An Amateur Radio publication for the Microwave Enthusiast

scatterpoint

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The UKμG Chip Bank for all your projects

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In this Issue

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Editor's corner

73 de Martin G8BHC

Subscription Information

The following subscription rates apply.

UK £6.00 US $12.00 Europe €10.00

This basic sum is for **UKuG membership**. For this you receive Scatterpoint for **FREE** by electronic means (now internet only) via the Yahoo group and/or Dropbox.

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

You will have to make a quick check with the membership secretary if you have forgotten the renewal date. Please try to renew in good time so that continuity of newsletter issues is maintained. Put a **renewal date reminder** somewhere prominent in your shack.

Please also note the payment methods and be meticulous with PayPal and cheque details.

PLEASE QUOTE YOUR CALLSIGN!

Payment can be made by: PayPal to

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

Articles for Scatterpoint

News, views and articles for this newsletter are always welcome.

Please send them to

editor@microwavers.org

The CLOSING date is the FIRST day of the month

if you want your material to be published in the next issue.

Please submit your articles in any of the following formats:–

Text: txt, rtf, rtfd, doc, docx, odt, Pages

Spreadsheets: Excel, OpenOffice, Numbers

Images: tiff, png, jpg

Schematics: sch (Eagle preferred)

I can extract text and pictures from pdf files but tables can be a bit of a problem so please send these as separate files in one of the above formats.

Thank you for you co-operation.

Martin G8BHC

Reproducing articles from Scatterpoint

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UKµG Chip Bank – A free service for members

The catalogue is now on the UKµG web site at www.microwavers.org/?chipbank.htm *Latest Stock Update was May 2015 – so do take a look!*

Non members can join the UKuG by following the non-members link on the same page and members will be able to email Mike with requests for components. All will be subject to availability, and a listing of a component on the site will not be a guarantee of availability of that component. The service is run as a free benefit to all members and the UK Microwave Group will pick up the cost of packaging and postage.

Minimum quantity of small components supplied is 10. Some people have ordered a single smd resistor!

The service may be withdrawn at the discretion of the committee if abuse such as reselling of components is suspected.

There is an order form on the website with an address label which will slightly reduce what I have to do in dealing with orders so please could you use it. Also, as many of the components are from unknown sources, if you have the facility to check the value, particularly unmarked items such as capacitors, do so, and let me know if any items have been miss-labelled. G4HUP's Inductance/capacitance meter with SM probes is ideal for this (Unsolicited testimonial!!)

Don't forget it is completely free, you don't even have to pay postage!

Mike G3LYP

UKµG Project support

The UK Microwave Group is pleased to encourage and support microwave projects such as Beacons, Synthesiser development, etc. Collectively UKuG has a considerable pool of knowledge and experience available, and now we can financially support worthy projects to a modest degree.

Note that this is essentially a small scale grant scheme, based on 'cash-on-results'. We are unable to provide ongoing financial support for running costs - it is important that such issues are understood at the early stages along with site clearances/licensing etc.

The application form has a number of guidance tips on it - or just ask us if in doubt!. In summary:-

- Please apply in advance of your project
- We effectively reimburse costs - cash on results (eg Beacon on air)
- We regret we are unable to support/running costs

Application forms below should be submitted to the UKuG Secretary, after which they are reviewed/agreed by the committee: http://www.microwavers.org/proj-support.htm

UKµG Technical support

One of the great things about our hobby is the idea that we give our time freely to help and encourage others, and within the UKuG there are a number of people who are prepared to (within sensible limits!) share their knowledge and, more importantly, test equipment. Our friends in America refer to such amateurs as “Elmers” but that term tends to remind me too much of that rather bumbling nemesis of Bugs Bunny, Elmer Fudd, so let’s call them Tech Support volunteers.

While this is described as a “service to members” it is not a “right of membership!”

Please understand that you, as a user of this service, must expect to fit in with the timetable and lives of the volunteers. Without a doubt, the best way to make people withdraw the service is to hassle them and complain if they cannot fit in with YOUR timetable!

Please remember that a service like our support people can provide would cost lots of money per hour professionally and it’s costing you nothing and will probably include tea and biscuits!

If anyone would like to step forward and volunteer, especially in the regions where we have no representative, please email john@g4bao.com

The current list is available at

www.microwavers.org/tech-support.htm

The Bodger's Guide to Microwaves

Talk given by John Worsnop G4BAO to Chelmsford Amateur Radio Society

http://www.g0mwt.org.uk/meetings/past15-apr-jun/index.htm#June

The greatest DX is not on HF but on the microwave bands, which are home to construction and innovation (much of which feeds down to lower bands). Without microwaves there would be no smartphones, Wi-Fi or SatNav.

Dr John Worsnop G4BAO, who is the treasurer of the UK Microwave Group and a member of the RSGB Propagation Studies Committee, travelled from his Cambridge QTH to enlighten us as to what is now possible.

John's talk first covered a bit of history from the first QSOs in the 1950s, but he was keen to dispel some of the common myths related to propagation and distances. The focus was on narrowband terrestrial DX, but he was also keen to point out other aspects includes data links, satellites/ISS, moon-bounce (EME) and amateur TV.

A distinguishing feature of microwave bands is the availability of high antenna gains and the absence of atmospheric noise making it worthwhile aiming for state-of-the art Tx stability and Receiver performance. This has driven new GPS-locked sources and innovative modes such as JTxx (initially for moon-bounce) that have all rippled down into the lower amateur bands.

Why Bodger? - well it highlights that microwaves is a field where DIY/Construction is alive and well - although nowadays many items are available off the shelf as well. The amateur licence gives us access to a huge amount of bandwidth relative to HF, so you certainly aren't as limited to just narrow modes, but the move from the original very wide-band sources to narrowband did offer huge benefits. In terms of history, John gave a quick summary of how technology had evolved (and continues to do so) over time:-

History in the UK

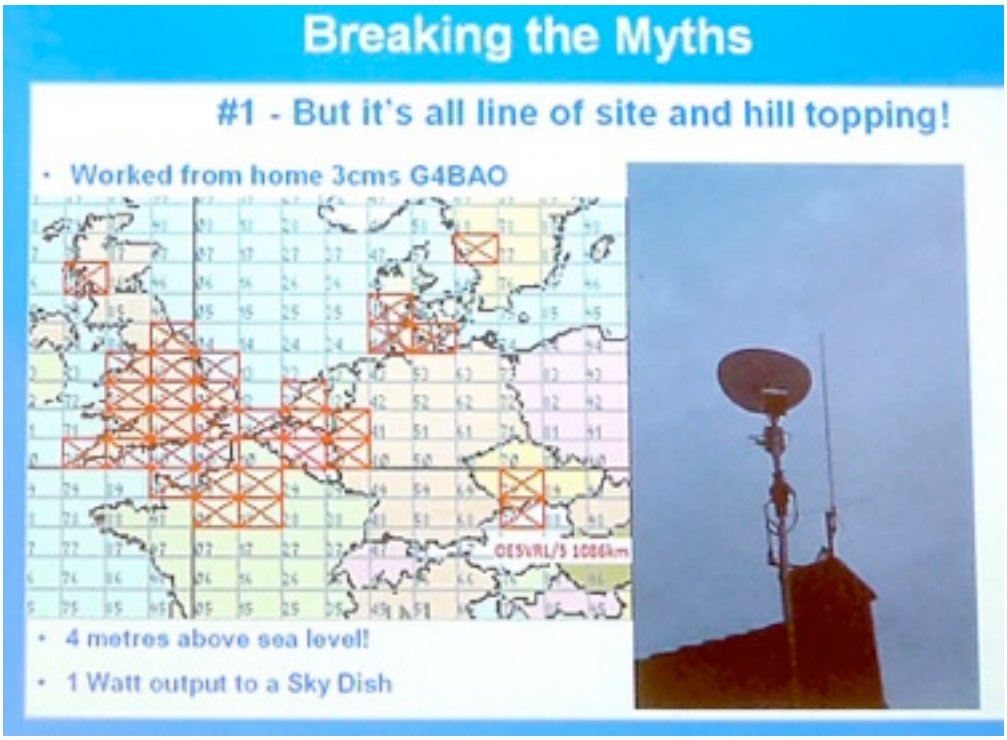
- 1950: first 10GHz QSO - 1.7m between G3LZ - G3BAK
- 1960s - Klystrons
- 1970s - Gunn diodes (eg doppler alarm modules)
- 1980 - Narrowband technology introduced - G3JVL Low Power waveguide transverter (Tx 0.5mW, Rx 8dB NF)
- 1990 - First microstrip/PCB modules introduced by Charles Suckling G3WDG

Nowadays most solutions are 'silver boxes', (not black ones). Whilst HF Receivers may have a noise figures of 15dB, amateurs have pushed the state of the art at microwaves with the G4DDK VLNA designs being ~0.2dB

Advances in transmitters have been helped by both synthesisers and GPS. This becomes increasingly important if you wish keep your few kiloHertz of CW/SSB stable at for example 75.976 or 134.928 GHz calling frequencies.

Much of the UK microwave beacon network is now exploiting sources like this so you can often be sure you are accurate to a few Hertz!

John was keen to dispel three Myths - that it was line of sight (i.e. not much DX), that it was expensive and that it was overly technical. His QTH in Cambridge is barely above sea level but his 23cm and 10GHz kit had achieved very impressive QSO distances across the UK and Western Europe. Modern kit often uses transverters that can be driven for a common multimode such as a FT817.



Propagation

Having highlighted the 1000+km distances he had achieved, he then went on to explain the propagation mechanisms. Most are natural, but a recent one exploits knowing flight paths - for Aircraft Scatter QSOs.

- Optical: 24/7 – Line of sight – hilltop to hilltop
- Tropo: Enhancement and Ducting - weather–dependent – Enhanced range up to 2500km (esp if near the coast)
- Tropo Scatter: 24/7 – Over the horizon up to 500km - esp if you have some power
- Rain Scatter: Weather–dependent - Over the horizon up to 800km
- Aircraft Scatter: 24/7 – Over the horizon up to 800km

Modern Microwave DX is very directional and long range, resulting in 2m talk back falling out of favour and the Internet helps instead. Most terrestrial microwave DX/spots are notified by chat rooms, of which ON4KST by far the most popular. Modern technology and free software also helps those who want to start on a low budget - John had a low cost Dongle and SDR-Touch on a low-cost Android tablet that could receive 23cm includiing the GB3MHZ Martlesham Beacon.

UK Microwave Group (UKuG) membership , which is just £6/ year, entitles you to the monthly 'Scatterpoint' magazine, free surface mount components (the UKuG 'chipbank') and a lot of technical advice and elmers.

Photos by Murray G6JYB

The so-called “ultra broadband” ceramic capacitors up to 40 GHz and more!

André Jamet F9HX agit@wanadoo.fr

Reminder

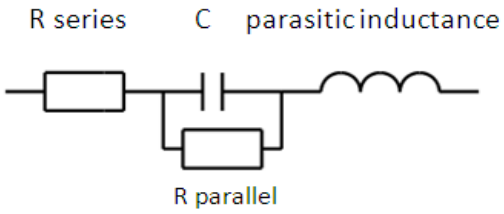
I already published an article on ceramic capacitors [1] giving their characteristics and using conditions. Before addressing these new capacitors, we best remember a few points on the ceramic capacitors.

There are several types of ceramic materials used for making capacitors:

- Class 1 dielectric: capacitors are called NPO or COG. The permittivity and the losses are low, comparable to those of mica, Teflon™ and Mylar™. The temperature coefficient is low. They can be used for all applications, but their bulk reserve to sensitive circuits, for example, tuned circuits.
- Class 2 dielectric: capacitors are called X7R. The high permittivity provides high capacity in a moderate size. But, this ceramic has more losses, a high temperature coefficient, and sensitivity to the applied voltage and subject to aging. We must therefore reserve them for link circuits and decoupling.
- Class 3 dielectric: capacitors are called Z5V and Y5V. The permittivity is very high and therefore allows even higher capacity than previous. However, the aforementioned defects are even more important. This must be added the adverse piezoelectric effects. Under the action of vibration, a voltage is produced and conversely, under application of an AC voltage, they "sing". We must be used with great caution as filtering and decoupling.
- Porcelain: these are the type AT100 A, the famous 1 pF widely used by microwavers. HF losses are very low but the temperature coefficient is higher than that of NPO / COG.

Ceramic capacitors can be provided in various packages: plate, tube, lead-through and CMS.

Their choice is guided by various requirements, space available, wired assembly or PCB, high frequency behaviour, voltage, and power.



The equivalent circuit of a real capacitor comprises the intrinsic capacitance of the capacitor C, the inductor L which is the equivalent inductance of possible internal connections, connections or connection pads, and the resistors Rparallel for the dielectric losses and Rseries those due to connections. Impedance Z is given by:

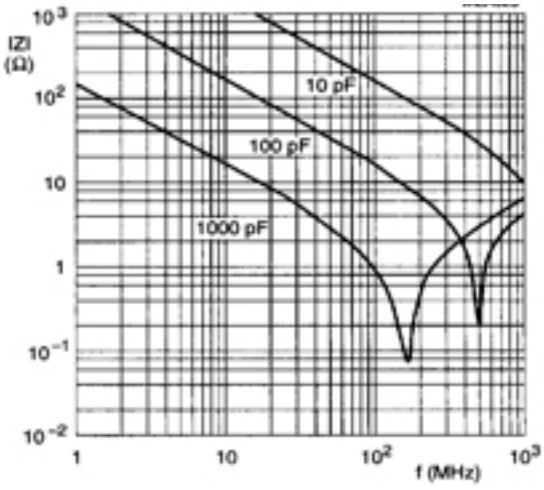
$$Z = (1/R+(C\omega-1/L\omega)^2)^{-½}$$

Self-resonance is obtained when: $f_0 = 1/\omega = 1/(2\pi\sqrt{(LC)})$

At lower frequencies the capacitor behaves as a capacitor, above, as an inductor and at the self-resonance, a resistor R.

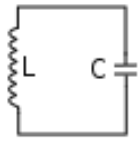
The type of housing greatly affects the parasitic inductance and CMS capacitors have significantly decreased it.

Typical values of resonance frequency for a COG capacitor

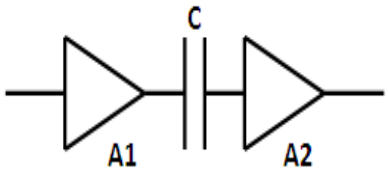


Using a capacitor

Three common cases can occur:



- **Tuned circuit:**
  The capacitor self-resonant frequency must be smaller than the tuned circuit and COG type for a stable frequency and low losses.



- **Coupling between stages:**
  The capacitor must have a low impedance so as not cause a significant drop of the transmitted signal. If it is at a single frequency, it is sufficient that the capacitor has low impedance at that frequency compared with that of the connected elements. This is achieved on both sides of the resonance frequency. If the signal can be spread over a range of frequencies, it is necessary that the very low impedance is obtained in this frequency range. This requires sufficient capacity at the lowest frequency and a self-resonance frequency at most equal to the highest frequency (audio and measuring amplifiers). The capacitor will COG or X7R types – the latter with caution, given the instability of its characteristics.

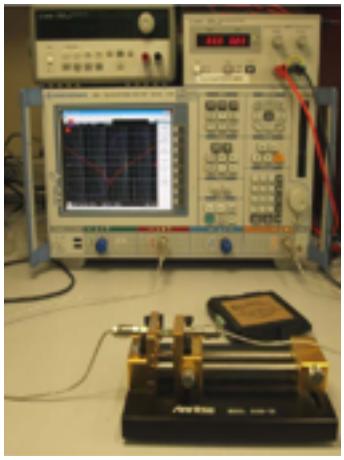
- **Source decoupling:**
  These are the same requirements as for a coupling element, be it a single-frequency or broadband signal. In this case, however, it will be more difficult since it is necessary to obtain very low impedance values for the decoupling to be effective, notwithstanding the very low source impedance decoupling. Thus, the decoupling of switching circuits, (low level: CMOS logic circuits or other) and power (chopper) is difficult because we are dealing with a relatively low base frequency, and discrete frequencies that can cover a very wide spectrum. The capacitor will COG type X7R, Y5V Z5V or, with the same reservations expressed above.

How to achieve effective decoupling over a wide frequency band?

It is necessary that the capacitor has a sufficient capacity so that its impedance is low enough to the lowest frequency. A MLCC (Multi Layer Ceramic Capacitors) structure is used. It allows up to 100 µF. But it is necessary that its self resonance frequency is at least close to the highest frequency which is incompatible with the number of layers needed to achieve capacity.

The paralleling solution of capacitors with different capacities is a solution. Hundreds of articles have been published on this subject and showed that this was not always very effective and even dangerous. Indeed, with capacitors wired connections, parasitic resonances occur with low-value capacitor. It may appear increases the impedance of the capacitor composite to certain frequencies, which can ruin the real weakening, obtained. Fortunately SMD capacitors have significantly reduced this risk if we take care to put them in parallel with near zero connections.

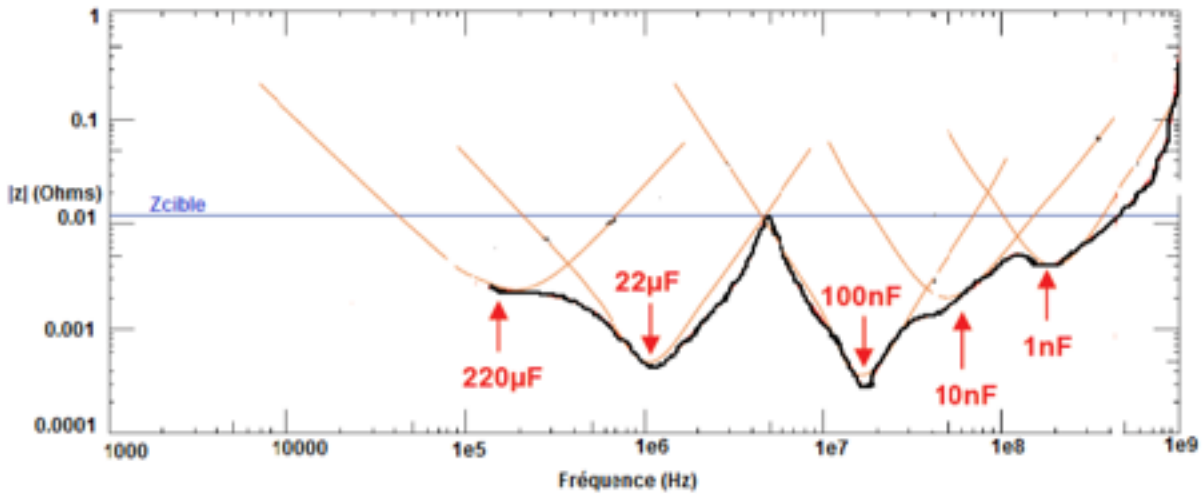
Inside his thesis [2], the author has devoted a significant part in the study of the behaviour of the only ceramic capacitors or parallel and the benefits of the so-called capacitors "ultra-wideband".



Test bench Test holder

The printed circuit board provided with the capacitor or capacitors to be tested is mounted in a test holder ANRITSU and the measurement is performed by a ARBV ZV B4 (150 kHz to 4 GHz) from Rohde & Schwartz.

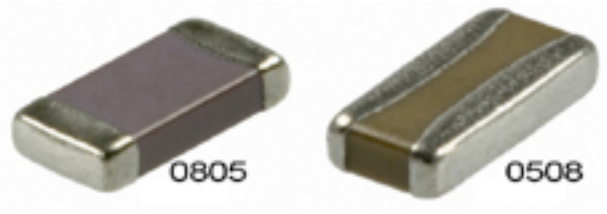
Here is example of paralleling values for standard SMD capacitors groups of different values, ceramics except 220 µF tantalum which is.



“Ultra broadband" capacitors

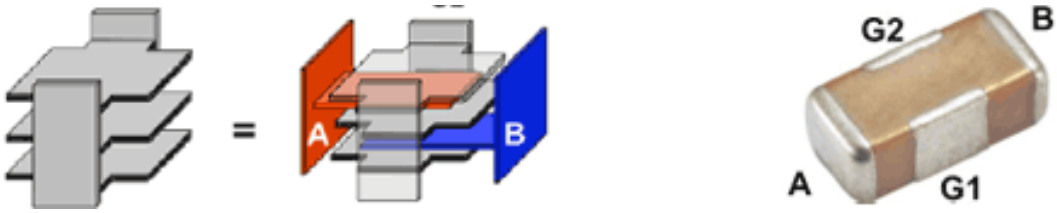
To use a capacitor over a wide frequency band, it is necessary to have both sufficient capacity and a very low parasitic inductance. The art of the designer is looking for the best arrangement of components.

A first approach is very simple: to minimize the distance between the connecting connections.

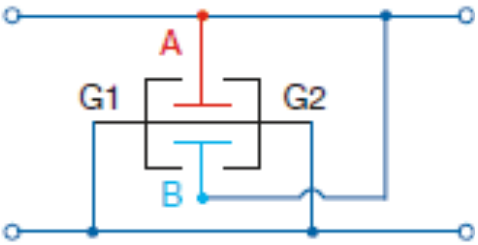


Example of modified CMS packages

But this is not enough and we must intervene in the internal structure. Starting from a standard multilayer capacitor MLCC is introduced intermediate electrodes called "screen", connected together and to ground: X2Y capacitor.

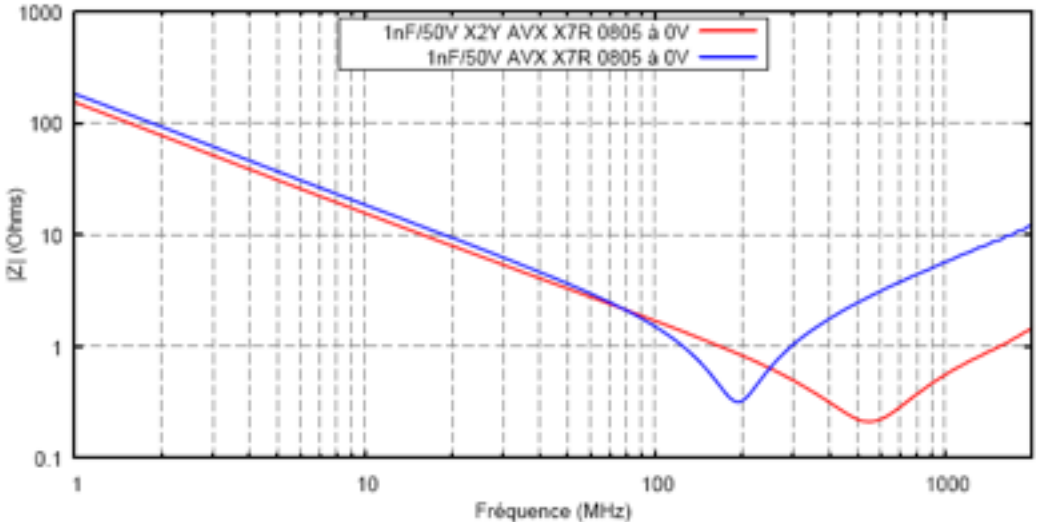


Internal Constitution of a X2Y capacitor

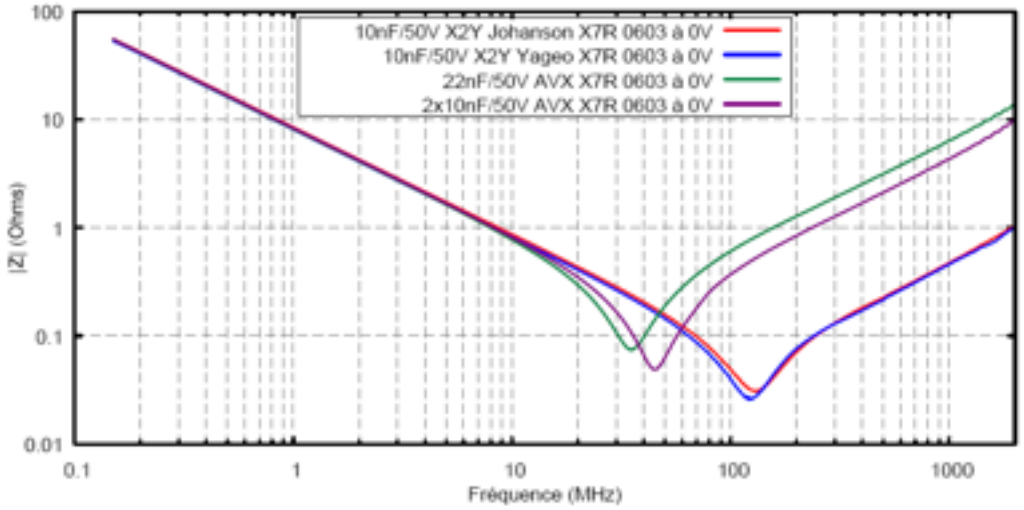


Schematic of a decoupling with X2Y capacitors

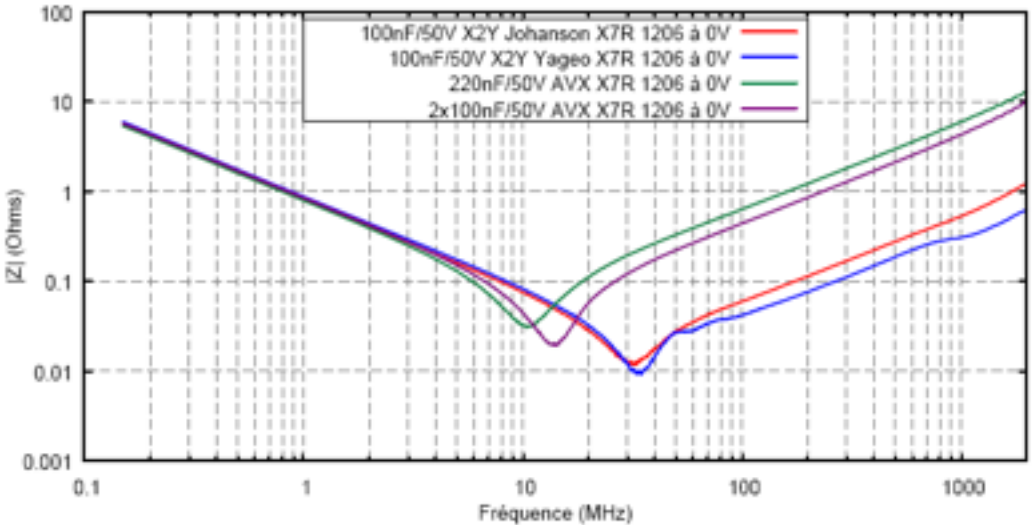
The following curves show the comparison of capacitors, one is standard X7R and the other X2Y



1 nF capacitors



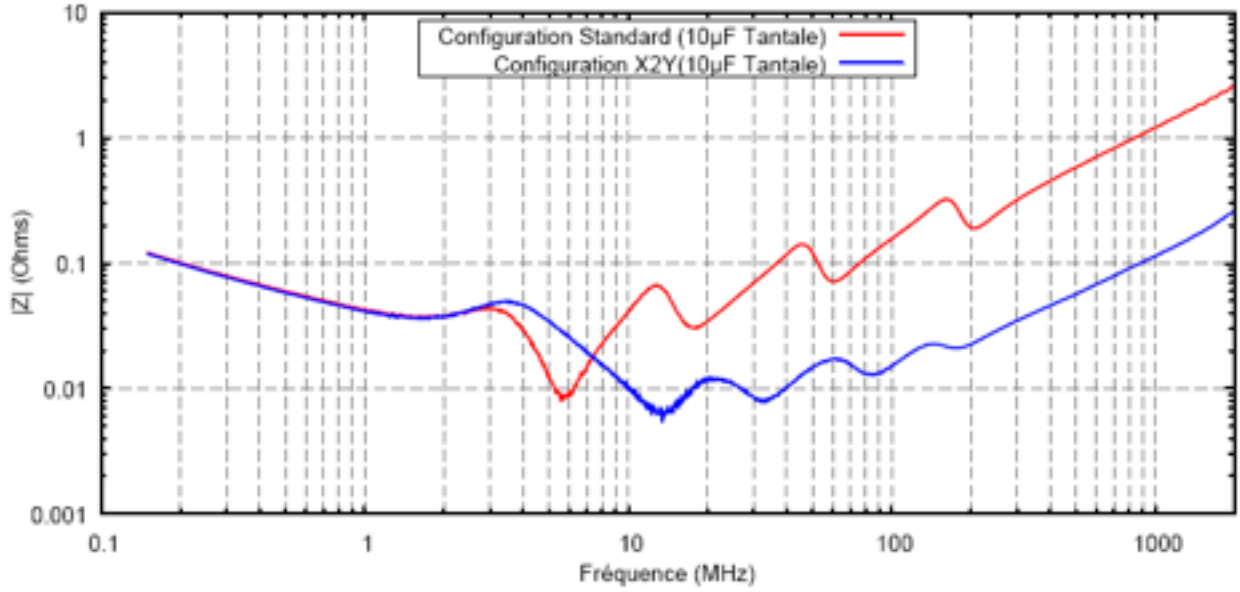
10 nF capacitors



100 nF capacitors

It is possible to obtain an effective decoupling from kilohertz to several GHz putting several different values in parallel, as already shown before with standard SMD capacitors. This is of a 10-uF tantalum in parallel with 470 nF (1812), 100 nF (1206), 22 nF (0805) and 10 nF (0805).

It includes the formidable effectiveness of X2Y capacitors in terms of parasitic inductance. If it is desired that the network impedance remains below 100 mΩ, standard CMS capabilities allow a bandwidth of 70 MHz while X2Y reach almost gigahertz.



Impedance (simulated) of a group of capacitors in parallel

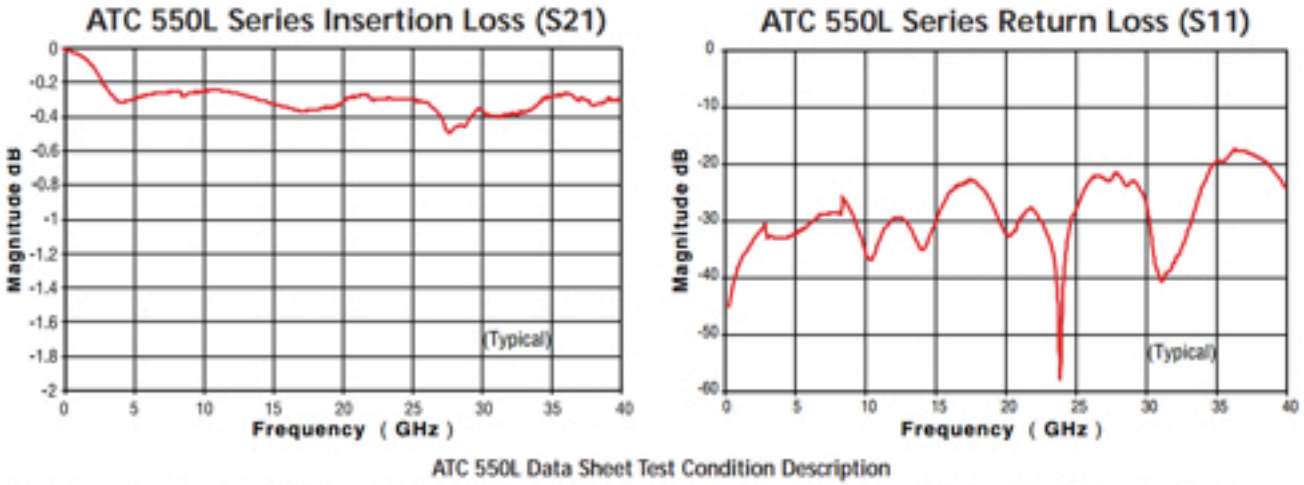
And 40 GHz?

This is generally not for decoupling function that we must raise as high frequency: it is as coupling between stages. These capacitors should be ceramic based since they are manufactured by specialized firms in this job [3,4,5]. Here's an example:

ATC 550L

capacity: 100 nF	Rated voltage: 10 Vdc	resistance: 107 Ω
ambiance: - 55 + 125 ° C	temperature coefficient: ± 22%	insertion loss <0.5 dB
working frequencies: 16 kHz - 3 dB up to 40 GHz		
Dimensions: 0.6 x 0.5 x 1 mm	standard size 0402	

Data is provided by the S-parameters. Some manufacturers even have curved up to 50 GHz.



ATC 550L Data Sheet Test Condition Description

All testing performed on 10-mil-thick Rogers RO4350 microstrip board, with the device under test subtending a 24 mil gap in a 22-mil-wide center trace (nominal 50-ohm characteristic impedance).

Conclusion

The X2Y capacitors allow professionals to obtain excellent results with certainty with a limited number of components. For the amateur, it's an opportunity to "clean up" printed circuits with logic circuits, or switching and simultaneously with high frequency analogue circuits. Their availability from suppliers [6] available to us as an amateur is not a barrier to employment. The unit price is about € 0.40 for 10 pieces.

The UWB does not seem to meet our needs; mounts to 24 GHz are not required to also pass the 16 kHz! Unit price is around € 5 for 10 pieces.

References

[1] Bien connaître les condensateurs céramiques pour bien les utiliser du courant continu aux SHF, F9HX, HYPER N° 175 11/2011

[2] Compatibilité électromagnétique des amplificateurs GaN radiofréquence à suivi d'enveloppe : Analyse et modélisation de l'influence du bruit des alimentations à découpage, N.Khelifi, Thèse N° 69-2013 Université de Limoges. To read with profit.

[3] Capacitors in Broadband Applications, Richard Fiore, AMERICAN TECHNICAL CERAMICS, www.atceramics.com

[4] Passive Plus Inc, 100 nF 16 kHz 50 GHz

[5] Decoupling Capacitors, A Designer's Roadmap to Optimal Decoupling Networks for Integrated Circuits, Freescale Technology Forum, Orlando 2005

[6] Suppliers : RS, Farnell, Elettronica di Roca Franco 12FHW, Mouser, Digikey

MMRT 2015 Trophies

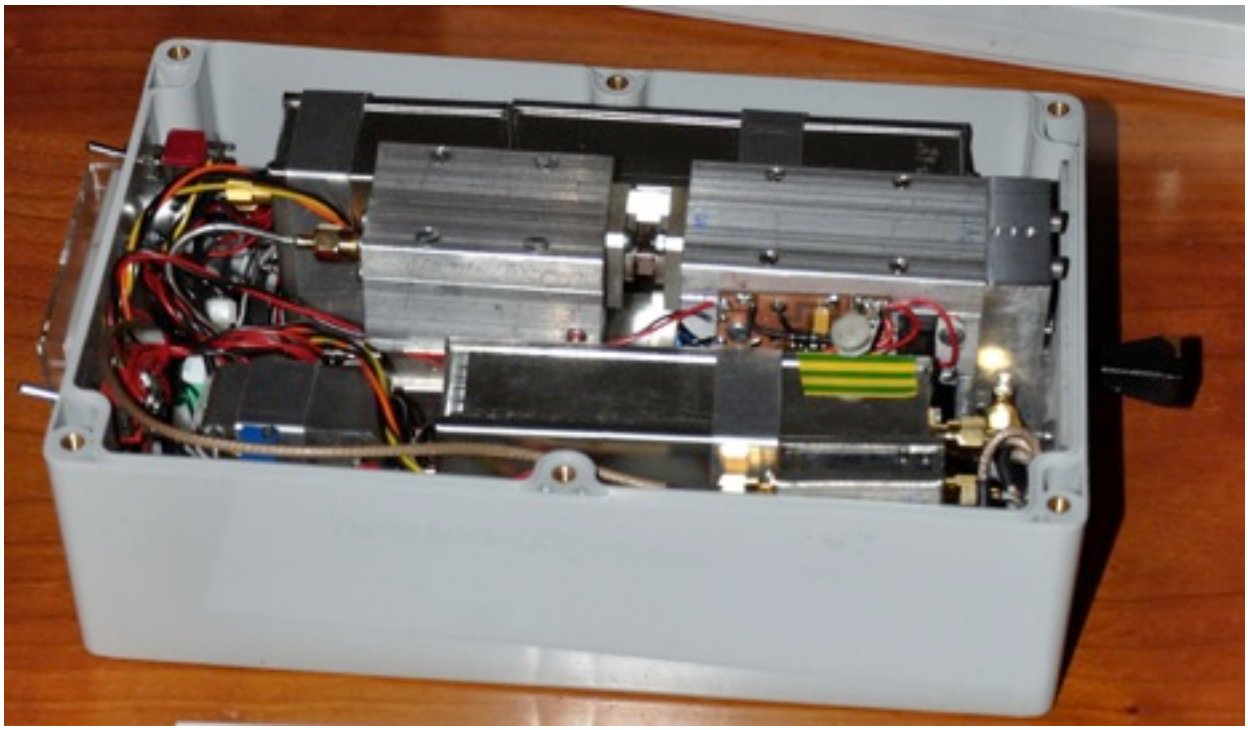
Photos by Dave Ackrill G0DJA

Clockwise: Roger Ray G8CUB, Nick Peckett G4KUX and ...

... Ian Lamb G8KQW

Some MMRT Construction entries

Photos by Dave Ackrill G0DJA



134.400GHz Tx/Rx by John Hazell G8ACE One half of polarplexer link 2m IF

Above: 144MHz - 2.3GHz transverter
by John Quarmby G3XDY

Right: 134 / 241GHZ transverter system
by Chris Whitmarsh G0FDZ

Pictures from “RAL” 2015

now HRT?

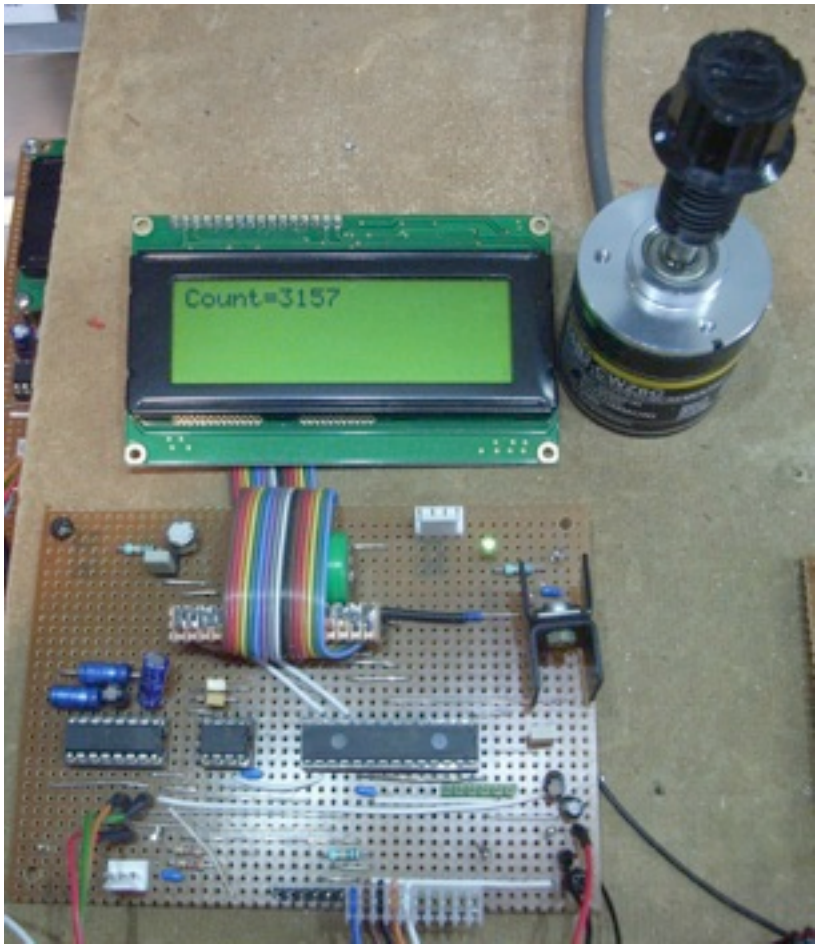
Clockwise: Mike G8CUL, Roger G8CUB, Measurements, Mike G3LYP with Chip Bank, John G4BAO.

Pictures 1–3 by Murray Niman G6JYB
4, 5 by Sam Jewell G4DDK

A reasonably priced shaft encoder

Brian Coleman G4NNS

Recently Omron Shaft encoders E6B2-CWZ6C 2000P/R have been offered on Ebay for about £20 including postage. These produce 2000 pulses per revolution with 2 phase output plus a zero tick.

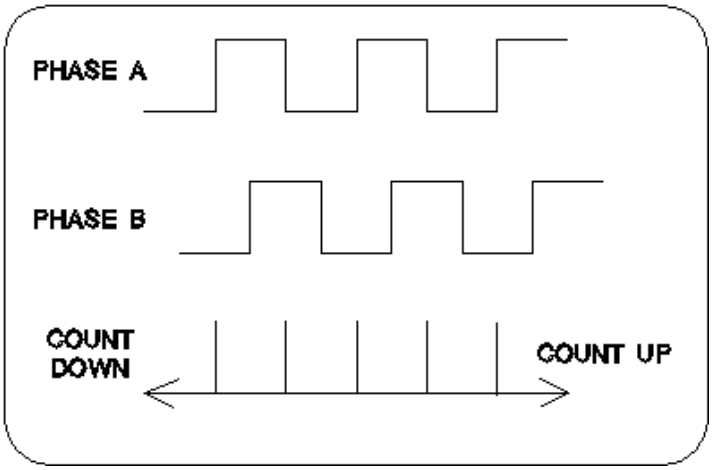


I use a 12 bit (4096 pulses per revolution) incremental encoder for measuring azimuth on my 3.7m dish used for EME up to 24GHz and find this quite adequate.

Using the two phases make it is possible to sense direction and with a bit of cunning the 2000 pulses can be doubled to 4000 to give approximately 1/10 degree (6 minute) resolution whilst retaining the up/down indication. False counts due to jitter are also eliminated.

The logic is as follows :- With Phase B low, A positive edge on Phase A counts UP, A negative edge on Phase A counts DOWN. With Phase B High, a positive edge on Phase A counts DOWN a negative edge on phase A counts UP. This way 4000 pulses per revolution are obtained.

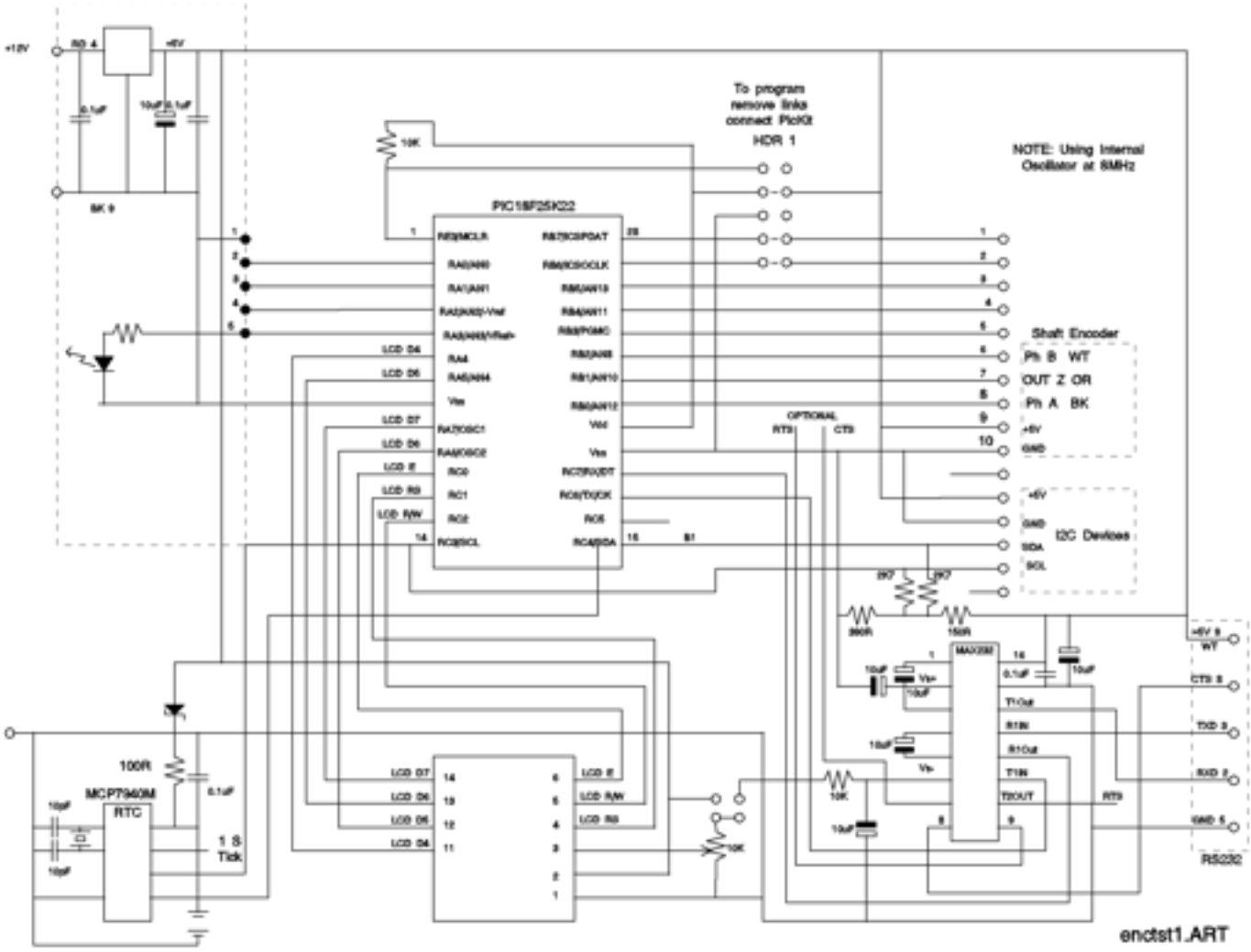
I set the encoder on my dish so that the “zero” tick is near the park position, which in my case is near South. Rather than zeroing the azimuth counter, the tick pre-loads it with the count corresponding to this position, which is approximately 2000 in my case. You could of course store the azimuth count in non volatile memory but it is little trouble to run the azimuth through the tick before a session begins thus calibrating the azimuth count .



I have been very happy with incremental encoders rather than the absolute type as they are so easy to interface and generally lower cost .

If anyone needs a code fragment for using this encoder with the PIC18F25 or 45 series I'd be happy to provide the source code. Although not intended for publication, the code I used also has some other useful features including 32 bit integer maths (so you could calculate degrees and tenths if you want), LCD driver, some I2C drivers and some monitor functions accessed via RS232.

The following diagram was the test circuit used to check the encoder. It had been used to develop my central heating control system so has some features not needed for this purpose. These include a real time clock and I2C interface.



Sales and Wants

For Sale

Peter Blair G3LTF QTHR

6ft 0.3f/D solid aluminium dish in a sturdy frame. OK for 9cm and probably 6cm as well. Will need a trailer to transport. I'm including a septum feed which will get you started on 9cm eme. £40

Wanted

Gus Coleman G3ZEZ

G3WDG-001 2.5 to 10GHz times 4 multiplier board or similar please.

Contact Gus G3ZEZ on 01255 425965 or gus@kestrel84.freeserve.co.uk

This month I 'ave mostly been building…

A column (idea borrowed from the SBMS Newsletter and with a hat tip to Mark Williams' character Jesse of the Fast Show) designed for those of you who don't want to write a full technical article – but also those of you who do but only have a snippet to contribute such as a new project or a progress report.

From Brian Austin G1IKV

I am looking to run a small personnel beacon using a beacon transmitter MKU 10 BAKE from Kuhne with 200mW and output frequency of 10368.90 MHz and one of Andy's G4JNT CW beacon boards, a SMA to waveguide transition, flange and a homemade 20dB horn, which I am in the process of making, copper sheet 1.2mm arrived this week (06/06/15) marking out, cutting and soldering hopefully very soon, sourcing WG16 waveguide to attach flange to horn has been something of a EBay search again hope some will be arriving soon, only looking for a 25mm length.

The aim of this little exercise is to have a quick pop up beacon, very portable even possibly mobile, rather than getting a dish out with all its setting up, and living on the South Coast with various high points within easy reach, and with the use of ON4KST to post beam direction or if a station requires a try, it might be interesting.

Hope this might be of interest for your column, also looking at 10GHz EME using 10w and possibly a 1.6M dish as the 1M dish I have may not be adequate.

Best regards Brian G1IKV

Doug Friend, MM/VK4OE

Attached are two images taken by my wife of me operating ”pedestrian portable” in Scotland on 10 GHz last Thursday afternoon from the Southern Fife coast near the village of Elie, IO86OE.

The two GM stations worked were Alan GM0USI/P and Brian GM8BGF/P, both of whom had gone out portable to maximise the chances of readily completing the contacts. The contacts ended up being S9+ each way across the Firth of Forth when Alan and Brian had their antennas pointed my way.

Using the waveguide slot antenna when pedestrian portable is interesting - quite broad in azimuth so hearing both stations without moving the antenna was easy but, because the elevation pattern is sharp, maintaining the slot close to vertical was critical to keeping signals strong. Power is from an 8 AH lithium polymer battery pack located in my coat pocket. The converted IC-202 runs only about 100 mW on transmit, perfectly adequate for LOS contacts!

Getting tired arms after holding the radio steady for a while, I set the radio one of several WW2 concrete tank-barrage blocks there, one which happened to have an appropriately uneven surface that allowed the radio and antenna to be set vertical.

Not earth-shattering distances by any accounts, but a whole lot of fun on a week day!

Cheers and 73,

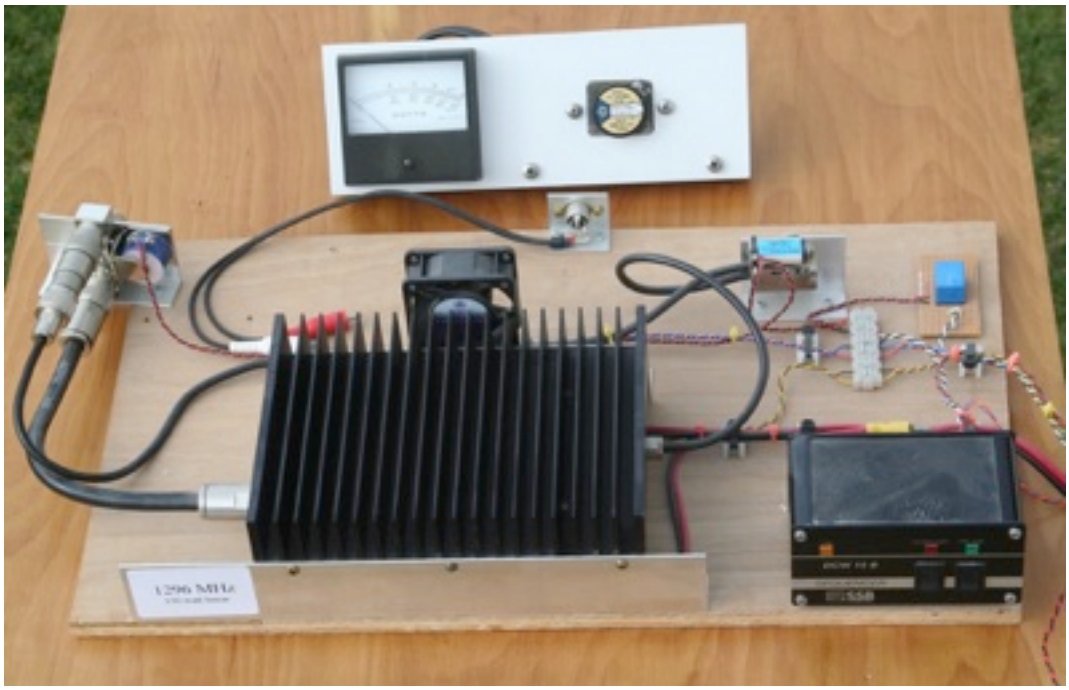
Bob Price G8DTF

I am busy trying to build a 6cm WBFM Transceiver system, 470mW into an 11dBi panel and a RX with a similar antenna.

Martin Hall GM8IEM

The photos (p20) show the PE1RKI 150W linear and associated circuitry before and after building it into a 2U enclosure, as mentioned last month.

Now fully functional on 23 cm again and ready to start work on the 3cm and 13cm systems.




1296 MHz 150w Linear
28v
SSB


T/R
13.8v Preamp
28v
PTT
AUX
13.8v
Meter
ANT

May 2015 Lowband Contest Results

Entry levels were well down for this event, despite the higher activity apparent from the coincident IARU Region 1 coordinated event. QSO totals for the leading stations were well up this year.

On 1.3GHz Mike G8CUL comes out on top of the pile, with Keith G4KIY as runner up. These two stations were well ahead of the remainder of the field. DF0MU in JO32 provided best DX for both stations.

G8CUL also won the 2.3GHz band, with G4KIY also runner up on this band. G8CUL had a substantial winning margin and took full advantage of the continental activity to make plenty of high scoring contacts.

Neil G4LDR virtually had the band to himself on 3.4GHz, and only reports one QSO, with G4ALY at 195km.

G8CUL was the overall winner with leading positions on 1.3 and 2.3GHz. Runner up was G4LDR, as the only 3 band entrant.

Certificates go to the overall Winner G8CUL and Runner-up G4LDR and to the following winners and runners up:

- 1.3GHz G8CUL, G4KIY
- 2.3GHz G8CUL, G4KIY
- 3.4GHz G4LDR

John G3XDY

UKuG Contest Manager

May 2015 Low Band Contest Results

Overall

Pos	Callsign	1.3GHz	2.3GHz	3.4GHz	Total
1	G8CUL	1000	1000	0	2000
2	G4LDR	174	145	1000	1319
3	G4KIY	733	247	0	980
4	G4BAO	0	225	0	225
5	M5MUF	186	0	0	186
6	M0BTZ	109	0	0	109

1.3GHz

Pos	Callsign	Locator	QSOs	Best DX	Points
1	G8CUL	IO91JO	37	DF0MU 593km	8461
2	G4KIY	IO92WN	28	DF0MU 507km	6201
3	M5MUF	IO92JP	11	PA6NL 370km	1572
4	G4LDR	IO91EC	6	PA6NL 410km	1474
5	M0BTZ	IO90GX	7	M1CRO/P 215km	924

2.3GHz

Pos	Callsign	Locator	QSOs	Best DX	Points
1	G8CUL	IO91JO	22	DF0MU 593km	5614
2	G4KIY	IO92WN	8	GD0EMG 347km	1389
3	G4BAO	JO02CG	8	PA0BAT 428km	1265
4	G4LDR	IO91EC	4	PA6NL 410km	814

3.4GHz

Pos	Callsign	Locator	QSOs	Best DX	Points
1	G4LDR	IO91EC	1	G4ALY 195km	195

Lowband Champions

	After three events, the best three events count towards the total				
Overall					
Pos	Callsign	3/8/15	4/19/15	5/3/15	**TOTAL**
1	G8CUL	2000	2000	2000	6000
2	M0HNA/P	1872	2463	0	4335
3	G4LDR	1999	0	1319	3318
4	G3UKV	1332	1471	0	2803
5	G4KIY	1203	0	980	2183
6	M0WXB/P	625	679	0	1304
7	G8EOP	797	492	0	1289
8	G3UVR	638	582	0	1220
9	G4BRK	0	1196	0	1196
10	2E0NEY	0	902	0	902
11	M0GHZ	0	827	0	827
12	G4NBS	814	0	0	814
13	M5MUF	165	311	186	662
14	G3VKV	0	531	0	531
15	G4ZTR	0	467	0	467
16	G3YJR	0	418	0	418
17	G4CLA	0	341	0	341
18	G4BAO	0	0	225	225
19	G8DTF	0	208	0	208
20	G1DFL	24	127	0	151

1.3GHz					
Pos	Callsign	3/8/15	4/19/15	5/3/14	TOTAL
1	G8CUL	1000	1000	1000	3000
2	M0HNA/P	715	984	0	1699
3	G4KIY	747	0	733	1480
4	M0BTZ	0	0	924	924
5	G4NBS	814	0	0	814
6	G3UKV	307	430	0	737
7	G4BRK	0	720	0	720
8	G3UVR	223	479	0	702
9	M5MUF	165	311	186	662
10	M0WXB/P	191	420	0	611
11	G4LDR	386	0	174	560
12	G8EOP	271	260	0	531
13	G4ZTR	0	467	0	467
14	G3YJR	0	418	0	418
15	G4CLA	0	341	0	341
16	G3VKV	0	275	0	275
17	2E0NEY	0	258	0	258
18	G8DTF	0	208	0	208
19	G1DFL	24	127	0	151
20	M0GHZ	0	147	0	147

2.3GHz

Pos	Callsign	3/8/15	4/19/15	5/3/14	TOTAL
1	G8CUL	1000	1000	1000	3000
2	M0HNA/P	736	479	0	1215
3	G3UKV	447	479	0	926
4	G8EOP	526	232	0	758
5	G4LDR	613	0	145	758
6	G4KIY	456	0	247	703
7	M0WXB/P	434	259	0	693
8	G3UVR	415	103	0	518
9	2E0NEY	0	321	0	321
10	G4BAO	0	0	225	225
11	G4BRK	0	215	0	215
12	M0GHZ	0	159	0	159
13	G3VKV	0	65	0	65

3.4GHz

Pos	Callsign	3/8/15	4/19/15	5/3/14	TOTAL
1	G4LDR	1000	0	1000	2000
2	M0HNA/P	421	1000	0	1421
3	G3UKV	578	562	0	1140
4	M0GHZ	0	521	0	521
5	2E0NEY	0	323	0	323
6	G4BRK	0	261	0	261
7	G3VKV	0	191	0	191

Activity News : May 2015

By Bob Price G8DTF

Please send your activity news to:

scatterpoint@microwavers.org

Introduction

This month there are some reports of activity in the May IARU Contest, the May 23cm UKAC, the SHF UKAC and some Monday night activity.

May IARU Contest

From Neil G4LDR IO91

During the 432 MHz and up contest at the beginning of May I managed to work EI3KD in IO51VM at the fourth attempt over the contest period. This was my first EI contact on 10 GHz.

From Bob G8DTF IO83

23cm

Quite low activity, but some good QSOs.

G8EOP IO93, GD0EMG IO74, PA6NL JO21, G8OHM IO92, G8CUL IO91, G4LDR IO91, G4KCT IO93, G1SWH IO83, G3VKV IO81, M1CRO/P JO01, G3TCU IO91, G8XVJ IO83, G4HGI IO83, G8NEY IO81, GW8ASD IO83, M0WXB/P IO81

The best DX was PA6NL who were a good signal even with the Pennines in the way. I think this is the first time I have worked PA6NL from home.

13cm

Tried with PA6NL and I did hear them, but no QSO.

G8EOP IO93, GD0EMG IO74, G8OHM IO92, G8CUL IO91, G4KCT IO93, G3VKV IO81, M1CRO/P JO01, G8NEY IO81, GW8ASD IO83, M0WXB/P

9cm

No QSOs

May SHF UKAC

From Bob G8DTF IO83

Not many of the locals out /P on 9cm and I was 15 minutes late getting on 13cm as I got a bit engrossed in 6m.

13cm

IO83	G3UVR, G4MVU, GW8ASD
IO93	G8SFI/P
IO81	G3VKV, G4WLC/P
IO92	G8OHM, G4ODA

9cm

IO83	G4MVU
IO93	G4JLG

May 23cm UKAC

From Erik G8XVJ/P IO93

This is the dish I use at IO93AD it's an old K band dish about 30 years old. I have had it for 19 years now and it is used at my /P location in Leek. It is a 2.65 m dish mounted at 9ft 5 ins above ground level. It is very hard to keep it pointed in the right direction in the wind.

From John G8PEF/P IO83

A bit of a poor result for me last night - conditions seemed very poor, with mega-qsb... And there was a bitterly cold wind - not good, as I'd forgotten my proper coat, and was just in a thin fleece and a waterproof jacket (even forgot my hat and gloves). Because my fingers were frozen it took me ages to get the mast/antenna up, so I was late starting.

I had a visit from Keith G8HXE, about 9:15 - he'd given it up as a bad job, and popped up to see how I was getting on - so by the time I'd spent 5 minutes stood outside the car chatting I was thoroughly frozen. I only made 1 further contact in the next hour, and the band seemed completely dead by then, so I packed up 10 minutes early and came home for a hot brew.

The extra power from the IC910 seemed to do the trick though - I was getting better than normal signal reports, even allowing for the poor conditions.

Total tally, only 18 contacts and 4 squares

From Bob G8DTF IO83

Good local activity again.

IO83	G8HXE/P, G4MVU, G3UVR, G4HGI, G4JLG, G3TDH, 2E0BMO, G8PEF/P, G1SWH, G6GVI, GW8ASD
IO82	GW8REQ/P, M0COP/P, G4BVE/P
IO93	G8SFI/P, G8XVJ/P, G8EOP
IO91	G4BRK, G8CUL, G3TCU/P, G4LDR
IO81	G3VKV, M0GHZ
IO84	G0EHV/P
IO92	G8OHM, G4HWA, G4CLA
IO94	G4KUX
IO74	GI6ATZ
JO02	G4NBS

Other Activity

From Neil G4LDR IO91

The Monday evening activity continues here in the south with myself, Brian G4NNS, Ralph G4ALY and Dell G1JRU being the regulars. We sometimes get others calling in and would welcome anyone who is within range. We normally operate from about 19:00 to 20:00 UTC on all bands from 1296 to 24048 MHz. We use 144.185 and/or 144.195 MHz for talkback (leaving the calling frequency 144.175 MHz free for others to use). G4ALY is too far (at 200km) for 24 GHz but is normally worked on all the other bands, often 10 GHz has the strongest signals. On 24 GHz I can work G1JRU on open waveguide from ground level over the nearly line of sight 35 km path.

I have borrowed the Group's 76 GHz loan system (G4EAT built system). I have now had the opportunity to test it across the garden and it works well. I am planning to do some tests with G8ACE soon. Frequency stability seems extremely good. I intend to be QRV for the 24 GHz and up contest in July. I am currently gathering items together to build a 47 GHz system and if I finish in time I will also be QRV on that band as well.

Beacons

From Ken G8DIR

It is with regret that the 23cm GB3CLE beacon (Clee Hill) has had to close as the site of its location is becoming a problem and thus we will not have the use of it. It has gone off air.

...and finally

I want to encourage you get on the air as often as possible and report your activity to clearly document use of the amateur microwave bands. This means not just DX and EME, but also local activity with ATV, low power or WB equipment.

Please send your reports to Scatterpoint@microwavers.org, remember the deadline is the 1st of the month.

73 Bob Price G8DTF

MMRT 2015 Construction - non-microwave entry

"A good accessory for the serious microwaver"

A 7MHz CW practice receiver using SM components

by Jeff Eastdown G4HIZ

The 2015 Crawley Roundtable, Sunday 20 September

We will be holding a heat for the UK Microwave Group annual project contest for the G3VVB trophy. Please do bring along your constructed equipment or project and enter. Entries do not necessarily need to have been finished during the last year. This year the contest will also accept software entries as well as hardware. The winner of this round will go on to be considered together with entries from all the other roundtables over the past year after this event.

The morning will feature the usual 'bring and buy' sale, so if you have something to sell then please bring it along.

The program this year offers the microwaver something different - come along and support the construction contest and hear the talks.

Below is the **provisional** timetable – **Please contact Chris G0FDZ if you have a talk!**

Location: Crawley Amateur Radio Club

http://www.carc.org.uk/

10:00AM	Venue opens
12:00	UKuG Project contest round judging commences
13:00	Lunch (rolls, sandwiches, tea/coffee available)
14:00	Opening address and the results of the Project contest heat
14:15	Talk-1 - tbc
15:00	Talk-2 - tbc
15:30	Break (tea & coffee available)
16:00	Talk-3 - tbc
16:30	End of meeting

If you need further information, contact Chris Whitmarsh G0FDZ or Derek Atter G3GRO

Access to Site:

The access road into Tilgate Recreational Centre and the CARC Clubhouse (Hut18) is via the sliproad at the new traffic lights on the southbound carriageway of the A23 (Brighton Road), just south of Crawley heading towards Brighton, and about 200m from the Broadfield Football Stadium roundabout which is well signposted.

The Clubhouse is accessed via a fairly narrow track for about 200m. Watch out for anti-traveller caravan chicanes then turn right at the 3rd sleeping policeman!

More Directions: CARC Directions

UKuG Microwave Contest Calendar 2015

Contest results are also published online - please follow the link from the UKuG Contests Page at:

www.microwavers.org/?contesting.htm

The contest rules and calendar for next year will be in the next issue of Scatterpoint but will appear first on the UKuG web site in early 2015.

Events calendar

2015

June 14	"RAL" at the village hall in East Hagbourne	Programme/Registration Hagbourne Village Hall
June 26 – 28	Ham Radio, Friedrichshafen	www.hamradio-friedrichshafen.de/
July 11 – 12	Finningley Round Table	www.g0ghk.co.uk/
July 24–26	Amsat-UK Colloquium, Holiday Inn, Guildford, Surrey	www.amsat-uk.org/colloquium/
Sept 5–6	BATC CAT-15, Finningley	
Sept 6 – 11	European Microwave Week, Paris	www.eumweek.com/
Sept 11 – 13	60.UKW Tagung Weinheim	www.ukw-tagung.de/
Sept 20	Crawley Round Table	
Sept 25 – 26	National Hamfest	www.nationalhamfest.org.uk/
Oct 9–11	RSGB Convention	rsgb.org/convention/
Oct 15–18	Microwave Update, San Diego	www.microwaveupdate.org/
Nov 7	Scottish Round Table	www.gmroundtable.org.uk/

2016

Jan 23	Heelweg	www.pamicrowaves.nl/
Apr 9	CJ-2016, Seigy	http://cj.ref-union.org/
Apr 16–17	Martlesham Microwave Round Table & UKμG AGM	
Apr 23	RSGB AGM, Scotland	
May 20 – 22	Hamvention, Dayton	www.hamvention.org/
Jun 24 – 26	Ham Radio, Friedrichshafen	www.hamradio-friedrichshafen.de/
Oct 3 – 7	European Microwave Week, London	www.eumweek.com/
Oct 7 – 9	RSGB Convention	rsgb.org/convention/

2017

Jun 23 – 25	Ham Radio, Friedrichshafen	www.hamradio-friedrichshafen.de/
Oct 8 – 13	European Microwave Week, Nurembourg	www.eumweek.com/

Loan Equipment

Don't forget, UKµG has loan kit in the form of portable transceivers available to members for use on the following bands:

5.7GHz **10GHz** **76GHz**

Contact John G4BAO for more information.