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GQRP Club Sales

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Graham Firth, G3MFJ, 13 Wynmore Drive, Bramhope, LEEDS. LS16 9DQ, UK

Antenna Handbook – 2nd edition – members price £6.00 plus post } £2.20 (UK) or £5.50 EU

Radio Projects volumes 1, 2, 3 & 4 – by Drew Diamond – members price - £6 each book + post) } or £9.00 DX per book

Polyvaricon capacitors – 2 types - 2 gang (A = 8 to 140pF + O = 6 to 60pF), and 2 gang – (both 8 to 280pF) Max of 2 of each
Both come complete with shaft extension & mtg screws, and both are £1.75 each. Postage is £3.50 (UK), £5.50 (EU) and £6.00 DX

A Pair of LSB/USB carrier crystals HC49U wires - [9MHz ± 1.5kHz] £4 pair } All components

HC49U (wire) crystals for all CW calling freqs – 1.836, 3.560*, 7.015, 7.028, 7.030, 7.040, 7.0475 } plus postage
7.122, 10.106, 10.116*, 14.060*, 18.086, 21.060, 24.906 & 28.060 all are £2 each (* also in LP) } (ANY quantity)

HC49U crystals - 1.8432, 3.5, 5.262, 5.355, 7.0, 10.006, 10.111, 11.5, 14.0, 22.0, 29.0MHz – 50p each

HC49U crystals – 2.00, 3.00, 3.20, 3.579, 3.58, 3.60, 3.6864, 4.0, 4.096, 4.1943, 4.4336MHz } £1.50 (UK), or

4.5, 5.00, 6.00, 6.7725, 7.2, 7.6, 8.0, 8.032, 9.0, 10.0, 10.70, 11.0, 12.0, 13.50, 15.0, 16.0MHz } £4.00 (EU) or

18.0, 20.0, 24.0, 25.0MHz 26.0, 27.0, 28.0, 28.224, 30.0, 32.0, 33, 40, 48MHz – all 35p each } £5.00 (DX)

Ceramic resonators – 455, 480kHz, 2.0, 3.58, 3.68, 4.00, 10.7, 14.32 & 20.00MHz – 50p ea. }

Diodes - Schottky signal diode – 1N5711- 20p each; 1N4148 GP Si – 10 for 10p }

Varicap diodes - BB204 – twin diodes, common cathode, 15pF @ 20v, 50pF @ 1v 50p }

SA612AN - £2.00 (note – I may supply NE or SA, 602 or 612 as available. (Max of 2 per member) }

MC1350 - £2.00 (Max of 2 per member) }

LM386N-1 - 4 to 15v, 300mW, 8pin DIL - £0.50 10 for £4.75 }

TDA7052A - 4.5 to 18v, 1W 8pin DIL low noise & DC volume control – £0.60 each }

TDA2003 - 10w audio amp – 5 pin £0.25 each }

TA-7642 Radio IC – direct equivalent of MK484 (& ZN414) – 75p each }

BC109B (metal) (npn) fT - 100MHz, hFE-320 - 10 for 50p }

MPSH10 transistors (npn) fT - 650MHz, hFE 60, VCEO 25V - 10p each, 10 for 80p }

2N3904 transistors (npn) fT - 300MHz, hFE-150, VCBO +40V - 10 for 50p }

2N3906 transistors (pnp) fT - 250MHz, hFE-150, VCBO -40V - 10 for 50p }

BC517 Darlington (npn) fT - 200MHz, hFE-30,000, VCBO +40V - 13p each, 10 for £1.10 }

FETs - IRF510 – 50p; 2N3819 - 24p; 2N7000 - 10p; BS170 – 12p - all each }

BF981 – dual gate MOSFET – 40p each (max of 1) }

Pad cutter - 2mm shaft: 7mm o/s, 5mm i/s diam, gives a 5mm pad with 1mm gap £6.00 }

10K 10mm coils – 1u2H, 1u7L, 2u6L, 5u3L, 45u0L, 90u0L – all 85p each }

Magnet Wire – 18SWG – 2 metres – 60p; 20 & 22 SWG – 3 metres - 60p; }

24, 25 & 27SWG – 4 metres - 40p; 30, 33 & 35SWG – 5 metres - 30p. }

Bifilar wire – 2 strands - red & green bonded together. Solderable enamel. 3 sizes }

21SWG (0.8mm dia) – 2metres = £1; 26SWG (0.45mm dia) – 3m = 70p; 30SWG – 3m = 60p }

Litz wire – double silk covered multi-strand wire 7/04mm -12p, 14/04mm. 25p. Both for 3 metres. }

All our magnet wire is solderable enamel insulated. Max of 3 sizes per member per order }

QRP heatsinks - TO92 – 30p; TO39/TO5 – 40p; TO18/TO72 – 80p (pics in Sprat 148) }

Axial lead inductors (they look like fat ¼W resistors) these are low current }

3.3, 4.7, 6.8, 10, 15, 18, 22, 33, 39, 47, 56, 100, 150, 220, 470 and 1000 - all uH, all 20p each. }

Toroid Cores – priced per pack of 5 – you may order 2 packs, but only if you actually need them. }

I will no longer supply packs of everything – order only what you need please. }

T25-2 – 50p, T25-6 – 60p, T30-2 – 70p; T30-6 – 80p; T37-2 – 80p; T37-6 – 80p; }

T50-1 - £1.00, T50-2 – £1.40, T50-6 – £1.60; T50-7 - £1.20, T50-10 - £1.60; }

T68-2 - £2.20, T68-6 - £2.50, T130-6** - £2.60ea; }

FT37-43 – £1.20, FT50-43 - £1.20, FT37-61 - £1.20, FT50-61 - £2.40; }

Ferrite beads – FB43-101 (3.5mm dia x 3.2mm long, 1.2mm dia hole) – 40p for 5; }

BN43-2402 - £1.50; BN43-202 - £2.40; BN43-302 - £3.40; BN61-202 - £3.40. }

All toroids are plus postage – up to 5 packs = £1.50 (UK), £4.00 (EU), £5.00 (DX). }

Each additional 5 packs, please add 50% ** Except ** item – these are heavy and each counts as a pack }

Standard MeSquares (0.25”), Little MeSquares (0.15”), MePads for DIL & MePads for SMD - £6.00 each plus post (UK & EU as parts }

for up to 4) : I can include up to 3 of these with small parts for no extra postage. }

I can supply UK & EU, will DX please order direct from Rex. These items from Rex's stock are pictured on the website. }

Limerick Sudden kits RX & TX both single band (160 through 20m); ATU (80 through 10m) £40.00 each plus post UK - £3.50, EU - £7.50, DX - £9.00 }

Sprat-on-a stick V9 – 1 to 192. Only £5 each to members plus postage, UK - £1.50, EU - £4.00, DX - £5.00 (they will }

travel free with parts) There will not be a DVD version any more as sales of them had almost stopped. }

Sprat Binders – nylon string type – Black with club logo on spine -16 issues per binder – £6.00 each plus postage }

(one: UK - £2.20, EU – £4.00, DX - £5.00. More - add £1.50, £1.50, £2.50 each) }

UK members can order by email and pay by Bank Transfer. The info you will need to do that is – THE G-QRP CLUB, }

sort: 01-07-44, and a/c: 54738210. By post, send money by cheque, PO, or cash in GBPounds, or US\$/euros (at the }

current exchange rates) – please send securely! Overseas members can order via e-mail and pay by PayPal - use }

sales@gqrp.co.uk – and pay us in GBPounds, or by post with cash, and you MUST include your membership number }

and address please. PayPal are charging us about 7%, so please add that if you can, or, send as a gift to friends/family }

– thanks. Maximum quantity of any item is 20.



SPRAT

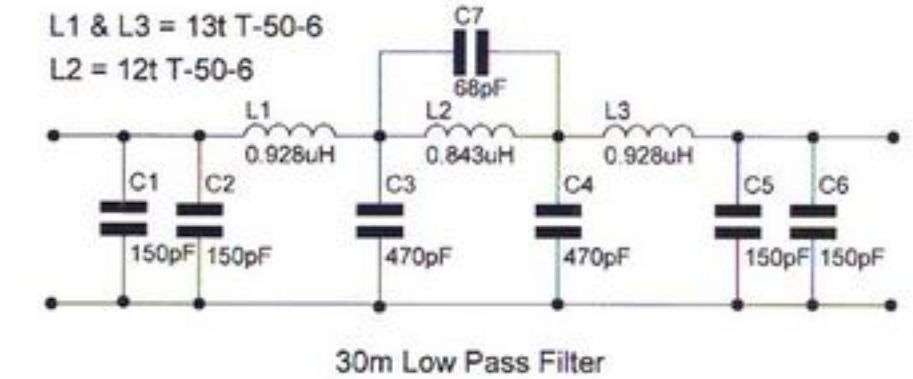
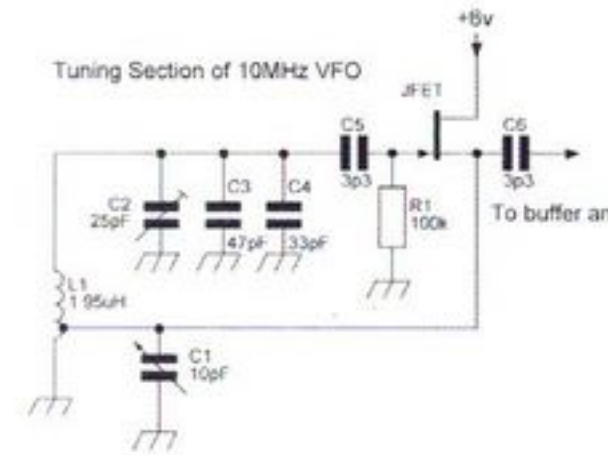
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DEVOTED TO LOW POWER COMMUNICATION

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JOURNAL OF THE G-QRP CLUB



Our founder George Dobbs G3RJV (SK)



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EDITORIAL

You will find news about the new Club Sales team later in this SPRAT. The good news is that the service is set to continue but in a slightly different way.

Thanks to **Paddy, G4MAD**, for volunteering to take on the Valves & Vintage role that **Colin G3VTT** did so well for many years.

Our annual Convention was well attended in September and much fun was had by all. **Lee G4EJB**, and **Vic GW4JUN**, have written a full report so I will simply record a big thank you to the Telford Club, the Buildathon helpers and the speakers who helped us make it happen. Hope to see more of you there in 2024.

And by pure coincidence, the 2024 G-QRP Convention will be happening on the Club's 50th anniversary. Yes, 50 years since the announcement in *Short Wave Magazine* that the **Reverend George Dobbs, G3RJV**, had agreed to form a club for those interested in low power communications! That Convention appears to promise to be a cracker.

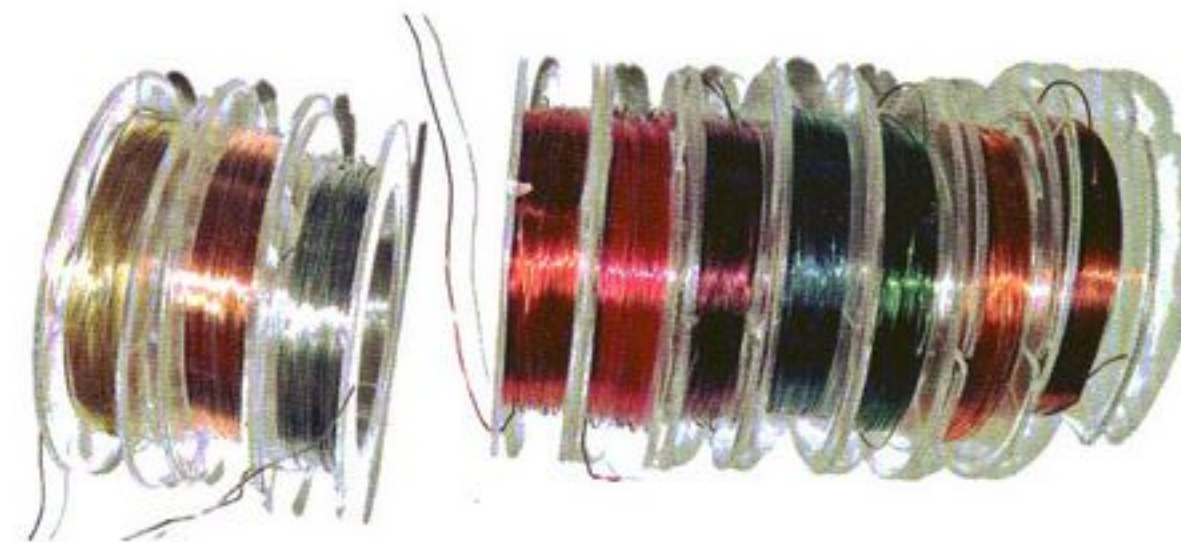
We are also hoping to do something special for *SPRAT* 200 in the Autumn of 2024.

Enzo M0KTZ, continues to whip up enthusiasm with QRP activity sessions on Wednesday and Sunday evenings. His report in this *SPRAT* has some important news about more activity events for Club Members. Please read it and get involved if you can.

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

Coloured enamelled copper wire.

Andy Eskelson G0POY email:andygio@g0poy.com



When winding transformers that need the windings to be correctly phased, i.e. when winding the transformers for a double balanced mixer. It is often useful to use a different colour wire for each winding.

This helps avoid confusion when configuring the transformer. For best results, each winding should be made with the same gauge of wire. I found an unexpected source of coloured copper wire, it is used in craft work for jewellery making.. However it only comes in a few wire gauges. 0.3mm (30 SWG) and 0.9mm (20 SWG) are the most common

However there is a very important point to note. A lot of coloured wire is Aluminium, which is no use to us.

I decided to give this wire a try, and bought a set of ten different colours to test. Each roll held 10m of wire. When the wire turned up, first impressions was that the colours were bright!

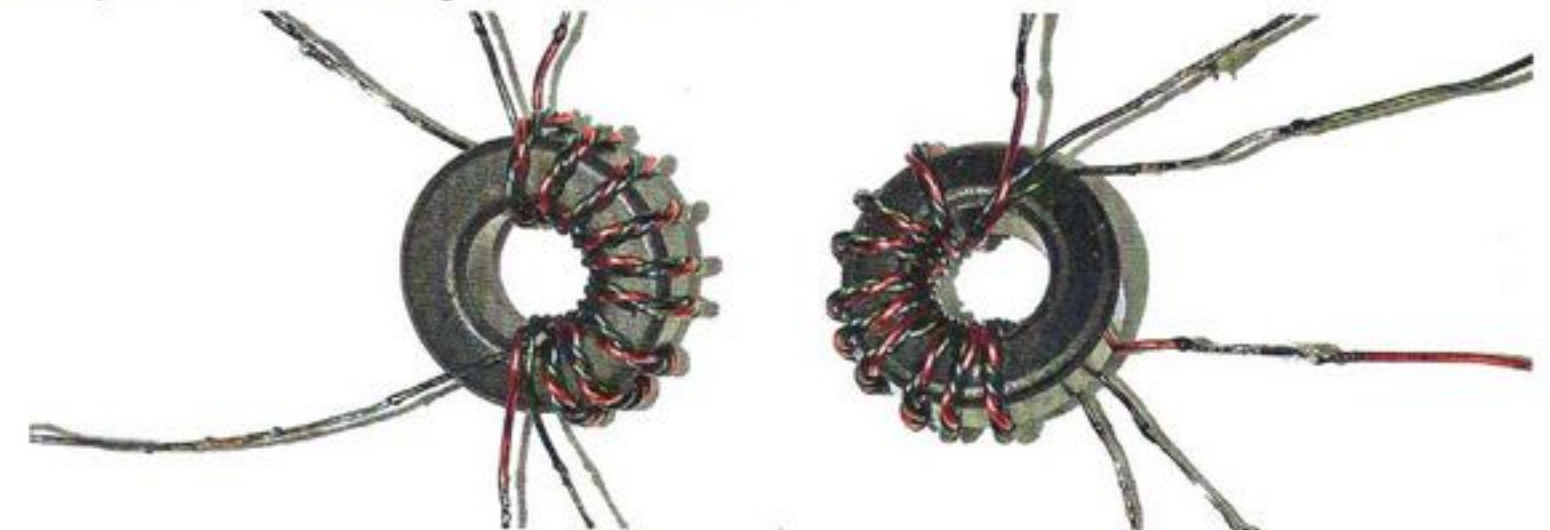
The first thing to check was the insulation on the wire. I used a small insulation tester that could generate a test voltage of 1000V

Three of the colours proved to be useless as they were conductive. They were the gold, silver and copper colours. The remaining colours red, orange, pink, green, blue, purple and bronze passed the insulation test.

Next I tried to solder the wires. The insulation easily soldered without the need to scrape it away. The photo above shows the ten reels with the conductive and useless three, slightly separated from the seven "good" wires. And below is displayed double balanced mixer transformers that I wound using this wire.

The Amazon link for this wire is: <https://amzn.eu/d/5jPuGdx>

It is also available on eBay (and elsewhere I expect). But just to repeat do be careful to check that you are not looking at aluminium wire.



Yet Another Magnetic Loop Antenna

Trygve EI7CLB, GQRP #13050

If ever there was ever a case for use of the acronym YMLA then this is it. The following is a description for construction of yet another magnetic loop antenna. It was a simple need that prompted me to try and build this as I live in a heritage area and I am constrained by basically the same as H.O.A. restrictions that a lot of folks have to live with regardless of their location.

It could also serve to alleviate 'advertising the fact that you have radio gear in the house. The loop is very simple to build and use and costs very little to make. The most expensive parts would be the capacitor and the feeder toroid. The configuration that I describe will allow the loop to be tuned across 20m to 40m.

I have to say that it is not an original design nor is there much new about the use of copper tape (sold most usually as 'Slug-Tape'). Copper tape has been used by many constructors of antennas, particularly Stephen (GM0FFB) and Alan (GM4FLX). The particular one that is described here is very light in weight, cheap and reasonably efficient. There is no way that it could possibly replace a 3 element Yagi tuned to perfection and mounted at 300ft but, it works pretty well and it is totally unobtrusive visually when used indoors.



The antenna is just about a metre about ground. The shack is about six metres above sea level. There is no doubt that my proximity to the sea (about 50 metres at high tide) has an effect on efficiency.

I use mine indoors (through 2 ft of the granite walls of the QTH) and as can be seen from one of the pictures it is comfortable just hanging on the shack door. Sometimes I open the door completely - moving the loop 90 degrees - to exploit the directivity inherent in a magnetic loop.

In practice it seems to make very little difference. It's aimed at QRP(p) operation,



The toroidal feed point

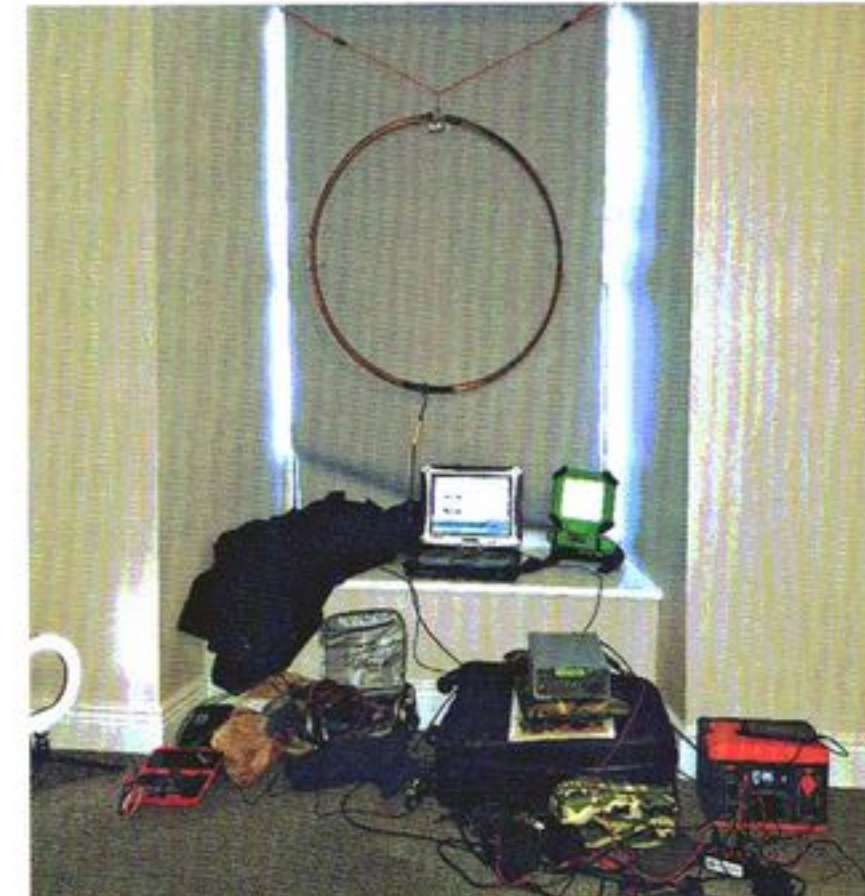
negating the need for any expensive vacuum variable capacitors. I have often used it at 5 watts without any of the problems associated with arc-over on the air variable capacitor.

The main loop itself is UPEX water pipe with a diameter of 20mm. The loop is just 690mm in diameter. The copper tape is just ordinary 'slug tape' available from your local hardware shop or garden centre. The diameter of the tape is 30mm. The loop itself is formed by connecting the ends of the UPEX with some plastic dowel of suitable diameter. That should be

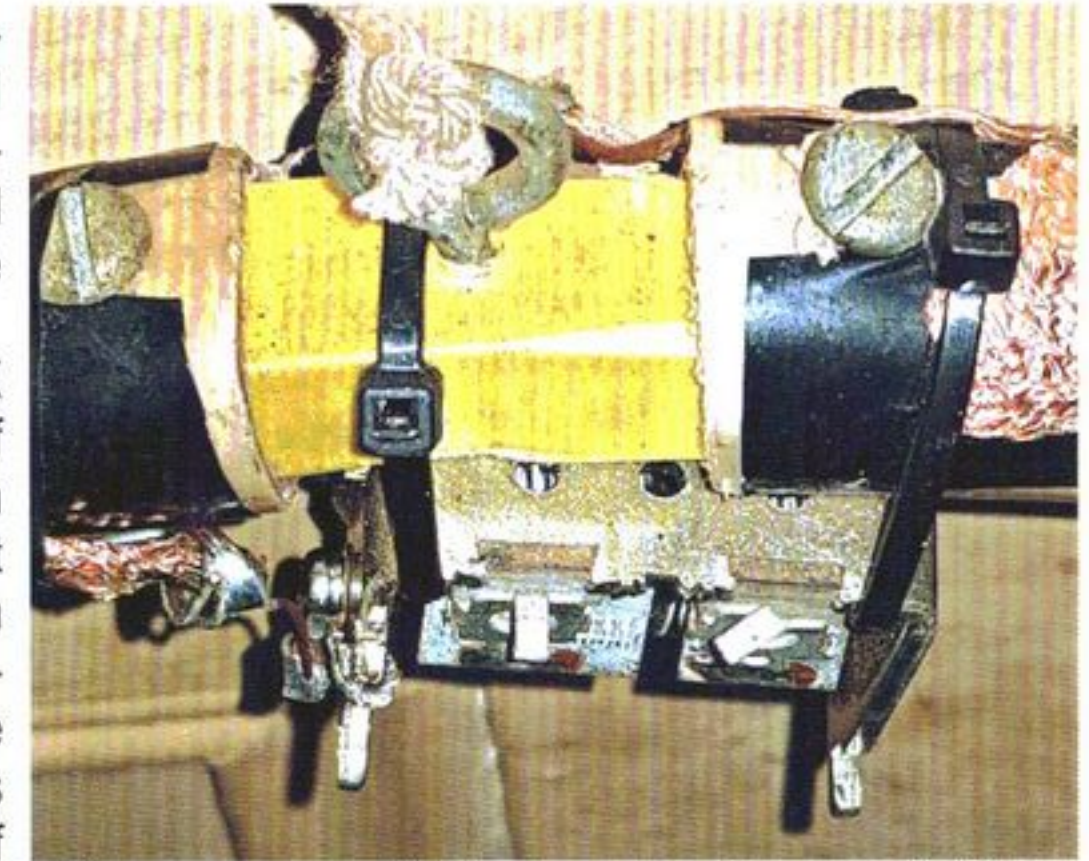
The feeder is a simple toroid core (see the picture on the previous page) - i/d 30mm and o/d 37mm with a depth or thickness of 7mm. The inner core of some RG58 co-axial cable about 3 metres in length is used (it is what I had to hand) in my case, though it is not super critical. The inner core of the cable is wound three times around the toroid core and soldered to the outer of the coaxial itself - the whole affair is finished with some heat-shrink tubing. I have used some ordinary insulation tape to electrically isolate the feeder from the copper tape of the loop itself.

A Gamma match or a Faraday coupling may be preferable to some that wish to try it, though personally I find that the toroid connection works very well.

The tuning capacitor is a dual gang Alps type that measures from 10pF to 110pF across the smaller gang and 10pF to 300pF across the larger, which is what I have used on my build. I have used different capacitors of the approximate value described during tests.



a 'DXedition' in a Clifden hotel room



The area around the tuning capacitor, only its frame is showing up well

In my own case I manually tune the capacitor using a variation of the NorCal 'Tuner Upper' based on the Steve Weber (KD1JV) design, by Song Kang (WA6AYQ). I would think that any air-variable capacitor that covers 10pF to 300pF would be okay, but like I said at the beginning; Your Mileage May Vary.

I have wanted to include a stepper motor for tuning, such as the 28BYJ type or a NEMA 17, depending on the torque needed - driven via an Arduino Nano, but I can do it just fine manually. If you look closely you can see the knob that I used. Obviously, tuning is to be done when the loop is not transmitting

owing to the very high voltages that are present even at extremely low power levels.

The loop is connected to the capacitor terminal and the other end to the capacitor body itself. The capacitor is held in place by some thin nylon tie-wraps. The fragile nature of assembly using copper tape is probably the most tedious part of the build so a short length of some ordinary de-soldering braid is used to make the connections.

Plain copper wire could also be used instead. The connection is soldered to a 3mm ring connector which is screwed into the capacitor body. Please be careful to use a suitable length screw that is not too long as you DO NOT want to inadvertently connect with the actual plates of the capacitor itself.

As can be seen in the picture, the loop is a bit 'Heath-Robinson' (or Rube Goldberg for folks in the US) in looks, but it works. I call it the 'Claddagh Ring' based on the area in which I live. Refinements could include a multi tap feeder to increase the bands that can be tuned. Thus increasing the amount of turns around the toroid, as was recently described by Gil (F4WBY) "The Radio Prepper" in a 3D printed enclosure. An LED/LDR based 'Tuner Upper' arrangement that would be connected to an Arduino which in turn could be connected via a controller to a suitable stepper motor. Some weather proofing would also be valuable should you wish to use the antenna outdoors on a more permanent basis. It is in a case such as this that remote tuning would be pretty much essential.

I have used the antenna successfully with a SOTAbeams WSPRlite Classic (200mW flat out) as well as a QRPLabs QDX which defaults to 5 watts regardless of which mode of operation is used. I have tested the antenna outdoors (housed in a tent!) and also in a hotel room in Clifden, County Galway, the walls of which are a fair bit thicker than the 2 foot here at home.

The QDX is a fine radio, (as is the WSPRlite) and when controlled with a computer a simple Raspberry Pi3B+ or an Inovato Quadra will do the job fine. I did use a Pi Zero briefly but it died and went to Pi heaven.



'Proof of the pudding' so to speak WSPR 'Spots'



I mainly use the antenna with WSPR and it works fine as the shot of my WSPR spots will attest. The main advantage of this antenna is the weight and portability of the thing. It lends itself well to /P and SOTA type operation.

Simple 'No Cost' T-match

Matthias Rauhut DF2OF

Years ago I built the 'No cost ATU' described by G4LDY in *SPRAT* issue 28. It's a Pi-circuit consisting of two capacitors and a coil which can be tuned by inserting a ferrite rod.

Recently I tried to match my random wire antenna with it, but without success. Thinking about it, I wondered a T-match would do the trick. But, if you search books and on the Internet, you will find that the various authors either use a tapped coil (i.e. Toroid) or even a roller coil in a T-Match. Far too complicated and too bulky. Well, you need a variable coil I thought and why not using the one from the 'No cost ATU'?

Half an hour later, and I had it rewired as T-circuit and it worked flawlessly! Matching the random wire was no problem on all bands from 40 to 10m.

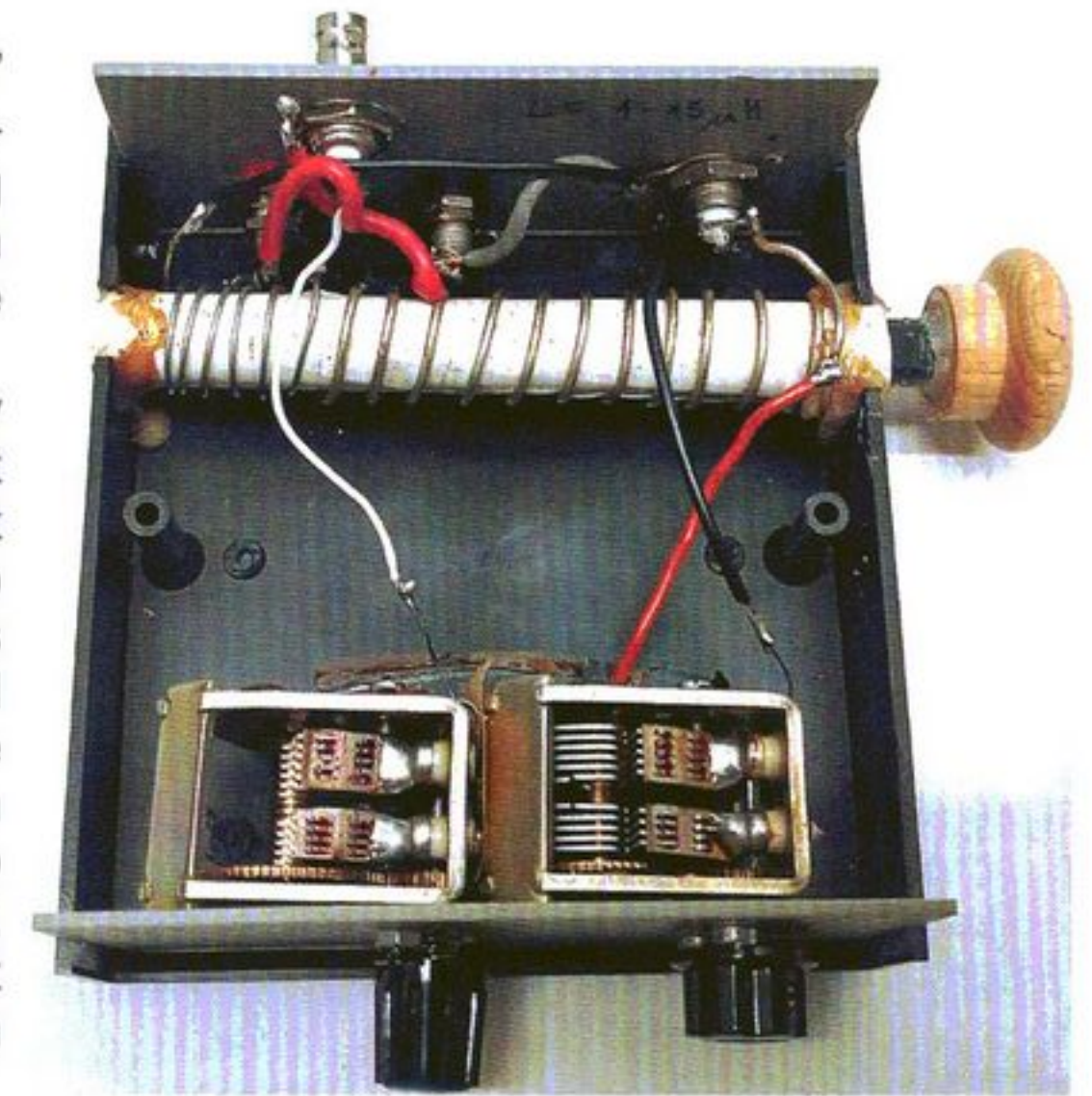
All you need are two capacitors with a maximum capacitance of at least 250pF or more out of the junk box, some wire 0,6-1mm, paper, glue, a knob, a ferrite rod from an old radio (10-15cm long), a plastic case and some connectors of your liking.

The coil (about 17 turns) in my circuit has an inductance variation of 1-15uH when sliding the rod in and out.

To create the coil former, you simply wrap several layers of paper around the ferrite rod, adding glue in between the layers. Once it's dried, it should be possible to move the ferrite rod in the paper former with a sliding motion.

Now wind the coil on the former while keeping the rod inserted. That's it. On one end of the rod I glued an old knob from a drawer, so it's easy to adjust the coil.

Be sure to mount everything in a plastic case of your liking, no metal ones please!



My Little Mate for 10MHz

Steve Hartley G0FUW g0fuw@gqrp.co.uk

As you may or may not know, the Club sells four rather good project books by Drew Diamond VK3XU. At rallies, my 'sales patter' is that everything I have built from those books works, and that is 100% true. The designs are excellent and Drew's writing style is very easy to follow. See Club Sales for details on how to buy the project books.

I have, for more years than I care to remember, been building a dedicated 10MHz transceiver. Several attempts never made it to completion and other projects always came along and grabbed my attention.

But not this time! I have now made a 10MHz version of the Drew Diamond 'Little Mate' transceiver from his Project Book Volume 2. Drew's original was for 40 & 80m but I have reworked the circuits for 30m, and it works a treat. You will need to refer to the Project Book for the full circuits but the modifications are covered below.

The VFO is a Hartley oscillator (no relation, as far as I know). I used a 'green plastic' trimmer for C2, polystyrene capacitors for C3 & C4, and a junk box variable capacitor of about 10pF maximum with a vernier dial for C1.

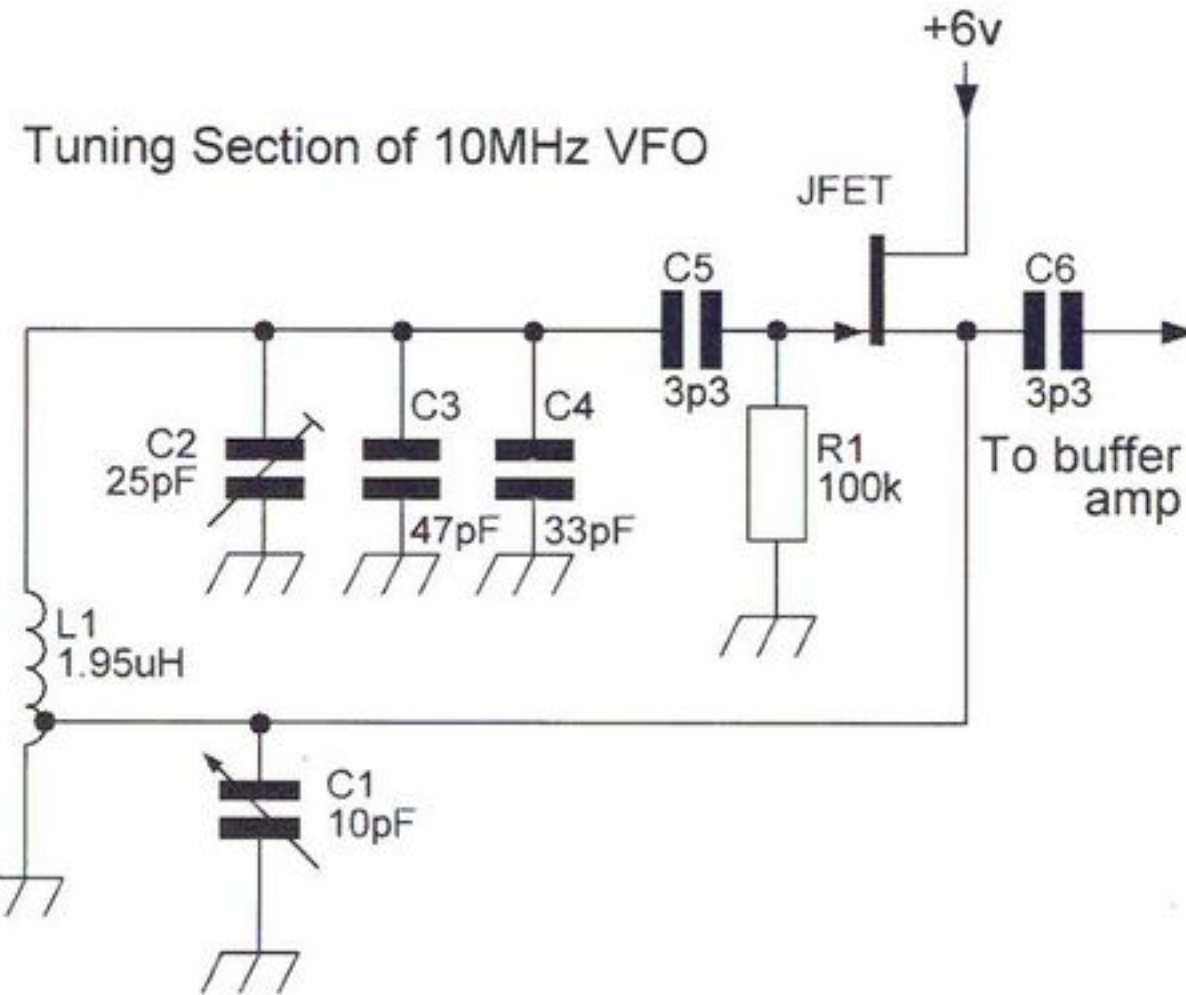
The inductor is 21 (L1) is turns of 26swg enamelled copper wire, tapped at 7 turns, on a T68-6 toroid for the inductor.

I found out (by accident) that connecting the VC (C1) to the tap on the inductor, rather than to top of the winding, gave a much reduced tuning range, but enough to cover the whole of 30m, which was nice. Boxed up, it is as stable an analogue VFO as I have ever built.

The doubler circuit and band switch used in Drew's original were simply omitted for my single band version.

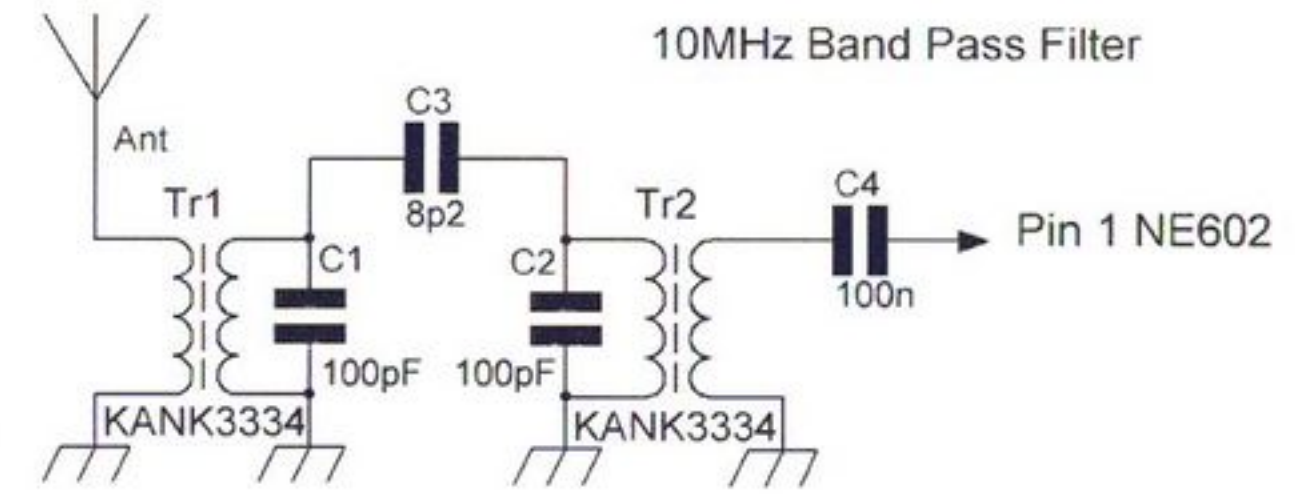
The receiver is direct conversion with a very simple three IC line up: NE602 product detector, uA741 audio filter/amplifier and LM386 audio amp. I actually used an LM380 amplifier, just because I had one handy, but I have tried both and there is not much to choose between them.

The only modification on my receiver board is the band pass filter on the input. I used one of the circuits from the Technical Files on the Club website using two Toko coils, although Spectrum Communications substitutes will work equally well in this application.



The transmitter is a single band version of the original, so only one Low Pass Filter, and no switches.

The transmit devices are a Club Sales freebie '2N3866' driver and an IRF510 power amplifier, keyed via a 2N2905. My Low Pass



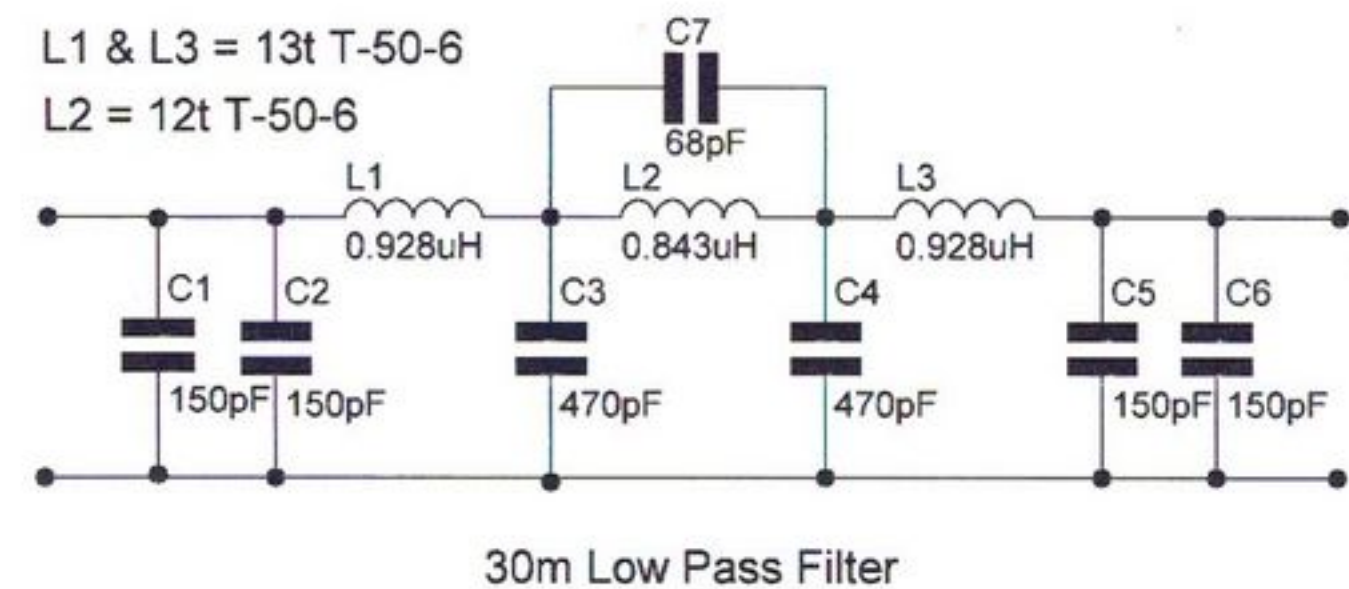
Filter is another circuit from the Club website; see the mighty fine paper by Ed, W3NQN for more info. I used T-50-6 toroids and a mix of ceramic and polystyrene capacitors. The VNA plot looked very much as it should with well over 50dB attenuation of any harmonics.

I built all the circuits using MeSquares (from Club Sales) and PCB sheet (from Bowood Electronics). I also built the case from sheets of PCB material that I bought at the Telford Hamfest for a few pounds.

Does it work? Oh yes. The receiver drives a car stereo speaker to good volume and lots of European/Scandinavian stations come through loud and clear, when propagation allows. Antenna is a hastily made and erected 10MHz off-centre-fed dipole on a 7m fishing pole above the workshop. Setting the bias on the power amp keeps the transmitter 'QRP legal'; I run mine at 3 watts out and the IRF510 seems quite happy with a fairly small heat-sink. It will produce a 'full gallon' 5 watts out, but the VFO starts to pull a little on key down. Not yet sure if that is my power supply wilting at the 'QRO' or genuine oscillator pulling.

Work in progress as I write this is to add semi-break-in changeover, sidetone and an active wide/narrow CW filter (mostly SPRAT circuits).

If you want a Little Mate for yourself, the circuits are in the Project Book Volume 2. The book, and most of the active devices, toroids, etc, can be had from Club Sales; this is not a project that will break the bank! Finding a 10pF variable capacitor for the VFO may require some 'cardboard box diving' at your local rally but there are plenty around in various 'junk' boxes if you are prepared to dig around.



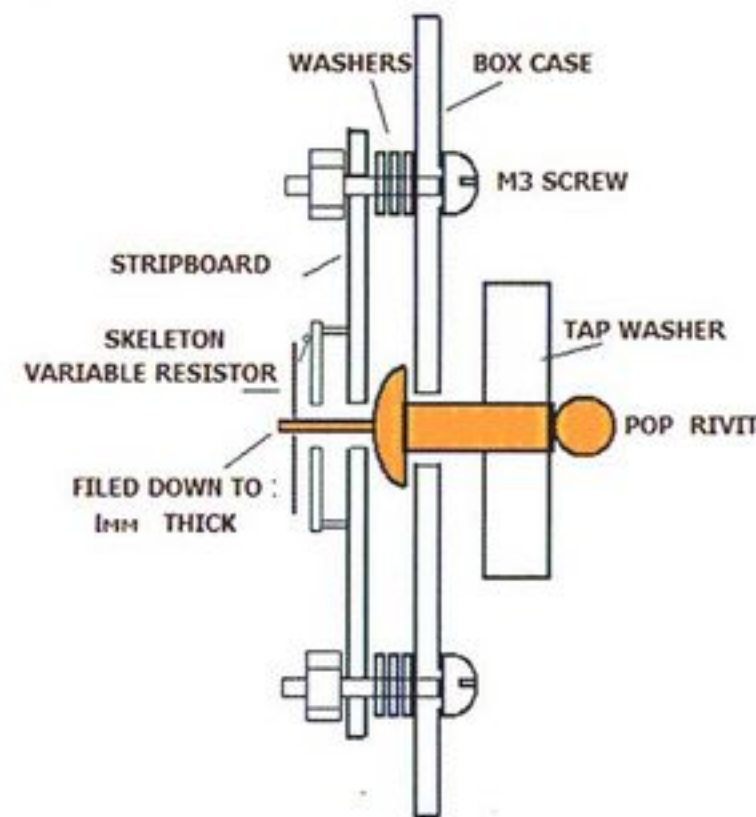
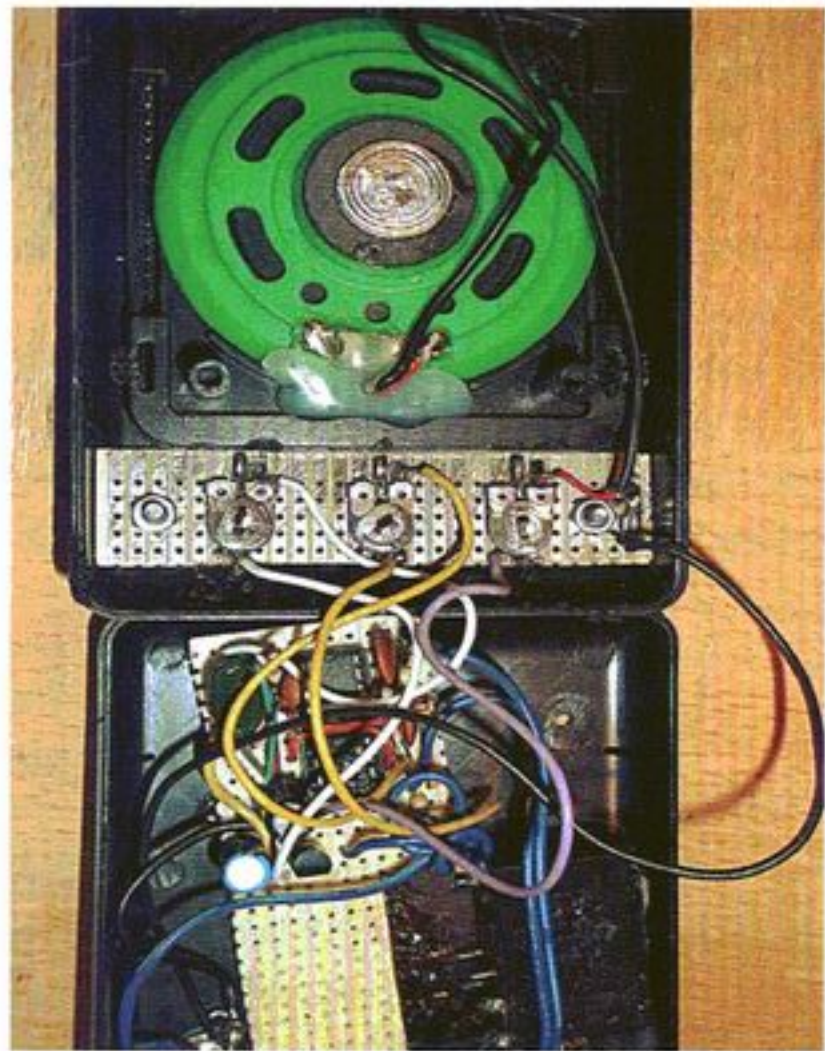
30m Low Pass Filter

Knobs for trimmer potentiometers

Peter Howard G4UMB

QRP projects are often made in small boxes. So standard variable resistors can be too big to look good, or be practical. For this project I needed 3 side by side in a small speaker box I bought from a Pound Shop. So I came up with this solution of using skeleton PCB variable resistors instead.

The drawing shows how I fitted them. I know they are meant to be used as pre-sets; but if you don't need to adjust them very often they will last a long time. They are harder to turn but never the less they have done the job and are considerably cheaper than regular potentiometers.



The tap washer improvised knob was glued to the pop rivet with super glue. The metal shaft of the Pop Rivet has to be filed down to suit the slot size in the resistor.

The spacer washers just need to give enough gap between the Stripboard and case to ensure the rivet is able to turn freely. I colour coded the washers with paper hole reinforcements.

Simple pole to fence/wall attachment

Klas OZ1DTF email: ke.wiman@outlook.com

For my very small garden I have for many years used a short fishing pole. Now the time has come to improve the antenna system

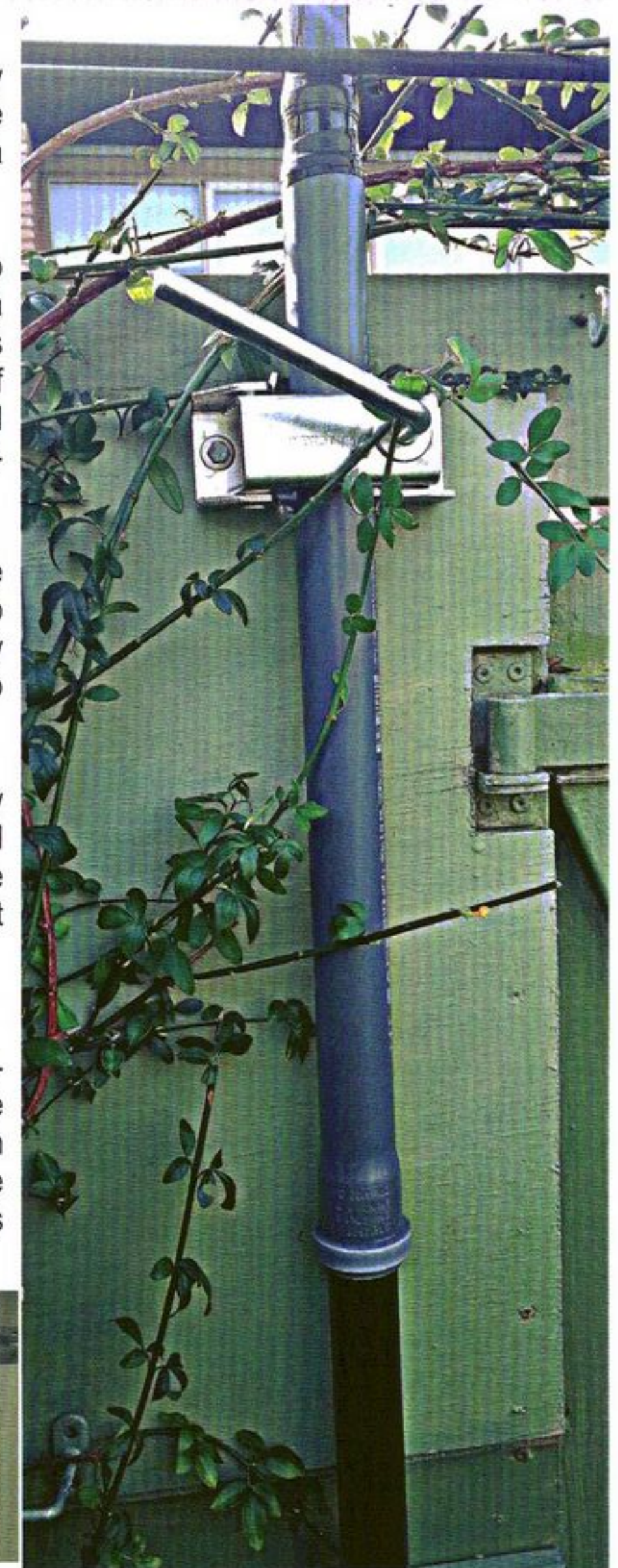
The main component here is a clamp which is intended for the nose-wheel for a trailer. The clamp is easily available. This clamp can be used with a pole/pipe of O.D. 48 mm. The movable part is hinged and can be released/fixed with the included handle.

My new pole is a 7m fibreglass pole from Spiderbeam.de. As 48 mm is too much for section 3 (OD 36 mm) of my pole, I use a standard plastic drainpipe to adapt the diameters.

The lower end of the pole is loosely attached to the fence with a traditional bracket. It is super simple to lower the pole: just release the top clamp and lift the pole (1 kg).

Bonus info:

I have shortened the pole. The uppermost section (no. 12) is "stored" inside section 11. It just projects a few cm. With self-amalgamating tape and a small hose clamp it cannot fall. Thereby the top is stiff.



Simulating with real audio in LTSpice

Cor van Rij, pa3cor, email: corvanrij@gmail.com

LTSpice is a fantastic simulation tool that can greatly help in your circuit design. For example, you easily get a bode-plot from a Cauer-filter, Fig 1.

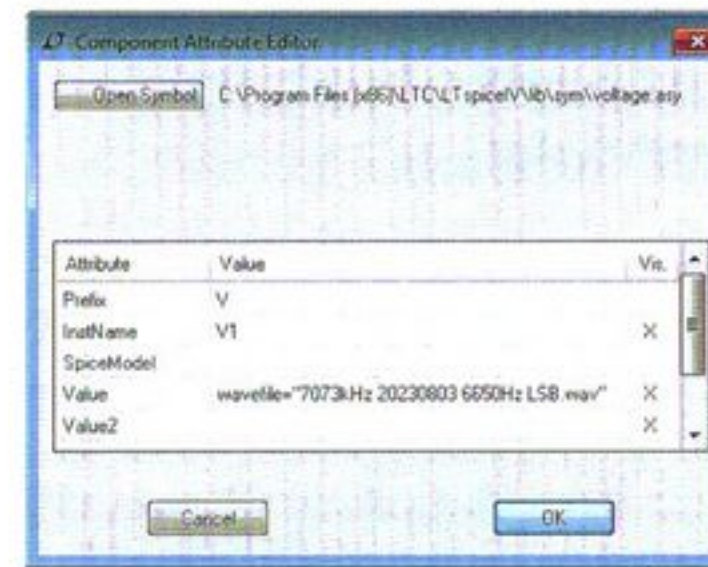
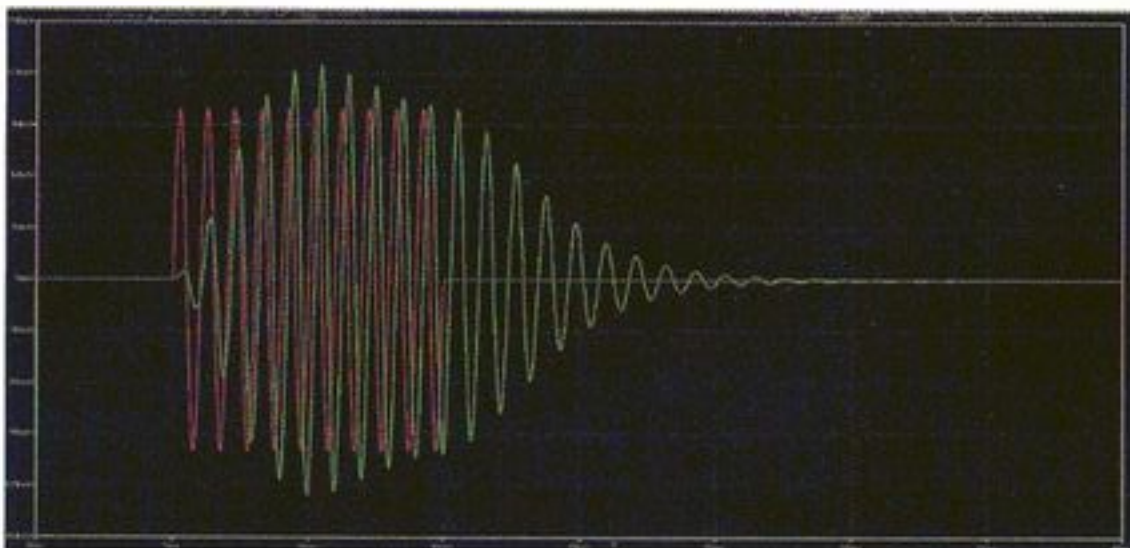
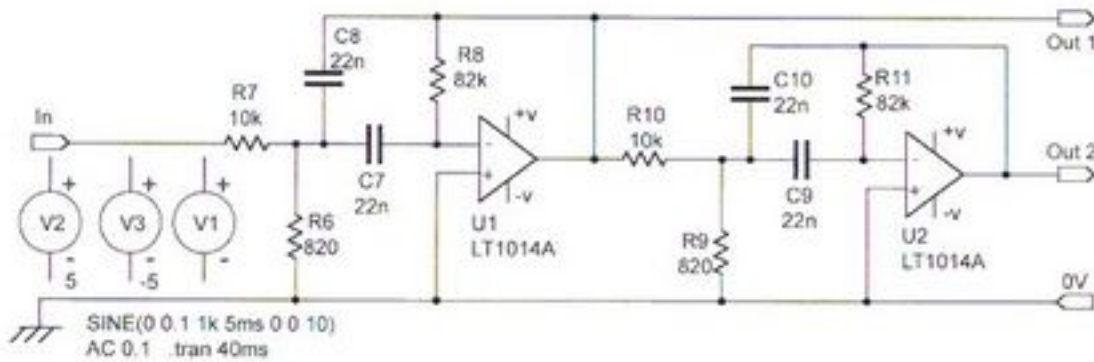
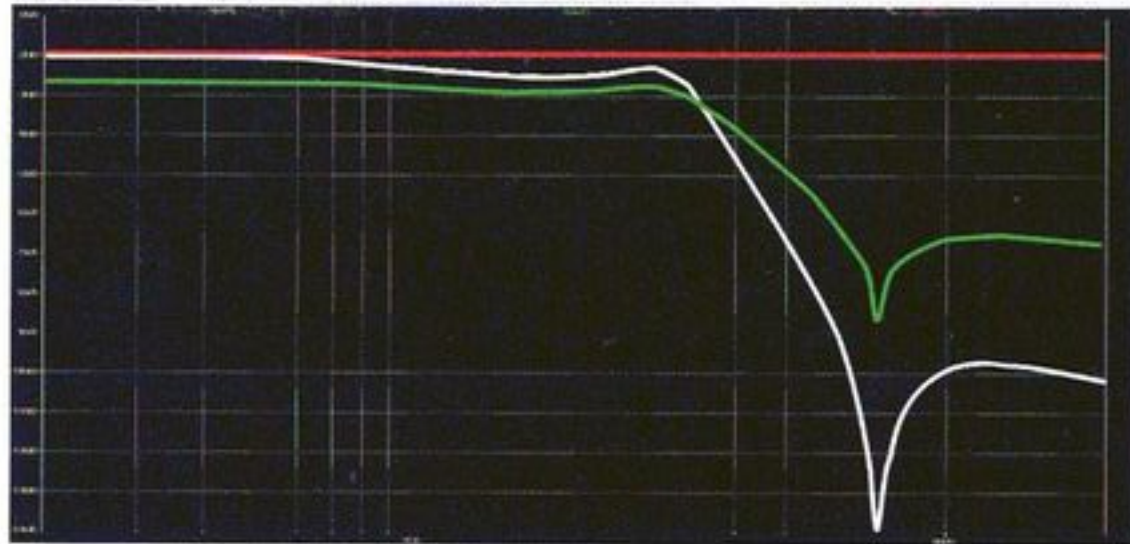
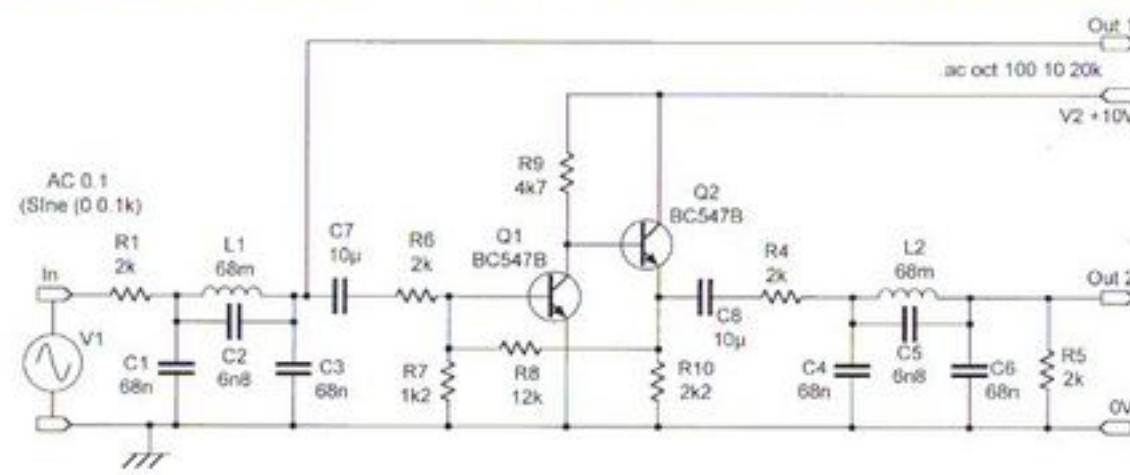
To determine how suited an audio filter is for a Morse code, get the impulse response after a tone burst. You can then see how much ringing there is in the filter.

However, one of the really cool, but nevertheless lesser known, features of LTSpice is the ability to use real audio as a source for your circuit simulations. Use your favorite receiver to capture some amateur radio broadcast and save it as an audio file (wav). This file can now be used as the input for the circuit you are currently simulating. You can thus verify how good your audio filter is before soldering a single component!

Let's see how it works

We need to change three small things. First we need to tell the voltage source in our simulation to use a WAV file. Then we need to tell LTSpice to record the output to another WAV file. Finally, we need to change the simulation time to match the length of the input WAV file (more or less).

1. For excitation of the filter an ordinary voltage source is used. To assign the voltage signals from the WAV file, hold down the CTRL key and right click on the voltage source. This will reveal the Component Attribute Editor, as shown in the figure below.



Change the value line of the Voltage source to wavefile="C:\NameOfYourWaveFile.wav". The full syntax of wavefile command is wavefile="FileName.wav" [chan=<chan#>]. The "FileName.wav" parameter is mandatory. You can omit the quotes if there are no spaces in the file or directory name, however. The channel parameter is optional. 'Channel' can have a value between 0 ... 65.535. Channel '0' is used by default if this parameter is omitted. In a stereo file, channel '0' is assigned to the left channel and channel '1' is assigned to the right channel. LTSpice will figure out the sample rate and the number of bits from the file by parsing the file header.

2. Next we need to capture the output of the simulation and send it to a file. This is done using the LTSpice .wave command.

```
.wave <filename.wav> <Nbits> <SampleRate> V(out) [V(out2) ...]
eg: .wave C:\output.wav 16 44.1K V(left) V(right)
```

<filename.wav> is either a complete absolute path for the .wav file you wish to create or a relative path computed from the directory containing the simulation schematic or netlist. Double quotes may be used to specify a path containing spaces. <Nbits> is the number of sampling bits. The valid range is from 1 to 32 bits.

<SampleRate> is the number of samples to write per simulated second. The valid range is 1 to 4294967295 samples per second. The remainder of the syntax lists the nodes that you wish to save. Each node will be an independent channel in the .wav file. The number of channels may be as few as one or as many as 65535. It is possible to write a device current, e.g., Ib(Q1) as well as node voltage. The .wav analog to digital converter has a full scale range of -1 to +1 Volt or Amp.

Note, that it is possible to write .wav files that cannot be played on your PC sound system because of the number of channels, sample rate or number of bits due to limitations of your PC's codec. But these .wav files may still be used in LTSpice as input for another simulation. See the sections LTSpice=>Circuit Elements=>V. Voltage Source and I. Current source for information on playing a .wav file into an LTSpice simulation. If you want to play the .wav file on your PC sound card, keep in mind that the more popularly supported .wav file formats have 1 or 2 channels; 8 or 16 bits/channel; and a sample rate of 11025, 22050, or 44100 Hz." (Source: LTSpice Wiki)

3. In the transient simulation example in the beginning, the simulation time was set to 20 milliseconds. Now we set the simulation time to be, more or less, equal to the length of WAV file. If we set the time span too short, the WAV file is truncated eq. only a small part of the file is used. If we set it longer than the actual length of the file, our simulation will end with silence....

The simulation time span is set with the command .tran <time> . (This whole scheme will only work in transient simulation mode, of course.)

Using the fantastic Twente University WebSDR (<http://websdr.ewi.utwente.nl:8901/>), I've recorded two audio samples. The first sample is a 6-7 seconds long recording of a SSB conversation with the bandwidth set to 6.6 (!) kHz. The sample was recorded at 7073 kHz at 1233h CET March 8th 2023. The 2nd sample is a recording of a CW exchange. Again with the

bandwidth set to 6.6 kHz and recorded at 7019 kHz at 1227h CET of the same day and it has roughly the same length. You can find both recordings at my web-site :

<https://www.pa3cor.nl/electronics/simulating-with-real-audio/>

Two stage elliptical SSB filter with real audio

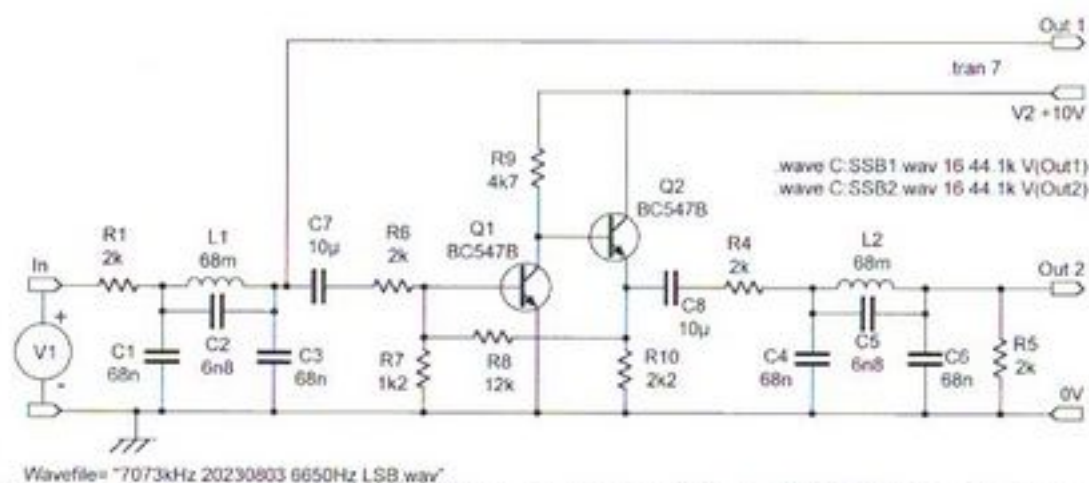
We are using the passive Cauer Low Pass Filter that we've used at the beginning of this post again. We use the Twente WebSDR SSB wav file recording as input.

Using Ctrl-Right click we open the Component Attribute Editor of V1 and we use the wavefile command to tell LTSpice to use LSB wave file as input (see schematic below)

We capture the output of the filter at two places. The output recorded after the first filter (out1) is stored as *ssb1.wav* This is done using the `.wave c:SSB1.wav 16 44.1K V(out1)` command. The output of the 2nd filter (labelled out2) is recorded as *ssb2.wav* using the `.wave c:SSB2.wav 16 44.1K V(out2)` command.

Since the audio captured with WebSDR was a little over 6 seconds, we set the simulation time to 7 seconds with the command `.tran 7`

That's really all there is to it! Now you can run the simulation and listen to the results. You can listen to the outputs of these filters with *ssb1.wav* and with *ssb2.wav* (you can find both at my web-site)

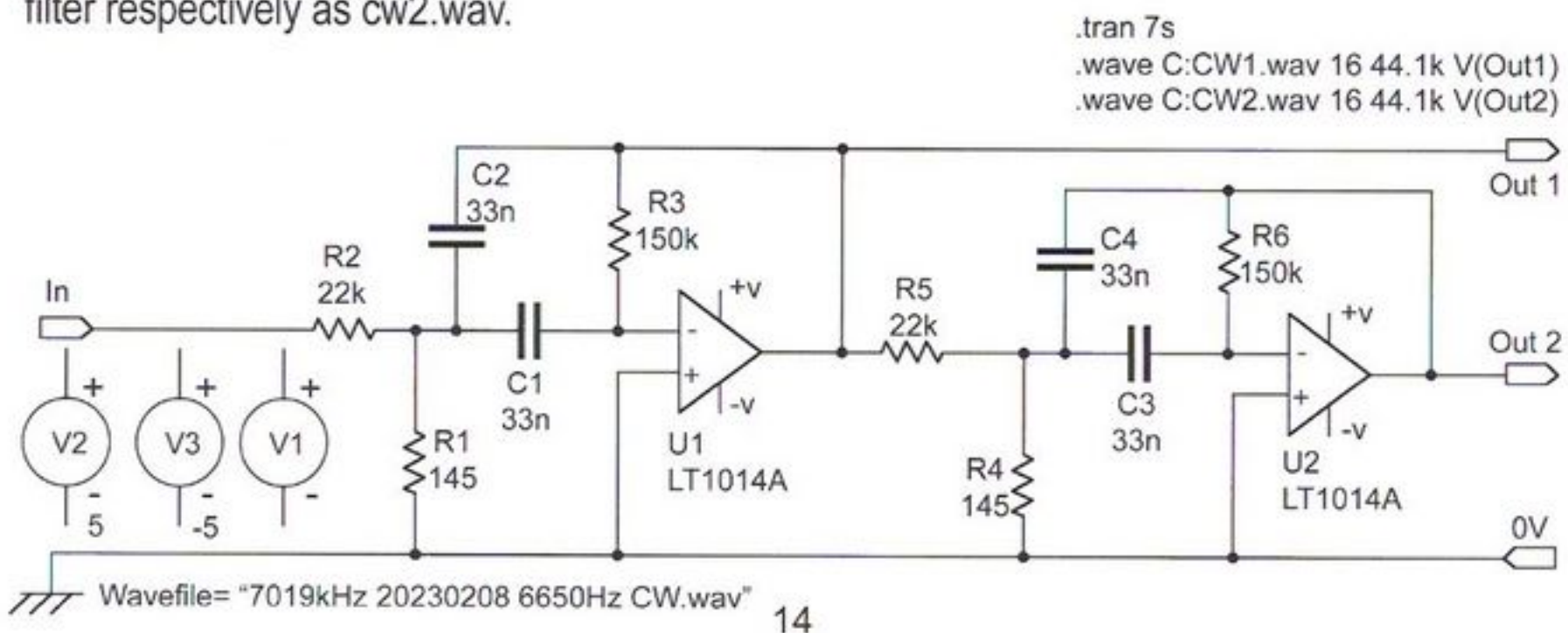


A CW filter tested with real audio

The CW filter is the same multiple feedback filter as used in the beginning. This time we use, part of, a CW conversation as input. Again the file can be found at my website.

It works exactly the same as with the SSB filter. We open the Component Attribute Editor with Ctrl-Right Click and use the wavefile command to use the CW wav file as the input. The output of both filter sections (out1 & out2) are captured with the `.wave` commands. Finally, the simulation time is set to match the length of the input recording with the `.tran 7s` command.

The output is recorded after the first filter (out1) and stored as *cw1.wav*. And after the 2nd filter respectively as *cw2.wav*.



Solderless Breadboard Wire Stripper

Andy Eskelson G0POY email:andygio@g0poy.com

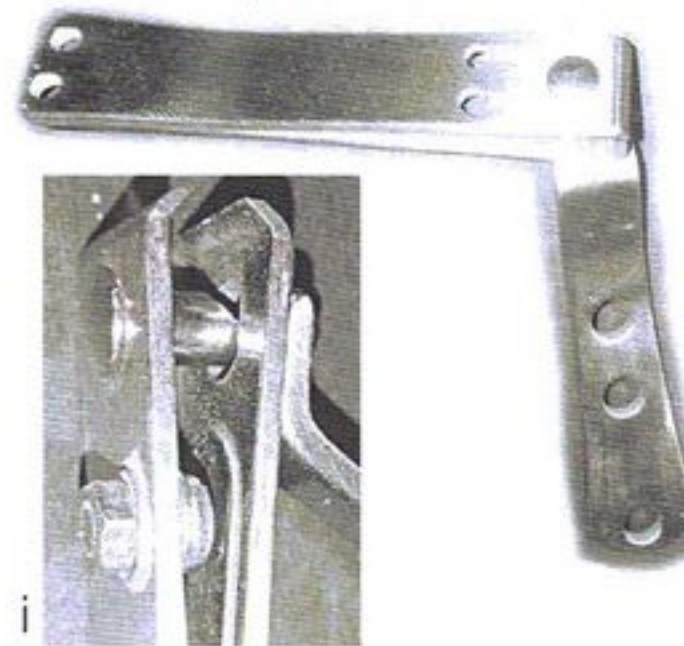
This is a very simple workshop tool for making wire jumpers for breadboards. Like many radio amateurs, I use solderless breadboards to build small circuits.

The interconnections on the boards are made with wire jumpers. 3 or 4 inches long and known as Dupont jumper wires. For a small number of connections, wires are fine, for a more complex circuit, or for one that you need to do a long period of development on, they can get knocked out of place and require re-plugging every so often. It is far more satisfactory to make custom length jumpers which, plug in and lie flat against the breadboard, as seen above.

The jumpers are usually made with solid copper insulated wire, approximately 0.9 millimetres in diameter. (20 swg) The main problem doing this is that you need to strip the ends of the wires to create the jumper. None of the wire-stripping tools I have work really well when you're dealing with a very small amount of insulation. It tends to pull the insulation off completely rather leaving a small piece in place. So I was looking for a different way of making these jumpers.

When I was dealing with fibre optic installations, you had to remove the outer coating of the core of the fibre optic. This was done using a very simple tool, which consisted of two blades which you just squeezed over the outer of the fibre, and pulled gently, and that would separate the buffer. These tools tended to be very expensive, and they were only made of plastic!

Looking around the desk, I spotted a pair of nail clippers. The nail-clippers used almost exactly the same operation as what the fibre optic tool I used to use. So, quick search on Amazon, and I found a large selection of nail-clippers. The one I ordered cost £5, and there were 2 two pairs. All I had to do was build some sort of a spacer arrangement to stop them closing fully. This turned out to be very easy to do.

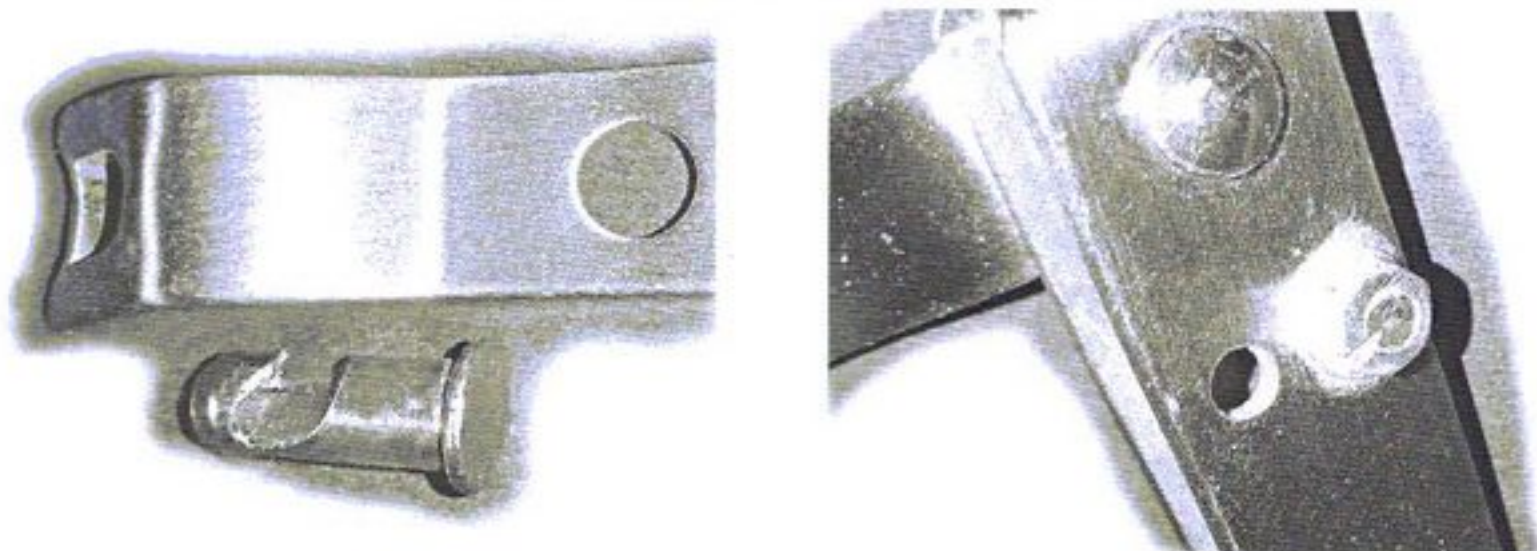


I was prepared to drill holes in the back of the nail clippers. But when they arrived and I turned them over, there were two extremely well placed holes already there (see picture left top). Also rather than having a curved blade, these clippers have a straight blade, and are even more suitable for this work.

I made the stop from an M3 nut and bolt with a single packing washer (see picture left lower) under the head of the bolt to provide the correct distance. This a matter for experimentation. It will depend on the size

of the head of the bolt that you use, and the clippers.

You may find it easier if you remove the lever on the top of the clipper. You do this by compressing the clipper's closed. Use a large pair of pliers to do this. Then you will find that the lever can simply unhook from the pivot pin, shown below left.



Once you have placed the bolt in position and adjusted the spacing, trim the threaded bolt off and file the end smooth as in the picture above right. If you wish you can use a small amount of screw locking compound to ensure that that does not come undone. This completes the main modification of the clippers.

The wire jumpers for the breadboard require a small amount of wire to be stripped and bent at each end. 6 millimetres is sufficient for this.

There is a bending gauge available on Thingiverse[‡] that can be 3D printed. My 3D-print using black PLA, is shown immediately below, with the Thingiverse image, which is clearer below that.



This gauge enables you to cut the jumper 12 millimetres longer than the hole spacing. This allows you to strip off 6 millimetres of

insulation at each end. To make this easy, a small stop needs to be fabricated and inserted into the clippers. I used a stick-on piece of rubber foot material to achieve this in the picture to the right.



In use, you hold the wire jumper with a smooth pair of pliers, insert it into the clippers until it hits the stop, squeeze the clippers closed, rotate them half a turn as you pull, and it will make a clean cut of the insulation. Repeat this on the other end of the jumper.

You then place the jumper back into the bending gauge, there is a hole at one end of the edge of the gauge you just fold the wires down into that hole and down the edge of the gauge at the other end, and that is the job done. It will then fit exactly into the appropriate number of holes the gauge is set for.

If you need a longer length of stripped wire, you just use the other side of the clipper

where there is no stop. Note that if you squeeze the clippers closed very hard, then the jaws will close more, and you run the risk of nicking the wire. However this does allow for some "feel" for slightly different insulation thicknesses.

The clipper body also has an area as a nail file. This works very nicely for removing the enamel coating on wires.

If you do not have access to a 3D printer, many of the PCB houses now offer a 3D printing service. I priced up the cost of producing the Thingiverse bending gauge, and it was approximately \$20 from JLCPCB. This was in a resin material. You will find similar prices elsewhere. You could also make a gauge from a piece of 0.1 inch matrix board.

- ‡ *Thingiverse is a website with predesigned 3D-printable creations for all sorts of tasks and hobbies.*
- Amazon link for clippers: <https://amzn.eu/d/9N7PYzu>
- Thingiverse link for gauge <https://www.thingiverse.com/thing:3587631>

CQ-DL DL-QRP Meeting / Treffen 2024

Manfred DK4NQ

The annual meeting of the QRP friends in Germany will take place on **April 26th - 28th 2024** in Konnersreuth/Bavaria near the border with OK (Cheb). Registrations for lectures, demonstrations and to participate as a visitor are very welcome via DK4NQ@t-online.de

The meeting will only be interesting if many practical lectures are offered. That's why we ask for numerous suggestions! Further information about the meeting can be accessed by email from OM Manfred DK4NQ in the spring.

VY 72 from the organizing team
Manfred DK4NQ

DL-QRP Treffen 2024

Das jährliche Treffen der QRP-Freunde in Deutschland findet am **26. - 28. April 2024** in Konnersreuth/Bayern nahe der Grenze zu OK (Cheb) statt. Anmeldungen von Vorträgen, Demonstrationen und zur Teilnahme als Besucher sind sehr erwünscht über DK4NQ@t-online.de



Das Treffen wird nur interessant, wenn viele praktische Vorträge angeboten werden; deshalb bitten wir um zahlreiche Vorschläge. Weitere Informationen über den Ablauf des Treffens können im Frühjahr über

OM Manfred DK4NQ per Mail abgerufen werden.

VY 72 vom Organisationsteam
Manfred DK4NQ

EAT32-RX.

Philip G4HOJ email: G4HOJ@yahoo.co.uk

EAT32? Well – Experimental, Ancient Technology, 3 Band, 2 Valve Receiver

You never know Rodders, this time next year, I might have come up with THE minimalist receiver of all receivers!?!...but then, that would probably be boring! I do really enjoy dabbling and trying different things on the bench – when I get the opportunity.

EAT?

Well, while I do get very many emails from people who are interested in valve stuff and certainly many from people who have a go at building one of my designs.....some building for the first time in a long time (or ever)....I am also aware that there are also many who are totally focused on digital/SDR/hi-tech/etc.

I did go through a phase myself where I thought everything should be latest tech., latest modes, software-linked, etc., but not anymore. That is not to say I am not interested but, nowadays, I want to design and build simple but good-enough gear that I can use, repair and modify, tear down and rebuild, etc., etc.....hence, another Experimental and Ancient Technology simple(ish) receiver.

32?

The 3 is for three bands (80m, 60m and 40m) and the 2 for two valves. The receiver is a superhet in principle but it employs a tuneable intermediate frequency and, although the tuneable part of the receiver is a self-detecting oscillator, some might think of it as a regen'., in which case, it should probably be labelled a "regenerodyne".

Circuit Description

The front end uses an ECH81 in which the heptode operates a self-oscillating mixer uses interchangeable or switched crystals for each band and the triode operates as the self-detecting tuneable oscillator. The input circuit is a basic, wide-sweep, tuned circuit that will cover around 3.4MHz to 8MHz with the capacitor I use.

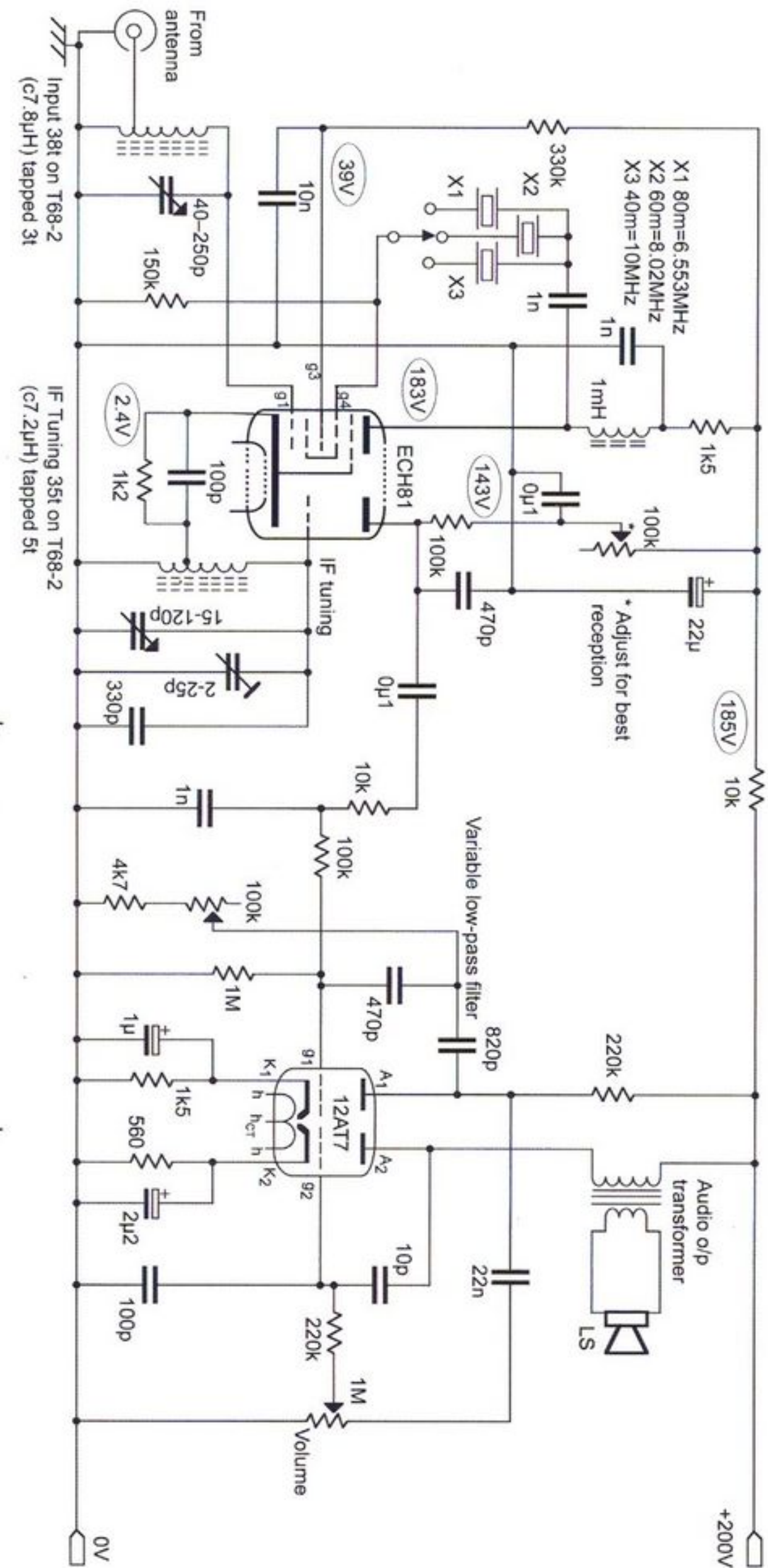
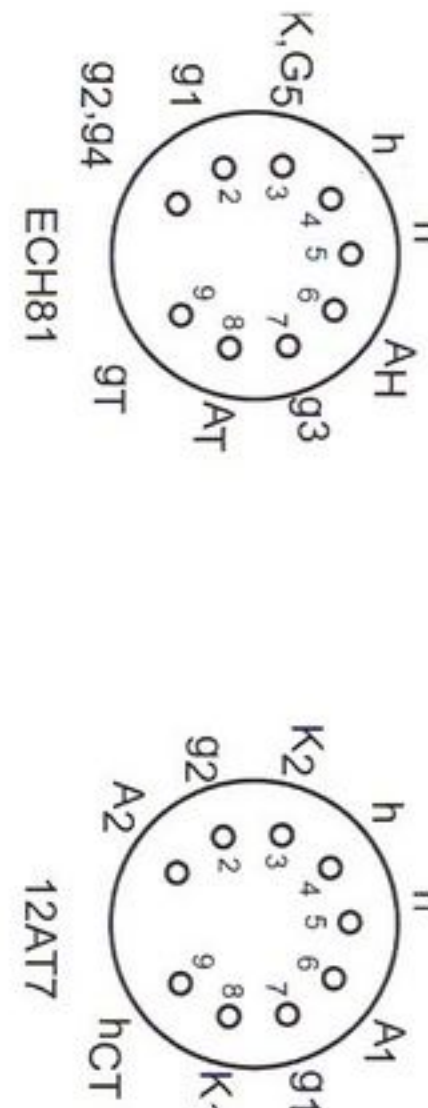
Tuning is quite sharp as the toroid input circuit is quite high Q. The crystals used are all available cheaply on "the Bay" currently (important to my calculations and design decisions) and, in fact, crystals can also be found there that will allow the receiver to work on Top Band and 30m. In this design, I couple the I.F. signals to the tuneable I.F. from the cathode of the converter.

The output for the full 80m band is 2.753MHz to 3.053MHz (reverse tuning for all bands) with the 6.553MHz crystal in the front end. The I.F. tuning range is obviously more than needed for the other two bands, 60m and 40m – with 8.192MHz and 10MHz crystals respectively.

The self-detecting oscillator gives a reasonably good account of itself (it is based upon several other similar receiver-hearts that I have designed over the last few years). Although, if looking for more complexity, one might try using the triode section as a buffer between the hexode converter front end and a different receiver concept. This might be such as a pentode-based detector and audio stages...or even a relatively simple superhet covering the

ECH81 Triode-Heptode used as an oscillator/mixer sharing a common cathode.

*Note:
The Heptode part has five grids with grids 2 and 4 connected internally*



same frequency span (but beware of additional opportunities for spurious signals (birdies) from the required VFO. The ECH81 requires 6.3v @ 300mA and its HT current is around 2mA (185 volts after the 10K resistor) in my experimental receiver.

The back end of the receiver is pretty much the same as in my Anoder design (but you will see I am only using the negative feedback low-pass components in this RX) and the output drives a speaker with just enough volume for my needs – needless to say, loud into low impedance headphones! So, two valves, three bands (possibility of five – although the input tuned circuit would have to be modified), and useful loudspeaker output.

Experimental

This is an experimental design but it works well enough. It hears the band noise on all three bands when using my inverted L (matched through Series LC or L match) and is fun to use. Downsides of simplicity? Well, there is no AGC so the volume control needs to be adjusted from time-to-time. And there is a tiny bit of frequency pulling as the aerial input circuit is peaked but it is relatively simple.

There is no tuned oscillator switching and the I.F. is relatively low, making for reasonable stability if built correctly, I have not detected any "birdies" or image breakthrough, and it can be built in a quite compact form.

It might be possible to buffer the tuned oscillator frequency (haven't tried yet) and use another mixer, feeding a sniff of signal from the crystal oscillator too, to generate a low level transmit signal for CW....that could perhaps be given a little amplification and then bunged into the front end of a formerly crystal controlled transmitter??

Certainly crystals are available cheaply that would provide coverage of 160m and 30m (4.864MHz and 13.104MHz respectively), so more opportunity for experimentation there.

The End

Actually, no, not the end! I expect to keep experimenting with this circuit and variations upon it because of the good performance versus relative simplicity. If any of you try it or something based on it, do please let me know. I am always interested!! You never know Rodders!

G-QRP Support for the RCF

Steve G0FUW email: g0fuw@gqrp.co.uk

When I mentioned to the GQRP club Secretary about my work with the Radio Communications Foundation (RCF), it was asked if we, as a Club could do anything to help. I mentioned that the RCF had just agreed to sponsor 60 Foundation exams a year for young people in full-time education, and suggested the Club might sponsor a few more. Dick, G0BPS, floated the idea with the rest of the committee, and sponsorship of 10 additional exams was agreed. For anyone who has not heard of the RCF, their website is here:

<https://commsfoundation.org/>

If members would like to donate themselves, or bequeath a donation in their wills, the RCF is a registered charity who benefit from Gift Aid, etc. Details of how to donate are on the website.

73, Steve, G0FUW

CLUB SALES NEWS



By the time you read this a new Club Sales Team will be in place. Our thanks go to **Adrian, M1LCR, Lewis, G4YTN, Steve, G7JHU & Dan, M7JJU**, who have volunteered to join **Graham, G3MFJ**, to form the new sales team.

We could not find anyone willing or able to take on the full task but by splitting it up we have been able to carry on and keep Graham involved. He will continue to handle orders and payments but the picking, packing and posting of parts, books and kits will be carried out by the other team members.

Fingers crossed, members will see no difference to the excellent service Graham has developed over the years. What we do expect to change, through having a bigger sales team spread across the country, is that the Club Sales should be seen at more rallies. All of the team members have agreed to

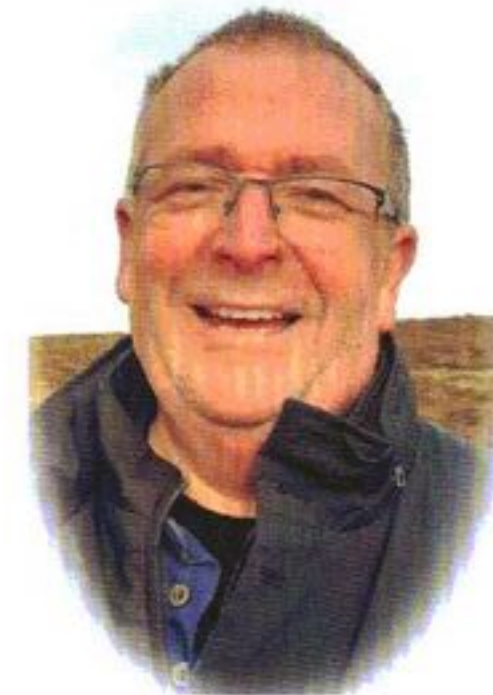
fly the flag at local rallies (Lewis already covers much of the South West and has been helping Graham at the Convention).

And, for the avoidance of doubt, there will still be a Club Sales stall at our annual QRP Convention at Telford. Graham will continue to join **Roy, GM4VKK**, for rally sales at Blackpool and Galashiels.

So, for mail order of Club Sales items (see website for full list) just send your orders and payment to Graham in the usual way (see back page). Your parts, kits and books will be despatched as soon as the postal system allows.

Three cheers for all our volunteers who continue to keep the wheels of the G-QRP turning!

The four new club sales team: above left Lewis, below left Adrian, centre Steve and below right Dan.



The BFR106 RF Amp Circuit

Pete Juliano email: n6qwham@gmail.com

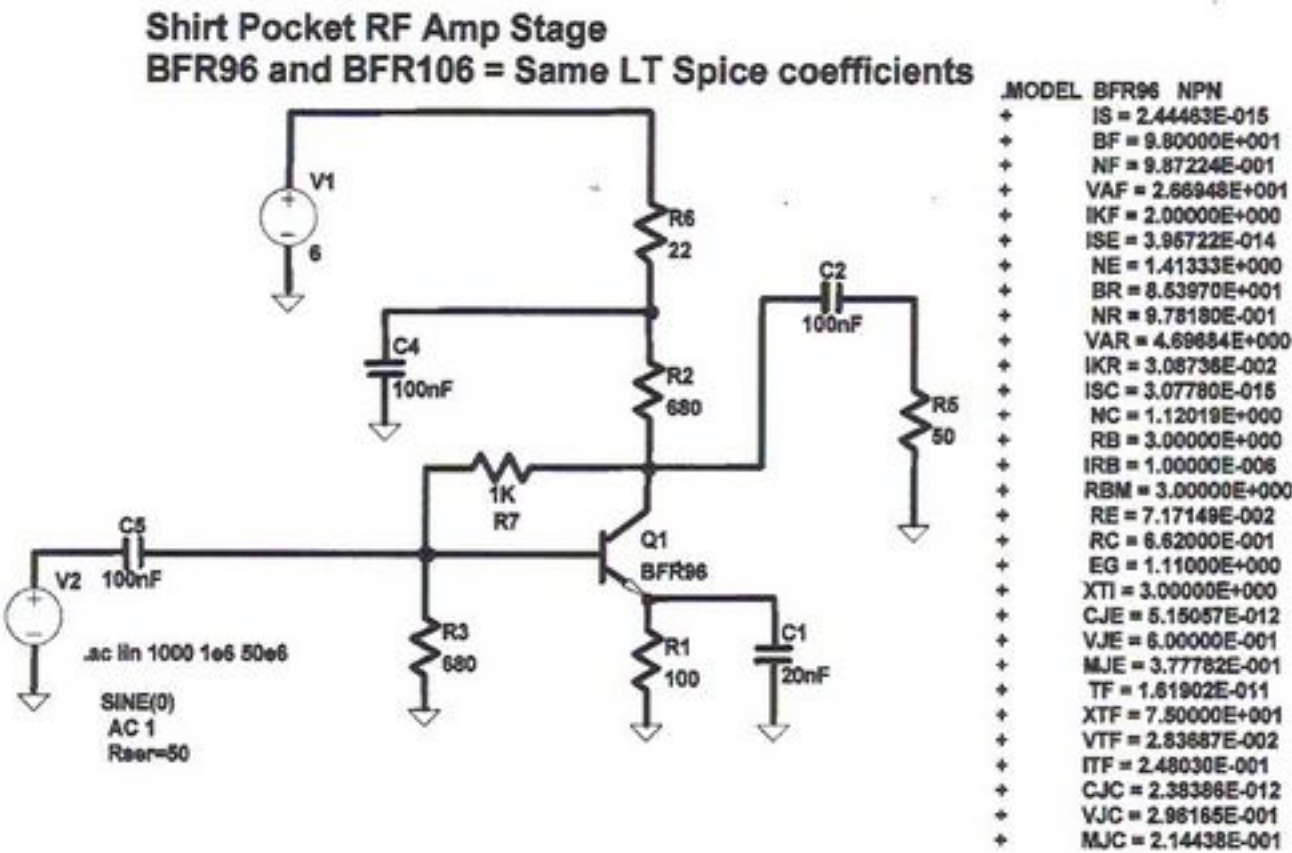
In 2011 I designed and built two Shirt Pocket sized SSB Transceivers. The second version was a diminutive 2x2x4 inches. It was a cool rig, but I had to make compromises to fit the space. That included omitting the Receiver RF Amp stage. That turned out to be not a good trade off!

Recently I found a neat transistor, the BFR106 an SMD device which is good from DC to 5GHz and costs \$0.43. This just might solve my RF Amp Issue.

I used just the *n*pn half of the Plessey circuit as is found in *EMRFD* as my starting point. I found that the Plessey *Z*in/out is 50Ω and has about 17dB of gain up to 6 meters.

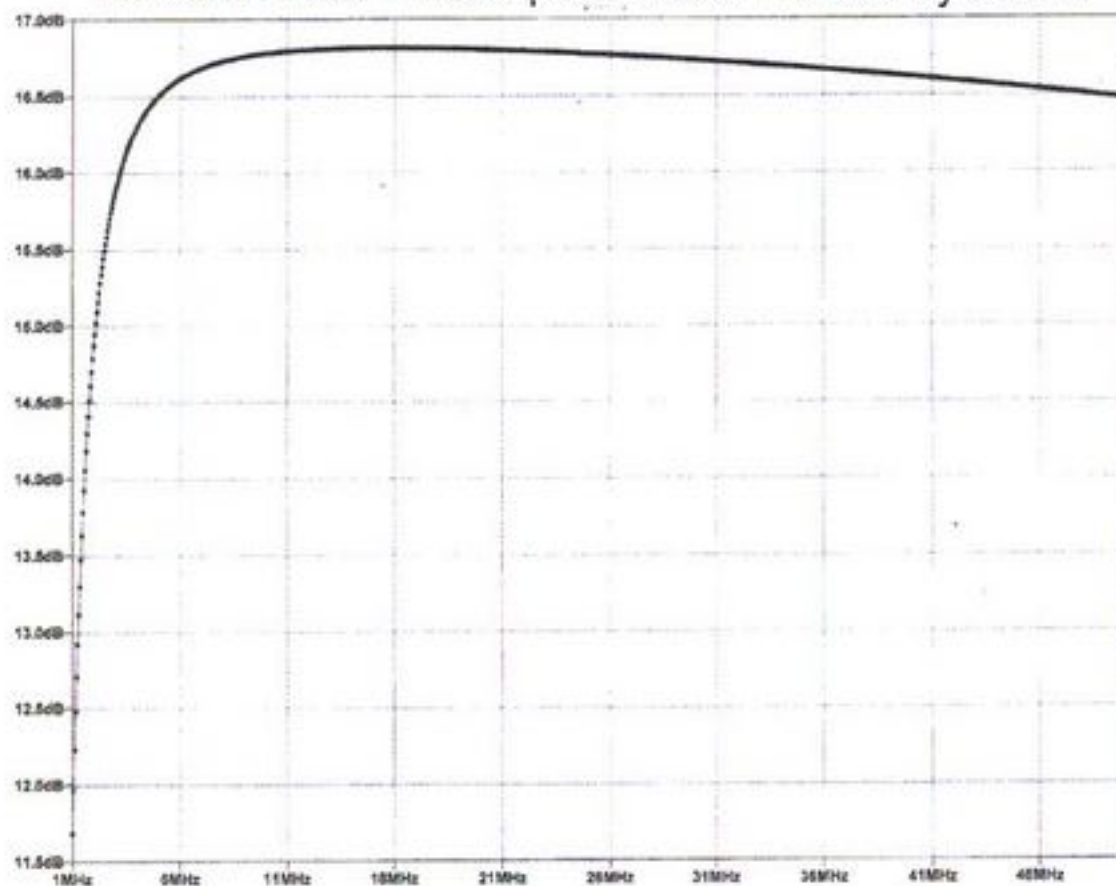
The BFR106 LT Spice Schematic is shown here on the right.

Note:
Both the BFR96 and BFR106 have Same parameters.



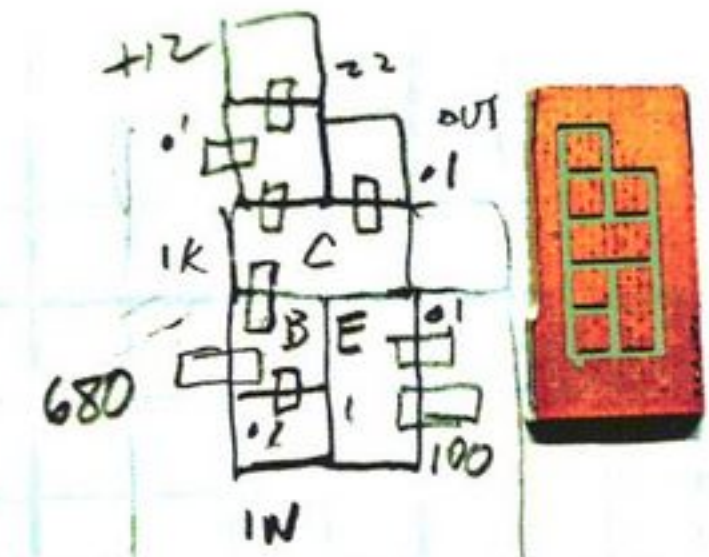
LT Spice simulation of the BFR106

The Gain Plot. The drop off at 50 MHz is only 0.2dB

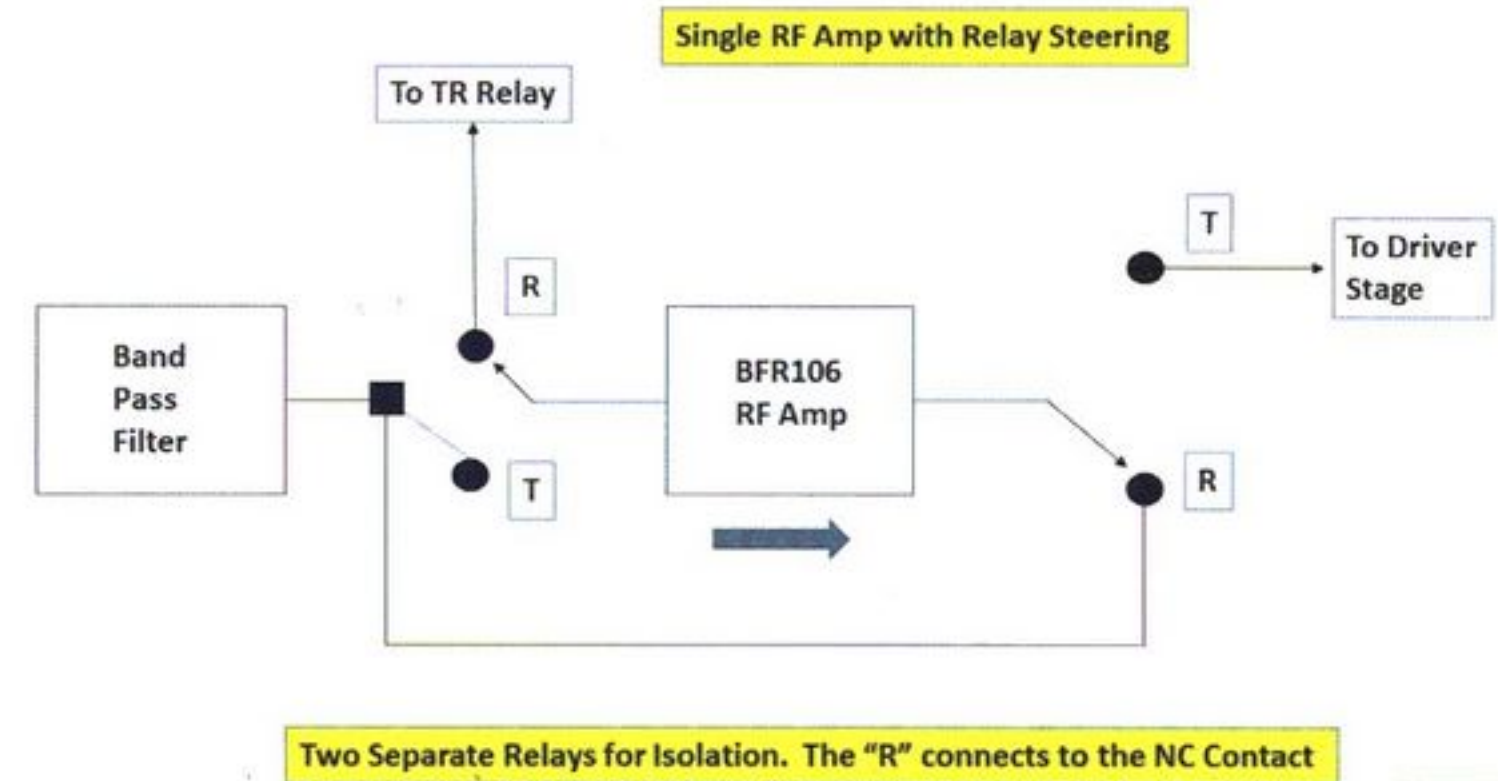


The photo shown here demonstrates the parts placement and the finished PC board which is less than 1 inch by 0.5 inches. (0805 SMD size parts are used)

The SMD board fitted inside the Radio



An alternative approach with the BFR106 is to have a set of relays "steer" the signal path so that on Receive the circuit is the Rx RF Amp and on Transmit it is the Pre-Driver. A block diagram below shows how that is done.

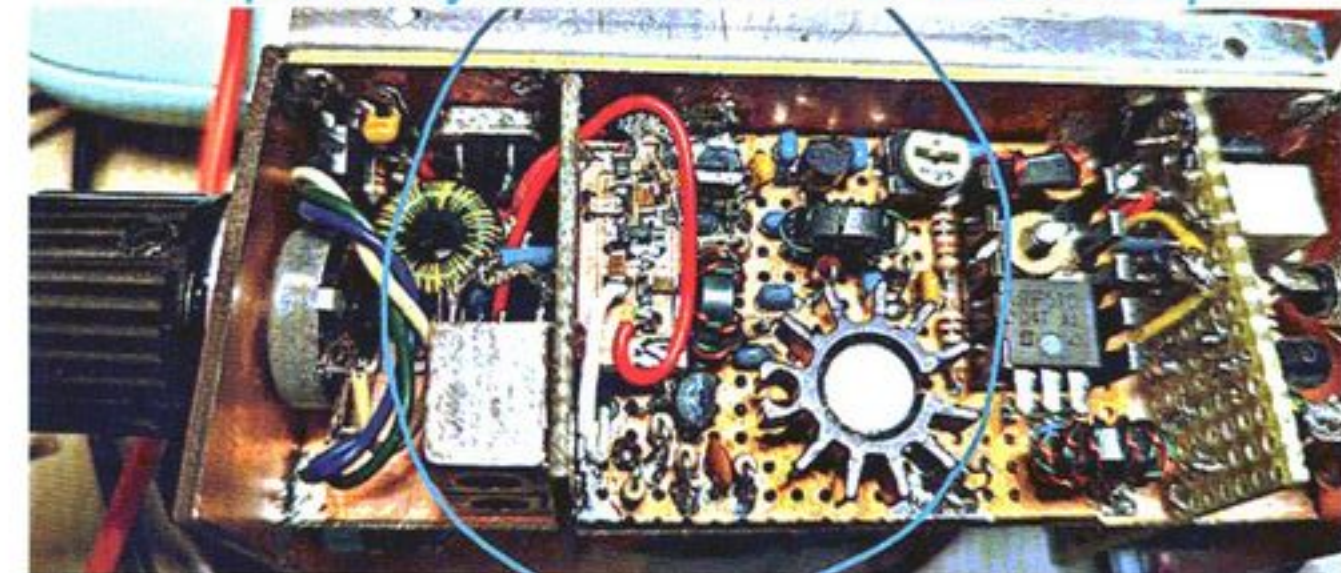


N6QW 10/2023

So how did it work? Perfect! The source voltage was 6 VDC and the gain was slightly over 11dB (simulation) and with 12 VDC the gain is near 17dB (plot) which is too hot for use in a front end. There is no AGC in the radio so a caution about too much gain.

The YouTube video documents the build of the reworked radio.

<https://www.youtube.com/watch?v=JCz8WMfGOpw>



73s
Pete, N6QW

QRP Upgrades - A Brace of Pennteks

Richard Meal M0RGM (mw0rgm@gmail.com)

After a number of years of solid use it has become time to retire my good old Elecraft KX1 and treat it with the respect it deserves, with outings on special occasions, but no more exposure to the weather or physical abuse, the question is what do I replace it with...? My fully loaded Elecraft KX2 is wonderful, but there are places that you might not want to take a radio costing well over a thousand pounds, so the search began.

Following a number of the QRP websites and reviews I ordered and subsequently took delivery of a Venus SW3b; this turned out to be a really good little radio, but it didn't match the analogue operational simplicity of the KX1, it simply didn't scratch my itch.

Don't get me wrong it does a great job and has now become the glovebox HF rig in my car, ideal for those random serendipitous moments when on a journey I find myself in a great location to operate.

My search continued and eventually I fell upon the Penntek TR-35 which really piqued my interest. A lightweight portable and rugged little 4-band QRP rig with digital display and yes analogue controls and switches! The reviews were all outstanding and so it was that I became the proud owner of a shiny new Penntek TR-35 after waiting for a few days for delivery from the US; never has the fedex tracking been followed so closely!

John, WA3RNC, who owns Penntek and who designed and built the radio was wonderful, answering all my queries promptly by email. In the end I opted for the slightly more expensive version with the optical encoding tuner, rather than the standard "clicky" rotary encoder, something that was, in my view, well worth the investment.

For those unfamiliar with the TR-35, it is a robust but lightweight 4-band ABS plastic cased radio with analogue controls (including keyer speed) which supports both straight and iambic



keys. With up to 6 W out and a voltage range from 9 to 14V, it can be paired with a multitude of power sources - I've used everything from a PP3 to dedicated 11.1V Lithium packs. Available as a kit for home build or ready built, the radio is a delight to use and if you are interested I would highly recommend visiting the WA3RNC website.

To say I was delighted with the TR-35 was an understatement and for a number of weeks it sat on my work desk at home, allowing me to monitor the bands when working remotely (not in the office) and during those periodic coffee breaks put out a quick CQ!

It is an outstanding portable suitable for SOTA or POTA with miserly power consumption and is incredibly light to carry. However, like a kid in a sweetshop I was fascinated with WA3RNC's next offering, the TR-45.

For those of us of a certain age who can remember the lunar shots and skylab (I was just a kid, honest), you will remember seeing images of equipment with dials, meters and switches - well John appears to have modelled the TR-45 on this era and has created a portable/base QRP rig that is beauty to behold, I encourage you all to take a look on his website!

This rig is (to me) something of beauty and like a moth to a candle I was drawn inexorably to ordering one. A quick exchange with John resulted in the availability of a bare bones 5 band model (80, 40, 30, 20 and 17m albeit with no ATU or battery pack) being available from the first pilot batch; indeed, this was the first TR-45 to come to the UK! As I placed the order I was so excited.

Despite the fact that my order coincided with the lowest value of the pound versus dollar in 40 years (this is not a cheap radio, particularly when you add import duties), the quality in use and pleasure I have had from this, in but a few weeks, has been worth it.

So how good is the TR-45? The TR-45 is absolutely amazing and even better than the TR-35 when operating as a base, although it too could be used when travelling. The features are extensive and even include CW filter, notch filter and audio filter, CW memories, SWR indicator, zero beat checker, not to mention the glorious analogue meter and clear digital display.

All of the above are controlled through a combination of rotary controls and toggle switches - the ergonomics alone are fun, with no menus to remember, just a great sense of satisfaction in use. The TR-45 is not yet on available as a kit, but ready built radios are available.

So was the investment in these two radios worth it? Absolutely! All I can say is that I need no other base station and with the TR-35/TR-45 combination I could happily sell nearly all my other radios (OK, I might just keep my KX1 and KX2 for posterity!).

The main image (previous page) shows both the TR-45 (left) and TR-35 (right) with a Palm key in the foreground and IC 756 Pro III to rear for scale. A screen grab of the site is shown here.

(Right) a 'grab' from the WA3RNC website:
www.wa3rnc.com/store/

WA3RNC

QRP Transceivers

WA3RNC TR-45L QRP Transceivers Now In-Stock!

The TR-45L factory serial transceivers are now available for purchase (they are not available, WA3RNC has been working on a conversion kit with delivery times of two to three weeks for serial TR-45L. Given the low base sufficient stock quantities to permit purchases for immediate shipment with no wait period. The TR-45L is available in two different forms, the standard original unit, and the new "library" version with a much more housing. Two options are available for the original version, an external 500mah lithium battery and an internal 2-mach antenna tuner. These options are not available for the "library" version because there is not sufficient room inside the thinner rear housing to accommodate them. A kit ball is included with the thicker version (see the photos). Stock is currently available for both versions, if stock becomes inadequate, you will be notified when placing an order and will not be able to complete the ordering process. We do not want to accept your payment if a product is not available for shipment.

- Order TR-45L Standard Version
- Order TR-45L "Library" Version



Standard Version TR-45L

TR-45L "Library" Version

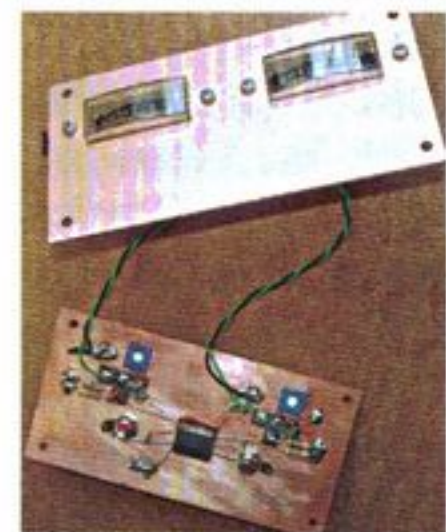
G-QRP Convention 2023

by Vic Winton, GW4JUN and Lee Aldridge, G4EJB

As in recent years, our Convention was held with the **Telford and District Amateur Radio Club (TDARS)** Hamfest at the large rural campus of Harper Adams University [1], near Newport, Shropshire in early September.

On the Saturday afternoon we had a Buildathon, well organised as ever by **Steve, G0FUW** and his team of helpers. This year's project was QRP SWR meter based on the Stockton design.

Sixteen eager builders were given a goody bag with all the components, parts & tools required and a step-by-step instruction booklet. (A big Thank You to **Paul, M0BMN** at **Kanga Products** for donating some parts). Each table had three or four builders, so a lively banter ensued. Everyone chipped in to help and less experienced builders were guided through the build by the helpers.



As each SWR meter was completed, the helpers calibrated it using a test rig. Any problems were checked through and corrected, then re-calibrated if necessary. With all kits complete and tested, there were a lot of smiling faces leaving the building room. Not only did we have a useful piece

of kit and a fun afternoon, some new friendships were also made.

There's a nice (short) slide-show of the Buildathon [2] courtesy of **Damien, 2E0EUI** – thanks!

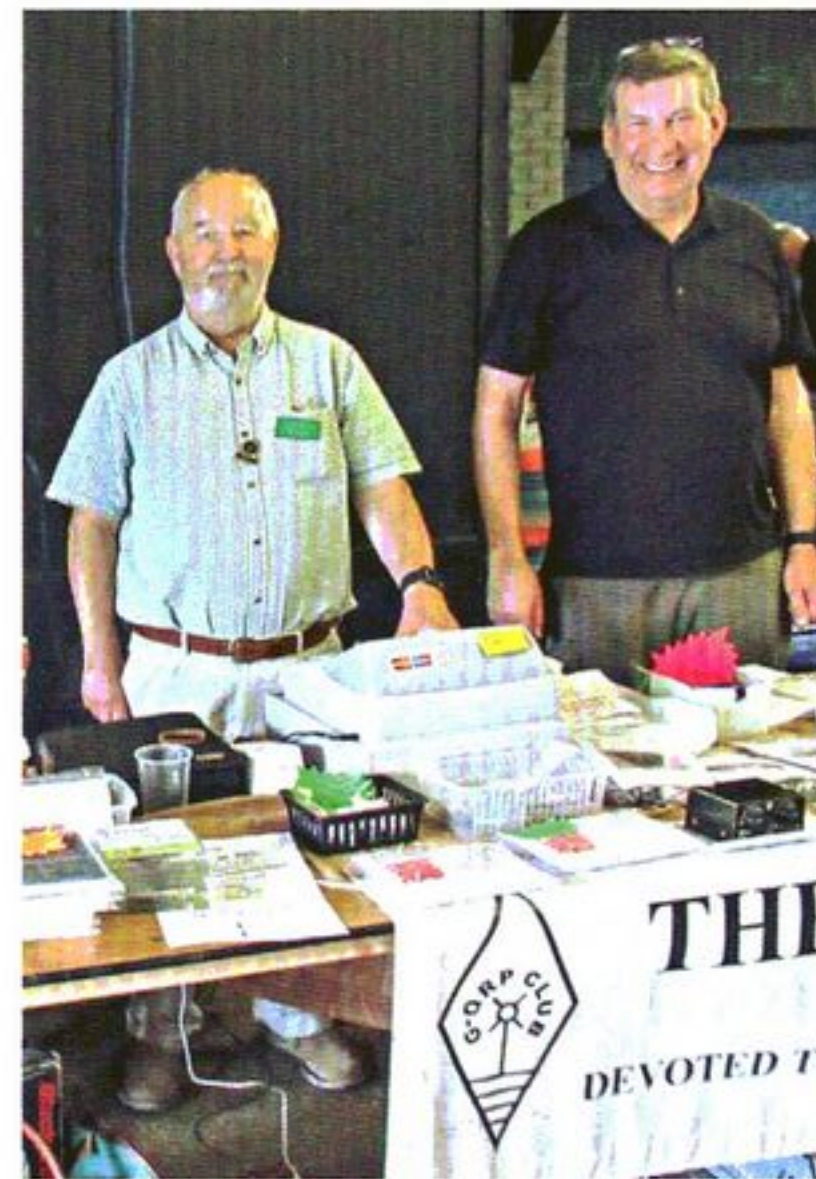
The G-QRP Club also put on an evening social gathering and buffet in the Harper Adams bar. It was a lively social get together with old friends and new ones, too. Discussions went on until late! Luckily, overnight accommodation was also available on campus with a hearty breakfast on the Sunday morning.

And that's when the Hamfest rally gets into full swing.

Inside the main hall



The goody bag and instructions



The GQRP club stall

There were two large halls, full of traders with a wide range of goodies, components, bring & buy, and special interest groups. There were also traders outside with various bits & bobs, radios and ancillary items.

The Club had a prominent stall inside with **Graham, G3MFJ, XYL Pat** doing a grand job.

Meanwhile our Convention continued with three talks arranged for the Sunday. This year we had three crackers!

First was Club On-Air Activity manager **Enzo, M0K TZ**. Enzo gave a truly original and inspiring talk on QRP operating, Club Activities and Awards aka getting on the air and having fun with QRP radio at the home QTH, in the garden, up a hillside or wherever. Enzo's enthusiasm was infectious and anyone who didn't feel inspired by his presentation should have checked for a pulse. Just ask him about QRPz!

Next up was "Building and Using the PAC12 and other Portable Antennas", by **John, VE3IPS** (live via Zoom). Lots of details and tips about how to build one or similar antennas using readily available parts or things you may have to hand. Very comprehensive.

Finally, a highly entertaining presentation by **Rex, W1REX** [3]. He demonstrated how to run a mini Buildathon in eight minutes! We all got a small bag containing a professional pcb with some turned headers pre-soldered in, plus three small voltage regulators and a few capacitors. The task was to build a 12V DC in to 5V, 6V, 9V, 12V DC out power supply. How? Just push fit the components into the header sockets. No Solder Required! And yes, we all did it in eight minutes. Brilliant!

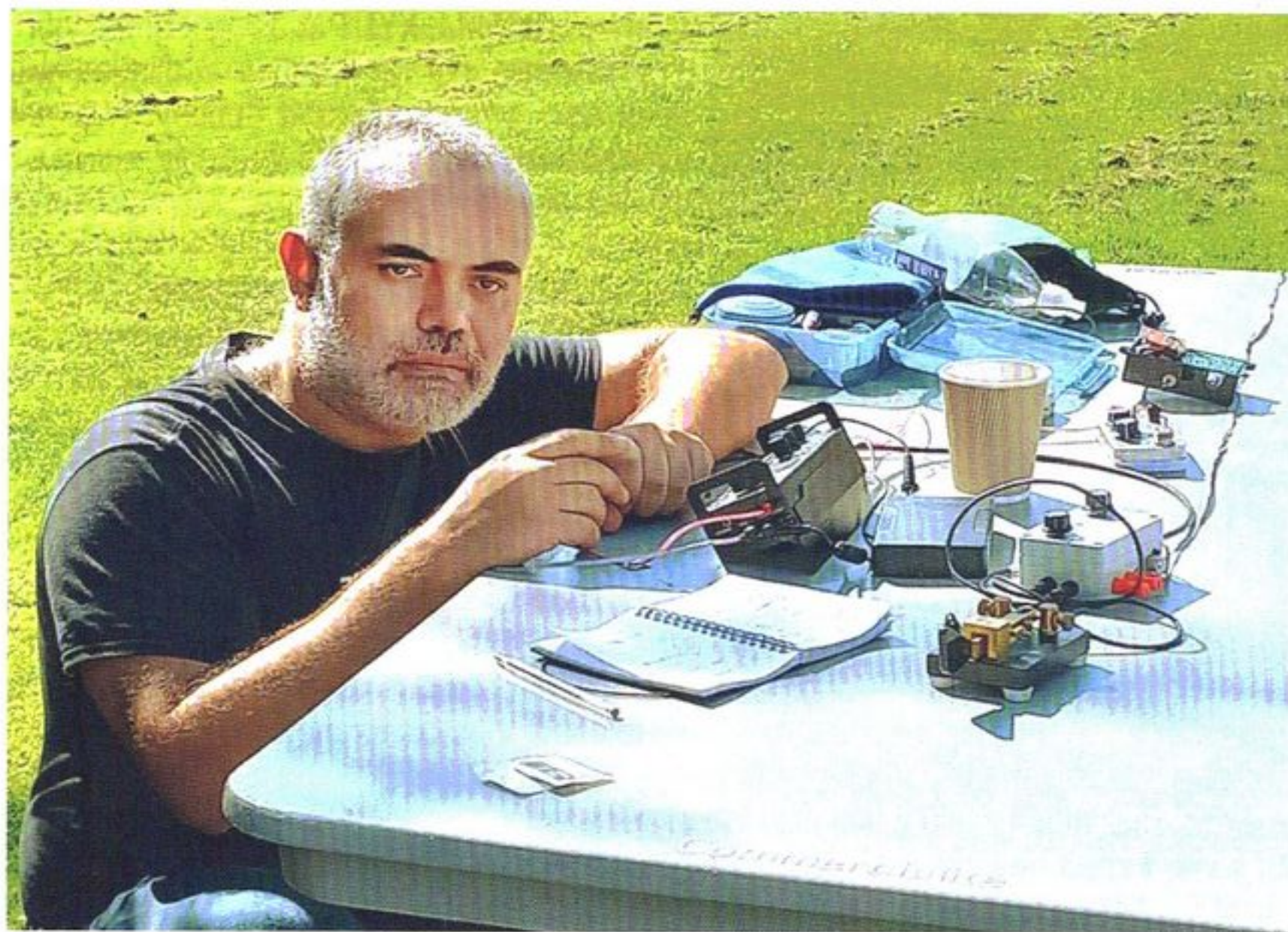
All in all, three excellent presentations!



Rex, W1REX giving his excellent presentation

After his excellent talk, Enzo, M0KTZ put up an antenna outside to operate with the Club call G5LOW. He reported back as follows:

'We had several QSOs, two were two-way QRP – Ferdinand, IT9QAU in Sicily (1400 miles) and one with Andre, F5JDG/M, a G-QRP member who was in the French Alps running 5W to a whip on his car roof. He was very glad to work the Club call from the G-QRP Convention, and we had a nice 20+ minutes chat. That made our day'.



Enzo, M0KTZ operating the G-QRP Club call, G5LOW

There was a good attendance and a real buzz to the whole event. The excellent facilities at the Harper Adams University help considerably from accommodation, to food and drinks as well as some excellent staff who make the whole experience thoroughly enjoyable.

Our thanks also to all those from the Club and TDARS who voluntarily gave of their time for us to enjoy the whole weekend. The glorious weather was a bonus!

If you like the idea of attending something a little unique with a few amazing people for company, how about next year? It'll be on 31st Aug - 1st Sept 2024 and it's the Club's 50th anniversary - well worth celebrating!!

Web links:

- [1] Harper Adams University see: <https://www.harper-adams.ac.uk/>
- [2] Buildathon slide show: https://www.youtube.com/watch?v=l_KIX839laQ
- [3] Telford and District Amateur Radio Society (TDARS): <https://tdars.org.uk/>
- [4] Rex, W1REX QRPme kits & fun stuff: <http://www.qrpme.com/>

My version of the SCD project

Gary Fisher G0WTL

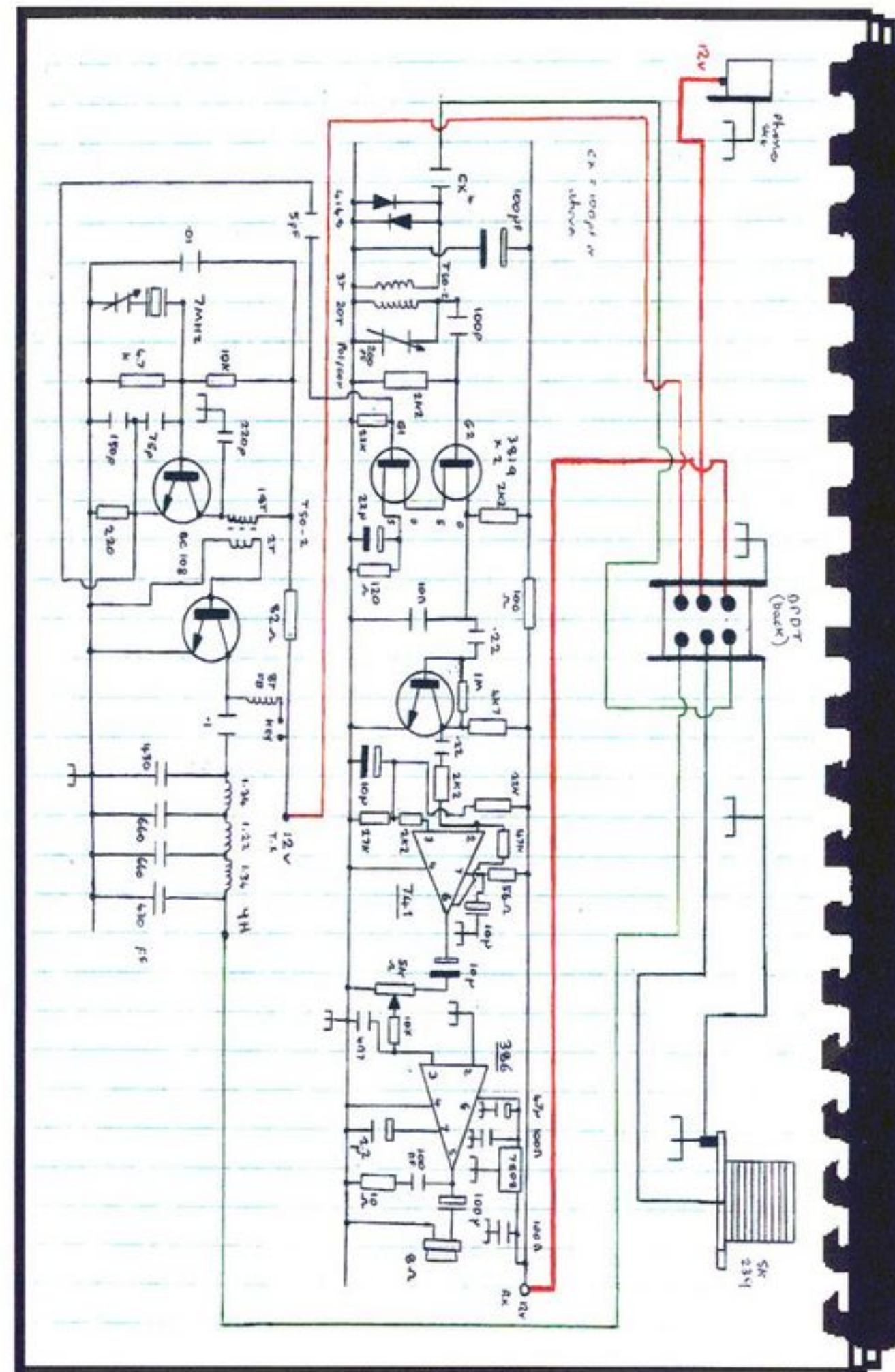
Dear Steve,
I read with great interest, your article in *Sprat* (184) about substitutes for the 40673 dual gate FET mixer.

I thought I'd send you my version of the SCD with some new modifications. These include using a pair of 2N3819s in the mixer part as you mentioned in your article.

I've used a d.p.d.t. switch instead of a relay. I've also changed the transmitter circuit over to the TAG transmitter, a project that was written by **Steve Ort-mayer**, and printed in *Sprat* issue 62.

On the audio side, the '741 op-amp filter and LM386 circuit is from your article in *Sprat* issue 69. A circuit that I've found to be very good.

I do hope that you'll find my version helpful in your latest upgrade to the SCD project.



De-bounce switches - software defined

MOYTT

Mechanical switches, sensors and rotary encoders do not normally produce clean and noise free signals that can be used reliably by discrete logic, or microcontroller, circuits.

The state of a mechanical device can be incorrectly captured if software driven polling is used as the state can be indeterminate at the instant of polling. Worse, if the mechanical device is connected to an integrated circuit, or software, counter the noise produced can be interpreted as multiple events.

The purple trace shown here is the signal



produced by a push-button switch connected to +5V via a 10K resistor, as shown in the circuit on the left, and the noise generated by the metal contacts rubbing against each other is rather clear.

A common microcontroller (MCU) such as the Microchip ATmega328 is used on many maker boards such as the Arduino UNO and Nano. Both digital and analog I/O pins are featured on these microcontrollers and it is the digital inputs that are normally used to interface with mechanical switch type devices. It is easy to find Arduino code on the Internet

that de-bounces switches using time delays to allow switch induced noise to be ignored – just ask ChatGPT! But it can be difficult to configure the timing and sometimes a trade-off has to be made between reliability and speed. If digital de-bounce software is not adequate, or reliable enough, often the designer will resort to a conventional analog solution using passive RC networks and Schmitt trigger logic ICs such as a 74HC14 hex Schmitt device, using more passive and active components and adding to the size and cost.

I wanted to create a software solution that would emulate an RC/Schmitt circuit with the minimum of passive components.

First I developed a software implementation of a Schmitt trigger with high and low voltage switching points and therefore an element of hysteresis.

An analog input on the MCU is used to create a software implementation of a Schmitt trigger and the code is shown on the next page.

A Boolean variable called Schmitt is defined, which can have one of two binary values TRUE (1) or FALSE (0). Also two analog thresholds are defined in terms of count values that can be compared with the number produced by the MCUs 10-bit Analog to Digital Converter

(ADC) with a range of 0 to 1023 equating to 0 to 5vDC. The defined thresholds equate to approximately 2.9vDC and 1.9vDC i.e. above and below the halfway voltage of 2.5vDC and with 1vDC of hysteresis.

The code listed just drives an LED on digital pin 9 of the MCU but could be used with the built-in timers and counters in the MCU or various software routines e.g. to assess the steps and rotational direction of a rotary encoder.

Next how to implement a low pass RC filter to remove high frequency switching noise. The obvious solution would be a resistor and a capacitor, but as a devout Yorkshire man I wondered if the cost of either could be eliminated? And yes – looking at the data sheet for the ATmega328 the analog input pins are connected to a CMOS comparator with an input resistance of 100MΩ and capacitance of about 10pF.

So the ADC input pin can be fed from a high value resistor without significantly affecting the voltages from the mechanical switch i.e. 0v or 5v. Using a high value resistor e.g. 1M creates an effective low pass filter just using the 10pF capacitance of the analog input pin resulting in a time constant of $10\text{pF} \times 1\text{M} = 10\mu\text{s}$ or in the frequency domain a cut-off frequency of 15.9KHz.

```
bool Schmitt = false;
const int threshold_high = 600; // in counts
const int threshold_low = 400; // in counts
const int LED_PIN = 9;

void setup() {
  pinMode(LED_PIN, OUTPUT);
}

void loop() {
  // Read input from switch
  // (assumed to be connected to A7 pin)
  int A7_input = analogRead(A7);

  // Implement Schmitt trigger
  if (A7_input > threshold_high && !Schmitt) {
    Schmitt = true;
  }
  if (A7_input < threshold_low && Schmitt) {
    Schmitt = false;
  }

  // Turn on or off LED based on boolean variable
  digitalWrite(LED_PIN, Schmitt);
}
```

The combination of a passive RC filter together with a software defined Schmitt trigger is very effective at eliminating noise and de-bouncing switches as is shown by the yellow trace the oscilloscope screen.

Space and cost are reduced as one resistor; one capacitor and logic IC have been replaced by a single resistor and a few lines of code.

Finally makers can vary the value of the input resistor and the software defined Schmitt thresholds to optimise this design to their specific needs.

Project materials are available for download at:

https://github.com/BenthaniITServices/debounce_switches_using_software_schmitt_triggers

Band Activity Report

Enzo M0KTZ email: m0ktz@katolaz.net

I am very glad to have several events to report about in this issue, including the GQRP Convention and the recent success of the weekly Activity slots, together with a couple of announcements about several forthcoming events. While winter closes in, many of us find more time for QRP activity and experimentation in the shack, get ready for the Winter Sports, and put their logs in order for the Chelmsley Trophy. We have just enough time to warm our rig up, as the Club 50th Anniversary is knocking at our doors, bringing all sorts of goodies. Make sure to read this column through the end, and thanks for the many contributions you have provided in the last few months. Keep them coming!

GQRP Convention 2023. I was really excited to come to Telford for my very first GQRP Convention, and I was not at all disappointed. A great Buildathon and a lively social event on Saturday, followed by the talks and the rally on Sunday had already made the trip worthy. But the real treat was to meet in person so many enthusiastic fellows, all having in common one form or another of the deadly joyful QRP disease HI. We had a good time chatting of QRP matters, and our little improvised CW Club station in Telford was a really nice addition: a double-size NorCal doublet on a 7m telescopic pole allowed us to put G5LOW on air for a couple of hours, bagging a few interesting QSOs over Europe across 40m-30m-20m.

At least two 2-way QRP QSOs, and a special one with Andre F5JDG/M, a Club member who was operating from the French Alps with 5W and a whip on top of his car! We had a 20 minutes chat with Andre, who was very happy to contact the Club callsign on the day of the Convention, and sent greetings to all the QRP crew in Telford. Overall, a great experience, also thanks to the all the organisers of the Telford Rally and in particular to "special John", a kind fellow who helped us with setting up stuff and whose callsign I unfortunately do not remember. Now we are all getting ready for the 2024 GQRP Convention, which will mark the 50th Anniversary of the Club. I really hope to see all you there.

Weekly QRP Activity Slots. Since early September we started experimenting with relaxed, get-on-the-air QRP activity periods, in an attempt to convince more members to get on the air. The idea came from several requests I received during the GQRP Convention: many members wanted to know when and where they could find other QRP operators on air. The answer was simple: "Let's make it happen", and so we did. We have set a "QRP Activity Slot" on **Sundays 17:00–20:00z**, and a "Mid-week QRP gathering" on **Wednesdays 17:00–19:00z**. All bands, all modes, any type of QSO, no scores, activity focused around (but not restricted to) the QRP Centres of Activity (CoAs, see at the end of the column). The idea is to just get on the air to test your latest QRP creature and to find other QRP fellows to talk with. It looks like we really hit the spot here, as the sessions have been very well attended. I have received logs and short reports from no less than 30 QRP stations, and several more are regularly heard on air during the activity slots. I guess this is a keeper. Several operators have written private emails to thank me for these activities, saying that this initiative has brought them back on the bands. Folks, the merit is not at all mine: these activity slots only work if people do get on air and join in.

You should congratulate the many members who have joined in and are making each and every session enjoyable and fun. This little success is all yours, and yours only. I have also received a couple of emails from members lamenting disruptions from other ongoing activities: well, the ham bands are a shared commodity, and the success of these events suggest that after all a lot of people still manage to find a spot for their puny signal, no matter what. Just let us keep going, enjoy the activity, get on the air, and be considerate with other fellow hams. We chose QRP because it is fun, not because it is easy HI.

Winter Sports 2023. The Winter Sports are the most traditional and iconic of all our Club activities. This is a friendly gathering of like minded souls on the bands on, or around the QRP frequencies. It takes place twixt the Christmas pud and the New Years hangover. For the non-Brits among our Club members, that is **between the 26th of December and the 1st of January**, both included HI.

As mentioned this is not a contest as such, none of the "UR 599, name Fred QSL? QRZ". Have a chat, put on air your new or old QRP creations, enjoy the bands, get back in touch with your QRP friends and make new ones. The G4DQP Trophy is awarded annually to the best log submitted of QRP contacts during the club Winter Sports. All logs and claims must be sent to Enzo Nicosia M0KTZ (via email) by 7th February each year.

Chelmsley Trophy 2023. The Chelmsley Trophy recognises outstanding commitment to QRP operation during an entire year. Duration 1st January to 31st December each year. All authorised bands 1.8 - 30MHz, modes CW SSB. Normal QRP power levels only. Antennas may not exceed 35ft (10m) in height or 132ft (40m) in length. Entrants may change the antenna in use throughout the year but not more than one vertical and one horizontal antenna may be in use at any one time.

All antenna must consist of not more than one radiating element without reflectors or directors. The submission must include a list of DXCC countries worked, together with a note on any "special" contacts and a description of the station equipment, together with any discussion of antenna or propagation studies/development carried out during the year. Detailed information can be found at: <https://gqrp.com/awards.htm#Chelmsley>

All logs and claims must be sent to Enzo Nicosia M0KTZ (via email) by 15th February each year. At the discretion of the committee a trophy will be awarded for the best log and also a runner-up certificate may be awarded. **N.B.: You do not need to work 300 DXCC entities in a year to be considered worthy of the Chelmsley Trophy. If you feel you have had a great QRP year, just put your logs together and submit them.**

Easter Egg-xpeditions 2024. Now this is something new and really exciting. The GQRP Club is happy to announce the Easter Egg-xpedition Challenge, a new Club Activity that will run between Good Friday and Easter Monday, both included (29th March to 1st April 2024). This activity is focused on Egg-xpeditions (the name is a brainchild of Steve G0FUW), namely **/P**, **/M** and **/MM** operations run by one or more QRP enthusiasts.

Your Egg-xpedition does not need to be to far-away exotic places: your backyard, park near home, a SOTA reference, or just a field in the countryside are all good enough for to use. There are not even limits on duration (anything from a couple of hours to a 4-day camping adventure). There's no limitations on the number of participants to each Egg-xpedition either,

anything from a single operator to a gathering of a dozen or more 'QRP nuts' is good..

The whole point is getting out of the shack, practising setting up an efficient QRP station in the field, honing our /P skills in a fun and friendly environment, and having fun on the bands with like-minded ham friends. Just get in touch with one or a few QRP enthusiasts and Club members in your area, novice or veterans, sporty or lazy, and organise your own very special Easter Egg-xpedition.

If you do so, just announce your planned Egg-xpedition by sending an email to Enzo M0K-TZ or by posting to the Club Reflector before the event. Those of us who will not be in the field, will still be at work as Egg-chasers. A list of all the announced Egg-xpeditions will be circulated through the Reflector closer to the date. Appreciation certificates will be sent to all the Egg-xpeditions announced in advance of the event. We will also have awards for the best Egg-xpedition team and the best Egg-chaser. Logs and Egg-xpedition reports to be sent to Enzo M0K-TZ by April 15th. More details in the Spring SPRAT and on our website.

GQRP 50th Anniversary Special Event Stations. 2024 marks the 50th anniversary of the foundation of the GQRP Club, and we want to celebrate by making a bit of puny noise on the air. The plan is to have a month-long QRP activation in September 2024, where the Gx5LOW Club callsigns and a commemorative SE callsign will be aired by GQRP members all around the UK and the Crown Dependencies, starting at the Telford Convention.

This is a call for action to all members not residing in the UK: if you can obtain and activate in your country a Special Event callsign during September 2024, containing the "LOW" or "QRP" suffix (possibly with a 50 mixed in!), then please send an email to Enzo M0K-TZ to let us know. The aim is to activate as many "LOW" special event stations all over the world, in as many countries as possible, for the entire month of September 2024. This will happen only with the help of all our members.

We already know of a special event station that will operate in DL, but that's just the first step towards covering the entire globe with "LOW" signals. We will have a special commemorative "50LOW" award to chase, and certificates for all the operators that will help with this endeavour. You cannot miss the chance of being an active part of this unique, extraordinary event, and to celebrate the power of low power in the best way possible: by getting active on the bands, and showing that QRP works, because physics works.

I am pretty sure that most of our members already know about our email Reflector, which can be joined at: <https://groups.io/g/gqrp>. The reflector is a high signal-to-noise venue that hosts interesting discussions about all sorts of QRP-related topics, from antennas to circuits to components to operating techniques. This is also the place where many of our members announce their QRP activities, experiments, and results. Also, several periodic reminders about Club Activities are circulated in there, including more frequent announcements about the 50th Anniversary celebrations and events of next year. If you have not joined the reflector so far, this might be a good time to do that.

72 de Enzo M0K-TZ

These are the International QRP Calling Frequencies:

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

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

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

MEMBERS' NEWS

by Chris Page, G4BUE

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

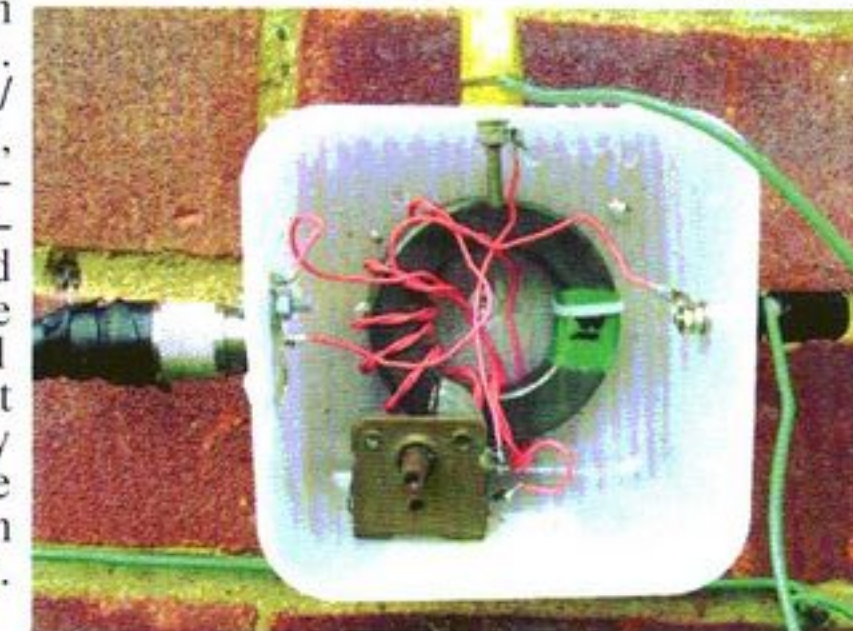


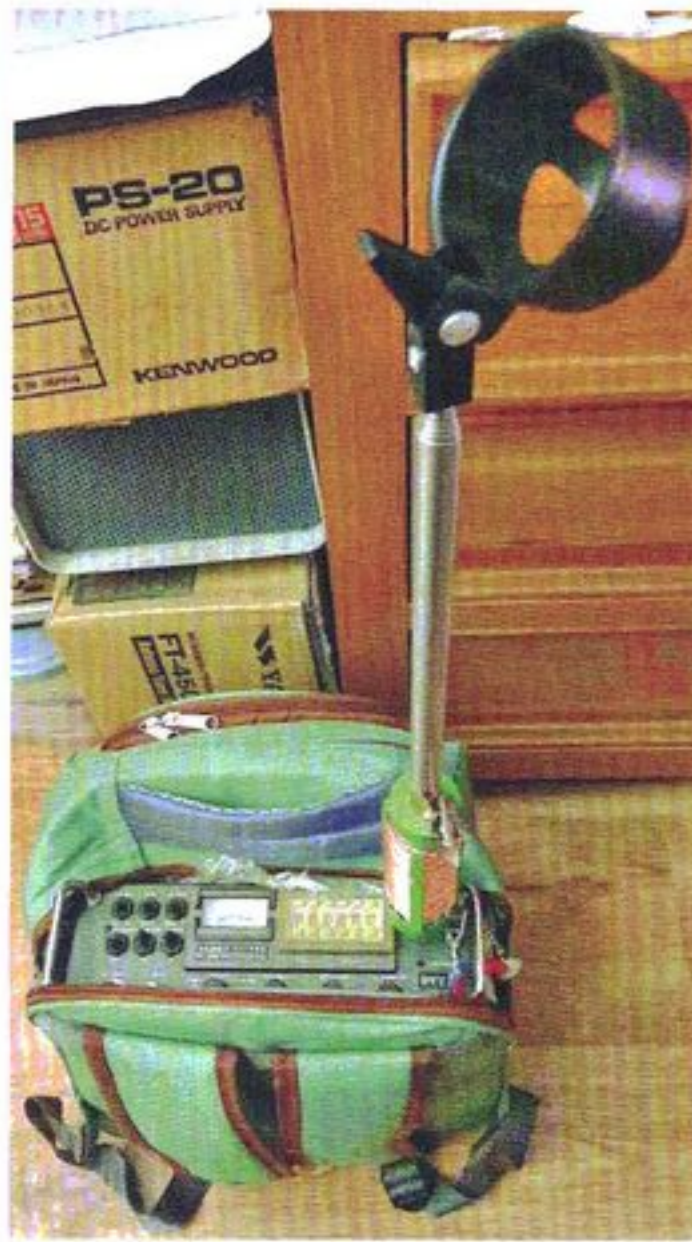
Your scribe did some antenna work in September and replaced the 'temporary' ladder lash-up holding up his doublet (see front cover and pages 28-31 of *Sprat* 195) with a Spiderpole 12HD attached to the side of the house. I had been using the 'temporary' set-up since January 2022 and thought it was time I made it more permanent! I also bought a DX Commander Signature 9 all-band

vertical that I have erected, with 32 quarter-wave radials for 40m (some bent to fit in the garden) near the end of the back garden between two trees to help hide it (left)! The coax feed to the vertical goes to the second antenna socket on the back of my K3 (the doublet goes to the first), enabling me to quickly choose between horizontal and vertical polarised antennas. The vertical is generally better on 20, 30 and 40m but the other bands depend on conditions and the location of the other station. I use the K3's in-built ATU to tune the vertical for a good SWR on those bands that need tweaking. I only use 5W CW and so far I am very impressed with the quality and performance of the Signature 9.

M3KXZ continued his operations from the Sussex beaches and on 20 August had a two-way QRP CW QSO with VK3YE and shortly after, another with SSB. Pete also QSO'd VK5LA and VK7ROY on CW. On the same day, VK3YE said, 'It was probably my best ever non-contest QRP session, some 25 contacts (some QRP) were made with Europe with 5W, mostly 17 and 20m with a vertical antenna. Video here <<https://www.youtube.com/watch?v=6QyfDfk8ONQAnother>>'. In late September, at another location on the South Downs at the Jack and Jill windmills, gave Pete QSOs with VK1CT/P, VK5CZ, VK2GR, VK6EA and two-way QRP with VK3GB.

G3YMC has a new antenna for 160m, a quarter-wave loop based on G0CWT's design <<http://www.g0cwt.co.uk/magloops/160loop.htm>>. With the restraints of his garden, Dave says, 'It is a tad shorter than a quarter-wave but near enough, series tuned with a suitable variable capacitor and matched via a toroid transformer. I found I needed a type 31 ferrite for enough inductance on 160m'. Writing on 1 November, he had worked 10 DXCC, the best being OK1CF, and said, 'On QRP, 5W from my Elecraft K2, it is hard going but seems to be giving me a few QSOs and a few more points in G3WGV's CW ladder, <<https://ukcwtable.org.uk/Results.html>>.'





G4FBC recently finished a second 3D design and printing course, got another printer, and made the base loaded vertical antenna pictured left for /P use, primarily with his FT70G manpack, and 3D print table clamp socket to fix it to a picnic bench. The whip is a 6.6 feet golf ball retrieving stick which telescopes down to just over one feet long, the tube from a spent firework rocket that landed in his garden, and the wire from stripped old cable. Roy printed the top bung and base for a PL259 panel mount plug, so it screws directly into the FT70G antenna socket. Earlier this year, **G3XIZ** went on a short bookbinding course in Bedford with **G6XDK**, and after learning a few of the basic techniques, Chris has been binding his *Sprat* magazines into hard covers year by year, and says, 'The results are not bad and I'm slowly improving. By the time I've finished my 15 years worth of magazines, I should be quite good.'

Looking for coil and pot trimming tools? **G8NXD** recommends a set sold by CK Tools, adding he has no connection with the company, just a very satisfied customer, <https://cktools-superstore.co.uk/epages/eshop841008.sf/en_GB/?ObjectPath=/Shops/eshop841008/Products/T4857>. **G1HSM** intends to try the interesting RPi SDR that only puts out a few mW, at <<https://g1hsm.blogspot.com/2023/09/raspberry-pi-as-sdr.html?m=1>>. Leon says, 'A Pi Zero consumes about 0.4 W, so the whole thing is well within the spirit of QRP. Another approach I intend to try is to use a Red Pitaya SDR barefoot. Power output should be about the same but the total power consumption will be much higher – something like 7.5 W as it contains a large Zynq FPGA. My eclectic blog might be of interest <<https://g1hsm.blogspot.com/>>.'

GM4VKI and **G3MFJ** decided it was too dangerous to travel to the Gala Rally, Grantham on 20 October due to the severe weather warnings. They were sorry to miss the event and will be back there next year, plus the Blackpool Rally on 21 April. **GM4VKI** has been QRV on microwave from the side of Dundonald Hill working well into the Lake Districk with 2W on 2320.200MHz, more in the Activity Section of *Sprat*. Roy repaired his Norcal 40 which blew the PA transistor, and started building a MKARS 80 for 80m, and two QRP2004 TCVR kits he bought and never built. **G4TGJ** has added a second TX board covering 40, 17 and 15m to his

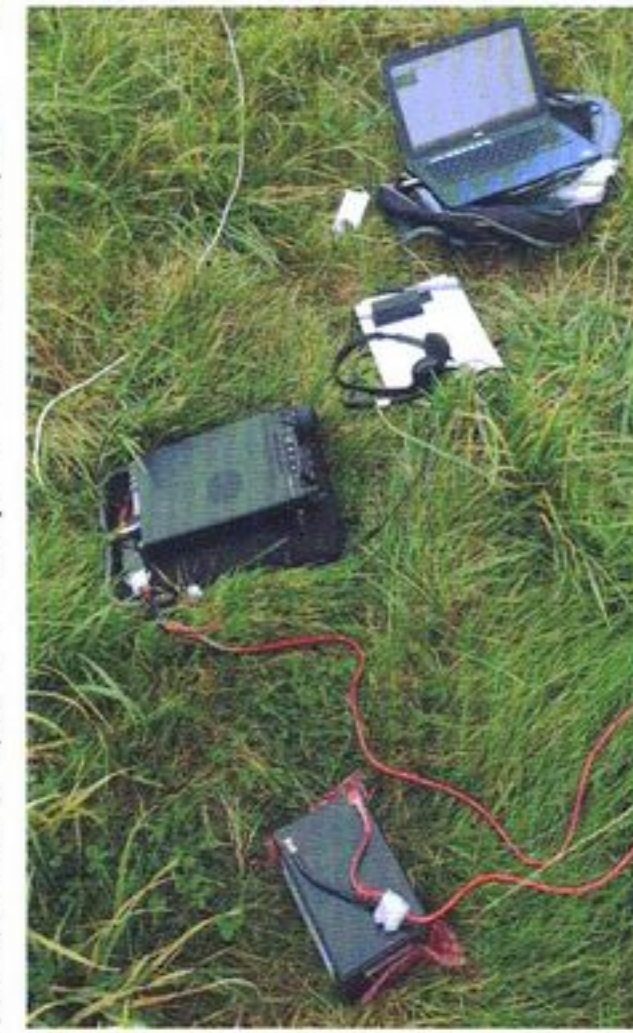
superhet based TCVR, so it now covers all bands 40-10m. Richard is now including at least one of 15, 12 or 10m on his regular SOTA activations and has recently QSO'd many USA and VE stations from summits, plus LU, PY and KP4.

G6NGR writes, 'Hot Iron lives on – albeit in different form, by being under new management – **W4NPN** has taken the management over from me, giving me a valuable release from all the commitments thus encountered. Frank has compiled a "compendium" list of topics and set up web pages appropriately. The newsletter is downloaded by readers wanting it rather than being "pushed" by email as I did. Frank is handling the bureaucracy; I'm keeping (a much abridged) tech side of things as I'm perennially interested in electronics et al. Tim Walford has approved; he's amazed at the response *Hot Iron* is getting from all over the World – especially the early issues about his kits. It's a unique resource for those with elderly Walford kits wanting schematics or information – an ideal resource for QRP home builders, as all Tim's schematics are included. *Hot Iron* being under Frank's wing has opened the door for *Hot Iron* into the USA "senior statesmen" radio amateurs; they are a huge radio resource of experience and I'm already getting a few queries from the elders – I suspect they are testing the depth of my thermionic experience!'

W4NPN says, 'The website hosting the *Hot Iron* newsletters is <www.w4nnp@gmail.com> and the library containing *Hot Iron*'s issues is found at <<https://www.w4nnp.net/hot-iron-directory/>>. The table showing which issue(s) a given subject is <<https://www.w4nnp.net/w4nnp-hot-iron-directory/>> and a searchable compilation, allowing searches by keyword, is <<https://www.w4nnp.net/hot-iron-searchable-compilation/>>. A selection of reference tables containing many types of information about electronics is <<https://www.w4nnp.net/wp-content/uploads/2020/06/Hot-Iron-Constant-Subject-Matter.pdf>>. There are about 860 subscribers at present (20 September) and readers can go here to subscribe. There is no cost and we do not share their email addresses with any other organisation.'

G4ERW's POTA site at East Hill, Hastings (right) where he was QRV on 27 September, albeit not with QRP (about 80W) with a FT857D powered by a LiFePo4 battery and a 49 feet elevated GP antenna (using an MRQ-213 whip). David and his wife have a static caravan near Fairlight and he is often QRV running under 10W with his KX3 for SOTA and POTA activations, enjoying the mini pile-ups that result from being a 'wanted' summit or park. One of the 31 QSOs David made on this occasion was to your scribe running 5W QRP on 15m, eight miles away in Bexhill-on-Sea! Other QSOs David made included USA and LU on 15m and USA and VE on 20m.

IU3QEZ, the 'Ladybird' award winner in the Summer Sizzler event, has a blog post of his SOTA activities at <<https://qrper.com/2023/06/guest-post-a-most-enjoyable-week-end-of-sota-and-pota-in-the-italian-alps/>>. Simone is a member of the Mountain QRP Club <<https://www.mountainqrp.it/wp/#>> (click on the USA flag top right corner for English). For the first time, **G3XIZ** has been QRV /P with his QCX console (photo in last *Sprat*). Chris writes, 'I had several great



QSOs with a remarkably low ambient noise level which was a real pleasure. I would have stayed longer but the two ladies who accompanied me had finished their picnic and were getting bored.' Another /P member is **G4LDS** who has been QRV with his **KX3** and Ampro 40/20 mobiles or a SOTABeams 40/20 bandhopper, for the new Bunkers on the Air Award. Chris says, 'Its been fun out at a local bunker, lots of activity and my QRP gets good comments! I also operate under the flora and fauna up here from Morecambe Bay, Leighton Moss and Arnside, as well as calling in the WAB nets.'

Welcome to **G6PMN** returning to the hobby after a break of 20 years. Mark says, 'Just to show how long ago that was, my last rig was a pre-ND model of FT-817 bought new. Just getting back on the air now with an IC-705, now nicely clothed for portable QRP in a perfectly fitting Samsonite Trekking camera bag of old.' Until 27 October, **SMØHPL** was QRV as **5X7W** with a mcHF on CW and two QDX (high and low bands) for digi modes. Anders' antennas were a Rybakov vertical and a Carolina windom. **GØUBE** mentions a video at <https://youtu.be/vI_0w3lqsrk?si=cJjbBkGhvZNQlaOy> announcing a new QRP Self Spotting cluster by **OMØET** at <<https://www.qrpcluster.com/>>.

K3DZ writes, 'Buyer beware! Years ago, while at a hamfest (or flea market), I purchased a partial box of eight #1864 bayonet type pilot bulbs, but only one worked, the other seven had blown filaments! I really doubt the vendor was trying to pawn off junk. This incident reminds me of some groups where I worked; the maintenance people, instead of tossing defective parts and components from repaired items, would squirrel them away in the same box as the new replacement item was packed in. Another story from work – a maintenance man once offered me some old spare valves from an obsolete and junked ultrasonic welding machine. I took the vacuum power valves and cautioned he not throw out the 866 mercury vacuum rectifier valves, suggesting he contact the plant's safety people since the tubes were likely classified as hazardous materials. The department's supervisor subsequently chewed me out for costing the company over \$500 to dispose of some dozen 866 tubes, and that was at least 23 years ago! Moral of the story: other than "buyer beware", if you're squirreling away blown out items for some reason mark them as such! Watch out for what you're squirreling away for prosperity, your heirs may be faced with an unexpected disposal problem and cost.'

G4EHT has moved QTH to a bungalow at Uttoxeter, Staffordshire and is QRV with 5W to a small doublet which tunes well on 40-15m. Bill has been, 'Working lots of members on QRP around the calling freqs.' **MØNDE** has also moved to a new QTH, on the North Wales coast, and writes, 'The IC-705 is currently connected to my remote tuned magnetic loop in the bungalow loft which gives me 20, 30 and 40m. There is also some local activity on 2m SSB. Work in the shack is on-going.' **G3UGF** says, 'Great to see a whole chapter of 14 pages dedicated to QRP in the new 15th edition of the *RSGB Handbook*. Even better to see the picture of Rev George on page one and a plug for *Sprat*.' **G4MAD** says **RX3G** reports a new edition of the *Ånñòíêê* 72 QRP magazine available at <<http://club72.qrp.su/vestnik/43.pdf>> and says, 'There doesn't appear to be any English text in the latest – but 'Professor Google' can provide a reasonable stab at translation.'

In what could be called 'QRP archeology', **N2CQR** has been obsessing about the Herring Aid 5 DC RX (*QST* July 1976). Bill tried and failed to get it going back in the day, and this year he found an original version HA5 at a hamfest, got it going, but in the process discovered numerous flaws in the design and the original article. He concluded the DC RX designed with **KK4DAS** for the high school RX project is far superior to the HA5, and is far more 'novice friendly.' Details (ad nauseum!) on the *SolderSmoke* blog. **G3ROO** is fairly QRV on the QRPQRGs from the Museum as **GB2SPY**. Ian says the antenna in the Museum is not brilliant but he usually manages to work something on 40m. He has also been repairing 'boat anchors'! This summer, two AR88s, two RA17a and a RA117. **GØEBQ** has been working on a replica Eddystone AW2 but had trouble adapting it to his existing chassis with the Skeleton TX, which works perfectly. Nigel says, 'Thanks to a lot of helpful advice on the forum, and a lot of reading, I've built the version with indirectly heated valves from the 1938 Eddystone manual and its working perfectly.'

In November **MØBMN** was QRV with 350mW on 20m with his little homebrew TCVR and end-fed half-wave about 25 feet, and was amazed to find he got over 1000 miles. Paul says, 'Originally the rig was on 40m and gave about 2W, I amended IT first to 80m and got about 3W, tried 30m and got about 1.5W, and 20m dropped right down to 350mW. It worked on all those bands with just a little change to the low-pass filter and a couple of other caps. Playing with this has been more fun than playing with a rig costing several £1000s of pounds, long

live QRP!' At the beginning of September, **G3YMC** QSO'd **JA7BXS** on 30 and 17m, **HS3NBR** on 15m and **JY5HX** on 10m, and in November **TJ9MD** on 17, 15, 12 and 10m, **A25R** on 15 and 12m, **VP9/AA1AC** on 10m, **ZL4YY** on 17m, **V26AC** on 10m and **KP4JRS** on 15m.



G4FBC spent all of September on Crete as **SV9/G4FBC** and took the opportunity to try out his uSDX TCVR (above) as a holiday rig. Roy was QRV from Crete a few years ago with his LNR mountain topper MTR-5B CW rig, but stayed on 20m CW this time using a homebrew EFHW 64:1 unun and 33 feet of wire slung sloper style from the apartment roof from a 6m fishing pole. Power was from a fold-up solar panel and rechargeable 9V battery, which gave him around 1W output. Roy used a small micro-switch as a Morse key, which he says didn't help his sending much, but gave him CW QSOs with **OK4QRO**, **IU3GK**, **LZ3XT**, **LZ2MW**, **LZ2PP** to name a few that gave him best reports. Only one QSO on 2M FM though with **SV9BUF**. He also had the great pleasure of meeting **GØVUH**, who was also holidaying on the island. Roy found it was impossible to see the small OLED screen of the uSDX in the bright sunlight and hence impossible to scroll through the menu! He much prefers the MTR5B as a holiday CW rig.

At the beginning of September, **MØKTZ** introduced some QRP Activity Periods on Sundays at 1700-2000z on 30, 40, 60 and 80m around the QRP QRGs. From reports on the G-QRP mailing group they are proving to be very popular. **G4MAD** mentions a USA Facebook group <<https://www.facebook.com/groups/qrpssb>> for a regular QRP SSB net on 14260kHz Fridays and Sundays at 6pm USA Central Standard time (-6 hours GMT). Paddys says possibly a little late for European stations but there might be night owls out there who fancy trying to get across the pond. The group use YouTube live streaming to co-ordinate activities at <<https://www.youtube.com/@QRPNet-Livestream>>.

Thanks to all the contributors. Please tell me how your winter goes for the Spring 2024 edition of *SPRAT*; what you have been building, interesting QSOs you have made and any other information about QRP, by 12 February. 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. Finally, please let me know if you intend operating from somewhere other than your home QTH during the spring and summer months, so I can let members know to listen out for you.

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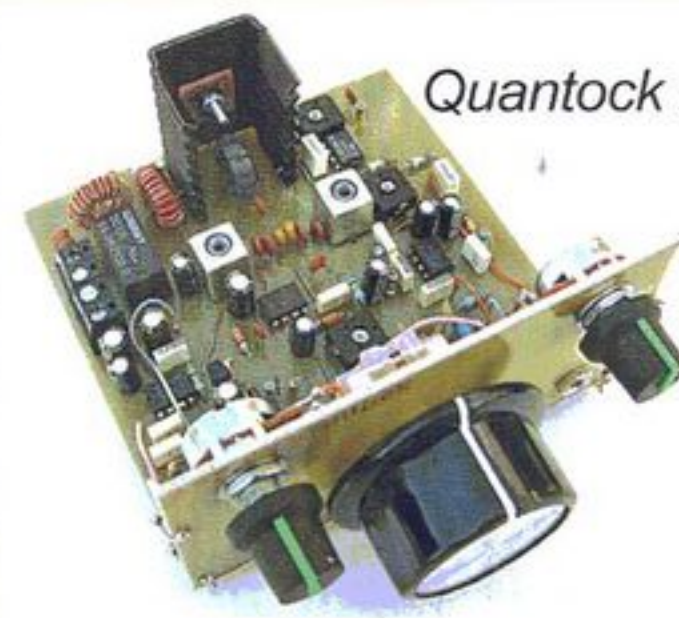
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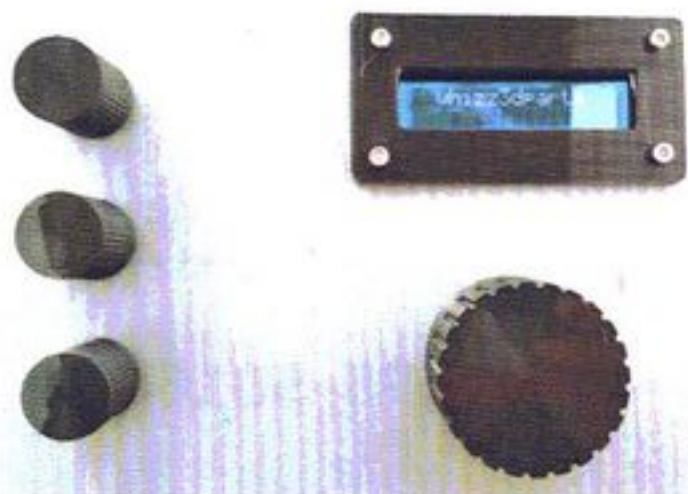
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