SPRAT

THE JOURNAL OF THE G-QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

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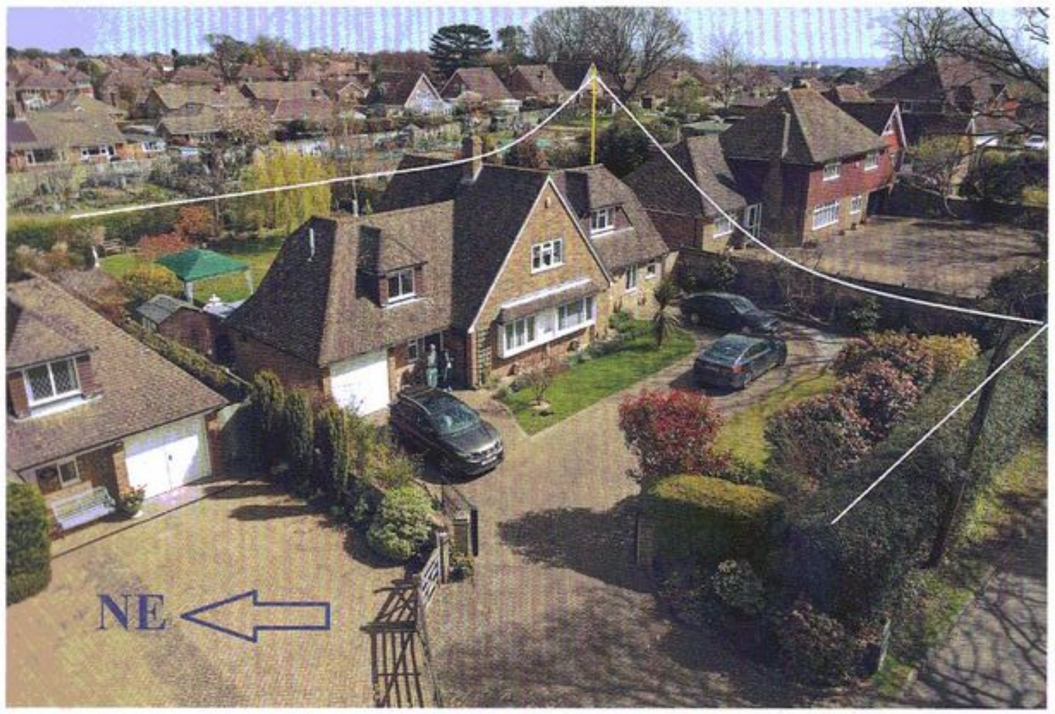

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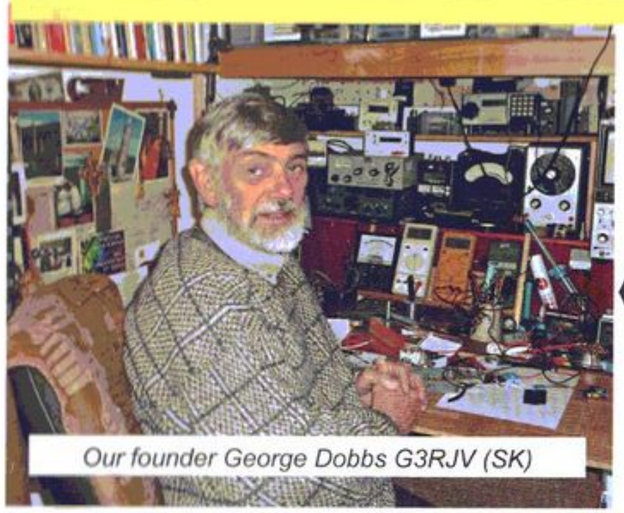

Our founder George Dobbs G3RJV (SK)

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EDITORIAL

You will see later in this *SPRAT* that we are on the lookout for a new Club Sales Manager. **Graham, G3MFJ**, is not throwning in the towel immediately, but needs to give up the role due to difficulties with his eyesight. He is receiving good NHS treatment but separating LM386s from NE602s is getting to be very hard work. See advert for more details.

We've recently had a request to change the Club position on contests. The Committee gave this due consideration coming to the conclusion that we should not set ourselves against contesting. We have members that really enjoy contesting with QRP, and some who just want to chat. We have some that love operating with FT8, and others who consider it to be a blight on our spectrum. The bottom line is that we do not own QRP Centres of Activity and bandplans are not legally enforceable; we all need to live together and enjoy our amateur radio as best we can. IARU recommendation is to use non-contest bands when contests are causing disruption; 5MHz & 10MHz can both provide good inter-G contacts, and there is much DX to be had on both the 18 & 24MHz bands. Interestingly, the RSGB had a similar letter in the May's *RadCom* and the President explained that the IARU position is unchanged.

The Club Construction Competition is now open for entries. Please send details of your projects (not the projects themselves!) to our Secretary, **Dick, G0BPS**, to arrive by the end of September. The winner of the **G3RJV Trophy** will be announced in the Winter *SPRAT*.

Finally, I hope to see as many of you as possible at the Club Convention over the weekend of 2-3 September at the **Harper Adams University campus** north of Telford. It promises to be an excellent event and we thank the **Telford Hamfest team** for their help in making it happen.

After many years of providing regular SPRAT columns, **Colin, G3VTT**, has decided the time has come to hang up his keyboard. Colin has been an active Club member for 45 years and his regular contributions will be sorely missed.

So, do we have a volunteer to take over the *Valve QRP* column in *SPRAT*, and/or the running of the Club Valve Days? Please e-mail me if you are interested.

Steve Hartley G0FUW
Chairman GQRP Club *g0fuw@gqrp.co.uk*

WANTED: New Club Sales Manager

Steve Hartley G0FUW

After more than two decades, **Graham, G3MFJ**, has given notice that he is retiring from the role of Club Sales Manager. He took over from **G3YCC** (SK) in 1999 and he has been processing orders ever since. Graham has been forced into this decision due to difficulties with his eyesight caused by macular degeneration.

So, we need to find a new Club Sales manager. Could it be you?

An outline of what is involved...

The Club Sales service has grown from just a few bits and pieces being offered through *SPRAT*, to a comprehensive offering of QRP essentials. Graham has developed a system of buying parts in large numbers and selling small quantities to members at 'bulk purchase' prices. He also puts together the Sudden kits and arranges for book printing, memory stick production, etc.

Most of the sales are via the post but Graham attends a few rallies and Conventions each year to make some sales in person. He also supplies a small team of regional sales reps who attend rallies and conventions in their areas. Expenses for attending these events are covered by the Club.

All this requires some storage space for stocks of parts, books and packaging materials. As a rough guide, this amounts to about 'half a garage' or a large shed. That might mean that the Club needs to hire a self-store unit if the new person does not have the room to spare.

The volume of sales generates about 500-600 packages a year. They are packed up and posted to members, mostly in the UK, but the Club has members all over the globe, so some packages go abroad, with the necessary customs labels attached. Packaging materials and postage are all paid for from Club funds, so the Sales Manager is never out of pocket.

Due to the mail order nature of Club Sales, and the vagaries of the postal system, the new Manager really needs to be located on the UK mainland.

Graham would like to complete the handover to the new Sales Manager by March 2024, so we are seeking expressions of interest now to allow plenty of time for a planned, orderly transition.

If you are interested but would like to know more about this volunteer role you can contact Graham via *g3mfj@gqrp.co.uk,* **or you can send your expression of interest to me via email.**

g0fuw@gqrp.co.uk
Steve Hartley, G0FUW

Valve QRP Report Spring 2023

Colin Turner G3VTT email: g3vtt@aol.com

Welcome to the report on the Spring valve QRP activities. My thanks to all of you who have reported to me your activities. Peter **G3XJS** was active with his Codar AT5 and Drake 2-B combination on 80m. He worked **G4ARI** with his Codar AT5 and **G4ZXN** was using his own Drake 2-B and asks if G0UCP was using one watt from a battery valve transmitter? Peter also supported the event by using his solid state K2 to work valve stations on 60m. To answer Peter's query John G0UCP he had an excellent valved rig operating weekend.

Conditions in the North West were better on the first than the second day, said John, but it was often those QSOs with marginal copy, relying on repeats to fill in the gaps, which were the most satisfying ones with QRP. He worked two Codar AT5s. Peter, G3XJS in Kent had one of them and he had a solid contact with 2 Watts at his end and 1 Watt at the other.

Peter sent 449 and G0UCP sent 559. Other contacts were had with QRP valve rigs including G4ZXN, G4ARI, G4ALG, G3XIZ, F6FAI and G4PRL. Five were on 80m, one on 60m and three on 40m.

Chris **G3XIZ** said there was a fine selection of drifting and chirping notes (including his!) with chaps engaged in real conversations using good old CW! He was again using his home brew eight valve transceiver but still hadn't done the 'improvements' he promised last year so he must work on the transceiver before it is put away.

The first job is that the AF filter needs sorting out and then 40m added making it a 4 bander. As always the local QRM was the limiting factor with difficulty copying signals much below S7. It was particularly bad this time with someone probably using an unsuppressed electric drill in the neighbourhood. This cost him a contact with Rupert **G4XRV** who disappeared under S9+ of noise. During this event he managed to get 23 contacts with 16 individual stations.

14 QSOs were valve to valve and with 9 unique valved stations. His local pal Pete **M0FMT** dug out his home brewed valve TX and gave him successive QSOs on 160, 80 and 60m. He worked Rog **GW3UEP** who was using his valve transmitter but he was then /A and on an FT991A. Later they worked again but this time he was using valve gear and Rog was not!

On the Sunday evening Ian **G3ROO** called CQ with a blistering strong signal on 3560 kHz and was answered simultaneously by several stations including Chris. They then tried replying to him one at a time but Ian apparently didn't hear any of them. His final QSO on Sunday evening was appropriately with Frank **ON5QRP** who was running QRPP at 1W. QSO breakdown by band were 5 were on 160m, 10 on 80m and 8 on 60m.

Rupert **G4XRV** found conditions to be generally awful for the April VQRP event this past weekend. He had 14 QSOs in total (3 on 80m, 7 on 60m and 4 on 40m) although one had to be abandoned midway through due to QSB. Valved stations worked were GW3UEP, G3XIZ, G4ALG, G4ARI, GI4CZW, G4ZXN and M0PJD. Rupert was using my 6J5/6V6 CO/PA TX running 5 Watts output to a 100ft Doublet with a 1937 McElroy "civilian" bug key being used for all of the QSOs. He used two different valved receivers over the weekend with a Collins 75A-4 being used for 80m and 40m QSOs and a Collins R-390A being used for the 60m QSOs.

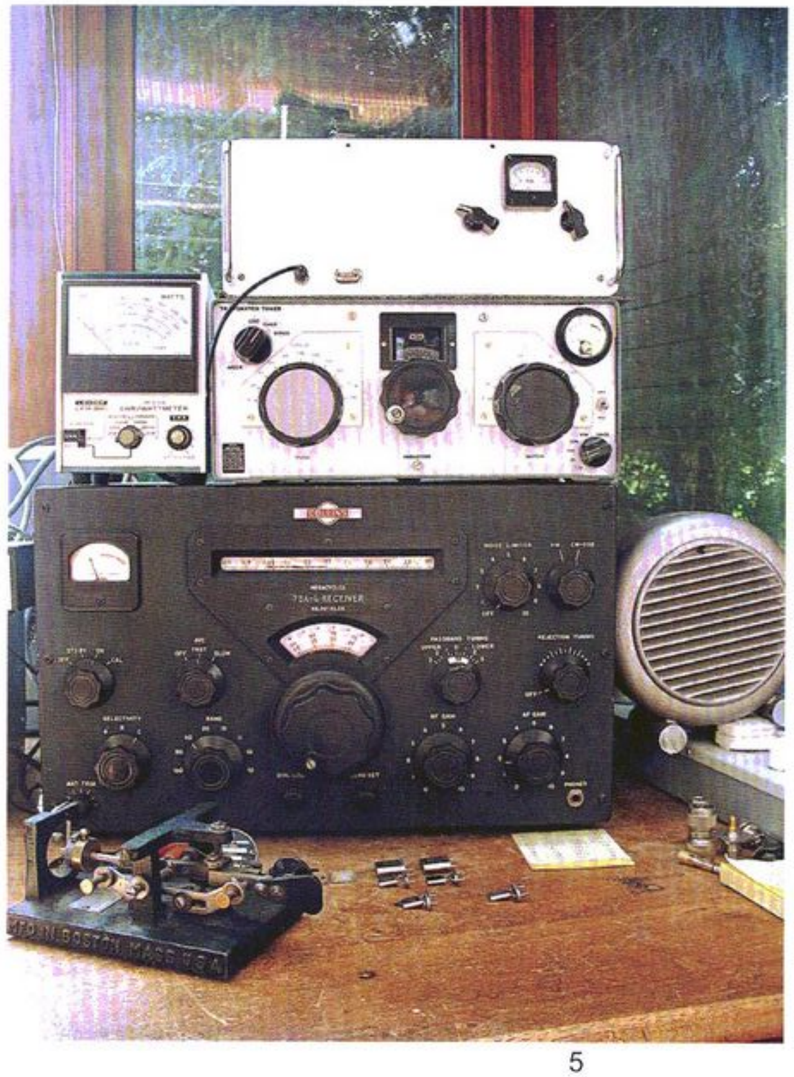
Alan **G4BLI** Had some fun with Valve Activity weekend 15th & 16th April 2023 and worked G0GGA, G3XIZ, G4PRL, G4ALG, G0OTT, M6MPC plus GU4HUY and F8APH using my

6AG7 /807 Valve CO/PA and G3OGR Frank Rayer design 3 valve VFO! YU7AE always supports this event and this time Kare worked SP9, DL8, OK1, I3, and SP80KATYN with good reports. He used his third oldest AN/GRC9 military transceiver giving five watts to a trapped inverted vee dipole.

Kare also took part in an EA contests which took place over the weekend along YUDX and CQMM contests. Kare still has work to do on the GRC9 replacing an on/off switch and a relay which causes instability from time to time. Finally Steve **G4ALG** in Lydney Gloucester made a staggering 37 contacts despite severe contest QRM in poor conditions. On 17m his best contact was NY2PO but working John G0UCP with a homemade battery transmitter was another highlight.

Steve's transmitter was an old FR50B with an external VFO and the companion FR50B receiver all fully repaired and restored. An R71E receiver was used with the well known 10 band VXO transmitter using 4 valves and a 5763 final. If you want further information then look at Steve's QRZ.com page. Of the 37 contacts he made **28** were two way QRP contacts and 16 were two way valve QRP stations.

That wraps it up for reports this Spring and it remains for me to thanks those of you who took part and for using such historical pieces of equipment. The next event is July 15th and 16th and I must also inform you that I will no longer be writing VQRP events after the July report as I'm hanging up my mouse and keyboard after writing for Sprat for many years.



I am planning to devote more time either on air working portable, home construction or with other pursuits as I move deeper in to old age. If anybody feels moved to continue writing this piece then please let the Chairman and Committee know.

72 to you all.
Colin G3VTT

'Borkum Riff'
84 Gravel Hill Way
Dovercourt
Harwich
Essex CO12 4XN

An 80m and 40m Inverted-L

Philip, G4HOJ@yahoo.co.uk

Background

I, like many people, have a not-so-big garden, with the restrictions of a Conservation Area and an odd-shape, all conspiring to reduce or eliminate the types of aerial I might try – especially on the lower bands. I do significantly more listening than transmitting and although I am constantly trying out new aerials on different bands, I always like to have the ability to listen to inter-G QSOs both on 80m and 40m.

I don't have room for a dipole on 80m and even an inverted vee on 40m is not really possible because of lack of useful support pole position opportunities. For this reason, much experimentation has been with small transmitting loops, short dipoles, verticals and inverted Ls. I have made loops work very well indeed and they would certainly be in the mix if I had even less space/opportunity but the need for high Q, and the associated need for tuning to achieve best performance, means that I tend to prefer wire aerials.

I recently tried several inverted L types for 80m/40m, all bending at around 28ft (max. I am allowed), against the best radial system I can achieve and fed with coax as far away as possible from the house, to try and achieve both band use, with varying observations, e.g.:

Half 80m/40m trapped dipole	Good for DX. Reasonable match on both bands. 80m efficiency down a bit because of reduced length and impedance. Not so good for inter-G but fits in small space.
Parallel 80m and 40m 1/4Ws	Works well for DX. A reasonable match achievable but some tricky sensitivity to spacing. Slightly more bandwidth. More wire in the sky. As above on inter-G.
Single 66ft wire	High feed imp. on 40m requires series + L match to achieve useful match on both bands. Brings better high angle 40m radiation but 80m still not so good for inter-G.
Various total lengths with 4:1 or 9:1 UnUns at the feedpoint	Generally, this type of arrangement worked less well than any of those above in one or more ways. A remote auto ATU could resolve but £££££
3/4W for 40m, c. 98ft wire	Resonant on 40m. Have to switch in series capacitor to 'tune out' 80m reactance. Best match 2:1 UnUn due to imp. being > 50 Ohm. Good results on both bands.

A Bit of Modelling

I modelled the Ls described above, perhaps unnecessarily because that just confirmed my on-air experience from the practical trials. Clearly, for my inter-G requirements, the 3/4w was the winner BUT that wire length meant that several feet of wire at the end had to be bent down and back into the garden to accommodate. Modelling showed that bend and the high impedance end nearer to earth did not help the cause and the arrangements for the wire bend and pull-back led to a little more visual impact for neighbours.

What to Try Next

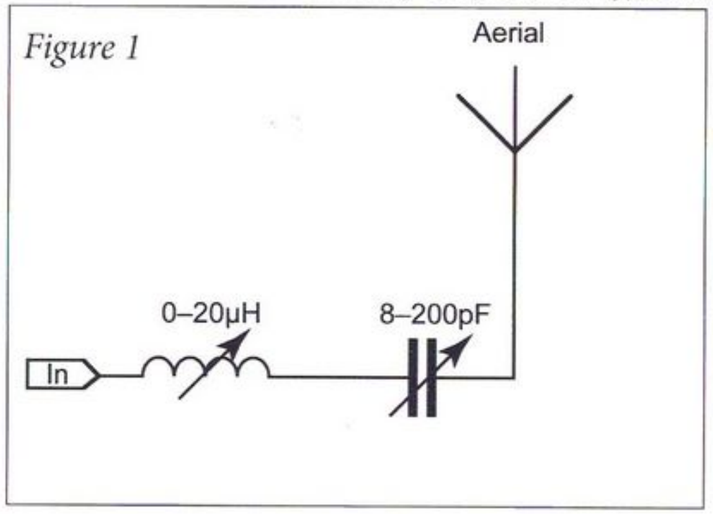
So, where to go next? Well having started up the modelling programme, had TWO coffees

and pushed my over-worked brain cell to drive the interface, I set about some virtual tinkering. The result of which suggested that it might be possible to come up with a solution. After a bit of real tinkering in the garden, I found that it was indeed possible to reduce the total length of wire and not noticeably detract from the high angle usefulness and to achieve 80m/40m operation without the need for a switch. This allowed the aerial to fit into my garden and therefore not need to bend down and back, which, in turn, meant a lighter pole could be used at the end and I didn't need a back-stay guy and so, importantly for my constraints, a much neater solution.

The Final Design

The inverted L is a simple aerial but it does need to work against a radial field of some sort. Many small garden areas cannot accommodate ideal radial directions or lengths and, inevitably, this means that there is more resistance in the system than one would wish. One slight advantage of this final efficiencydesign is that the feed impedance of the 89ft of wire (28ft up and 61ft slightly sloping down and away) is > 50 Ohms so the impact of the earth resistance is reduced and overall efficiency is up a bit on typical λ/4 system efficiency. The main advantage of the longer top section for my purposes is the good NVIS/higher angle radiation.

Figure 1



On my wire/earth Inv. L system (yours may vary a little of course), in the middle of the bands, I measured around +230 Ohms reactance on 40m and -300 Ohms reactance on 80m. To cancel the reactance(s) and help achieve a concurrent match on both 80m and 40m without remote switching, I utilised a series arrangement of L and C, the effective combined reactance of which shifts in each band to pretty much cancel that offered by the wire.

As an example, if my inductance measures 11.73uH and my capacitor measures 76pF, the reactance presented by these components at 7.1MHz is +523 Ohms and -295 Ohms (summing to +228 Ohms) and at 3.65MHz is +269 Ohms and -574 Ohms (summing to 304 Ohms) – so it can be seen how the reactance encountered on the two bands can be cancelled without switching.

I used and old roller coaster and an old valve broadcast receiver variable capacitor for my experiments and by slightly tweaking either or both, reactance can be cancelled out for the required segment of both bands simultaneously. As you might imagine, reactance does not change so quickly on 40m as it does across the 80m band.

Once reactance is cancelled, all that is required is to drop the final resistive load value down to better match the coax feeder impedance. My aerial system presents a higher impedance at 3.8MHz than at 3.5MHz, passing through 100 Ohms in the band. On 40m, as with reactance, the impedance changes less across the band but is also around 100 Ohms.

There are a number of ways to achieve somewhere between 2 and 2.25:1 transformation..... you may already have such a transformer (UnUn) to hand. I believe I used a T200-2 toroid for my transformer. I used the trifilar winding approach (used 11 turns) and did actually wind it such that I could vary the transformation ratio slightly with a couple of taps at 10 and 9 turns but it seems not to be too critical.

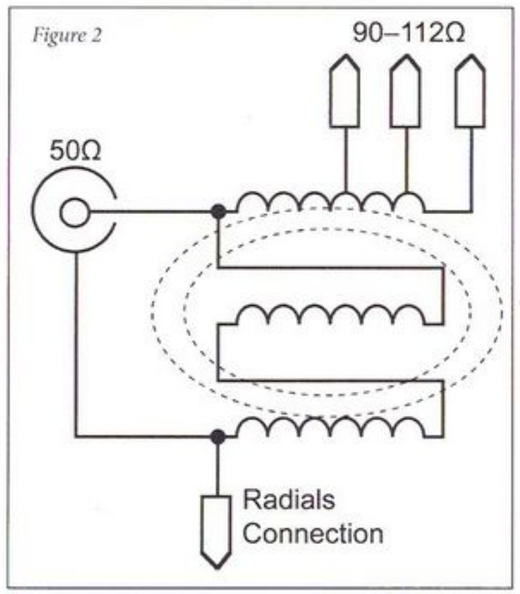
My matching system looks like Figure 1:

And

my toroid transformer wired like Figure 2:

A diagram of matching arrangement at base feed point. So, if your needs are similar to mine, then you could do worse than to try something along these lines?

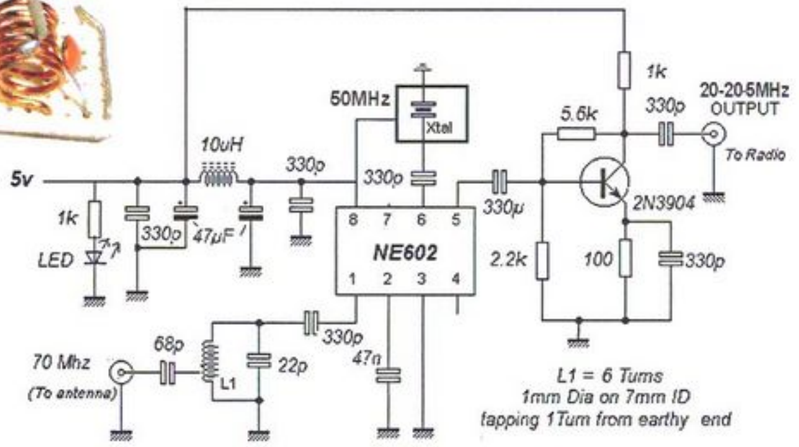
Figure 2



A Simple 70MHz downconverter

Peter G4UMB

So I could listen to my local 4m repeater on 70.386Mhz FM and local stations, I made this simple receiver converter.



I found this circuit on the internet and modified it to make it simpler .The 50MHz crystal oscillator is a ready made unit from Ebay. Coil L1 is the only component that needs making. I wound 6 turns of 1mm diameter wire on a 7mm drill shank with a tapping at 1 turn from the earthy end. The crystal module mixes with the incoming 70MHz signal to give you an IF frequency of 20MHz So it can be received on a regular HF receiver.

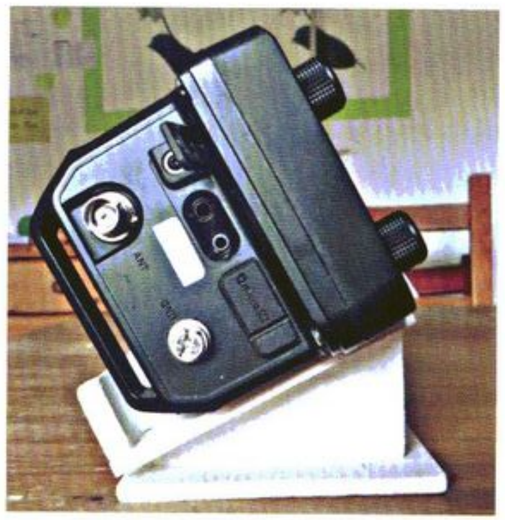
The NE602 IC mixer is available from Club sales. My dipole ant. is simply made from 2 lengths of 101 cm. long threaded bar. Screwed to a piece of plastic trunking The circuit is made on strip board. Perhaps the sensitivity could be improved by adding a VHF RF pre amp IC eg. a MAR-6 or a SPF5043.

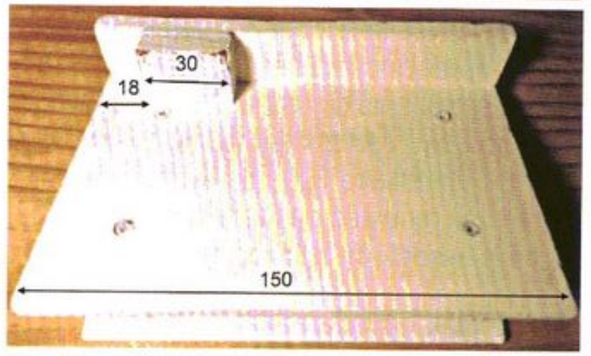
An Icom 705 table-top support

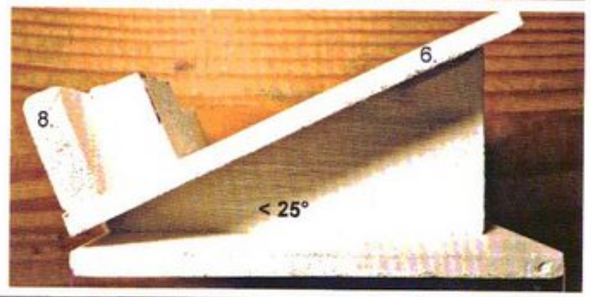
Jürgen Carow DF3OL

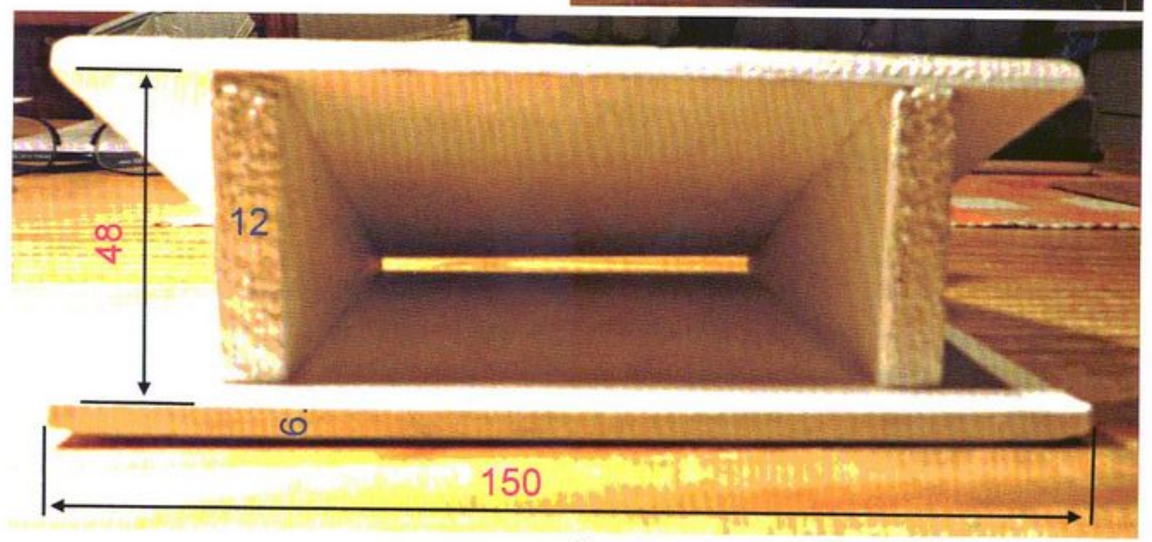
The IC705 is quite compact and this makes it difficult to operate on the table top. So I made an angled support stand for it to sit on. Now the transceiver sits tilted up at an angle.

The operation has now become very simple. The support is made of 8mm thick balsa wood, which is glued together and then painted to preference. The pictures show the dimensions and steps taken









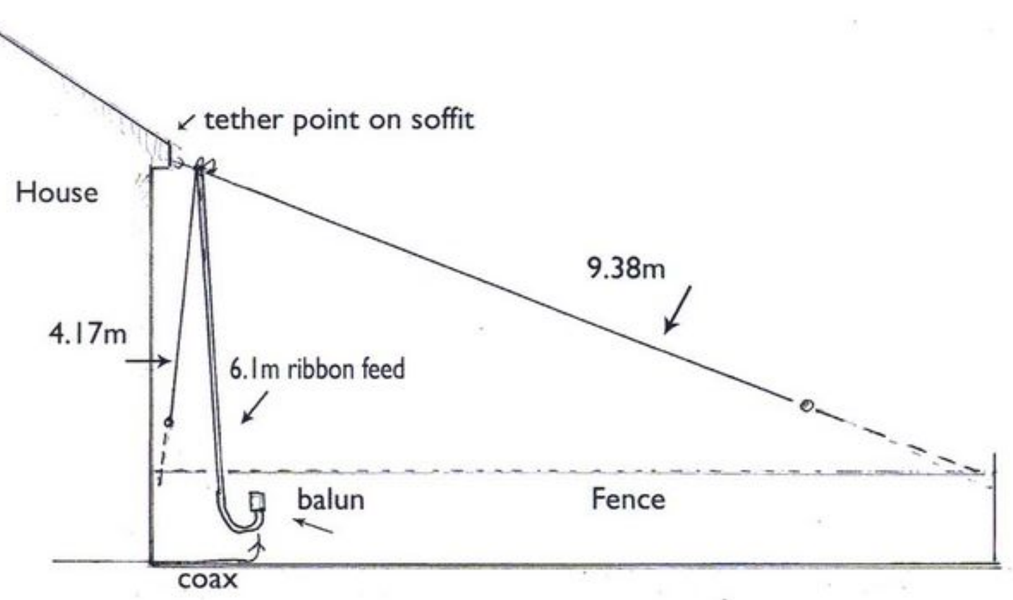
A 30m Band Off-Centre Fed Dipole

Ken Maxted, GM4JMU email: kjmaxted@gmail.com

This antenna was designed to present a no-tuner 50 ohm feed on 30m and has the additional feature that it is easy to tune on 40m and 20m with a simple Tee match tuner or auto-tuner and does not require any additional counterpoise or ground connection when doing so. The off-centre feed-point is not quite at the one-third, two thirds place recommended in antenna books for use with a ribbon feeder but it is this that achieves an exact match on the 30m band.

I needed a discrete wire antenna at my new house, preferably end fed. The antenna is erected with the feeder junction at the eaves soffit board and slopes down to a fence at the end of the garden, only just over 33 feet of space is required, the feeder, 300 ohm ribbon, is taken down to a fence alongside the house and the shorter length of the main span 13' 8" (4.17m) is also taken down to the same fence from the soffit board but at an angle from the feeder, spreading to a few feet apart.

The current maximum, which in a conventional dipole is at the feed-point, is out along the 30' 9" (9.38m) part of the main span, in the clear. At the coax connection end of the 20 feet (6.1m) of Westlake 300 ohm window ribbon feed-line, is a Guanella type balun in a small plastic box mounted on the fence with an SO239 socket for the main coax feed. The balun, which is essentially a 1:1 common mode choke is essential but is easily constructed.



The 300 ohm feeder length is a quarter wavelength transformer which has been adjusted to allow for the velocity factor of the ribbon used. It is likely that any heavy duty 300 ohm ribbon feeder will be similar and the 20 foot length used will be reliable. At this QTH it was measured out using a VNA to check the characteristic impedance and establish a true quarter wavelength with a 1.8k end load to simulate the high impedance end which transforms along the ribbon cable to 50 ohms non-reactive.

The antenna span is a half wavelength on 30m cut at a point at which its characteristic impedance is also 1.8k and connected to the top end of the ribbon. If the main section is cut to 30' 9" (centre insulator to end insulator) all adjustment can be made by varying the length of the sloping short end section, so it is suggested that this is cut to be 15 feet long and folded back on itself to a nominal overall length of 13' 8" from the feed-point insulator to the end. It is simply adjusted for minimum SWR on 10.125MHz and this should result in a perfect1:1 SWR match.

It is possible that an antenna mounted at a much greater height would show a different impedance at the off-centre feed-point but for practical purposes in a normal installation these measurements should prove reliable.

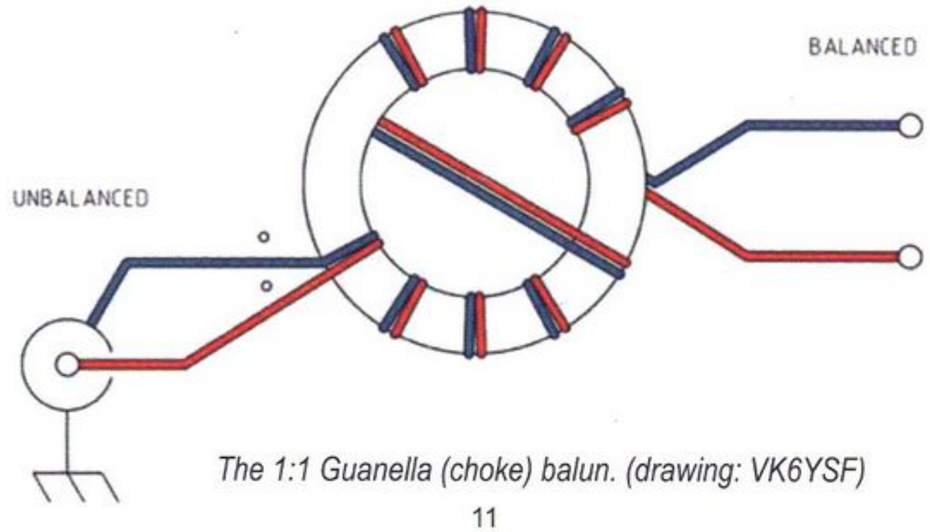
My Guanella balun was constructed on an RSGB supplied ferrite ring (the type supplied for interference suppression) and comprised 8 turns of twin enamelled balun wire (SPRAT Supplies) in a Z-configuration (ie four turns on one side, then through and across the core to repeat four turns on the other side, the input and output being diametrically opposite). It is terminated at one end in the SO 239 socket and at the other in two 3mm sockets for the ribbon feed-line. A twisted pair of enamelled wire or connecting wire could also be used, as could a length of figure-of- eight twin flex, it is not critical at this frequency. The balun always remains in circuit and the tuner, if other bands are required, can be located at the shack end of the coax feed. I always use it without a tuner on 30m. As the antenna presents a medium impedance on 40m and 20m (and nearly a perfect match on 29MHz), the losses on tuning at the shack end of the coax are negligible.

Dimensions and construction:

Made like a conventional dipole but with an offset feed-point where ribbon feeder is connected directly. The feed-point is also close to the wall attachment for the house end of the antenna.Main span 30' 9" (9.38m) in a straight line plus 13' 8" (4.17m), cut about 50cm longer and folded back on itself for adjustment and sloping down to a tether point a meter or so away from the feeder.

Feeder length, 300 ohm heavy duty ribbon (Westlake), 20' (6.1m), measured between connection points. whwestlake.co.uk

I used SOTA light duty antenna wire for the main span and end section. End insulators and the centre Tee insulator were cut from an old plastic kitchen chopping board.

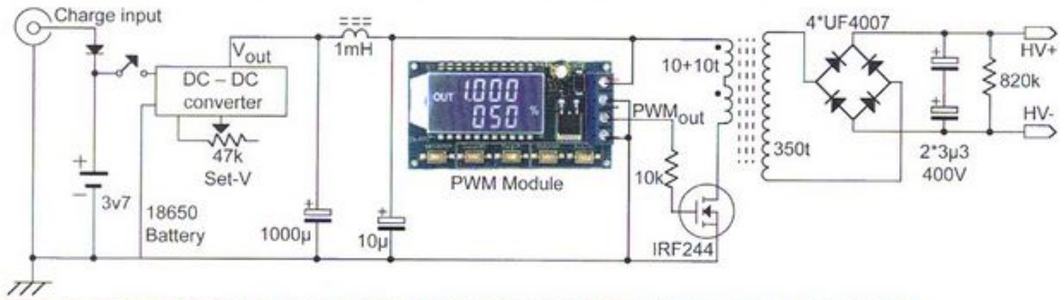


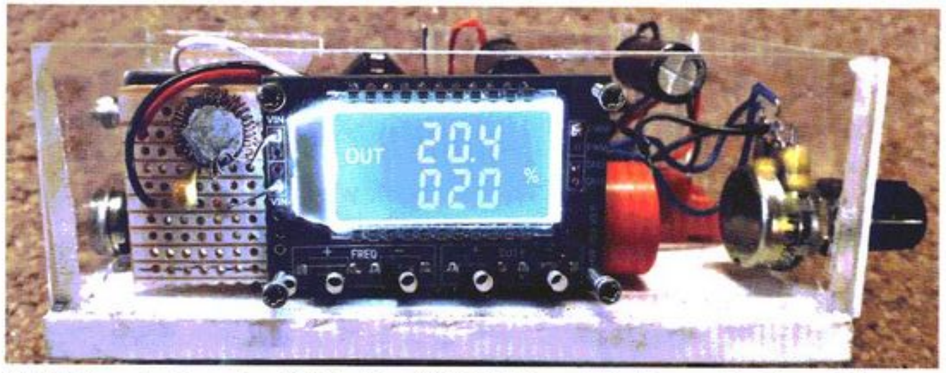
The 1:1 Guanella (choke) balun. (drawing: VK6YSF)

Experimental High Voltage PSU

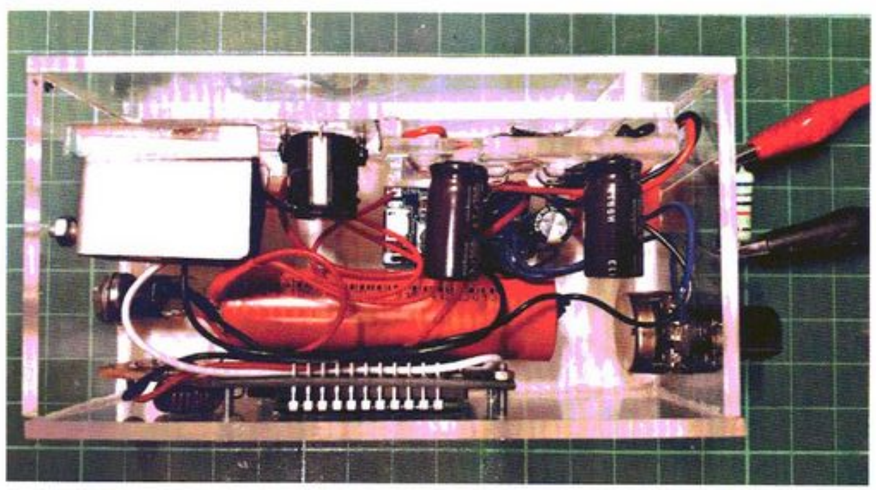
Richard Wilkinson G0VXG

This is a PSU that has a voltage range from about 50 to 800+ volts at 1W output power. I have always had problems designing efficient high voltage PSUs and in the past have used variable mark space ratio 555 timers. Looking on "Ali_bay" I notice a PWM module that went up to 150kHz and had a variable duty cycle of 1 to 99%. The parameters are either entered via 4 switches or through a serial link and they only cost a few pounds.



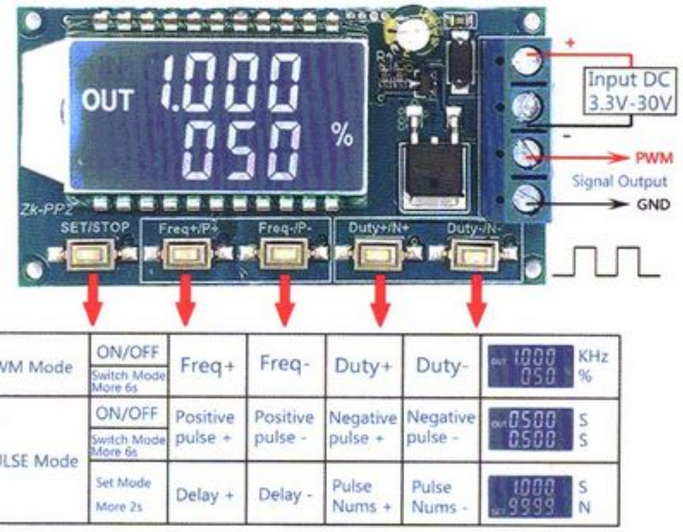


By varying the frequency and duty cycle I could get an efficiency of up to 85%, depending on the load and a voltage up to 800V. I wanted run the PSU off an 18650 LiPo cell but found that I could only get about hundred volts, so decided to use a Boost converter. These come with a 100k trim pot so I removed it and connected a 47k pot to make it easier to use, this gave a voltage range from 3 to 15 volts. The transformer consisted 10+10 bifilar turns for the primary and 350 turns for the secondary and was wound on a 20x15x15mm ferrite core. The output is full wave rectified using 4 x UF4007 diodes and smoothed with 2 x 4.7 400v capacitors from an old CFL lamp. I added a 1mH + 10µF filter to the PWM module to prevent any spikes causing problems.



Also added an 820k resistor to the output to limit the voltage when off load.

The sides of box are made from offcuts of Plexiglas (thanks to John M0XJA) and the base from Foamex printing board.



Uses:

I have tested the PSU with some old valves that I have had for ages and was not sure if they worked. Testing Neons and Nixie tubes also high voltage Zeners works well.

I needed a high voltage to calibrate an electroscope which will be used to test Zamboni piles. These consist of a square of aluminium foil and a paper square covered on one side with manganese dioxide and charcoal powder bonded with wall paper paste. They produce a voltage of about 0.5 to 0.8 volts with a current in the nano amps. There is a famous piece of kit called the Oxford bell ‡ that has been ringing for 185 years and contains some 2000 piles.

I hope that you find this little project of interest, it gives a good insight into flyback transformer circuits and switch mode PSUs. By adjusting the frequency and duty cycle by a small amount can make a big difference to the efficiency of the PSU. With the PWM module going up to 150kHz smaller cores can be used and experiments can be conducted.

‡ The Oxford bell

This remarkable 'machine' resides at the Clarendon Laboratory at the University of Oxford. In the mid-1800s, Robert Walker, a physics professor at the University of Oxford, acquired an interesting device. It was a battery designed to propel a hanging metal ball quickly back and forth, between two small bells. Today, 183 years after it was manufactured, the Oxford Electric Bell, as it is often referred to, is still ringing—in fact, it is said to have rung over 10 billion times.

Built by Watkins and Hill, a London instrument-manufacturing firm and with a note attached in Walker's own hand reading "Set up in 1840," the battery would eventually come to be displayed at the University's Clarendon Laboratory.

How exactly has the apparatus, dubbed the "world's most durable battery" by the Guiness Book of World Records, functioned for so long? No one knows for sure. That's because, as Koebler points out, opening the device could potentially "ruin an experiment to see how long it will last."

20m Delta Loop Antenna Revisited

Charles G4JQX GQRP No. 553

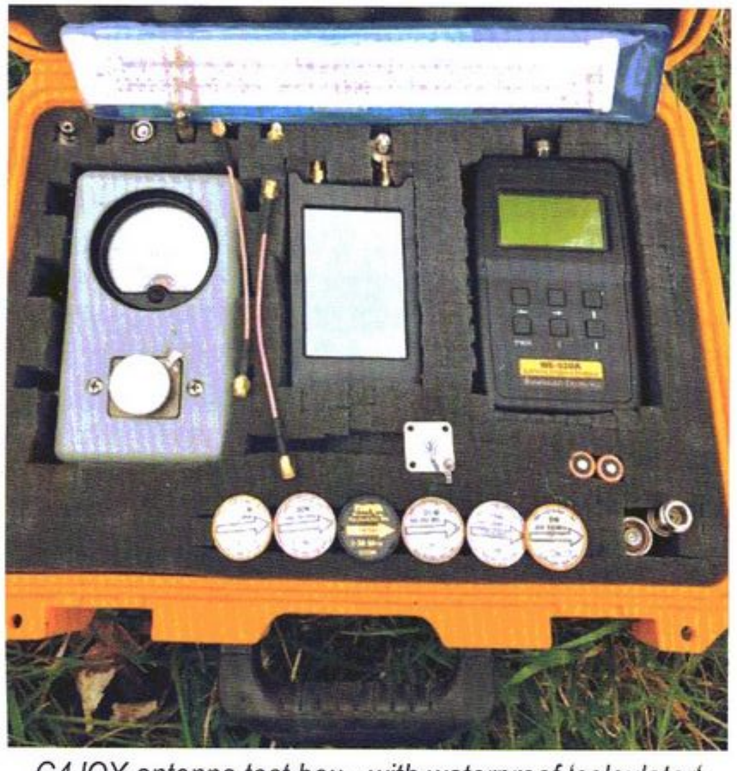
I must thank **Tuomas OH5JJL** for his article on the 20m Delta Loop in *SPRAT* 194 (page 22) where he draws attention to the DL4AAE 50Ω impedance matched design. I've never considered using one because I always thought some form of matching network would be required to get from the 100 -150Ω loop impedance down to either 50Ω for coaxial cable, or up to 600Ω for my homebrew balanced feeder runs.

I live on the northern escarpment of Salisbury Plain and it's a very windy place due to the updraughts caused by the high Plain and anything high (or even not so high) up in the air attached to a wire antenna rapidly creates stress fractures in the wire and will not last long. As an example, the usual commercial window ladder line only lasts a few weeks. So, antenna solutions here have to be robust and present minimal wind loading. Installation testing is also performed by our sheep – so if the wind doesn't cause damage, then the sheep will.

Temporary knots will be chewed off, unprotected cables will have insulation stripped and anything presenting a respite from the wind will be used as a shelter. It had never occurred to me to try and find a 50Ω match in the manner as you would with an Off-Centre-fed (OCF) antenna, so I'm grateful to Tuomas for pointing out that DL4AAE showed that it's possible.

Unlike the implementation detailed in Tuomas' article, I prefer the inverted Delta loop configuration – ie with the tip pointing at the ground. We have plenty of organic supports here for the upper guys and the single downward guying attachment for the tip, gives the sheep less to chew through. In fact, by using a long metal stake, I can get the single downward guying attachment above sheep height. The inverted Delta will also be vertically polarised and will benefit from the higher effective height – even lower angles of radiation are a possibility than Tuomas suggests because of the inversion.

The main 20m antenna here is an ex-military ship quarter-wave configured as a Marconi vertical with 50 or more radials and wire netting laid out as a buried mat – so it's a good comparison for an experimental delta loop. Radials are buried (think sheep again) and the Marconi vertical is approaching the idealised 38Ω vertical in terms of its impedance.



G4JQX antenna test box - with waterproof 'calculator' (thanks to G1TEX for the gift of the 'slip-stick'!)

Delta loop Construction and Tuning

I have plenty of multi-strand insulated copper wire bought cheaply when the UK harmonised wire colours came in, so I used this for construction, it will stretch a little in the wind in due course. I used the old fashioned egg insulators in each corner and a dipole centre for the main feed point. I cut the wire length to 23m initially (Tuomas recommends a final length of 22.46m) with the extra length left in the flat top of the delta. A 20m run of RG58 served as the testing feeder and after calibration with the feed line in circuit, a nanoVNA was used to measure resonance.

Raising the loop to 2m off the ground soon had me trimming 400mm off and the loop was resonant on 14.040MHz. Tuomas was right to caution about height and impedance though, I had trimmed off a bit too much – with the loop top up at 10m or so height, the resonant point had moved to 14.140MHz. However, the SWR was still plenty low enough in the CW end of the band to not worry about it and of course, the loop would grow slightly over time in the wind.

The coaxial feed position appeared to be critical though – it needs to come away at right angles to the feed point because if it does not, the impedance varied as it moved. I created an air cored choke 4" diameter air cored choke with the 10 turns of RG58 cable with (15 turns would have been better, but I didn't have enough coax left to reach my field coax disconnection box) and tied this into one of the tree support ropes and led the coax cable away more or less at right angles. Final checking with my Waterbeach antenna analyser in the shack showed a good match.

Directivity

The Reverse Beacon Network was used for initial comparisons between the established 20m Marconi vertical and the new Delta Loop. The test is simplistic, but useful.

There is no doubt the Delta Loop works well. Conditions were reasonable on 20m (SFU 160, A15, K1) for initial testing and a late afternoon CQ call on both antennas (but on different frequencies) soon had plenty of returns on the Reverse Beacon Network. The RBN network showed that the delta loop was directional through the open sides of the loop which was aimed to North America – and indeed, in this direction, it appeared to outperform the established Marconi vertical with more 2000+ mile RBN returns in the aligned direction.

To the south and north the Marconi vertical got a lot more returns, indicating that these directions were a null for the delta loop. At height then, I think it can be concluded that the inverted delta loop is directional and is in line with text book theory. Tuomas indicated that at low heights the antenna should be omni directional – but this configuration is just not practical here with the sheep police.

QRN

The delta loop is more responsive to noise than the 20m vertical – at least at this QTH. Being on the edge of Salisbury Plain, high up, with only the military for neighbours, we have a very low background noise floor. However the self-inflicted noise from electric fences, 3-phase inverter water pumps and the like that we need at this QTH to manage and water our animals, were at higher levels on the Delta loop.

Although the noise certainly wasn't bad, but could be sufficient to lose a very marginal contact – for more general QSOs the noise level wasn't noticeable and indeed, my commer-

cial rig noise blanker has no difficulty with electric fence pulses. I just put up with it on my homebrew rigs that don't have this luxury.

I hastily compared the loop noise pick up with a portable 20m EFHW set up in the horizontal plane at 10m as well and the delta loop was significantly better. Textbooks and folklore will claim that verticals are inherently more responsive to noise, but I have always found the opposite to be true here at this QTH. A Marconi vertical with a good radial base is exceptionally quiet here – but no doubt the combination of plentiful radials and the chalk / green-sand Salisbury Plain uplands, has something to do with it. It looks like a Delta Loop with vertical polarisation is nearly as good.

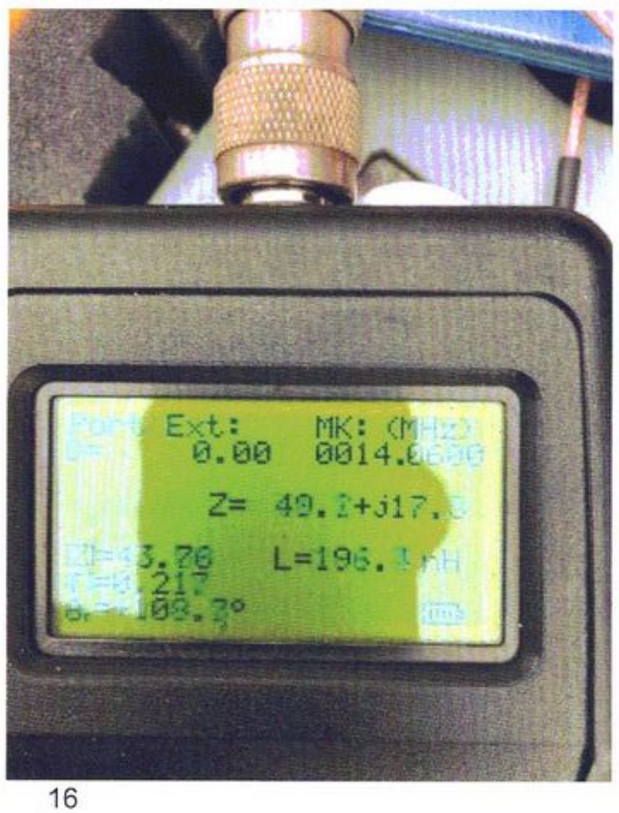
Operations

With it being lambing time here at the time of testing, I had the opportunity to operate at strange hours. Conditions are good currently of course – but there is no doubt the inverted Delta loop is a very good performer indeed – it is more directional than the stand alone Marconi vertical and it outperforms the vertical in those directions by two S-points or so, which is more than expected. However, its ability to "fill in" the fading experienced on DX signals received on the Marconi vertical makes it a very useful addition. It has been great to listen to a DX signal on the Marconi and as it starts to fade, flip over to the delta loop and get the signal back. During initial QSOs I established that the delta loop nulls were about 4-5 S-points down for EU contacts.

It was during the evening greyline times that the delta loop really held its own – on a later day with solar flux index (SFI) at 158, A 8 and K0, conditions were good and RBN reported both the Marconi vertical and the delta loop being heard by ZL3X and both at similar SNR. The Marconi vertical got there first as the greyline progressed, but the delta loop was close behind it. For closer in contacts less than 1000 miles, the delta loop outperforms the Marconi vertical on most occasions – the directivity appears to be less pronounced and I am looking forward to giving it a good work out in the forthcoming months.

In conclusion, the 20m vertical with all the attendant radial work and ground mats just has the edge over the delta loop for DX at this QTH– but it's a close thing. If you haven't got room for a radial field, but you can get a delta loop in a favourable direction up in some trees, then I would highly recommend you try it – I will not be taking mine down (but the sheep might!).

73 Charles



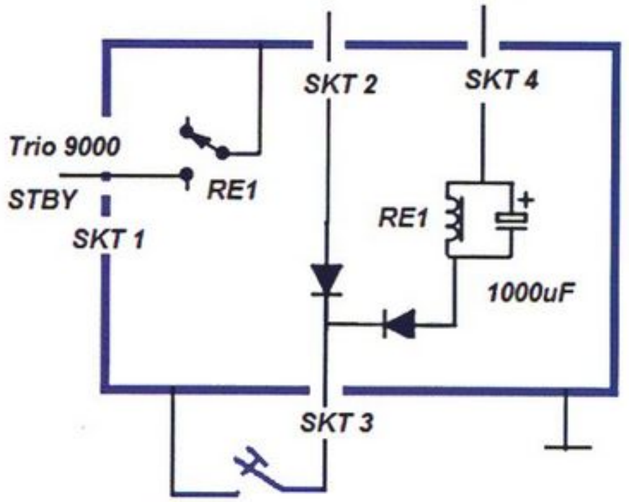
Final loop configuration test

A Simple Break-in Circuit

G4UMB

I recently bought an old Trio 9000 VHF Multimode rig. When using it on CW you have to hold down the PTT mic switch to allow it to transmit otherwise you just hear the side tone. The Trio 9000 has a 2.5mm jack socket (STBY) on the rear to connect an external switch which duplicates the PTT switch. You could buy an accessory for the Trio 9000 which plugged in to this jack socket and gave you the facility. I would have preferred the Trio to have had a break-in feature so that I didn't have to hold the Mic PTT switch at the same time as keying. So I made this circuit in a small box to overcome this .

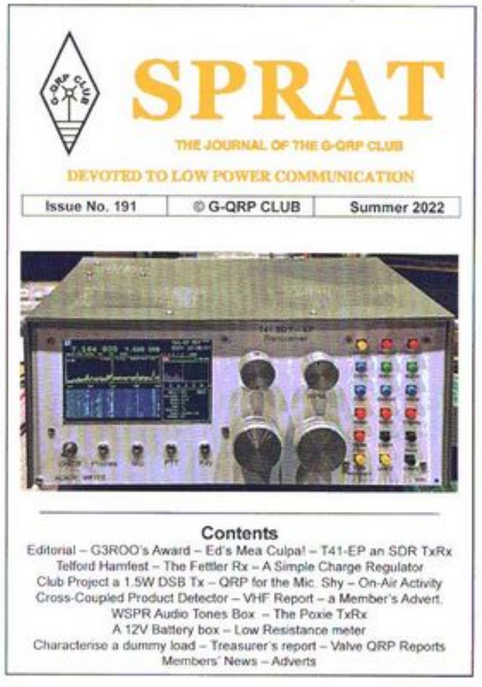
The 1000µF cap. can be increased in value to further delay the receive changeover. With my relay coil resistance it will hold the relay on for about a second after you stop keying.



CW Breakin Adaptor for Trio 9000

Update to WSPR Audio Tone Article

Paolo IK1ZYW


SPRAT

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DEVOTED TO LOW POWER COMMUNICATION

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While reading through *SPRAT* 191 I came across a mention of a previous 'work' of mine by Hugh GM-8FXD, in the WSPR Audio Tones Box article. I would like to issue a warning for the RTC modules as some models included components to charge a LIR2032 coin cell. If a non-rechargeable CR2032 was used, it would be subject to a charging voltage leading to battery damage.

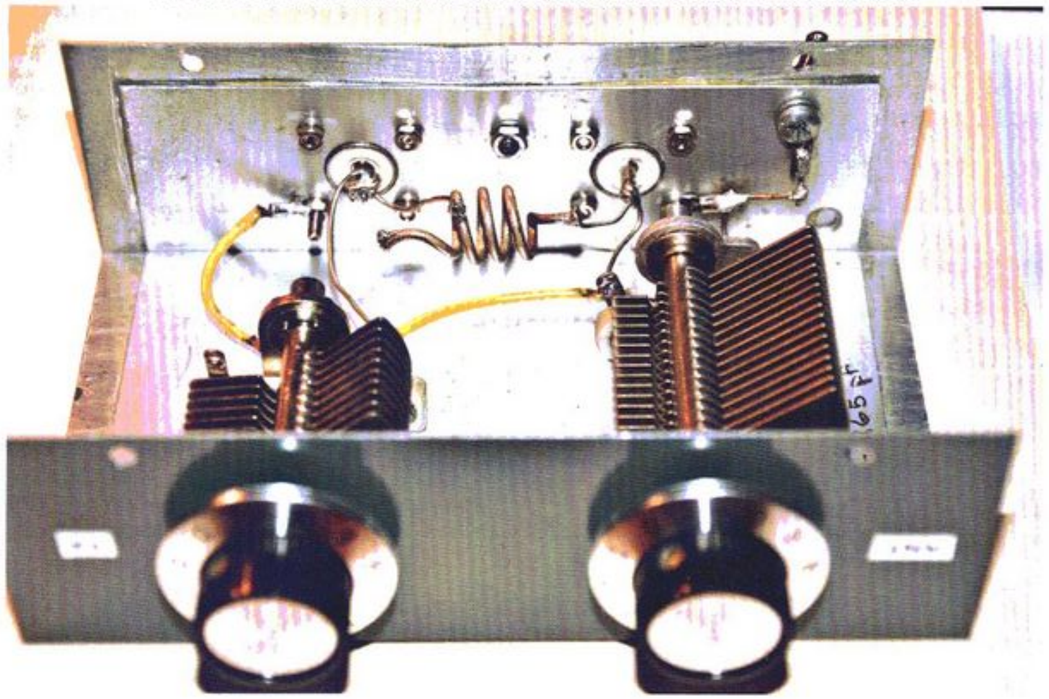
I have documented on my blog how to identify the extra components and a couple of ways to (permanently) disable the charging feature. I don't own the exact module shown in colour in *SPRAT*, but you all know how to find out with a voltmeter if a voltage is applied to the battery when the module is powered with 5V.

Stay safe and good DX!
72 / 73,
Paolo IK1ZYW

A 6 Metre Pi-Network Tuner

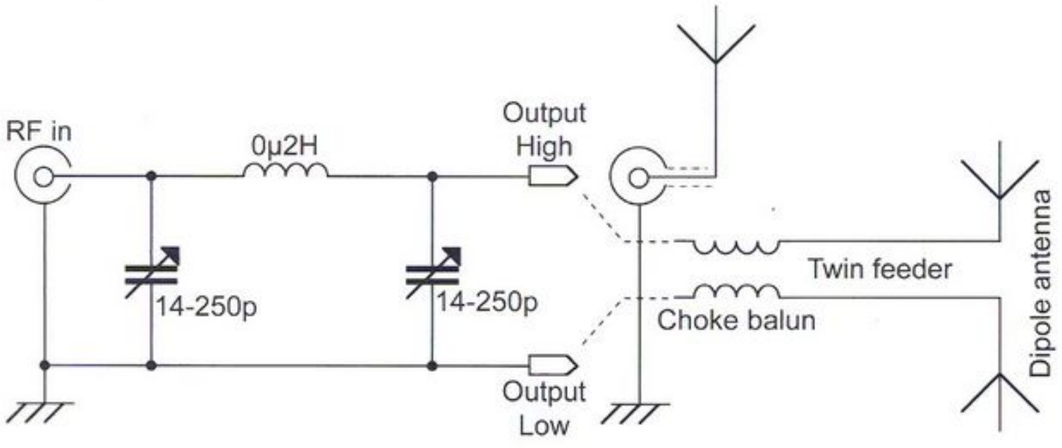
Matt Newman, VA3MGN

"Well suited for the unbalanced coaxial cable fed antenna"



In most cases a tuner for 6 metres is not needed if the antenna is properly balanced. However not all antennas fall into this category. Typical is an unbalanced (asymmetrical) coaxial cable-fed antenna such as the long wire, ground plane, OCF dipole, mobile, or ¼ wave whip.

The 6m pi-network tuner depicted here is well-suited for the unbalanced antenna, especially true in a smaller setting with limited antenna options. or with the use of a suitable choke balan, balanced twin feeder. It is able to match a wide range of impedances and can achieve a 1.0:1 match across the entire 6m band. Components shown are large enough to handle a Drake TR-6 on 6m at 175 watts. Hand capacitance is minimized since capacitor rotors are grounded.



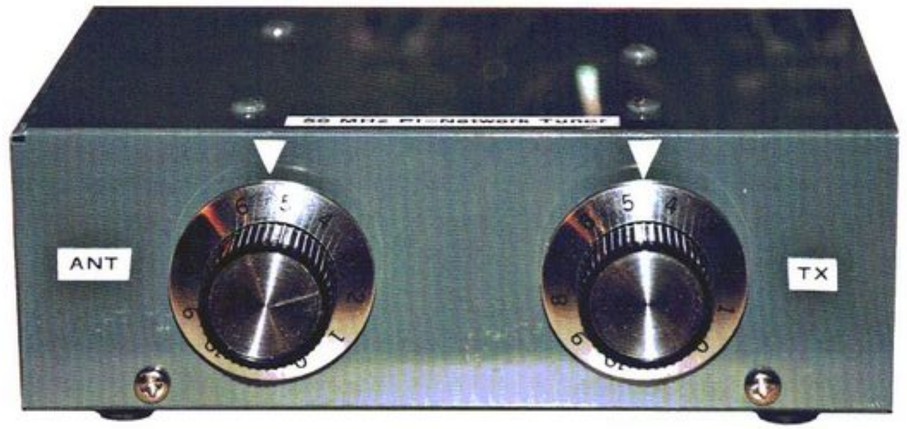
The tuner is built inside a 2" H x 3-1/2 " D x 6" W chassis with two female N or SO 239 connectors and two variable caps, 100 pF each. Chassis size is determined by the physical size of the variable caps and spacing between each. Pig tails of the coil between the capacitors should be no longer than 3/8 inch. Ensure the coil is located at least ½ inch or more away from the chassis.

The inductor is made from #10 solid wire, 9/16 OD, 3 turns. It measured 0.030 uH out of circuit. Spreading the turns out will lower the inductance, squeezing them together will increase the coil value. With the aid of a VSWR antenna analyser, adjust your coil and tap point with the variable caps in mid range for a 1.0:1 match. Connective wire is 14 AWG insulated.

Due to losses with coaxial cable and the possibility of high antenna impedance, it is highly recommended that a current balun be used at the antenna feed point. Current baluns isolate or add impedance to unwanted common-mode current paths, reducing or controlling common-mode current.

Matt Newman, VA3MGN, is a member of the York Region Amateur Radio Club, RAC, and the ARRL. He can be reached at ***va3mgn@bell.net.***

VE3IPS: We have several 6m nets operating in the Toronto area as many users are exercising the 6m capability on the HF radios. The tuner allows low band SSB use on 51.0 MHz and then FM Simplex or repeaters up at 52.525 MHz. Antenna experimenters will find a dedicated 6m tuner to allow better matching capability.



QRP SWR Protection Circuit

Ron Taylor, WA7GIL, wa7gil@gmail.com

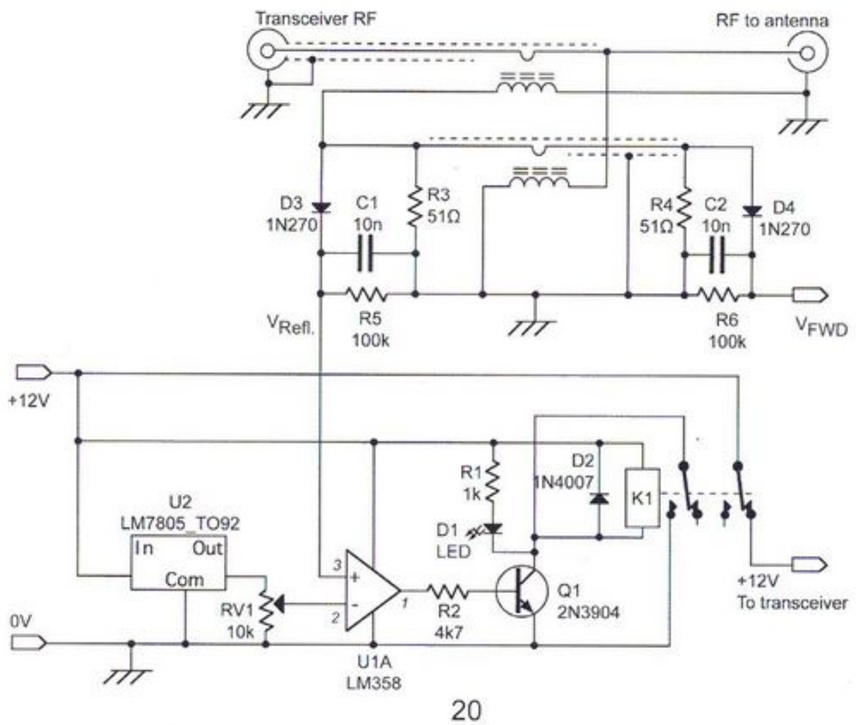
After reading a lot of stories about destroyed finals due to high antenna SWR, I wanted to show a simple circuit I came up with to use outboard to any QRP transceiver. I'm sure others have made circuits similar to this and I did not do an extensive search to see what was out there. I make no claims as to being the originator and make no guarantees of performance. Use it as you see fit.

It consists of a standard 2-way directional coupler with diode detection for Forward and Reflected voltages. That part is taken from the ARRL Handbook and is used in many SWR meters, including the Oak Hills Research WM-2 QRP wattmeter. It can be home-brewed with a couple of FT50-43 toroids and some small coax and miscellaneous parts or can be purchased from various sources.

I only used the reflected voltage and I added an op amp as a comparator to energize the protection relay when the reflected voltage goes above a pre-set value. This would mean the forward power should be in the QRP 5 watt class to get enough reflected voltage at say above 2:1 SWR to trip it with the settings I show in the drawing.

Enterprising hams can make use of a small microcontroller as well as both forward and reflected voltages and actually calculate the SWR and set a SWR level at which to produce the circuit trip command in order to be more precise at other power levels.

This circuit energizes a DPDT 12 volt relay when reflected voltage goes above 0.44 volts measured at pin 2 of the comparator and adjusted to that value with the 10K pot, (your results may vary) which, in my case was an SWR value above 2:1 and less than 3:1. The set point is adjustable to any sensitivity you want. One set of normally open contacts keeps the relay energized until power is removed. The other set of normally closed contacts is in series with the 12 volt supply to the transceiver. I know there is a finite relay energization time that could be long enough to destroy finals anyway under certain conditions of voltage or current maxima, but it is less than the length of a dit at 20 WPM and, at least with this circuit, if your antenna falls down while transmitting, the very next "dit" or "dah" should cause the rig to shut down, hopefully saving the finals for another day and there should be no smell of the magic smoke permeating the shack.



I constructed a prototype using dead bug style wiring for the coupler and a breadboard for the comparator. This is a brute force protection method and you will think the rig failed, but simply fix the antenna issue, power it back up to reset it and start transmitting again.

The single turn on both toroids is a piece of RG-174 or similar diameter coax passed through the centre of the toroid after winding 12 turns of any wire that fits. Only one end of the coaxial cable shield should be grounded as shown in the schematic. Construction was done on a piece of plain one-sided copper clad board, using dead bug construction.

Later a 4.7µF cap was added to the base of the relay driver transistor to actually slow the response slightly. I was seeing a burst of voltage out of the LM358 on circuit initialization that could trigger some relays. Start off without using this capacitor and add it or less capacitance only if needed.

Of course the best SWR protection for your QRP rig is a dummy load or known good antenna. With the widespread use of Hi-Q loop antennas and short loaded whips it is a little harder to guarantee an antenna will stay at a low SWR for extended periods of time, so some sort of vigilant SWR monitoring might make the difference between a working rig and a funny smell.

Tribal Knowledge

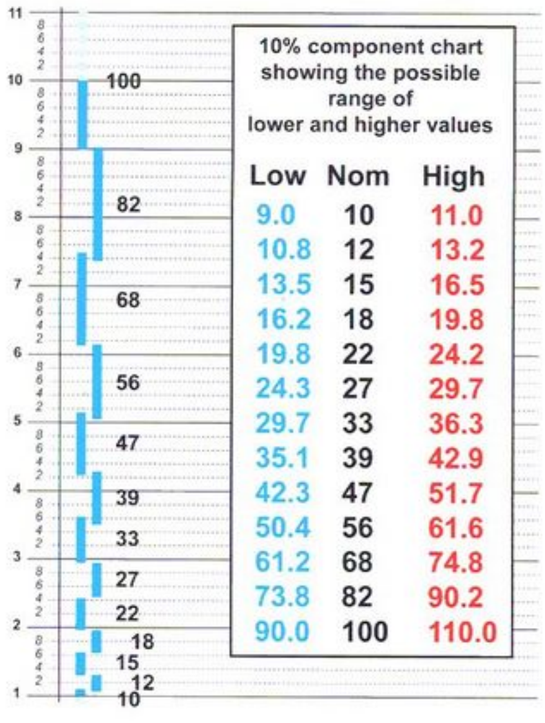
'Anon'

While acting as an 'Elmer' for some members in our club, some, found electronics was still a bit of a challenge. I noticed that some didn't quite follow the significance of the tolerance bands available for components.

There was some confusion mainly as to why some values that they could measure with their multi-meters, didn't seem to match up with the colour code printed on the resistor bodies.

With a view to illustrating the reason why, I came up with the chart shown on the right. This chart only covers the 10% tolerance numerical values, with steps with the series of 10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68 and 82 before repeating.

Some found it interesting that there were some small gaps, when no actual value should be found, and places where either of two values could appear on some measured components.



10% component chart showing the possible range of lower and higher values

Low	Nom	High
9.0	10	11.0
10.8	12	13.2
13.5	15	16.5
16.2	18	19.8
19.8	22	24.2
24.3	27	29.7
29.7	33	36.3
35.1	39	42.9
42.3	47	51.7
50.4	56	61.6
61.2	68	74.8
73.8	82	90.2
90.0	100	110.0

A WSPR / QRSS Amplifier

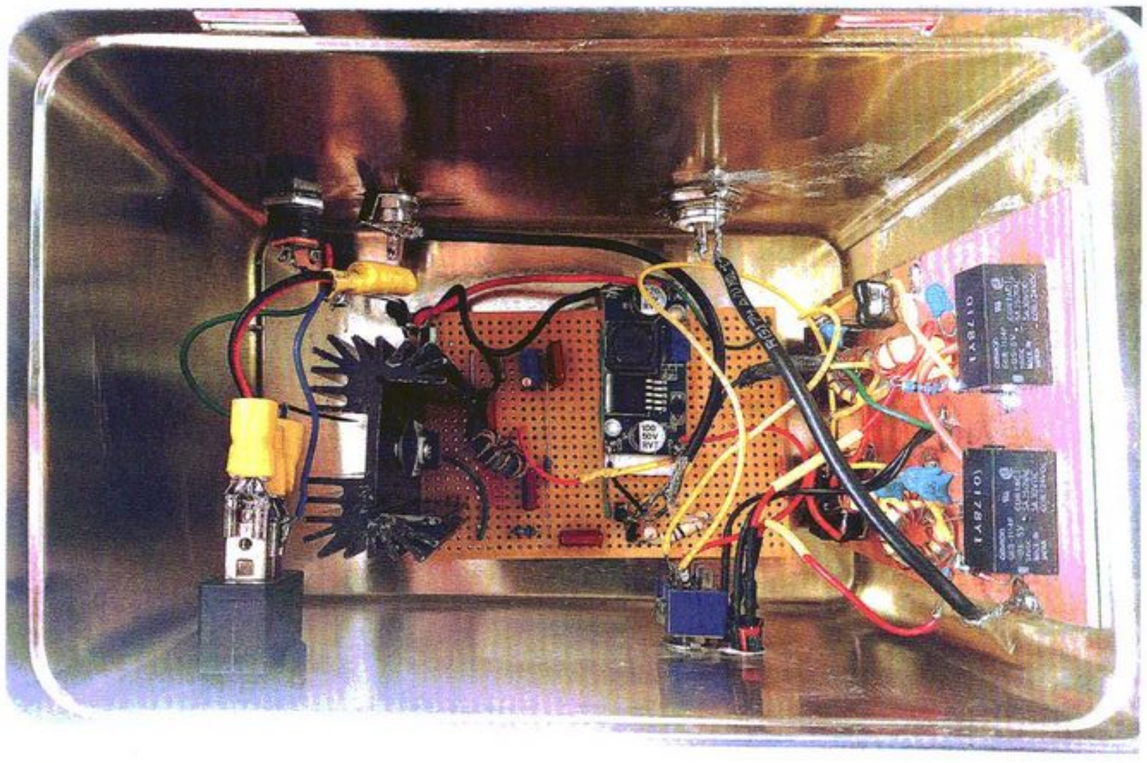
Andy Eustace, M0RON, email: aeustace@sky.com

I have a good friend, **Eddie, 2E0ETU**, who doubted that he would be able to gain intermediate. But by gently encouraging him he passed to his amazement. Now Eddie is in poor health but derives great satisfaction from his QRPLabs U3S, which I built for him, seeing where his couple of hundred mWs is received from a far from optimum antenna.

I decided to build him a small amp to help him on the higher bands as the power from the U3S drops off substantially after 17MHz, I decided on a simple IRF510 amp with 2 filters relay controlled via a toggle switch.

There are plenty of these simple amps online, G0FTD is one such design. I decided to use 24V as I had a handful of 24V relays lying around in a box, indeed the whole amp was built from bits that were easily to hand. To get the 24V I used an ebay XL6009 DC-DC boost module with 12V input, the input was split with one feed going to a 7805 for the bias feed via a variable resistor and a couple of others to base.

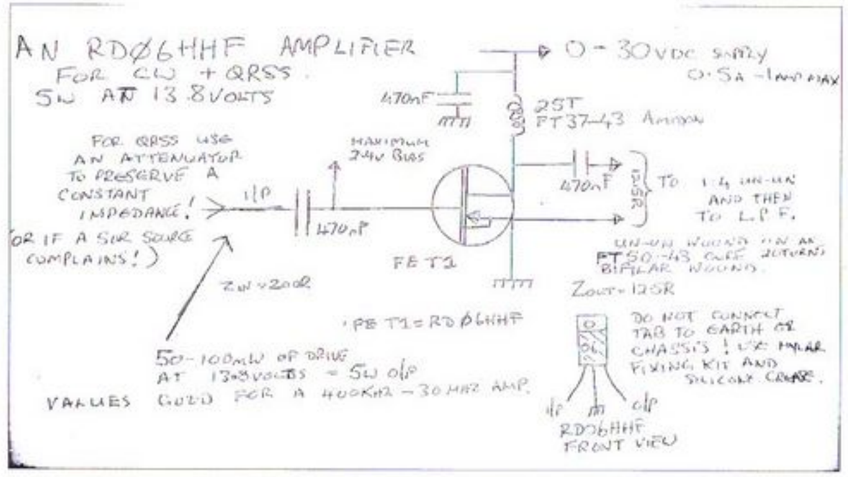
The 24V output then went through a trifilar winding on a T50-43 to the drain pin and the PA output and then to the relays. Source to ground. There is a 3dB 50Ω pad on the RF input, RF in should be maximum of 400mW from a U3S. There are two filters, one for 20 and 17m, the other for 15, 12 and 10m.



AKA the psu killer.

So how did it perform and why is it called the PSU killer? Powering up the amp from a current limited supply bias was set to a point where the IRF510 was just about to start drawing current, a watt meter and dummy load were connected and my U3S set to 14MHz putting out 400mW.

After passing though the 3dB pad 5W output was seen on the meter, I was pleased with that. The higher bands were tried and produced lower amounts of RF as expected, input RF was very low on 10m but still gave a useful increase in power. Then curiosity took over and I wondered what it could produce on 40m forgetting that my U3S produces almost 1W on 7MHz. Wow, 17W, then it dropped to 16 then 15.



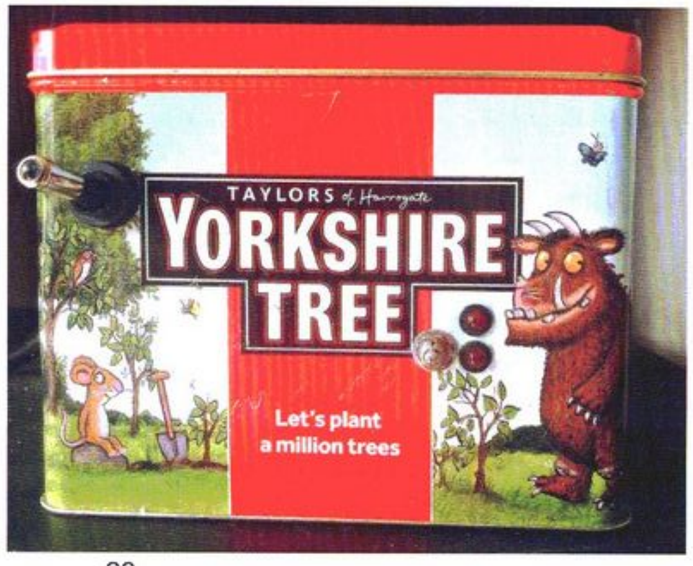
I touched the heatsink to see if it was getting hot whereupon a ghostly wisp of white smoke like a Genie engulfed my finger and power out fell to zero. There was also the smell of hot electronics coming out of the tin, touching the inductor of the DC-DC board I burnt a finger tip. Power was removed from the amp whilst I thought about what had just happened and how stupid I'd been.

At this point it is worth mentioning that I had swopped the current limiting PSU for a fixed voltage 3A linear supply and was using that to power the amp when it fried something. Autopsy started and investigations showed that the DC-DC board was giving out slightly less than 24V, input however was now 23V, the 5V rail was also odd with 23V on the drain and base pins and higher than normal values elsewhere on the rail, I concluded that the IRF510 had gone short internally.

Odd that there was also 23V input to the DC-DC board, tracing back towards my PSU it showed 24V output from a 13.8V outlet, the pass transistor had blown and was putting out the full rectified voltage. With the PSU repaired and the IRF510 replaced I started again, the 7805 and DC-DC boards had survived and back to their normal values.

This time all went well, on a 2 minute WSPR cycle repeating every 10 minutes the heat sink was just warm to the touch on 20m, I backed the output voltage from the DC-DC board off to below 20V and left it to run for a couple of hours.

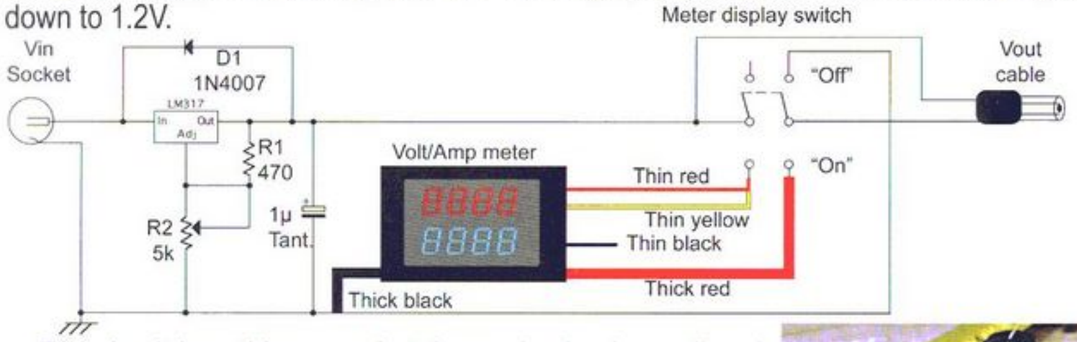
A nice simple project that turned into a useful learning exercise and will give Eddie lots of enjoyment, cost was minimal as all components used were lying around, other than the pass transistor, as was its eventual casing. As it is set now the amp gives 2W on 20m dropping to 100mW on 10m, plenty of power for WSPR and runs nice and cool.



A Simple Voltage Controller

Scott Schillereff, VO1DR, email: scott.schillereff@gmail.com

A common way to adjust power for QRP /p rigs is to control input voltage, but most /p operators are stuck with whatever battery voltage they have. Here is a simple inline voltage controller that can also display V_{out} and I_{out}. It is based on the cheap LM317T voltage regulator with V_{in} max 40V, V_{out} 1.2-37V, and I_{out} up to 1.5A. It drops V_{in} by 1.5V, with continuous V_{out} control using R2. The V-A display drops out at ~4V, but is still adjustable down to 1.2V.



The circuit is nothing new, but the packaging is small and light, and the display is switchable (to save ~30 mA) . You can plot P_{out} (for each rig) for various V_{out} values, then just dial in the V_{out} you want, then shut the display off to save battery life. You could eliminate the switch entirely to save space; just hard-wire the display to always be on.

I wired all connectors the same, so I could use it on all my rigs when I want a blistering 5-6W output. If you "care enough to send the very least", you can route supply voltage through this controller and dial down your P_{out}, even during a QSO for more fun. Many rigs still produce output power with supply voltages down to 6.5-7V. You could also wire an adaptor to supply 5V to a QCX-Mini USB input, as well.

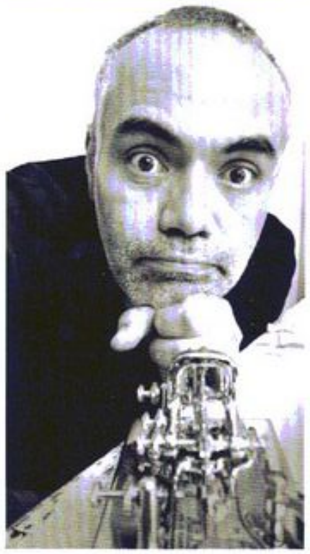
I chose this little metal chewing gum tin because it just begged to be repurposed. But the end-opening form factor was like building a ship in a bottle – quite fiddly. A small clamshell type enclosure or other tin with a full lid would be easier. Hard-wiring the output cable saved the space of a V_{out} jack (and the need for a separate jumper cable to my rig that I might lose!). The LM317T is bolted to the metal tin for heat sinking using a nylon screw and silicone insulation pads (Fig. 4). A teeny little perf board is mounted on up-turned pins of the regulator for mounting passive components (R1, C1, diode). Use a small diameter pot (or a trimmer with screwdriver control) for R2. The rest is just a regular small slide switch, a V_{in} jack, and careful wiring and heat-shrink tubing to avoid shorts.

Hope this adds some versatility to your field kit! 72, Scott, VO1DR

40 Halifax St., St. John's, NL, Canada, A1A2P7

ON-AIR Activity Manager

Enzo M0KTZ email: m0ktz@katolaz.net



Well, hello everyone. As you might have read in *SPRAT* 194, our dear **Peter G3XJS** has decided to pass on the bat after having served the Club in that role for many years. I believe to interpret the intentions of all the members in wholeheartedly thanking Peter for the excellent work he has done as Communications and Activity manager. Anyway, the next time you hear Peter on the bands, make sure to let him know how much you appreciate his long service to the Club.

When I joined the Club, about two years ago, I did not expect that today I would have found myself writing this column. I was quite surprised when I was asked to cover this role, as I did not think I had anything that special to say or to do. I thank the Committee for the trust they have endowed me with, and I hope I will not disappoint our members. I accepted this role wishing that my service to the Club could help encouraging more QRP activity on the bands, which I really believe is an essential aspect of our hobby. I like to say that QSOs and on air activity in general are to hams what swimming pools are to swimmers: I guess a guy who seldom (if ever) gets into a swimming pool would make for a very unusual swimmer, right? HI

While pondering about accepting this role, I went through the Activity columns of all the old SPRAT numbers, trying to get inspiration for what kind of flavour to give to my service to the Club. We must admit that times have changed a lot since SPRAT 1, when a printed quarterly periodical was the main or only way of keeping informed about all the stuff happening in the QRP world. Nevertheless, SPRAT is an authoritative and highly respected reference in the hobby, so I maintain that we need to include as much relevant and interesting information as possible in its pages.

As also shown by the lively activity around Winter Sports, our Internet Conference (or Reflector, or Mailing List, however you would like to call it) together with our Club website, are two other powerful ways of reaching out to our members. So I will use them relatively often to provide reminders and pointers that just cannot wait for the next SPRAT to land on our door mats. This will include some short monthly reminders sent to the Reflector, with info about the forthcoming club activities, members operating from abroad, Club participation to events and rallies, and so on.

We are now starting to plan the celebrations of the Club 50th anniversary, which will happen next year. These celebrations will cover all the aspects of QRP, including homebrewing, experimentation, portable operations, social events and so on. So watch this space for more news.

Top Band Activity.

There was some surprisingly good spur of QRP activity on Top Band in March and April, with Peter G3XJS reporting about a super 4-way QRP QSO on 1836kHz on 11th April involv-

ing G4ALG, G4HMC, G3ROO and himself, with good signals throughout and some valve transmitters put to good use. Steve G4ALG reported some additional nice chats with G3XIZ, G4FGJ, and G4WIF, plus several reports from other stations able to hear him. The QRP gang has hanged up on Top Band on Tuesday nights around 20:00 local time. With Spring (meh!) and Summer coming up, noise on Top Band will obviously increase, but there is appetite for revamping this weekly activity starting next Autumn, so watch this space for more info.

International QRP Day.

A celebration of QRP activity and achievements runs on 17th June every year. In 2023 this will be on a Saturday, so probably the best opportunity to switch our rigs on and make our puny signals heard loudly throughout the world. The QRP Centres of Activity (CoA) on all bands are a great place to start (see the bottom of this column), but hundreds of QRP stations will be heard all over the bands. Thanks to the effort of many members, the Club callsign G5LOW will be on air on the 17th of June, with several regional locators (e.g., GM-5LOW, GW5LOW, GD5LOW, etc.), on all the bands, using all modes. So look for the LOWs, have a chat with old friends and make new ones, show how loud a flea can scream, and above all, have fun.

Suffolk Trophy.

The Club has traditionally run the Suffolk Trophy on International QRP Day. Power and limits as for the Chelmsley Trophy but with operation for six hours only in not more that two periods. Contacts are with any Region 1 country; normal QSO, no serial numbers.

Scoring: Each Region 1 country counts 1 point on each band. The total score is total of IARU countries on the bands used. Only one contact per country per band is allowed irrespective of mode. The other station may be QRO.

Please include Name, address, call, power used, equipment, time, call band for each contact. All logs and claims must be sent to Enzo M0KTZ *m0ktz@katolaz.net* by 17th July. A trophy to the winner plus runner up certificates.

Summer Sizzler.

By the time you read this column, the Summer Sizzler might already be in full swing. This stress-free get-on-air Club event runs between the 17th and the 26th of June. It is not a contest, rather a relaxed activity that we can use to meet and greet new and old friends, to test our latest homebrew creations, and to fill the bands with friendly QRP signals. QRP power levels only, the other station might be QRO.

Logs should be sent to Enzo M0KTZ *m0ktz@katolaz.net* by the 17th July 2023, but more importantly, please accompany your logs with a description of your experience of the event, which is far more important than sheer numbers. If you need to send paper material, just drop me a line and we will arrange it. The most interesting news is that the best log submitted will be awarded **The first GM3OXX Trophy**, with certificates available for runner-ups. On top of that, we will award five more certificates, namely

The **Busy-Bee certificate** (for contacts made using exclusively homebrew equipment), The **Tiny-Flea certificate** (for QRPp contacts, i.e., using 1W output or less), **The Old-Beetle certificate** (for contacts made using vintage rigs, 25 years or older), **The Iron-Knee certificate** (for POTA, SOTA, /P or /M operations), and **The Ladybird certificate** (for logs submitted by hams licensed less than three years ago).

Notice that we will not necessarily award logs with "the highest number of contacts or DX worked": even a log consisting of one single interesting QSO might be worth one of the certificates, so just submit whatever you get. And more importantly, get on the bands and have fun operating QRP!

GM5LOW success in the UKEICC DX contest.

Bill GM4UBJ ran the Club callsign GM5LOW in the UKEICC DX Contest on 29th and 30th April 2023. Conditions were not optimal, and Bill had to fight with high noise levels, especially on the lower bands, but the results were astonishingly good. Bill entered the 12Hr QRP section, making 208 contacts in total for a score of 60288, which resulted in GM5LOW getting a well-deserved second position. Well done Bill! And thanks a lot for having run GM5LOW for many leisurely and more conversational contacts on 40m and 20m before and after the contest, as well.

If you have ideas, suggestions, or proposals for this space, please reach out via email. I am also on air every day on CW, quite often around the QRP CoA on each band, and will be thrilled to meet as many GQRP members as possible. Please keep the QRP flag flying, have fun building your next project, and really hope to see you soon on the bands.

72 de Enzo M0KTZ

These are the International QRP Calling Frequencies:

CW: 1836, 3560, 5262 (UK only), 7030, 10116, 14060, 18086, 21060, 24906, 28060kHz

SSB: 3690, 7090, 14285, 21285, 24950, 28360kHz

Notice that these are Centre of Activity, so please spread out when activity levels are high (and use those CoA to make sure we all need to spread out!)

Mea Culpa!

Belated chart update from Sprat 135

Referring back to my Toroid Inductance Chart that was featured on page 26 of *Sprat* 135, I'd like to draw attention to an error that was spotted by **Neal W3CUV**, who said, "The inductance for 10 turns on a T68-2 toroid is .570µH. (The chart says .750µH)".

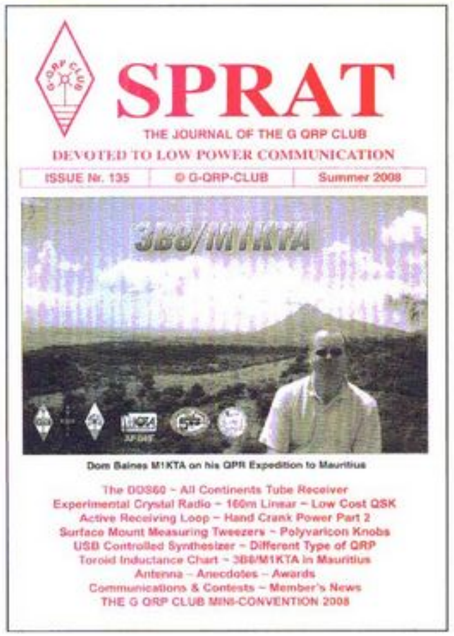
And indeed it should read 0.570µH.

Many thanks to Neal for letting us know. I went through it umpteen times....typical typographic error.

Conclusion:

DO NOT hire 'COE as a proof reader!

Take care **Dave, G4COE .G8621**



Chelmsley Trophy Application

Or Dxing With A 'Wet Noodle' Antenna

By Christopher J Page, G4BUE

Introduction

I first heard about the 'wet noodle' antenna from G3FXB (SK) soon after I was licensed in 1973 when he and Dennis, F5VHY (G3MXJ then), recruited me and some other local amateurs to join them in the Channel Contest Group (later G4DAA) that they had just formed.

Al mentioned the 'wet noodle' antenna at that first meeting and, not wanting to show my ignorance or naivety, I went home to check my antenna books, but wondered why I couldn't find it in them. It was a couple of meetings later that I realised it was Al's description of a poor wire antenna!

Chelmsley Trophy Application

1. I was only QRV for 42 weeks of 2022 (between 22 January and 14 November) due to a QTH move at the beginning of the year and health issues at the end of the year (mostly resolved). I only operated with 5W CW during the year on 160, 80, 60, 40, 30, 20, 17, 15, 12, 10 and 6 metres with the same single-wire 'wet noodle' antenna.

2. I made a total of 4045 QRP QSOs during 2022 giving 137 DXCC, of which 116 were confirmed on LoTW (84.7%). I worked 675 band-slots of which 521 were confirmed with LoTW (77.2%), and 32 CQ WAZ of which 28 were confirmed with LoTW (87.5%). I only used LoTW for QSLing in 2022.

3. The breakdown of DXCC worked by band with QRP is as follows:

Band	**160m**	**80m**	**60m**	**40m**	**30m**	**20m**	**17m**	**15m**	**12m**	**10m**	**6m**
Worked	31	42	21	72	70	96	72	92	61	90	28
Confirmed *(LoTW)*	28	38	12	56	57	82	50	72	37	67	22

Total DXCC Worked	**137**
Total DXCC Confirmed (LoTW)	**116**
Total Band Slots Worked	**675**
Total Band Slots Confirmed LoTW)	**521**

4. The breakdown of zones worked per band with QRP is as follows:

Bands	**160**	**80**	**60**	**40**	**30**	**20**	**17**	**15**	**12**	**10**	**6**	**2**
Worked	4	7	3	13	14	24	20	23	18	23	4	0
Confirmed	4	5	3	13	10	19	14	19	15	20	3	0

5. Using two-way QRP, I made 67 QSOs of which only 16 have been confirmed by LoTW (23.9%), including 17 DXCC of which only 6 were confimed with LoTW (35.3%), and 29 band-slots of which only 8 were confirmed by LoTW (27.6%).

6. The breakdown of DXCC worked by band with two-way QRP is as follows:

Band	**160m**	**80m**	**60m**	**40m**	**30m**	**20m**	**17m**	**15m**	**12m**	**10m**	**6m**
Worked	31	42	21	72	70	96	72	92	61	90	28
Confirmed (LoTW)	28	38	12	56	57	82	50	72	37	67	22

Total DXCC Worked	**137**
Total DXCC Confirmed (LoTW)	**116**
Total Band Slots Worked	**675**
Total Band Slots Confirmed LoTW)	**521**

7. Whereas it is very encouraging that 84.7% of my DXCC QSOs were confirmed by LoTW, it is very disappointing that only 35.3% of my two-way QRP DXCC QSOs, and only 23.9% of my overall two-way QRP QSOs, were confirmed by LoTW. This shows that QRPers do not use LoTW nearly as much as other amateurs. I wonder why?

8. The Chelmsley Trophy application asks for, "a note drawing attention to any contacts which by virtue of the very low power used, rarity or any other reason the applicants consider it outstanding." There are many! I have used QRP since 1975, with better antennas than I used in 2022, but I never cease to be amazed what 5W of RF can achieve, even with a low single-wire 'wet noodle' antenna folded around my garden!

My sixth QSO on the first day after setting up the station was on 20m with W1RM in Burlington, CT, and although Pete has a beam on a high tower, my 5W had to get across the Atlantic to him. This was a good start and encouraged me to try for more DX in the shape of P4/DL4MM on 15m the following day. What would 160m be like with this antenna, I wondered?

The CQWW 160 Metre Contest at the end of January allowed me to find out. I switched on at 0615z on the Saturday morning and there was VY2ZM calling CQ. I had QSO'd Jeff many times before and knew his QTH was very quiet, but looking out the shack window at my antenna, I thought no way. Jeff answered my first call and I was stunned!

My 'wet noodle' appeared to work quite well on all bands, but I was especially impressed with 40m and 30m. I think 72 DXCC on 40m including FY, KP2, KP4, PJ2, R9, TI, UN, VE and W, and 70 DXCC on 30m including JA, KP4, OX, R9, TZ, UN, V3, VE, VK and W, was pretty good. Another surprise was 28 DXCC on 6m, including CN, ISØ, OJØ and Z6. In fact, I worked Z68XX on eight bands (missing 160, 80 and 60m). 20m was the best band for DX with 96 DXCC, followed by 15m with 92 and 10m with 90 DXCC, no doubt helped by the contests I played in. If I hadn't lost 10 weeks operating during the year, I think I probably would have reached 100 DXCC on these three bands.

The overall total of 137 DXCC included 3B9, 5V, 5Z, 8P, 9J, 9N, 9Y, A6, BY, C5, CE, CO, CX, D4, D6 (on two-way QRP), EX, EY, FG, FM, FY, HC, HK, HS, JA, JT, JW, JX, JY, KH6, KP2, KP4, LU, OD, OX, P4, PJ2, PJ4, PJ5, PY, PZ, R9, SU, TI, TR, TY, TZ, UN, V2, V3, VK, VP5, VP9, VU, XE, YV, ZD7, ZL and ZP, which showed my 'wet noodle' was getting out in all directions.

9. After the first few decent DXCC worked, I acquired confidence to work more and soon found myself deep in the DX pile-ups. I was sensible though. I would wait through the first couple of days or so of a DXpedition and just monitor how the DX station operated, especially if they

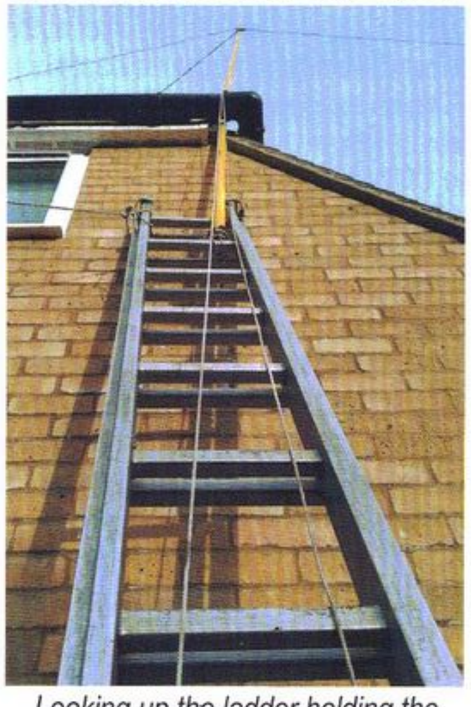
used 'split', so that when I did decide to join the fray, I stood a better chance of getting through. Similarly in major contests, the first day I would 'search and pounce' (S&P) the easy stations, leaving the more DX ones to the second day when they began running out of stations to work. The RBN was also very helpful and often enabled me to quickly make a QSO with a DX station immediately after they were 'spotted', and before they went 'split' and the pile-up grew.

10. I entered the CDXC DX Marathon Challenge for 2022 and was placed a credible 62 in a table of 321 entrants, the vast majority of who were running higher power and better antennas. My 653 band-slots put me in an even more credible position of 19 of the 321 entrants.

The simple 2022 G4BUE QRP shack

11. My simple station for 2022 consisted of an Elecraft K3 running at 5W CW ouput with a P3 panadapter and a Schurr Profi-2 paddle.

The ladder and mast at the side of the house.

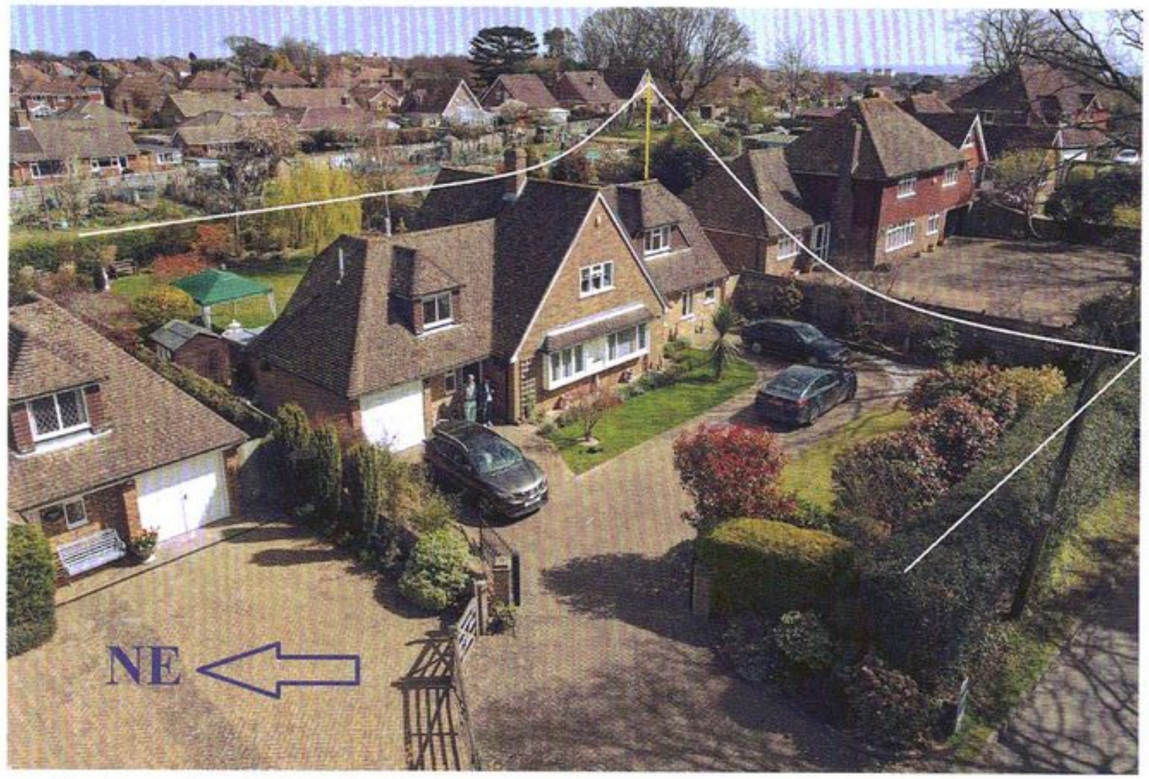


Looking up the ladder holding the fibreglass mast.

12. My single-wire 'wet noodle' antenna used throughout the year is a 132 feet centre-fed inverted vee doublet, fed with 450 ohm twin-feeder through an Elecraft BL2 balun to the K3. I used the K3's internal ATU to match the antenna on each band and obtained a 1:1 SWR. The centre of the antenna is 32 feet high held up by a fibreglass 20 feet pole tied to an extension

aluminium ladder leaning against the south side of the house!

The installation was supposed to be just temporary to get me on the air for the 2022 FOC Marathon held over the first week-end of February, but here we are nearly a year later and it is still giving me good service! Our garden is not large enough to extend the ends of the doublet straight out from the mast, so when they reach the end of the front and back garden, they are bent 90 degrees, and the last 30 feet or so of each leg is laid along the top of the eight feet hedge at the end of the front and back gardens.



The front of the G4BUE QTH with the postion of the mast and antenna imposed on it.>

Summary

In making this application, I am hoping that what I have achieved during 2022 with my 5W and temporary antenna will encourage other radio amateurs who are using a 'wet noodle' antenna not to give up on DXing or contesting, even if they choose to make life even more difficult for themselves, by using QRP.

My 'wet noodle' was inspired by my good friend GM3OXX (SK) who, during his QRP career over many years, never used more than 1W CW with his immaculate home-brewed equipment. George made 300 DXCC at this power level using a 66 feet centre-fed doublet fed with open-wire feeder on the roof of the block of flats where he lived in Edinburgh.

Admittedly it was higher than my antenna, but he only used 1W compared with my 5W. George wasn't able to cover 160m and so I decided to have a longer antenna (132 feet) than his that would allow me to also be QRV on that band, even if I had to fold the ends along the hedges at the ends of the garden.

I'm now at DXCC 106 for 2023, using the same power level of 5W and the 'temporary' antenna setup.

A Video Game Keyer (You Know, for kids)

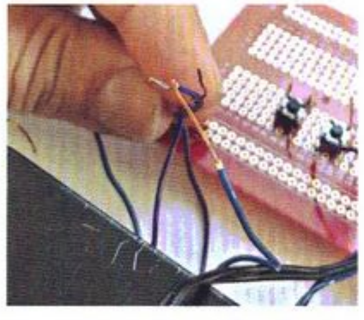
Hamilton Carter, KD0FNR email: hcarter333@gmail.com

"Dah di dah di dah dah…dah dah…dah dah…" Damn it, one of the TV switches I'd made the RockMite's keyer with a decade ago broke. It's not like there're TVs laying on the sidewalk this week. I mean, sure, some weeks—like the week I built the TV button keyer back in Ought 8—but obvs, not this week. My old Morse code keyer for the Rockmite, the one its box had been built to hold was a thing of the past.

You've got to move on though, to let go of the past, so I cannibalized the switches that never really worked well enough for the kid's binary adder. I mean, it's just Morse code right? But the switches couldn't hack it. After a few hundred—hundreds only!—dits and dahs they gave out.

I went back to the three wire keyer from the original flying RockMite. It works, but perhaps makes keying a bit too much of an adventure. And that's when I came across the open headset interconnect standard from N6MTS-Mark The standard reminded me of the first version of the three wire keyer situated at one end of a CAT5 cable whose other end was connected to the Rockmite circuit board—suspended in midair—half way through a halfwave dipole, hence the Flying Rock-Mite.

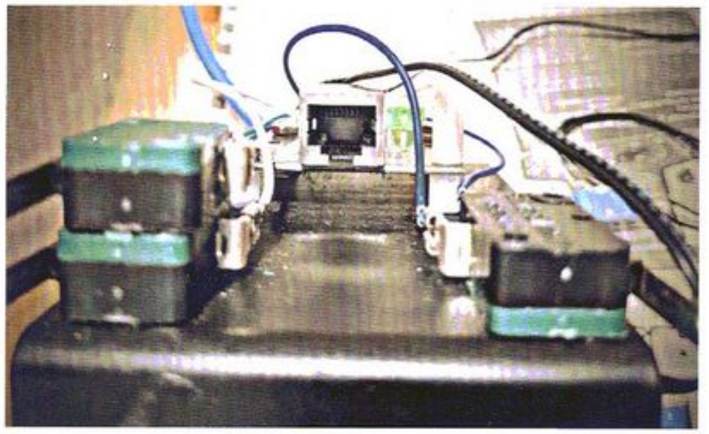
For whatever reason while I'd employed CAT5 cable to bring audio, keyer, and power back to ground, it'd never occurred to me to use the RJ45 connectors at both ends to make everything simple. (Thanks Mark!)



Now that I'd classed up the joint by adding connectors my next thought—of course—ran to enclosures. What kind of box would hold eight batteries, three switches and a headphone jack?

In my end analysis, I concluded there just wasn't a box that could do the job. I had a battery case. I had switches. I had no classy enclosure. What to do? Then, I encountered a stack of copper clad boards on the workbench of our local maker space. My first thought harked back to that article about making enclosures using copper clad boards and a soldering gun. That sounded like a looooottttt of work. And then, it occurred to me. What's the other thing you do with copper clad boards? Dead Bug Construction complete with Super Glue connectors! That was the answer! And thus, build on battery construction was born.

Having recalled the magical wonder of Super Glue, I realized that while the switches I'd



chosen didn't fit in the box, they fit quite nicely on the box.

And let's talk about the switches. After wearing out two sets of push buttons I decided to give levers a go. I found Baolian switches for $1.15 a piece at Adafruit. What I hadn't realized until they arrive in the mail was that they're actually video game switches. (Well, at least that should take care of the reliability issues.)

I won't bother you with the iterative details, but the end result is a very steampunk looking little thumb keyer. The battery case has a nice heft to it and the switches are good and clacky, just like a mechanical (gamer's) keyboard.

And then, as I was clacking out CQs, the last little bit of this project occurred to me The keyer's thumb operated like a smartphone keyboard; the thing's literally made with video game switches for Pete's sake; of course, it needed its own Twitch channel. And so you can watch live streams and replays of the little video game switching keyer.

And what about the Flying Rockmite? Next time, let's talk about BNC to banana plug adapters and bell wire antennas, and the iterative step of 12 AWG braided into banana antennas.

Biography

Hamilton Carter is an electronics engineer, adventurer, and dad of 3 kids aged 12, 10, and 8 who are all learning Morse code. He's dedicated to making ham radio cheap and easy and portable via backpack; you know, for kids.

815 Peru Ave., SF, CA 94112

Build a Better Battery Buddy

Steven Bennett M0YYT

Lithium Ion (Li-ion) rechargeable batteries are popular for QRP transmitters and receivers and a commonly used type is the 18650 with capacities up to 3500mAh – anything larger is a Chinese fake! Li-ion batteries do not like to be stored fully charged or heavily discharged. Better quality chargers often have a feature called STORAGE, which charges, or discharges, a battery until it reaches a resting voltage between 3.7 and 3.8V prolonging the life of the battery if it is not being used for some time.

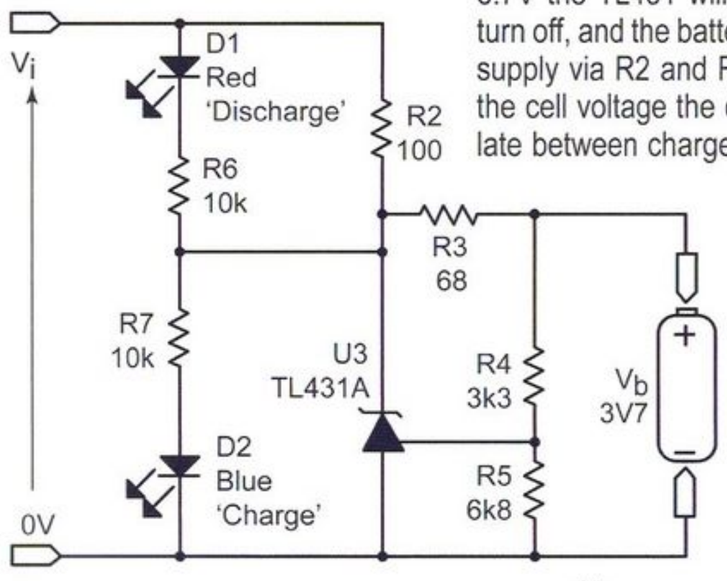
If your battery charger does not have the STORAGE feature it can be provided with a simple project using a shunt voltage regulator like the TL431.

The TL431 is an interesting device that crams a precision 1.2 V Widlar bandgap reference generating 2.5V via a bit of transistor magic, an operational amplifier and an *npn* transistor into a 3 pin TO-92 package. Normally the TL431 is used with just three resistors to form a precision shunt voltage supply, but can be included in more complex circuits providing higher voltages and currents.

The TL431 is designed to be used as a closed loop feedback device to provide a regulated and stabilised voltage from 2.5V up to 36V.

In the battery buddy the TL431 operates in an unpublished open loop mode more similar to a voltage comparator and uses a characteristic that is not defined in the devices datasheet. That characteristic is the cathode to anode voltage when the reference pin is held at a voltage above the internal 2.5V reference and is about 1.8V.

Looking at the circuit V_i is a 5V supply, which could be from a USB socket, and V_b is the Li-ion battery. Without a battery connected the TL431 operates in its intended closed-loop mode and the voltage at the battery terminals will be 3.7V. When a battery is connected the negative feedback loop is eliminated and TL431 is forced to operate as a voltage comparator. If the battery voltage is above 3.7V then the TL431 cathode will fall to about 1.8V and the battery will start to discharge through the 68Ω resistor R3. If the battery voltage is below 3.7V the TL431 will exhibit a high impedance state, turn off, and the battery will start to charge from the 5V supply via R2 and R3. Because of the hysteresis in the cell voltage the circuit will eventually slowly oscillate between charge and discharge centred on a cell voltage of 3.7V. For a visual indication a couple of high brightness LEDs and 10kΩ resistors can be connected between the TL431 cathode and the 5V supply and ground.

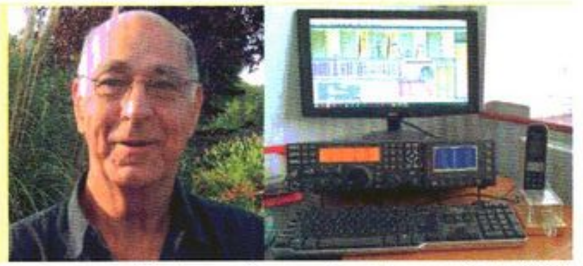


Once the Li-ion battery reaches 3.7V it can be removed and safely stored.

MEMBERS' NEWS

by Chris Page, G4BUE

E-mail: chris@g4bue.com
gc4bue@gmail.com



Readers of this column over the last 45 years or so will know I am strongly against QRP stations using the /QRP suffix to their callsign. Many still do, especially in Europe, as evidenced by the RBN spots. For those who continue to use it, this posting on the CDXC reflector in May from **5B4AGN (G3ZEM)** may cause them to reconsider. 'I found when DX-peditioning that those signing /QRP disadvantaged themselves and denied others a QSO. It is surprising how often QSB provides for repeat copy of /QRP, while leaving the meaningful part of the call unread. I don't give up on callers easily, but the incidence is higher with those who sign /QRP. When it happens I'm left thinking how much better it might have been had the operator's focus been upon sending what needed to be communicated without unnecessary padding. Conversations with other DX-peditioners suggest this is a commonly held view.' Can anyone suggest a good reason why stations should sign /QRP, other than advertising you are running QRP?

F6HIQ has been QRV /P from different locations in France (above left) and Kyoto, Japan as **JK1PZI** (above right) with his FT-817ND, SignaLink interface for digi modes, and homemade coaxial magloop antenna (1m diameter made of RG213 and fishing pole parts on a light camera tripod [pictured right]). On the Atlantic shore in France, the loop was on balconies and in Japan, indoors from two different traditionnal houses. Hervé says, 'Since I'm a QRP fan, I've used many kinds of antennas (full and short verticals, EF, wire dipoles) but think this magnetic loop is the easiest to carry, especially on planes, and to set up, with very good results indoors. Most of my traffic is by digi-modes. I have 127 DXCC and 49 US States in FT8/FT4 modes. The RigExpert AA55 analyser is helpful with the loop when changing bands, and fixed digi QRG don't need any additional tuning: cool with a narrow bandwidth (+/-15kHz)'.

GØBPS's shack pictured left, all in a space about 16 x 8 inches. The rig is an IC7300 and the key a Brown Bros that Dick bought at Dayton, Ohio, USA for $100 many years ago. He says, 'It is a major step down from what I used to have, much like you. The FT817 on top is **G3RJV**'s old one. We both bought one at Dayton many years ago and I bought it from JoAnna in memory of George'.

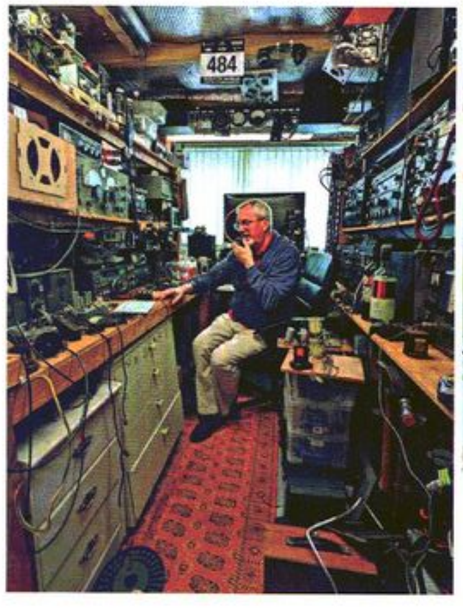
GØXAR writes, 'Those of you who operate portable, or experiment with wire antennas, might like to know about the paracord winders *Amazon* sell to prevent tangles and knots, <https://amzn.eu/d/7sXhbjt>. At a little more than £1 each, they are a cheap and cheerful solution to the tangle of wire and cable tie method many of us use.'

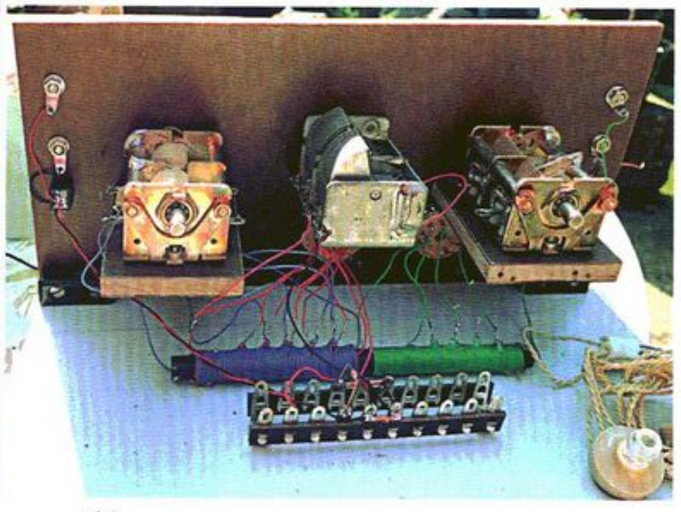
G3YMC entered the RSGB' Commonwealth Contest (BERU) in March and says it is a good opportunity to work good DX, as evidences by his QSOs with 5Z, 9G, 9J, VK, ZD7 and

ZF. Dave is only QRV on 20m and higher at the moment and so his 49 QSOs were lower than usual. **VK3YE** went /P from two local beaches with his FT-817 and end-fed 20m wire, and found an 'excellent long-path pipeline to the UK, with many stations replying to my calls.' Peter made 60 QSOs and made a video at <https://www.youtube.com/watch?v=AjaFap9ocJU>. **GWØVSW** also entered BERU with his Xiegu G90, 5W CW and SSB, to an inverted **G5RV** antenna, and made QSOs with 9H, VE, VK and ZF on 20m, 5B and VE on 15m and 5Z, 9G, 9H and 9J on 10m. Carl also made 164 QSOs with 41 DXCC in the CQ WPX SSB Contest, including 5B, A4, CN, CT3, J6, KP4, OHØ, PJ2, PY, TF and V2 on 20m.

Welcome back to amateur radio to **G1BKI** after a long break from the hobby. Mick has created a *YouTube* playlist of 93 videos that may be of interest to members <https://youtube.com/playlist?list=PLTfK2lg_vYBXmRevAi2etvEBluk9KTAxF>. **G4EFE** has created a page containing all the weblinks from *SPRAT* 194 at <https://martinpeters7.wixsite.com/sprat-weblinks/post/copy-of-sprat-issue-no-193-winter-2022-23>. Martin says, 'Don't be put off that the link appears to refers to *SPRAT* 193, long story!' The 30 March edition of *RadCom Basics* contains an article by **G4EJB** called 'What is QRP?' – thanks **G8UKT**. If you are struggling to learn CW, **M3KXZ** mentions the 'Slow Morse Club' *Facebook* group, that he highly recommends to anyone with an interest in learning CW, or refreshing their skills after a hiatus, or who want to help others.

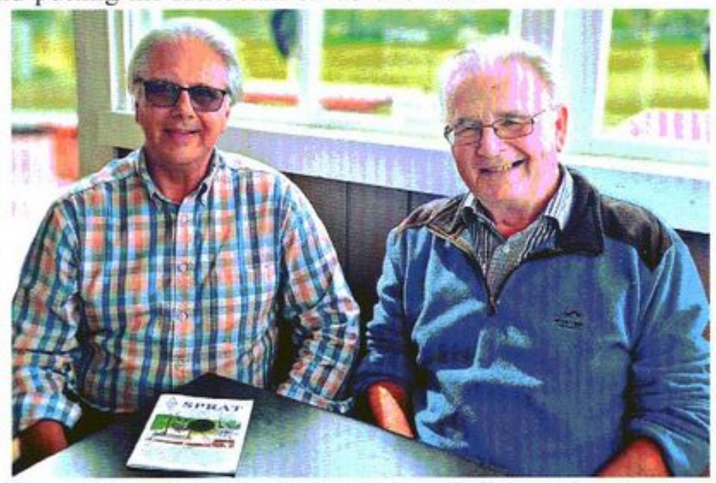
GØJXX says the Worthing Radio Events Group (WREG) have been busy with the ultimate QRP challenge! The 'Crusty Challenge' is set each year by Paul, **G3SXE**, (aka Crusty) and this year it was to make a crystal set RX that would get the largest DC output on MW and 1980kHz. Mike says, 'Most members took part and the range of styles is impressive. Using a 132ft long-wire and good earth, the MW challenge had a DC voltage of 1.5V recorded (local MW transmission of Talk Sport is very loud), and a test transmission for my QTH on 1980kHz gave an audible output! [picture below]. Next year, a self-powered TX perhaps?' Pictured right is Mike's crystal set and below are receivers built by **G7RQD**, **G4DXO**, **G8AQX**, the Meccano 160 Special by **GØJXX**, and below 'a complicated but effective crystal set' by **G8AQX**. **G4TGJ** has continued his regular SOTA activations with his home-brew QRP CW rig. During April there were two special summit-to-summit days and Richard got up very early to get QSOs with other activators in VK and ZL on 20m CW (plus one on SSB using his FT-817). He also made QSOs at the end of April in the Europe/North America day with W1 and W6 on 15m CW. On the construction front, Richard has completed his superhet based TCVR and will be taking it out on SOTA activations.





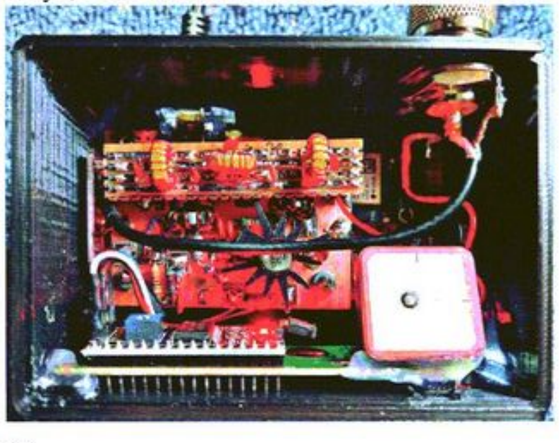
KE4MIQ had to laugh at my reference to **K3DZ**'s Leeds and Northrup Model 8687 potentionmeter in the last *SPRAT* because he too had an L&N instrument – a Conitel 2050 SCADA System, controlling power generation, transmission, and distribution for a NERC Control Area. James says, 'It was my first job out of Georgia Tech (BEE 1975) and I got it because L&N was two years late on a six month software enhancement project. The system was crashing 2-3 times a day and the despatchers were not happy. The code was two six-inch binders of assembly language for a Lockheed Electronics LEC-16, which turned out to be my favourite minicomputer assembly language of many.' A longtime proponent of DSB, **N2CQR** has been gathering info on two Cuban DSB rigs: the tube type Islander and the solid state Jaguey; articles from *SPRAT* are often cited. Bill is also experimenting with Franklin oscillators, modifying a uBITX, and putting his Hexbeam on 15 and 10m.

Pictured right is **ZL/GØFUW** and **ZL3DWS**, after a very pleasant pub lunch near David's current home in Paraparaumu Beach. They have known each other (virtually) for many years, and David contributed ZL video clips for Steve's 'How to do a Buildathon' DVD in 2009, and was instrumental in the CQ Scotland initiative when he was **MMØHQD**. They first met in person at one of the Rishworth Conventions and then again in March this year when Steve was on holiday in ZL. David hopes to be back in the UK to join in the Club's 50th Anniversary celebrations in 2024.



G6XDI built the low-bands QDX last summer but hadn't used it until February when one afternoon he decided to see how many DXCC he could work in two hours on FT8 with 6W on 40m, 4W on 30m and 5W on 20m to a Caroline Windom antenna. Chris managed 20m: F, 30m: EA, and 40m: HB9, DL, I, PA, OZ, GW, SM, HA, ON, G, OH and GM. A week later he worked YO on 20m and TA, GM and OE on 40m and says, 'I've been using it quite a bit since and it's a great little transceiver to build and operate.' His 80m antenna is an HF2V that he says doesn't respond well to QRP. **F4IUJ** has started building the 18MHz sudden TRX as part of the club build and is, 'enjoying every minute of it!' Using a half-wave dipole for 40m at just 4 or 5ft AGL and 5W or 10W SSB from his FT-991A, **M5AML** made contacts across the UK and DL, EI, F, I, ON, OZ, PA and S5. John says the dipole has gone now due to gardening, and on his indoor bent dipole he made SSB QSOs with EA on 6m; CT and I on 10m; **SØ1WS** on 12m; LZ on 15m; EA, I and S5 on 17m and DL, I, R, S5 and VE on 20m. Using the Coronation call **MR5AML** had netted him 44 QO-100 QSOs by 9 May.

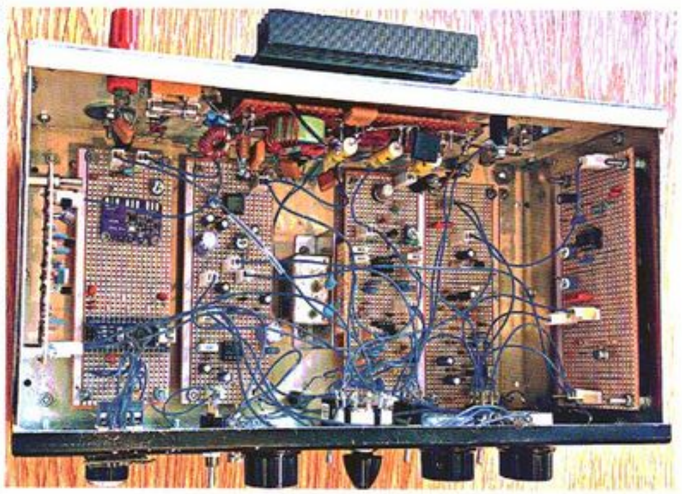
GØORG has just completed a build of **VK3HN**'s Arduino controlled WSPR TX into a 3D printed case that allows easy access to change LPFs and reprogramming the Arduino to the desired WSPR frequency (pictures below). Neil says, 'The Arduino Nano, GPS and Si5351a



clock generator are on Veroboard, and the PA uses a 2N3866 equivalent built on minipads on single sided FR4 to provide around 250mW RF. The LPF shown is a 20m version from the GQRP technical sheet and I used the capacitors to hand which, although not best quality, were matched as carefully as possible. First tests indicated la oss of 2.18dB and it had significant effect on power output. Talking with Paul, I realised I was sorely short of good test equipment and a nice second-hand VNA, new storage oscilloscope and LC meter duly arrived in the shack! Rebuilding the LPF, including advice from Paul and remembering when a turn through a toroid is a turn, I managed to realise 1.62dB loss and good roll-off from 20m. The second harmonic reads as 57.75dB, so it shows what can be achieved with careful layout and construction. Results have been great and the tiny 200mW ish output is more than enough to demonstrate grey-line enhancements for long and short E/W path, as well as other surprising quite short term but strong N/S paths. I'm looking forward to using it next winter to see the changes to post sunrise D Layer absorption on 80 and 40m amongst other studies of the often short, but strong, perpendicular enhancements I've used at mid point grey-line between DX and the UK on 17m. It's a good tool and my thanks to **VK3HN** for all of his help and advice.'

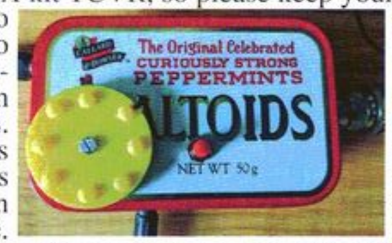
G4FBC recently took a course on 3D modelling and printing that included building his own 3D printer, which he was allowed to keep on completing the full course modules – introducing Fusion360 3D modelling & Cura software for producing the printed models. Ron says. 'The application of 3D modelling in our radio hobby seems limitless and I have been able to make my own project boxes, antenna items, hand microphone cases etc. A few items he has printed are above and left – a morse key and vertical antenna base loading coil.'

M3KXZ registered **M3KXZ/P** as one of the official stations for International Marconi Day on 22 April and set up portable on the beach at Tide Mills, East Sussex, site of the former Newhaven Marconi Station, with his 5W of CW. Pete says, 'The bands were not very kind and during two hours from 0700z, I QSO'd **OH6NPV**, **SP150WK** and **9A1AA** on 20m and **OK3EQ/P** on 30m. A quick listen on 20m SSB followed with **HA5YD**.' He added, 'It's been very challenging operating /P this past few months. If it's not been rain storms, it's been solar storms instead, but the challenge of working 5W CW has, as always, been so enjoyable. Between high noise and radio blackouts, as well as lots of EU QSOs, I've had plenty of great DX working **K5TF**, **VK2GR**, **ZL1RQ**, **VK5CZ**, **VK2IO/P**, **VK2ARZ**, **WK2S**, **VK6T** and **VE3KZ**, plus **JL1ICF** near Tokyo. **MØKTZ** planned to be QRV on Marconi Day as **9H/MØKTZ** and then from Sicily as **I/MØKTZ** in August using a doublet and long-wire. Enzo says he might try activations from interesting places, including the Etna Volcano.

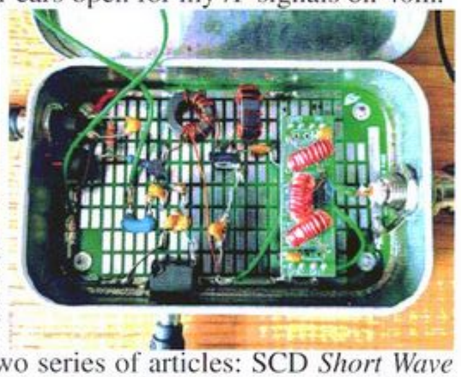


G3XIZ's antenna mast guy wires started to fail so he replaced all eight, which was most fortunate because shortly afterwards he had severe gales! Chris has built another SSB TCVR (MK II) based on the **ZL2BMI** *Sprat* design (right) and says, 'It is still being tweaked but seems to work very well and uses easily obtainable G-QRP club sales parts. As is usual with my home made gear, it

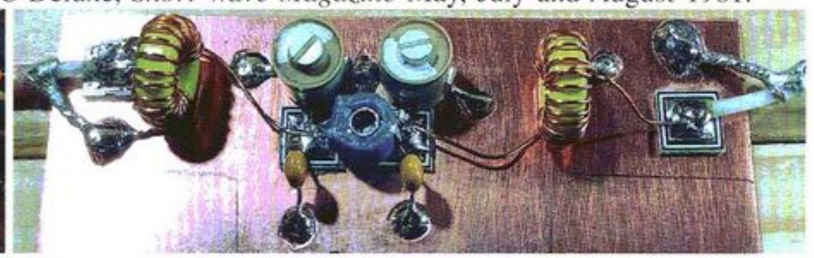
is built mainly on veroboard with header pin connections for ease of servicing. The original MK I worked ok, but my new unit has improvements, and I now join the local radio club's nets. I have promised myself this summer, for the first time, I shall try some portable operation using my little QCX kit TCVR, so please keep your ears open for my /P signals on 40m.'



G4USI went back to basics and built a two transistor ceramic resonator 2W 80m TX from the design of **VK3YE**. Daimon says it works excellently and covers the whole CW portion of the band, and more.



On 8 May, he QSO'd four OK stations, two DL and a G station, and says, 'One of the German stations even commented on the high quality of my chirp! The RX was RSP1a SDR. A whole lot of fun!' **KCØG** (**MØKCY**) writes, 'The SCD TCVR was new to me and I found two series of articles: SCD *Short Wave Magazine* January, March and April 1980, circuits shown in a datasheet on the- GQRP web site, under 'Sprat', and SC Deluxe, *Short Wave Magazine* May, July and August 1981.



MØNTV has been, 'having some fun with a little (tr)uSDX QRP TCVR recently.' The TCVR is a five-band SSB rig with a class E final amplifier which Nick says means much more of his precious power is getting to the antenna and not the heatsink. He is amazed at some of the contacts made, including **VE9FI** with 5W on 20m. He has also begun his next homebrew TCVR: a dual-band QRP rig for 10 and 15m. He is documenting the build stage-by-stage on his *YouTube* channel at <https://www.youtube.com/c/M0NTVHomebrewing>. The picture above shows the 15m BPF. Nick added his antenna is, 'an end-fed half-wave which is cut for 40m (but with the additional 110uH loading coil plus dog-leg gets me on 80m too), and all the harmonics = 80, 40, 20, 15 and 10m. It is the best antenna I've ever built.' For a couple of months, **GM4IEW** has been 'playing around with WSPR mostly 40m'. John had all the hardware and just downloaded the software. He found he needed to reduce the power of his 5W, and built an attenuator to allow 500mW and then 50mW, which is RF switched to get better effect. The culmination was reports from VK at 500mW on 40m, with an email from *VK6KLI* who reported using a home-brew 1.2m mag loop! John's antenna is a dipole at 35ft. **PA1B** has a spreadsheet for attenuator design on *QRZ* that he recommends.

MØKTZ, who has recently taken over the of Club communication/on-air activity manager role from **G3XJS**, says the Club Diary at <https://gqrp.com/calend.htm> contains details of many club activities and on-air activities that will be updated monthly. Next summer, **F4IUJ** hopes to be QRV from Bogota, Colombia while visiting his in-laws, assuming he can get authorisation. Yannig says, 'With propagation becoming better and noise levels, which hopefully should be low in the countryside, I hope to do some DX QRP! Sadly, I don't know yet the callsign they will give me!' **DM4EA** will be QRV 15/25 June on holiday in Greece and will focus on the 40-10m QRP QRGs – favourites being 30 and 17m. Tom's antennas will be, 'simple wires, my go-kit keeps a doublet, a random wire and possibly a multi-band end-fed + 6m fibre pole.'

Thanks to all the contributors. Please tell me how your summer goes for the autumn 2023 edition of *SPRAT*; what you have been building, interesting QSOs you have made and any other information about QRP, by 12 August. Also, interesting pictures please, don't be shy in letting members see what you have been building and/or where you have been operating from, your antennas, who you have been meeting, and even a shack picture to let other members know what you and your equipment look like. Let me know if you intend operating from somewhere other than your home QTH during the autumn and winter months, especially during the Winter Sports, so I can let members know to listen out for you.

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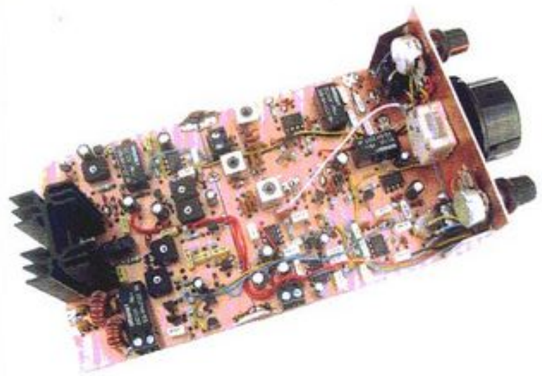

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