily fashioned out of two pieces of 19mm OD round bar, mounted on a small piece of aluminium plate as shown here in Figure 3.

All the elements, including the driven element, are mounted on the underside of the boom.

Figure 3: Driven element jig

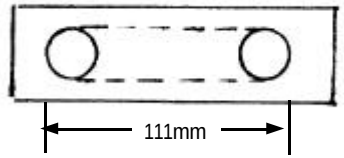
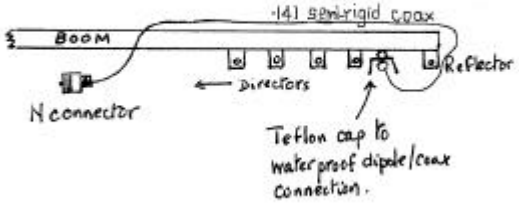


Figure 4



The balun is as the Dubus article fig. 3. The feeder is 0,141" semi-rigid coaxial line, approx, 1 metre long, taken directly from the driven element and back over the reflector as shown in Figure 4

A teflon cap waterproofs the driven element feed point centre section, as detailed in Figs. 5 and 6.

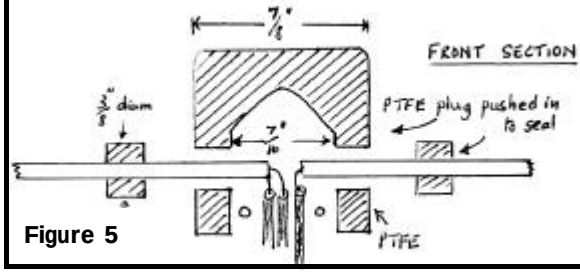


Figure 5

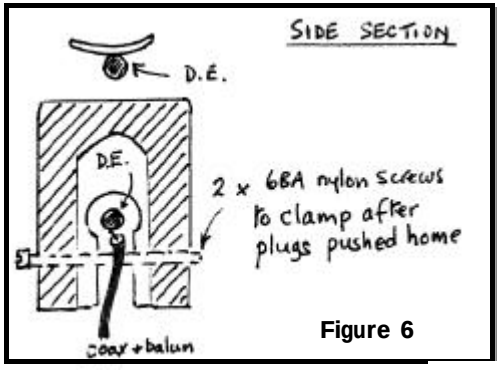


Figure 6

The completed yagi should be supported about its centre by a "trombone" bracket section as used in UHF TV antennas. This allows the yagi to stand clear of the supporting mast, which can be, for example, a 2 inch diameter pipe.

MANY THANKS TO RAINER FOR THE FINE BASIC DESIGN!

few dB better than the old aerial but it seems to be not as sharp as I would have expected. However, I will have to do some more tests on that front

I make a few points that I believe you would need to look at before you part with over £100 of your hard earned money:

1 At 5.1m long with only 15mm boom size and only held to the mast in 1 position, I personally would never recommend this aerial to those in exposed locations for I fear it would fall apart in the first big gale. It would be worth, I feel, making some sort of home brew bracket on the bottom of the aerial so you could secure the aerial in 2 places instead of 1. I have since modified my antenna and placed another bracket directly onto the boom and this seems to make it more stable with 2 places of support.
2 The use of a mix of Stainless steel and aluminium is, as we all know (especially those near the coast) never a good idea but on this one time will tell.
3 The balun is encapsulated in a clear silicone type mastic with a simple plastic cover over the top. I personally would much prefer to see a more solid epoxy resin used as over the years the weather tends to get at silicon that's left to the winter frosts.
4 Both myself and G4BRK had trouble fitting the Rear reflectors due to a manufacture fault. Bang goes German Quality and attention to detail!!

In conclusion I would recommend this aerial only to those who do not live in an exposed location, or if they do, are able the get aerials down in storms. I truly believe, having been an professional aerial rigger for 15 years, that in my view this aerial would not survive the worst of the UK weather if left unchecked. If anyone out there is interested in purchasing one of these aerials and wants to have a look before you buy then please get in touch I will be more than happy to let you look at mine over a coffee or two! If you're wondering how it survived the last gales it is fine. However, playing on the safe side of caution, my tower was wound over into the garden during the past weeks of bad weather.

Reg Woolley G8VHI, 103 Mancetter Road, Hartshill, Nuneaton, N. Warks, CV10 0HP.
Tel 07970 759632 or 02476 396575

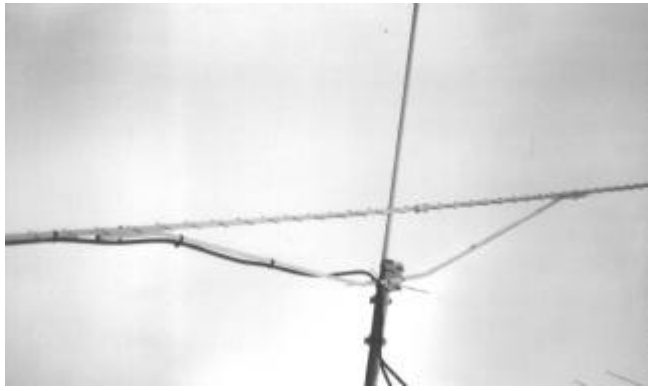


Photo left:
This photo shows the original trombone support of the beam and how Reg has had to make an extra mast extension out of plastic tube to make the centre of the antenna a more rigid structure than that of the original manufacture.

SHF2367 23cms Antenna Review

Right To Reply by Simon Lewis, GM4PLM, Wimo UK Representative

I was interested to receive Reg Woolley, G8VHI's, review recently and appreciate the opportunity to reply to his comments.

I have always said that was I ever to sell anything to another amateur I would a) have to believe in the products ability and b) would buy it myself. The SHF Design antennas are, I believe very good value, and an excellent buy. They certainly populate my antenna stack and perform very well.

Reg comments that he could buy it cheaper directly. With exchange rates changing dail, the advertised prices from myself are not able to show the direct changes in DM-Pound rates. I am certain that had he ordered via me he would have paid the same prices he paid direct. I am merely an English speaking extension of Wimo – I am not buying these and then reselling them. Antennas purchased are bought from Wimo and that is who collects the money! There is no middleman!

Reg also notes some mis-alignment of antenna elements (the same as G4BRK) but I have never heard from either station feeding me back this information so that I could pass it on ... or is that asking to much?

Antenna radiation patterns are very good – I was a bit confused by Reg's comments about patterns? Their online catalog has patterns printed in it if anyone is interested but I am very happy with mine!

He also comments about construction – I live on the West Coast of Scotland and my antennas have now been up for over a year – they have also been thrown in the back of my Landrover for numerous outings and then moved house! They still look and work fine! I also live directly on the coast and exposed to the sea. So far I see no signs of any corrosion. Time will tell, but so far so good!

I was most bemused by Reg's comments about professional antennas. My antennas have survived quite nicely but even I wind my tower down during gales, simply as a precaution!

I appreciate Reg's comments – everyone is entitled to their opinion. I started to import these antennas into the country through Wimo as I believe they represent good value for money, perform well and are of service to the UK microwave community. I still believe that and am quite happy to demonstrate that. As I said, if I didn't believe that – I would not be selling them!

73 Simon GM4PLM, Wimo UK representative

A "DO–IT-YOURSELF" YAGI FOR 1296MHz

~ sketches and noted by Peter Blair, G3LTF

Editor's comments:

This is not a complete constructional article in that the numbers of elements and their dimensions are left to the individual to decide. The beam is based on the DL6WU design (for which there is DOS-based software freely available) and on the article by Rainer, DJ9BV, in Dubus 2/94 and Dubus Technik V page 96. One departure from the printed article is the use of fully insulated elements, mounted underneath the boom rather than on top of it. Anyone with access to a drill press, hacksaw and calipers should be able to make themselves a high performance 23cm yagi at low cost, if these diagram (and the DJ9BV articles) are carefully followed.

.....

Boom diameter:	19mm O.D round section tubing
Elements:	3.6mm O.D aluminium rod
Driven Element (D.E.):	4.5mm copper rod
Element supports:	15mm plastic pipe clamps (from DIY or plumber)

Each pipe clamp is drilled with a 3mm drill, 8mm from the boom, in the position shown in Fig.1
The clamps are secured to the boom by means of a self-tapping screw. Each element is a tight, push fit into the 3mm hole and is secured with window sealant injected into the original screw hole in the end of the clamp (see * in fig.1)

Figure 1: Element insulator/support

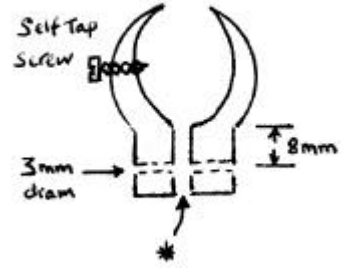
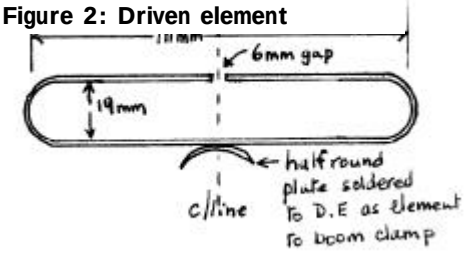


Figure 2: Driven element



The directors should be made 9mm shorter than the dimensions given in Dubus. Lengths should be accurate to +/- 0.3mm. Elements end should be filed flat across the rod end cross section.

The Reflector length is 113mm.