SPRAT

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DEVOTED TO LOW POWER COMMUNICATION

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Our Membership Secretary Tony Fishpool, G4WIF, receiving the Don Cameron Award from the RSGB President in April this year. Picture courtesy of the RSGB

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Modified Limerick Sudden TX for 5262kHz ~ Communications and Contests

Valve QRP day ~ Antennas valves & vintage ~ Members' news

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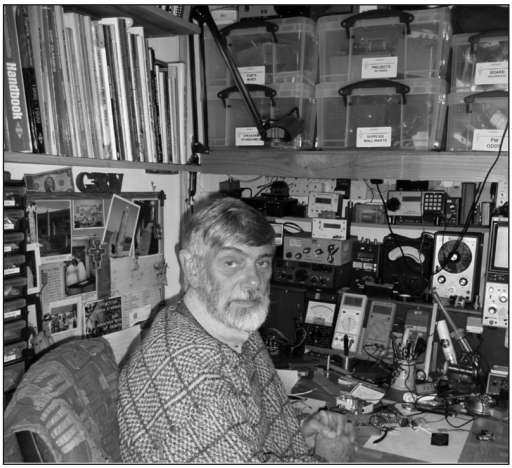

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May I add my congratulations to Tony, G4WIF, on his award of the Don Cameron trophy by the RSGB at their AGM in Cardiff recently.

Several members have been asking me about the future of the Club Convention. This has been discussed in the last few issues of Sprat. We have had to move away from Rishworth School due to increased costs, and changes at the hotel we used, plus the fact that we are all getting older and it was getting harder to run. The event will move to Telford and the organisation will be in the hands of a reliable team of local people who have run a successful rally there for many years. We hope that you will join us for the first convention there this coming September. Steve and his usual team will be running the usual buildathon. I look forward to meeting you all at our new venue.

Members in Germany. Please note that Tony G4WIF is looking for a volunteer to replace Dieter Klascha DL2BQD who has now retired. Please look on the Germany page on the club website for a list of what you would need to do. Contact Tony at g4wif@gqrp.co.uk

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G-QRP Convention at Telford HamFest 2nd - 3rd September

Martyn Vincent G3UKV

First a reminder that there is a cut-off date (July 8th) to book a discounted overnight room on Saturday night at the Holiday Inn for the Social and Buildathon, as described in Sprat 170 (page 3). For a booking, phone the Hotel on 01952 527385 and ask for the GQRP Convention to get the discount. Of course there are numerous other hotels or B & Bs in the area, including some in the Ironbridge area where the Sunday HamFest and G-QRP talks take place. The choice is yours!

It is planned to have at least three prominent speakers at the Sunday event, following the Rishworth pattern of previous years. Dave Pick G3YXM, well known for his regular LF column in RadCom, has already agreed to present some aspects of current LF operation to an audience at the HamFest. George, G3RJV is researching others.

If you've not been to Telford before, it has a lot to offer. As far as I recall, there has never been a really wet event in the 40-odd years it has been running, which is quite an achievement, although I remember the dawn thunderstorm in the year Princess Di died (August 31st 1997) as we were setting up the rally. Coalbrookdale is set in an attractive location, and is part of the World Heritage site of Ironbridge, alongside the River Severn. Nearby Telford is a large shopping centre, where in fact the very first 1978 Telford Rally was held before Sunday trading was permitted. It has expanded enormously since then, of course. Please consider coming along – all are most welcome – for a great day or weekend out. There's more info on the website www.telfordhamfest.org.uk .

Our team member, Heather M0HMO, has sent the following:

2017 QRP Social evening and Buildathon, 2nd Sept. Holiday Inn - Telford.

For the 2017 QRP Buildathon we have designed a pocket sized, Digital Power Meter for you. Based on the ubiquitous Arduino Nano this little meter offers a small OLED display Panel, built in regulators to run from a normal 12V supply and an attenuator enabling it to measure power levels up to 10 Watts, with a resolution of 10mW.

Thanks to the Nano's USB interface the meter can (optionally) be connected to your computer to see the results on the screen and for experimenters the meter has header pins that give access to I2C, SPI, analogue and digital interfaces for making your own additional devices.

The Nano will be pre-programmed with all the functionality you need to have a fully operational meter at the end of the evening. However, if anyone is interested in the programming side of the project, we will also be able to show you how to program it yourself and you can even try your hand at writing a program for it (it is a lot easier than most people imagine). We will be starting things off at 7pm in the Heslop Pritchard Function Room at the Holiday Inn, Telford on the 2nd September.The Project costs will be 25 Pounds, Socialising is free! Heather Lomond, M0HMO (07802 548 938) (QRP Buildathon and Social co-ordinator, heather@myorangedragon.com)

Junk-Box Valve Tester

Colin McEwen, G3VKQ colin@the-mcewens.co.uk

I acquired a quantity of 1940s vintage octal valves, mostly receiving types, nearly all 12-volt heaters, and wanted to find out how many of them were still usable.

I had enough components in my junk box [+ some standard stock items such as 1N4007 diodes] to build a valve tester. This led to some compromises on test conditions but avoided the risk of spending more on the tester than the value of the valves.

The circuit diagram is shown in the figure. The screen voltage supply of 85 volts was defined by the highest voltage Zener diodes in my junk box. The HT on-off switch and the large capacitor in the grid-bias supply are necessary to avoid a problem at switch-off. The design must ensure that the grid bias supply stays on as long as possible, certainly longer than the anode supply, at switch-off. If not, the valve may be overloaded when the grid bias drops to zero and the anode supply capacitors still have significant charge. The valves I wanted to test were 12V heaters, but transformers are available that give 6V if that is needed.

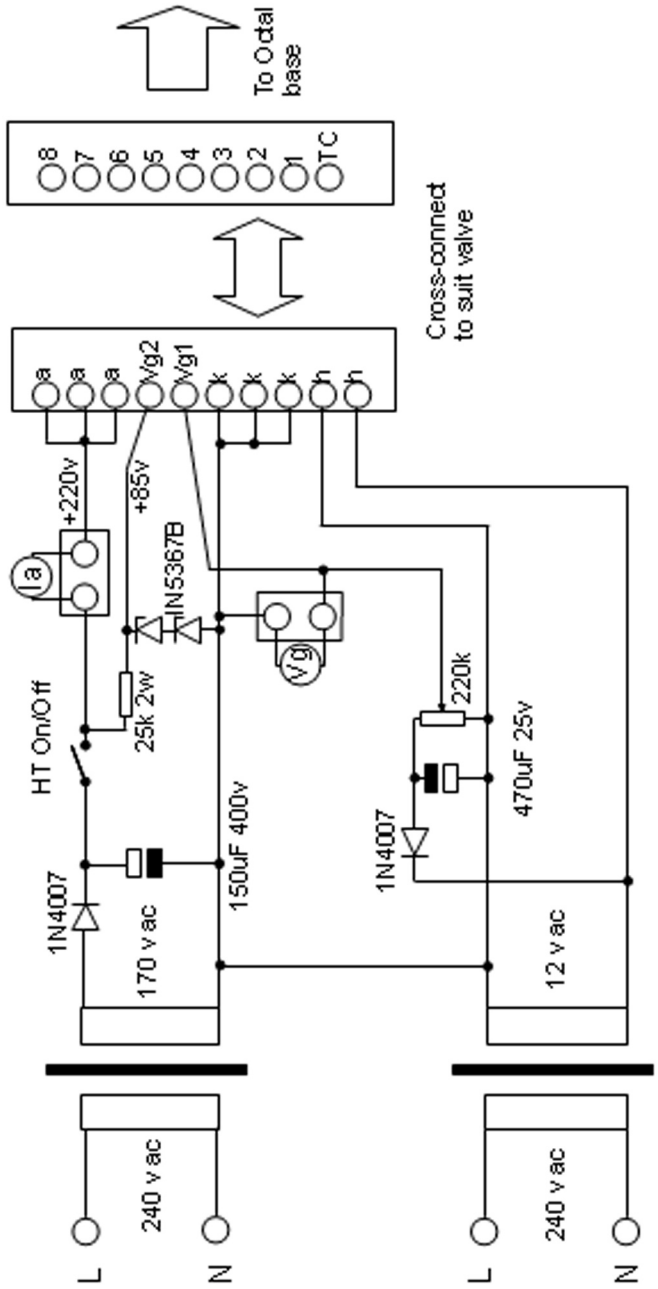
I dealt with the various pin-outs by connecting the 8 pins of the valve base, plus a flying lead for top-cap connection, to a 10-way “choc-bloc” terminal strip. I used another 10-way “choc-bloc” to provide feeds for anode [3x, see later] , grids 1, 2, & 3, cathode [3x], heaters, and shield [metal octal valves]. Cross connections between the two choc-blocs provided any combination of connections. More choc-blocs were used to connect the heater supply and two multimeters to measure anode current and grid bias.

Cross-connections were limited to 1:1 straps by providing 3 anode connections [anode, grid 2, grid 3, for triode-connected pentodes] and 3 cathode connections [for cathode, grid 3, shield].

I did not have a genuine top-cap connector but discovered that the top-cap is slightly larger than a BS1363 plug-top fuse, and therefore the Live terminal clip from a broken 13 amp plug could be used - with some careful bending out of the clip contact.

Test Method: Valve data sheets are readily available on the Internet. I set up the test voltages and grid bias specified in the relevant data sheet and measured the anode current. I found that quite a few valves gave at least 80% of the specified current with the worst being 50%. I stuck a label on each valve giving the %age figure as simple documentation.

N.B. Please be careful – lots of places to touch that could kill you!!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220k
1N4007
150uF 400v
470uF 25v
170 v ac
12 v ac
240 v ac
240 v ac
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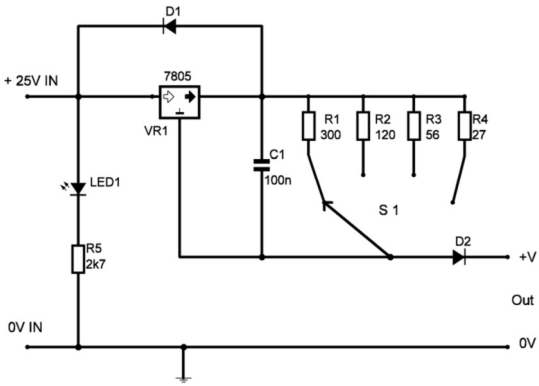
Switched range constant current charger

Phil Stevens G3SES (philg3ses@gmail.com)

During an attempt to organise the shack I came across numerous Nickel-Cadmium and Nickel-Metal-Hydride batteries. These range from the usual 1.3 V cells to 6V, 9V and 12V units. The rated values were from 280 mA/H to well over 1000 mA/H.

I realised that to check their state I needed a constant-current battery charger which would give the 10 hour charging rate usually used for charging these types of cells and batteries. Not wanting to buy a battery charger I decided that a simple voltage to constant current could be built around the very cheap and available 7805 5V 1A three terminal regulator. The National Semiconductor voltage regulator data book gave me all the information required.



My aim was to have current output ranged in a binary sequence of 25 mA, 50 mA, 100mA and 200 mA with current set by a four-way rotary switch.

The voltage across the 7805 must not exceed 35V and it should be connected to a heatsink with all the terminals insulated from chassis, including that usually called 'ground'.

As I had a suitable mains transformer I built a standard 25V DC supply which would provide at least 0.25A. If you have a variable bench PSU then that could be used.

The output current is determined by the resistor between the 'ground' and 'output' regulator terminals. The formula to determine the value is as follows:

Current Out Io = 5V/R + Iq

R is the value of the resistor in ohms.

Iq is the quiescent current out of the 'ground' and taken as 8 mA

As an example, suppose we need to decide the resistor value for a charging current of 100 mA.

R = 5V / ((100 – 8) x 10^-3) A = 54 ohms

The nearest preferred value is 56 ohms. The 27 ohms resistor needs to be 1W rating. The two diodes are for protection of the 7805 and are the usual 1N400X type. The capacitor across the resistor is to ensure oscillation cannot take place.

My prototype was built in a ventilated small metal box and the tab of the 7805 was insulated from the box (heatsink) by a TO220 insulator, screw insulator and silicon grease.

Maximum dissipation occurs when the charger is providing 200 mA into a single cell and is less than 5W in the 7805. If you have any problems or queries please contact me

VK5TM Noise Canceller

Terry Mowles VK5TM - www.vk5tm.com

The VK5TM Noise Canceller is another version of the design originally developed about 1989 by G4WMX and GW3DIX. Later, Hans DK9NL updated it to include a HF Vox circuit, however, it proved unreliable on SSB transmission and has been removed in my version. A couple of other changes include the use of SMD JFETs and a double-sided pcb.

The operation of the circuit involves the cancellation of local interfering signals, that are picked up on a relatively inefficient 'noise antenna' and are made 180o out of phase with the signal on the main antenna, which also contains the interfering signal plus the wanted signal. After the mixing of the two interfering signals, the main wanted signal remains. Tony G4WIF's blog at http://www.fishpool.org.uk/noisecancel.htm has a nice list of links (supplied by Nick G8INE) to more information about how these work and other variations.

It should be pointed out that this circuit is not a cure for broadband, multiple noise sources. If you are experiencing this sort of interference, you should probably be looking more towards DSP noise cancelling techniques.

There is nothing out of the ordinary as regards the circuit and construction is straight forward but a couple of quick points first.

Without power applied the circuit is in bypass mode (so you won't do any damage transmitting into an unpowered unit).

The power supply input is diode protected to prevent damage from reversing the power connections.

The changeover relays are two 6V 3A contact rated units wired in series. A 220uF capacitor in series with the supply enables quick operation of the relays, while the paralleled 150Ω resistor reduces the hold current once the capacitor has charged.
The bandwidth of the unit is determined by transformer T1, depending on the core used and number of windings. This is an area you can experiment with.
Maximum transmit power through this unit should be 100W or less.
Rather than take up all the space in the magazine with the full testing, adjusting and connecting to your station of the Noise Canceller, you are referred to my website www.vk5tm.com for a more in depth article including parts list etc.

Schematic

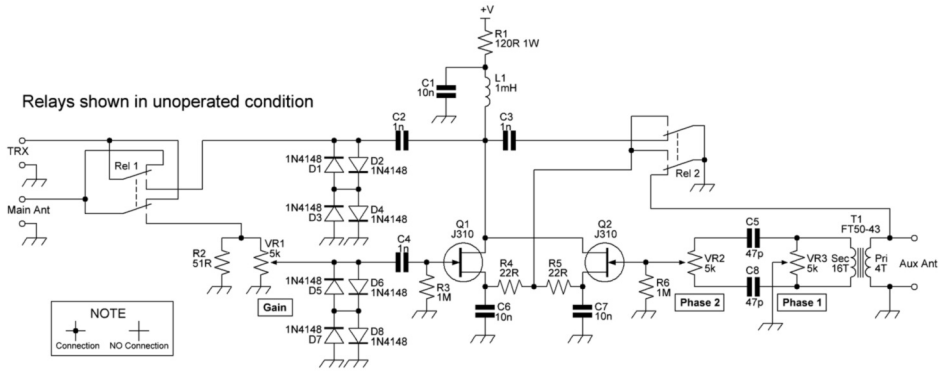


Fig1 - The active part of the Noise Canceller

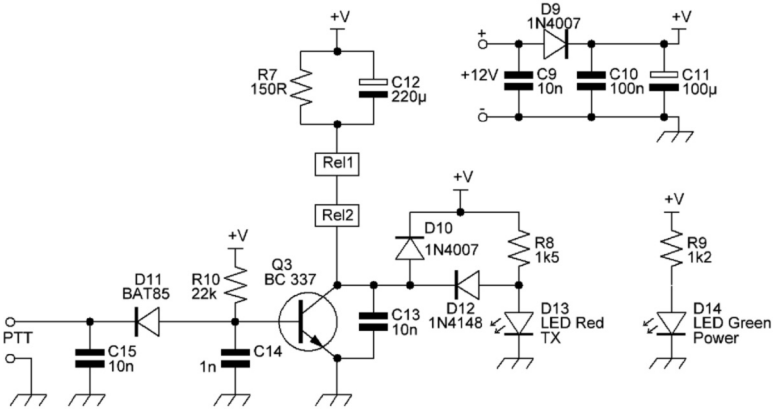


Fig 2 - Power supply and PTT section

Construction

The suggested sequence of construction is to first fit R1, R3 & R6 followed by C1, C6, C7 & L1. Note that R1 & L1 will run warm and should be fitted proud of the pcb by a couple of millimetres to allow airflow around them. These components are fitted first to help prevent static build-up during soldering of Q1 & Q2.

Next fit the two smd devices, Q1 & Q2. After that, fit all the remaining low profile components (resistors & diodes) followed by the remaining transistor and capacitors.

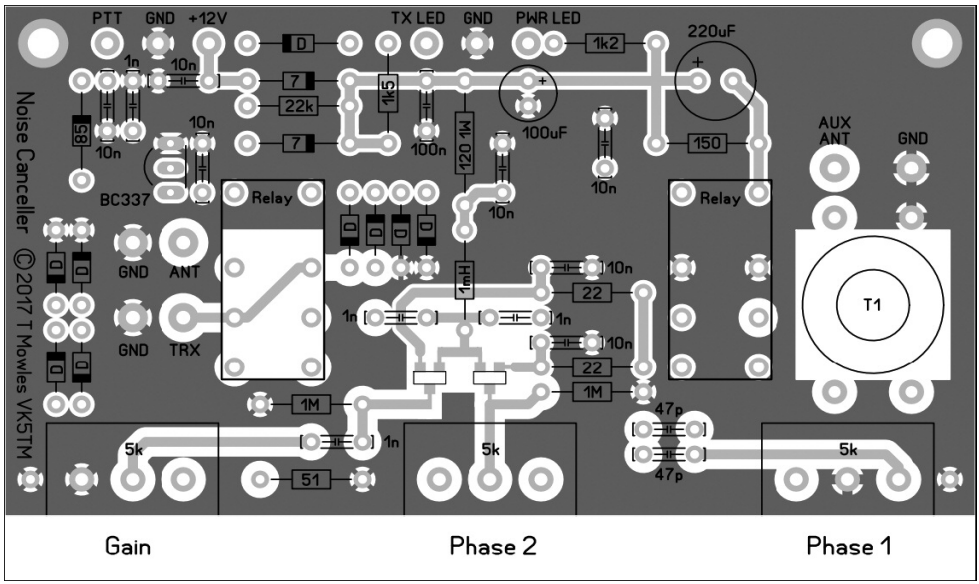
Relays 1 & 2 can be fitted next followed by transformer T1.

T1 is 16 turns secondary/4 turns primary, 0.2-0.3mm enamelled copper wire, wound on an FT50-43 toroid core (0.5mm wire was used in the prototype and is somewhat easier to handle).

Finally, fit the three potentiometers. An earth wire is then soldered from the earth point on one side of the potentiometers, across the top of the potentiometers to the earth point at the other side. This wire is then soldered to the body of each of the potentiometers.

Hand capacitance has a marked effect on the controls, particularly VR2, as does stray external RF, so this unit should be mounted in a metal enclosure. If you have or can source potentiometers with plastic shafts, they would be better than the metal shaft variety.

Component Overlay



The diodes marked ”D” are 1N4148’s, “7” - 1N4007’s and “85” - BAT85.
(1N4007’s were used as that is a standard component in my workshop, 1N4001’s, 1N4002’s etc should be equally suitable and a 1N5819 was used for the BAT85).
The pcb is available from the author (see website) for $10 AUD (Australian residents need to add GST) plus Post and Packing and a kit of parts, excluding case, connectors and knobs, should be available by the time you receive this edition of Sprat.

Finally, I would like to thank Tony G4WIF, Nick G8INE and Paul VK4APN for their valuable feedback during construction of the prototype version of the Noise Canceller.

Tribal Knowledge

Tony Fishpool G4WIF (g4wif@gqrp.co.uk)

On the Soldersmoke podcast a term has come into use which describes the passing on of useful knowledge around the "tribe". Here are a few of mine.

Over 40 years ago, at the college which I attended, there were three lecturers that taught me to love electronics. They were Mr Deakin, Mr Balance and Mr Deadman. They imparted much wisdom, including a phrase that pops in my head whenever I look at a transistor circuit and wonder what is going on. This article honours their memory (for that phrase, and much more). It was "Positive, No Power". It was a memory tool that reminded you about PNP transistors and referred to the base, that if it was held positive (with respect to the emitter), there would be no power. The transistor wouldn't conduct. The opposite polarity would make it conduct.

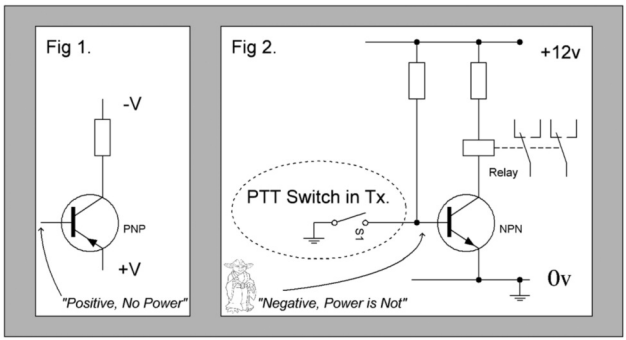


Fig 1. Shows a PNP circuit.

Fig 2. Shows a circuit using an NPN transistor very much like the PTT switching circuit in the VK5TM Antenna phasing canceller.

When Terry VK5TM sent me a prototype board for his noise canceller I did not have the BC337 transistor that he specified. We shouldn't always get hung up about not using the exact component stipulated in an article – certainly not if it is a transistor used as a switch. As long as (in this case) it is NPN and it doesn't get hot, it will probably work – eventually! My substitution didn't quite – (more later).

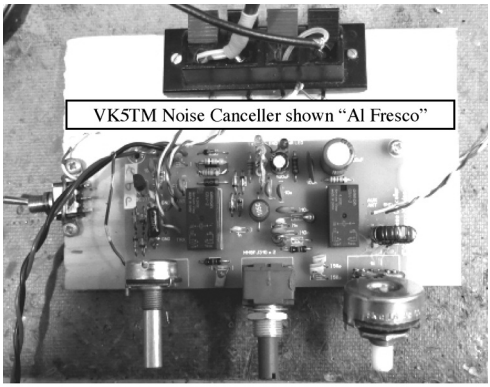
I worked out that Terry had designed the circuit so the relays would operate on power up and only release when a ground (or negative) was connected from the transmitter PTT line. First I had to invoke the tribal knowledge of my old lecturers "Positive No Power", but as it was NPN, I used a very Yoda like alternative "Negative, Power is Not". If the base was taken to ground, the transistor would not conduct and the relay would not operate. With the unit in receive mode, the base was pulled up toward the +12v rail and the transistor biased on. Except that the relay wasn't fully pulling in. There wasn't enough collector current because the base resistor Terry had specified was too high for the substitute transistor. I needed more volts on the base so I decreased the resistance until it worked and operated with a nice "click".

When authors publish circuits it is more often than not using components that they have on hand. Great if you can establish the specifications of the substitute transistor and it can be compared with the original. Otherwise, don't be afraid to experiment, just try it!

That 0.15uF decoupling capacitor an author stipulates can probably be replaced by an 0.1uF - if that is all you have at hand.

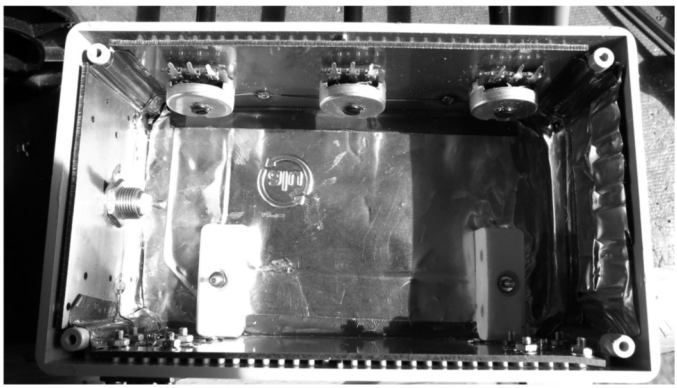
Long ago I discovered that the way to guarantee that a project will not work is to put it straight into a box and only then test it. That is just mocking the radio gods and without doubt they will smite you. When my projects didn't work first time I had to remove the circuit boards to start debugging - which is a royal pain.

Now I always build on a small plank of wood and transfer to a case only when the project actually functions correctly. Hopefully this item of tribal knowledge will save much future frustration. The unit worked OK on the plank, but it did ultimately need screening.


VK5TM Noise Canceller shown "Al Fresco"

Terry specified a metal enclosure. However, I happened to find in my stock the perfect size plastic box. I also happened (the previous weekend) to enjoy some very nice barbecue spare ribs. They came in a nice aluminium tray. The perfect material to line the inside of my plastic box I thought.

After cutting with scissors to fit, I glued the aluminium tray inside and then added some scraps of double sided copper board with both sides linked together (to avoid making a capacitor) in places where components or "socketry" would mount and to ensure good connection to ground.



In the corners you might be able to see adhesive copper gardening "slug tape" to complete the screening. This is thick enough to solder to and is probably more effective used in the shack than when protecting my strawberries.

So then, three items of tribal knowledge. "Positive, No Power", "Build on a plank" and "Use what you have in stock". Please send your tribal knowledge to George G3RJV.

A Doublet Experience

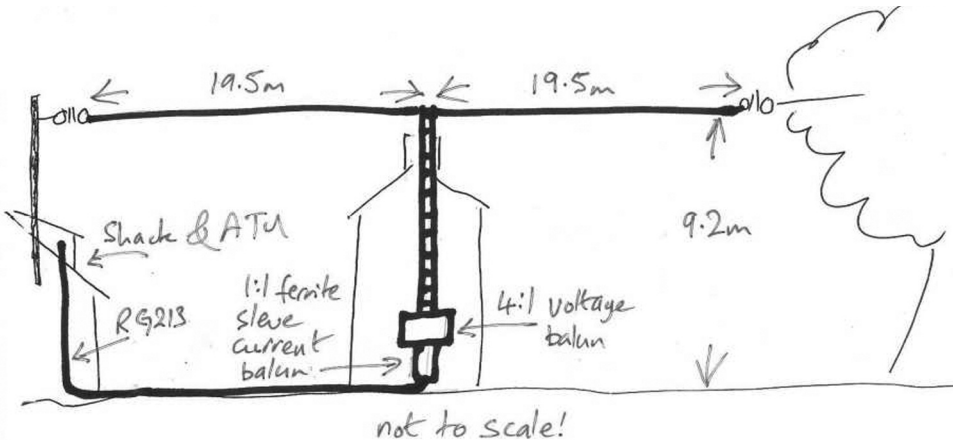
Ian Liston-Smith G4JQT

For a number of years I had a 42 metre random wire running north-south with the centre supporting pole mounted on the chimney reaching a height of 9.2 metres. At one end was the shack above the garage and the other end a tree. I had counterpoises running the length of the antenna and beyond, with three earth rods at the shack end.

Like most random wire antennas this arrangement could be matched on all bands from longwave to beyond 30 MHz, but I wanted to explore other antenna possibilities. Any replacement had to work from 160m to 10m, make use of the centre support and, importantly, allow coax feeder into the shack. This suggested a doublet-type antenna using open wire feeder from the centre to near the ground where it met the coax. But all the textbooks unhelpfully show the shack at or close to the doublet centre, with the open-wire feeder gracefully entering the building. My shack (like many others) is at one end of the antenna, and upstairs!

The obvious answer is a full-sized G5RV, where the coax can be routed behind sheds and between bushes, but even G5RV himself described his doublet-based antenna's limitations.

With many more bands now than it was ever designed to cover, I felt it was a serious compromise. Then I found the ZS6BKW antenna, developed about 30 years ago by Brian Austin who used computer analysis to design an optimised multiband doublet-style antenna.



This looked ideal; it is a little shorter than the G5RV, but needs about two metres more height - depending upon the impedance of the ladder line. Unfortunately I doubt the present centre pole mounting arrangement could support an extra two metres, and the house is in a conservation area - and I don't want to push my luck!

Back to square one.

It seems doublets are very versatile. They can be almost any length and height (although there are some dimensions best avoided), but do require a balanced feeder all the way into the shack. I've been told that routing this type of feeder is not as problematic as many textbooks suggest, but trailing it along hedges and behind sheds and between bushes for over 20 metres didn't seem like a recipe for success.

After a lot of web searching I found the comudipole (aka the coax-cable fed multiband dipole), attributed to PA2ABV. This is a doublet with a horizontal length of whatever is convenient, likewise any convenient ladder-line length to the ground, where it meets the coax via a balun. (I guess it's sort of G5RV/ZS6BKW, but made from whatever dimensions and space you have!) So I chose the comudipole, with home-made balanced line, via a balun attached the 24 metres of RG213 to the shack.

I found this antenna is described in the RSGB Handbook, 10th edition which also describes a suitable balun that can be wired 1:1 or 4:1. This exact article is available online in a pdf version of chapter 15 of the RSGB Handbook by just Googling "comudipole practical HF antennas".

During this research I discovered much about baluns of which I was unaware. The balun suggested in the RSGB handbook for this antenna is, I believe, a voltage balun. I later learnt that most informed opinion suggest this is not the best choice in a real-world antenna setup like this. But I don't intend to dwell on balun theory here.

I carried out some tests using a MFJ-259B antenna analyser at the shack end of the 25m coax run without any ATU. Whether using the 1:1, 4:1 voltage baluns or a ferrite sleeve choke balun (in effect a 1:1 current balun bought for a half-sized G5RV many years ago), there were no unmanageable variations in SWR on any band from 80m upwards. After assessing the numbers, the 4:1 balun gave the lowest SWR on most bands. The worst was 7:1 on 80m and best 1.5:1 on 17m with all other bands including 60m somewhere in between.

At about this time I became a WSPR user (using a Hans Summer U3 transmitter kit), and assumed this would be an excellent tool to test all of this. No doubt it would, given much time and statistical analysis. But unfortunately - particularly on the higher bands - there was so much minute to minute variations in measured S/N ratio (often varying by up to 20dB at any one station QTH in sequential two minute transmissions) any differences in balun configurations were not clearly apparent.

Even on 80m daytime groundwave I couldn't see a pattern emerging between the different balun arrangements.

Then I found an interesting on-line balun article written by W7EL ("Baluns: What they do and how they do it") which gave me food for thought. My above tests indicated that the 4:1 voltage balun was the least worst balun solution for my setup (voltage baluns don't stop RF common-mode currents flowing on the coax outer). However the article said that a 4:1 current balun although being a bit awkward to make, especially to get consistent performance across all the bands, would be a better choice. However, the article suggests a 4:1 voltage balun followed by a 1:1 current balun was in effect a 4:1 current balun. That seemed like a good option, and the easiest way for me to do that was add my coaxial ferrite sleeve choke (my 1:1 current balun) to my 4:1 voltage balun's output just before it joins the RG213 coax cable.

Before doing this I operated my transmitter on 80m and went up and down the garden along the coax with an RF sniffer. Sure enough there were lengths where the coax was radiating. Adding the ferrite sleeve choke at the balun/coax junction noticeably reduced that radiation - I'd estimate by at least 6dB. A test on 20m didn't show as much difference. Adding this ferrite sleeve choke increased the SWR a little on some bands and reduced it a little on others, but maybe it will ensure that more of RF enters and leaves via the antenna now! I don't use enough power to ever get noticeable RF in the shack, so that wasn't an issue.

Of course there are a number of solutions to my requirements. For example I could use a fan dipole covering each band, but that's a bit conspicuous in a conservation area. Or a remote ATU at the bottom of the ladder where it meets the coax or mounted at the top of the pole to match the antenna and coax up there. Unfortunately remote ATUs are not cheap!

The present arrangement reduces the varying impedances of the doublet from band to band for easier matching by the ATU in the shack, which of course 'matches' the whole system, not just the doublet. Inevitably this means losses in the coax, but I hope my use of RG213 keeps that down to a minimum.

Conclusion

As far as I can see, my tests only prove that like most antenna systems, there are many variables to take into consideration and results just aren't clear cut. It's possible that my final configuration makes a more efficient antenna, but to be honest if I just connected the coax straight to the balanced feeder, I'm not sure if the theoretical deterioration in performance would make a noticeable difference!

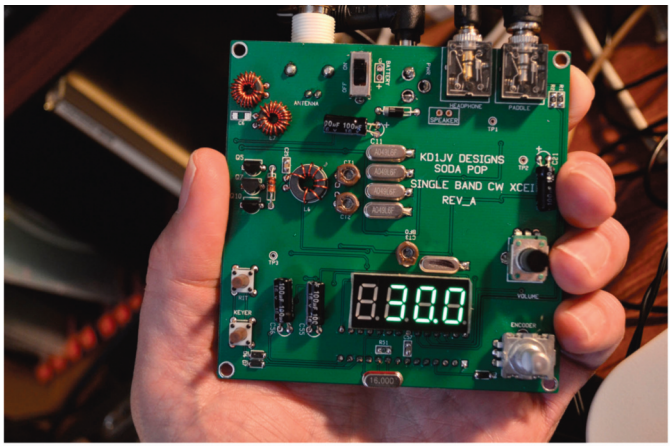
Compared to the random wire it does seem quieter. Unfortunately, but unsurprisingly, it's worse than useless for 160m. Nevertheless loading coils or draping extra wire at the ends may resolve that. A future project perhaps…

Soda Pop Radio by KD1JV

Steve Nichols G0KYA

I finally finished my 40m 5W Soda Pop CW radio by Steve Weber KD1JV. I was lucky enough to get my hands on the single band QRP transceiver kit recently. Soda Pop is meant to be a play on "SOTA Op" as it is meant to be a lightweight portable radio for "Summit on the Air" operators. Steve only produces a design every two years or so and they instantly become classics. It is a lottery as to whether you are lucky enough to get one and this time I was. My other KD1JV rig is a 3-band 3W Mountain Topper Radio, which I built myself (you can now buy them ready made via LNR precision).

All of Steve's rigs are fantastic, tricky to build as they are nearly all SMD, but offer fantastic performance. You can blame Colin M1BUU for getting me into these. Colin's Steve Weber rigs are works of art and regularly go up mountains for SOTA. As I live in Norfolk (which is very flat) I have to make do with the odd hill!



I'm happy to report that my 5W 40m Soda Pop rig is now built and working well. Built using hand soldering over a period of a few days – a total of about 8.5hrs – I was delighted to find it worked first time. Sensitivity seems good and power output is 5.1W with a 12.3 V Li-Ion battery. I aligned it by ear as I don't have an oscilloscope and got it close. It was perhaps 20-40Hz off frequency, but a quick tweak in the calibration mode got it pretty much spot on. Anyway, it is early days for the Soda Pop – the 40m band was in lousy condition at first and there were only a few signals on, but they seemed about as loud as my IC-756 Pro3.

Building the board took about 8.5hours. But preparing the hardware from scratch took a lot longer. I used a Hammond die cast box and drilled the hole for the controls. I then chain drilled, cut and filed the aperture for the display. My metalwork skills are limited to what I can do in the garage with a Bosch drill and a selection of files. I ended up having to elongate the holes for the controls and turn the hole for the antenna connection into a slot, otherwise I couldn't get the board in at the angle required. As a result I had to make up a plastic blanking plate for the back.

The box was painted with Plasticote metallic blue and gloss varnish. The panel label was produced using Photoshop and a photograph of mine of Happisburgh Lighthouse in Norfolk (we don't have any summits as it is very flat!). Once I was happy I then used Photobox to produce five copies of the photograph (in case I screwed a few up) and lacquered that too. The whole thing was assembled after the front panel was stuck on with red Spraymount.

I'm happy with the result, although I might do the front panel again at some stage to get the hole alignment a little better and also lacquer it with a matt rather than gloss varnish. So far I have worked Italy, Ukraine, Poland, Germany, and Estonia with it.

Many thanks to Steve Weber KD1JV for a great little design. I'm planning a Norfolk "Bumps on the Air" (BOTA) outing to Beeston Hill near Sheringham with it quite soon.

Tidy Toroids

Paul Smith, G4BJG mithsp@gmail.com

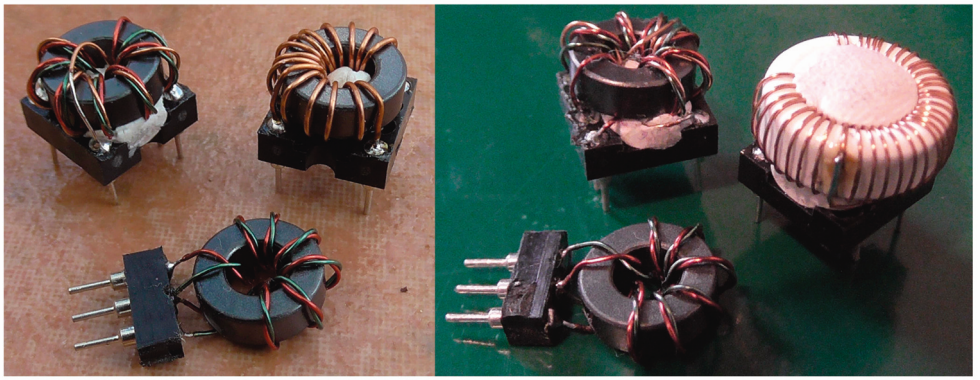
I use many inductors, transformers and bifilar/trifilar/quadrifilar windings wound on a T37-2 (and 6), FT37-43 and similar toroids but how could I tidy up the assembly so that they look something better than a spider walking across the PCB?

My latest idea is to mount the wound toroid onto an 8 pin DIL IC socket, preferably of the turned pin variety. I remove any pins not required by drilling them out using a 1.5 or 1.6 m.m. drill. While drilling it helps to hold the body of the individual socket (not the pin) with a pair of snipe nosed pliers, preferably the type with teeth.

Tin the wire ends and leave enough lead length to push them into the sockets and solder. One tip here – push the IC socket into another one. This stops the pins moving at an angle during soldering!

Use a small amount of White/Blutak between the toroid and the IC socket to support it. This method seems to work for many assemblies. A bifilar winding, inductor or tapped coil sits happily on a single-in-line socket strip. I didn't use any Blutak as support on this one but a small amount may help.

I have shown these assemblies made from T37/FT37 and T50 toroids. The T50/FT50 toroids overlap a 0.3" pitch IC socket but I managed to make a reasonable job of it. A T68 toroid might require a cut down 0.6" pitch IC socket.



No Cost Traps

Richard Witney G4ICP

Traps seem to be making a come back and there are different ways to build them. This is my attempt at some 40m Traps made from scrap/recycled materials (i.e. zero cost), to be used for a 80/40m Trap dipole.

For me, the main criteria for Trap building are:
1) Sourcing suitable Capacitors
2) (Reasonably) Accurate and simple Trap tuning
3) Repeatability
4) Price (QRP style, cheap as possible, preferably nothing)

I heard that scrap offcuts of coax could be used as high voltage low value Capacitors. The capacitance occurs between the inner and outer conductors. A short length can be cut for the required C value, remembering to allow an inch extra or so for "cut and try" when tuning. I found the resulting Trap has high Q.

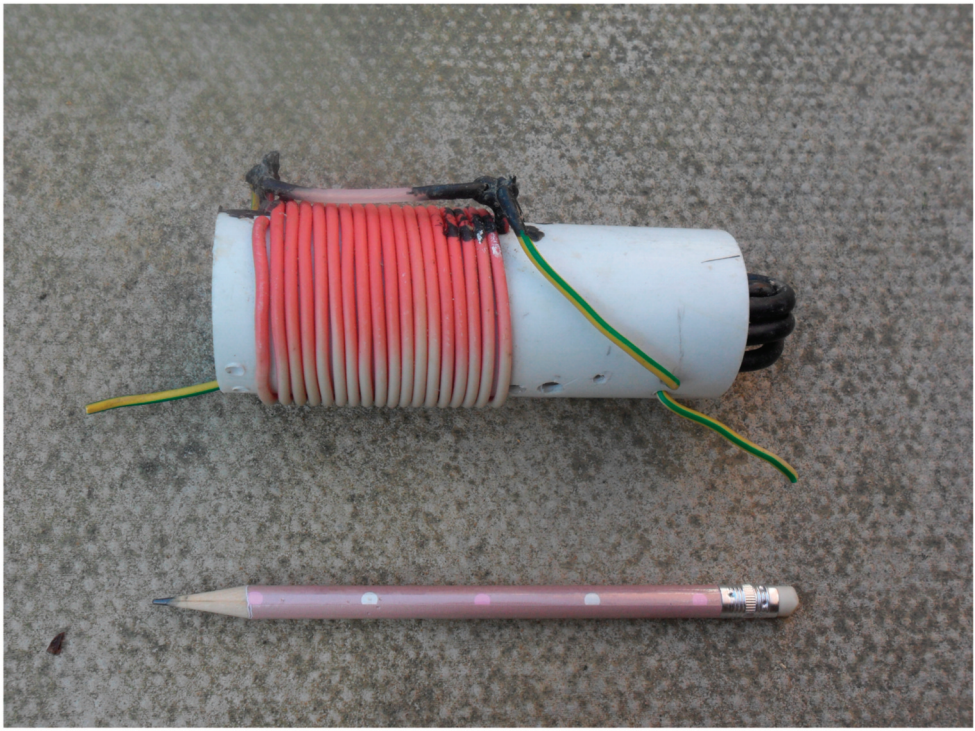
According to the data: (ref 1)
UR43 52 ohm cable has Capacitance of 29pF /Foot
so for 50pF cut 2 feet, which allows for some trimming.

(other coax cable types could also be tried)

For the 40m inductor, I used 18 turns of plastic coated single strand copper wire stripped out from some old "Twin and Earth" cable wound on 40mm diameter white plastic waste pipe

The coax "capacitor" is then soldered across the inductor exactly as you would connect a standard component, with the far end of the coax open circuit.

Tuning
I made a wooden jig to support the Trap clear of the bench. Resonance is checked with a GDO and referenced to an accurate receiver, in my case a SONY 7600D (remember those?) Other methods of trap tuning can of course be used.
Fine tuning is done by simply trimming the coax with cutters, starting low in frequency working up to 7100 kHz for a 40m Trap. Once tuned, the coax "tail" can be neatly folded, cable tied and stuffed inside the plastic tube.



My red wire faded due to sunlight exposure over a 2 year service period. The black blobs are "liquid electrical tape" (ref 2) I had in stock and used for waterproofing the joints/ends etc. The coax is inside the tube and is just visible on the right.

I used the above method to make a pair of Traps for a 80/40m dipole following the standard aerial dimensions. It worked very well, in spite of being squeezed into a 30 foot square garden, but that's another story!
72 Richard G4ICP

Footnote:
It is worth mentioning that in order to achieve the textbook harmonically related multi-band operation of a 80/40m Trap dipole on 20/15/10m, certain criteria for L and C ratios must be met. My build was just for a 80/40m device so further experimentation is advised should this multibanding be desired.

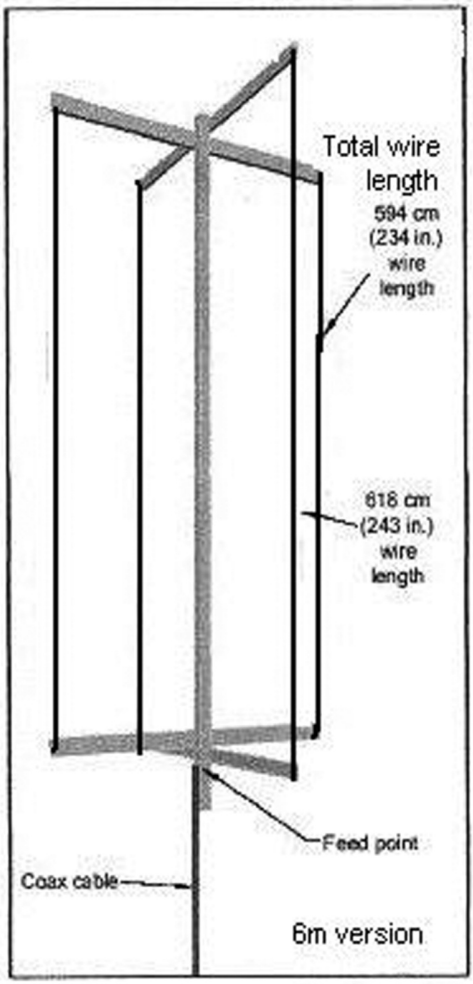
References:
1: RSGB Radio Data Reference Book, Jessop G6JP 5th Edition p153
2: Liquid electrical tape is available from Richard G3CWI at Sotabeams.

VHF Manager's report

John G8SEQ QTHR john@g8seq.com

I had some replies to my queries on the 6m beacon at Buxton. Keith G0RQQ in Lincoln says he can copy it at 559. Bob, G4FTY in Coleshill who's QTH is on the same beam heading as the beacon from copies it, but still nothing heard in Coventry, so something has changed.

I also had some comments from new member Ed, K1RID on VHF activity in his area. He says: “2 meter activity: I spend 3-5 days per week driving for work throughout Maine, New Hampshire and Vermont. Over the last 2 years I worked HF mobile because 2 meters was just dead”.



In the last 6 months, however, I switched back to VHF due to difficult HF condx. I am now making 5-10 simplex qso's per week on the US national calling frequency. I think more hams may be moving bands looking for others to work.

Lastly, our little club has been holding a VHF cw net in 144.055 with some modest success - 2-5 stations mostly.” While in Australia & New Zealand recently, I noticed a distinct lack of activity on VHF/UHF although this may have been due to the fact that I was away from population centres a lot of the time. I wasn't able to deploy my HF antennas very often either & when I did listen band conditions were a bit strange – 40m was open to Southern Europe and North America while 20m was almost dead.

Also from the 'States, another antenna for VHF. Bob G4GEE came across an article by John K4ERO (QST April 2017) . Bob scaled John's 6m design for 4m and has been trying it out in the recent RSGB contest. Best dx was IoW from Cov. A drawing of the antenna is reproduced here. What attracted me to this design is its simplicity. It consists of two rectangular wire loops mounted at right angles to each other and fed in parallel directly from 50 ohm coax.

John made the loops slightly different sizes to produce the required 90 deg. phase shift.

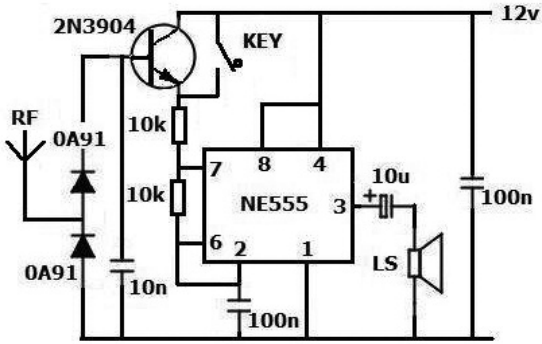
Because the loops have a 2:1 aspect ratio the impedance of each one is 100 ohms + 100 ohms reactive. The capacitive impedance of the short loop cancels the inductive impedance of the longer loop, thus leaving 2 x 100 ohms in parallel, giving 50 ohms, so matches standard co-ax. A fuller explanation is given in the QST article along with construction details – basically screw five sticks together and wrap some wire round them.

I put together in about an hour one of these antennas using five pieces of wood, eight screws & two pieces of wire. Last night I went on the local 6m net & compared the two antennas – my double turnstile and K4ERO's design. The K4ERO was about one s-point down. I also worked about 10 contest stations twice the same evening using my call G8SEQ on the double turnstile and GX7ASF on the K4ERO. Results were similar, but I did notice that the K4ERO antenna picked up more noise. The noise is local to me and is to do with where the antenna is situated. Had it been in the clear I'm sure its performance would be closer to the double turnstile I normally use. I am now working on a version which folds flat to make it easier to transport for portable use.

RF Sidetone

Peter Howard G4UMB

This circuit creates an audible tone and is straightforward and sensitive enough to pick up the RF from your QRP transmitter to make a side tone if you position the antenna of it near the rig. It's also useful when you want to learn or practice the Morse code using the Key switch.



QRP from New Zealand

Clive Smith, GM4FZH, Ravenstone House, Whithorn DG8 8DU,
gm4fzh@gm4fzh.co.uk

I thought I would write a bit about my preparations and QRP operation in New Zealand using my trusty Yaesu FT-817. The trips were Dec/Jan 2014/5 and Dec/Jan 2016/7 but I had used a 2/70 handheld there prior to these two visits. Australia and New Zealand use the same arrangement as the CEPT recommendations for visiting radio amateurs.

There is quite a lot to think about to start with:-

Our trips away normally last 60 days, it is not worth going for shorter. The number of days is also tied in with the house insurance policy – have you ever looked at yours to see how many days it can be empty in a year and whether it is per trip or accumulative? In any case, we have someone keep an eye on the house or relatives may stay.

The first thoughts were - what to take, what would get through security and what must go in hold luggage. (My partner said she would disown me if I got stopped at security!). Obviously it would be wise to take the more expensive items as cabin baggage; take a copy of your licence with you, however I have never been asked for it. Would I have to exchange clothing for radio equipment in my holdall, possibly? In any case we travel light and do washing en route. Batteries should be taken with cabin baggage but I am not sure how the new (trumped up!) regulations will affect this, especially as it differs with which airline you are on and where it is based.

Other thoughts were, NZ – it's a long way from anywhere – some 2000+ kms to Australia even, where should we stay in order to get an antenna up, SSB or PSK31 or CW. I could possibly get some running repairs done in NZ as we stayed with Paul ZL4AX for some of the time and I am sure any other amateur would help out. I decided against CW as mine is rusty and I only have a desk key which is heavy, I never got one of the small lightweight units aimed at the FT 817 and similar.

In New Zealand it is possible to hire cottages or bachs (NZ term for a simple holiday hut/cottage) for just a few days and not in full weeks as is typical in the UK. Summer holidays also start after Christmas there so it becomes busy. Hence, some of the planning was finding suitable locations, mainly just outside towns where I could get an antenna up – we booked these all well in advance. No-one ever refused permission to let me put up the antenna and folks were curious as to where I managed to contact.

My list of equipment was:-

Yaesu FT817nd	ATU	SWR meter
Antennas	Pole	Coaxial cable
Guys and fittings	12V PSU	Mains adapter
Spare battery	Multi-purpose tool	PC tablet
PSK31 interfaces	Coaxial cable adapters	Tape
Vehicle Adapter	Spare antenna wire	

Antennas, Cabling and Lanyard

Modes of operation were chosen as SSB and PSK31, although on the last trip I stuck to SSB only. I made an interface similar to Wolphi-link (see Internet) and also modified a car Bluetooth unit to provide a wireless link between my FT817 and the Android tablet. The SWR Meter was the Dave Stockton design. In addition to this, I wide-banded my FT817 in order to give the additional coverage allowed in NZ on 2m and 70cm.
I use the FT817 normally on mains power as it gives me the 5W output. Mains voltage and frequency in Australia and New Zealand are the same as here; the mains plug is different to the UK (but the same for both antipodean countries), so an

The two antennas were home-made and were linked dipoles for 7MHz/14MHz/21MHz/28MHz and 10MHz/17MHz/24MHz/50MHz. The linked dipole is very useful as you just undo or make the links to get the relevant length dipole – in fact I only needed the first one as 7MHz and 14MHz were the main operating bands plus on the first trip a bit on 21MHz and 28MHz; these last two bands appeared lifeless on the second trip. Some of the time there was also for travelling and sightseeing and so the time balance was important.

Homebrew SWR Meter

adapter or two is required – you never know if you are going to lose one!
The mast was another issue – which one? Inverted V was the obvious antenna configuration. I found a very portable item on the SOTA website, collapsible and only 65cm

long – it JUST fitted diagonally in my holdall. I did find two disadvantages with this mast; if left up overnight and it was windy it sometimes collapsed at one of the joints below the guying point – and I double-checked them for tightness as it was assembled. To overcome this I used insulation tape wound around the joint, this worked BUT when you take the tape off it removes some of the paint. To overcome this I use the tape sticky-side out for a couple of turns to overlap itself and then turn it over and bind it tightly. I suppose you could use something like cling film first and then tape but I don't carry cling film with me on holiday!

The coaxial cable was a mix, because of the fragility of RG174 and its connectors, I only use this for the vertical section down the mast and tied in a loop at the top to the balun to reduce strain on the connector. On the ground I use RG58. With the adapters I carry I can interchange the cables or only use one of them.

Ancillary Equipment

An ATU (LDG Z817) was used on the first trip – I was afraid of damage to the PA of the FT817 as that would curtail my operation. I was more bold on the second trip and, although I took the ATU, I did not use it, my little home-made SWR meter giving me the indication I wanted! On the first trip I used a ferrite balun but on the second trip I used a Sotabeams balun which I could change between antennas if required.

Before leaving the UK I had several practices in the garden in erecting and using the antenna and deciding on equipment. I was able to hone my techniques for raising the pole and antenna by myself and getting the equipment connected quickly.
One word of advice, make sure the pegs for your guys are CLEAN (and any other equipment including your shoes), Australia and New Zealand operate a very strict biose-curity regime and equipment may be checked as you enter the country. I clean anything that has been in contact with the soil with a strong bleach solution, hot water and wipe clean if necessary.

And so the journey began, Manchester to Dubai, Dubai onwards, some days spent in Australia and then on to New Zealand. I did operate a little VHF in Australia - Alice Springs, Sydney, Tasmania, Adelaide and Melbourne - but just a few contacts as the accommodation was always hotels and not conducive to HF antennas.

One interesting aside was the visit to the Telegraph Museum in Alice Springs and the story of the installation of the 3200km telegraph line across the centre of Australia from Adelaide to Darwin (opened 1872) and the sub-sea cable to Indonesia and hence communications back to Britain. Links were eventually made through to New Zealand in 1876. There is also the Flying Doctor Museum in Alice Springs and well worth a visit.

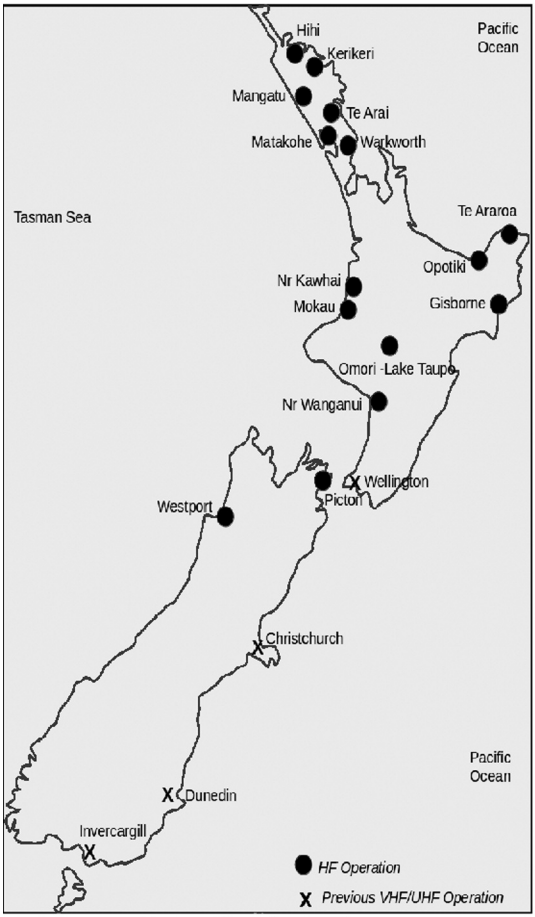
My first HF operation was from what we called the “Red Shed” near Te Araroa on East Cape and on my first QSO made it to Hawaii. I heard W1AW/KH6 on 14MHz and with my meagre 5W got a 59 report back – surprise, surprise as it is the best part of 7500km. This site was superb as it looked straight up the Pacific and had high cliffs behind which I suspect helped propagation. Contacts then continued with California and Japan.

During the first visit contacts were made with USA, Japan, New Caledonia, Australia, Tahiti, Cook Islands and of course New Zealand itself. However, it did not include Europe and there was a total of 41 QSOs. Inter-NZ working was usually on 7MHz apart from the occasional foray on VHF and UHF. I did have trouble in Gisborne with QRM, our cottage here was within the city limits and I suffered with S9 noise, I assume probably plasma TVs and broadband - it made operation impossible. This is why we always try to get something “out of town”.

On the second trip I made 102 contacts which included Australia, Spain, New Caledonia, Solomon Islands, Japan, Papua New Guinea, Cook Islands, Finland and – wait for it – England (G0EGW in Norfolk) and all on 5W SSB. I expect with most stations the antenna system at the far end was somewhat superior to my linked dipole. On this second trip the

best propagation on 14MHz was to be had after about 20:00 local time (typically 07:00 UTC) – a 13 hour time shift.

One must always remember that, apart from local Kiwis, most contacts from NZ are long distance, even to their neighbour Australia. I never made it to the West Coast of Australia but did make a HF contact with an amateur in Alice Springs (VK8KMD) and a YL operator on an Island in the Gulf of Carpentaria (VK4SWE). Most VK contacts were along the Eastern side. In some cases my signal was weak and I thank all those for the perseverance they showed, one QSO took 20 minutes to exchange basic information. With some non-English speaking countries the prefix ZL/ took some getting used to and the / (slash) was a real problem with one contact. Some countries are just not used to these reciprocal arrangements.



Operating Locations

On the first trip PSK31 and my interfaces worked fine and I enjoyed some good contacts. On the second trip it was voice only as it was quicker to get running and I did not have to keep the PC tablet fully charged.

We did visit some locals on the last trip which included Barry (ZL1BG), Alan (ZL1RQ), Graham (ZL2ABN), Kevin (ZL3DHC) and Janette (ZL3DYL). Many thanks for the hospitality shown. I should not forget our good friend Paul (ZL4AX) and xyl from Pukekohe (they originally came from Cumbria) with whom we spent some happy times and two good Christmases in some cottages.

I am always sad to leave New Zealand as I feel it has become my second home and if only I was younger! What began as a one-off holiday has meant that I have now been to NZ five times! Will there be another trip? Who knows!

Modified Limerick Sudden TX for 5262 kHz

John F Alder G4GMZ johnalder1@btinternet.com

The 60m band QRP CW calling frequency is 5262 kHz and a transmitter/receiver [TX/RX] need only operate within a couple of kHz of centre to cover most activity and indeed, the band [5258.5 – 5264.0 kHz in UK]. Rather simple designs of TX are practical and few more so than the Limerick Sudden [L-S] TX modules available from the GQRP Club although there is not one available for 60 m. The Club has made available the circuits and construction details on the webpage:
http://www.gqrp.com/Sudden_TX_Kit_manual_40m.pdf
and it is straightforward to plan design changes for experimentation and for members to purchase many required components also from Club Sales.
For this project the goal was an 8W CW TX matched to a small antenna centred on 5262 kHz to work initially with the base station Icom R9000 RX & LW antenna [35m wire at 4m above ground level and 25m counterpoise].
The centre frequency 5262 kHz is mid-way between 3560 and 7030 kHz and it is not certain which of the 80m or 40m TX modules would be best to modify. Study of the circuits quickly identified the frequency dependent components and almost arbitrarily it was decided to start with a 40m TX kit as it left me with a 7030 kHz crystal which will be useful in another project! To calculate the values of components required for 5262 kHz operation two approaches were used: a “half-way” estimate and “proper calculation”; in reality the half-way method proved quite adequate within experimental error. The chosen values that were different from the components supplied in the L-S 40m kit are shown in Table 1 against the part designation used in the component list for the kit.
The output Low-Pass filter values were calculated using the tables given in “Radio Communication Handbook” 10th Edn RSGB p.A4; and in “Building a Transceiver” E Skelton EI9GQ & E Richards G4LFM; RSGB 2014 p 46, for a 0.1 dB ripple 7-Pole Chebyshev LP filter which is the same component layout as used in the L-S 40m TX kit .
The circuit was constructed on the kit circuit board using the toroids and wire provided and worked almost immediately. Component R6 was changed from 10R to 22R in order to bring drive adjustment into the middle-range of RV1 for optimisation. The frequency control of the crystal centred at 5262 kHz and tuned between 5261 and 5263 kHz after optimising with the trimmer on VC1. The handy power meter module supplied was beefed up a bit after initial measurements at 2W, using higher voltage-rating and powerdissipation components to cope with the anticipated 8W to be measured. An AVO-8 meter was used to measure output voltage of the module. Output power from the TX into the 50R dummy load was set and measured as between 1.3W with a 12.0V power supply and 2.5W with 13.8V; the transmit frequency did not alter significantly over this supply voltage change. Before connecting to an antenna the LPF was disconnected from the circuit and connected to the RF wattmeter module. The RF from a signal generator was input to the filter and monitored on an oscilloscope at the dummy load input. The filter parameters had been calculated for cut-off at about 6 MHz; the filter was seen to show peak transmission at 5.6 MHz; which by 6.4MHz was -20 dBV and by 7 MHz was -40

dBV on the peak signal. From 7 MHz up to 16 MHz the signals were too small to measure with the kit available. The completed TX terminated in 50R was set next to the RX and the harmonics of 5262 kHz up to 30 MHz were all well down in the noise from the RX; the filtering was considered adequate.

L-S TX: Changed Components for 5262 kHz Operation		
Component	**Value Employed**	**Comment**
R1	22 R	¼ W
C12	570 pF Foil	470+100
C13	1000 pF	Foil
C14	1000 pF	Foil
C15	645 pF	Foil 2x330
C18	150 pF	Silver/mica
L1	18 µH	Axial lead
L3	15 µH	Axial lead
L4	T37-6; 23 turn	30 SWG, 35cm
L5	T37-6; 22 turn	30 SWG, 35cm
L6	T37-6; 23 turn	30 SWG, 35cm
X1	5262.0 kHz	HC49/U

Use of the L-S 5262 kHz TX as driver for a PA

The power amplifier circuit chosen is by Drew Diamond VK3XU described in detail in Rad.Com. Handbook p 5.10 et seq, loc cit. It is simple to construct and is for a 1.8 to 10.1 MHz push-pull amplifier providing 5W using two IRF510 switching FET [available from Club Sales]. The only change needed was to optimise the components in the output filter for 5262 kHz operation and this was done with the aid of the table provided on p 5.10 loc cit. The coils for the LPF were wound on T68-2 toroids. The three inductors were wound with 18, 19 & 18 turns each; 40 cm each of 22 SWG enamelled wire leave 10-12mm tails. [Toroids and wire were from Club Sales.] The capacitors used were two each of nominal 600pF and 1000 pF foil type and the calculated filter cut-off frequency was between 6.3~6.6 MHz when the actual component measured values were put in, using the formula explained well by Skelton & Richards p 46 loc cit. The circuit was built into a metal sweetie box and optimised by driving it at 6 & 7 MHz from a 100 mW ex-MoD Test Generator.

The L-S 5262 kHz TX & PA were brought together and powered from the base station PSU. Output was to a Tokyo Hy-Power Labs Inc ATU and a Carolina Windom 40-10m antenna at 4m agl. Keying of the L-S TX was with a Redifon telegraph key which has a parallel contact that closes before the morse key contact is made. That was used to mute the R9000 thus providing full break-in keying. RF output at 5262 kHz was measured at ~7W into the ATU 50R dummy load from a 12 V supply and ~10W from a 13.8V supply. Total current from the PSU was ~80 mA quiescent and ~1A key down [12V]; ~2A key down [13.8V].

The Limerick Sudden 5262 kHz TX & PA have since proved to work well over many months with good reports from contacts into Europe and over UK. The construction was most enjoyable and this simple approach to home-brew 60m CW QRP operation can be recommended.

COMMUNICATIONS AND CONTESTS

Dom Baines, M1KTA, 34 Bury Road, Stapleford, CAMBRIDGE. CB22 5BP
m1kta@gqrp.co.uk

Hi all, thanks for the comments (please keep them coming). Don't forget there are loads of large and small contests on right through the summer some with special QRP or LP sections. Check out http://www.hornucopia.com/contestcal/contestcal_qrp.html

Summer Sizzler
Hope everyone is looking forward to the August bank holiday week when the Summer Sizzler will be taking place. Dates are the week BEFORE the bank holiday to the Monday 28th. I am hoping many members might take part and activate the WARC bands (12m, 17m and 24m) as well as the more usual HF (20m, 30m, 40m and 80m) frequencies.

Operating for all these activities should take place on and around the International QRP Calling Frequencies.
CW: 1843, 3560, 5262, 7030, 10116, 14060, 18096, 21060, 24906, 28060
SSB: 3690, 7090, 14285, 21285, 18130, 24950, 28360 kHz

I recommend if there are a few stations on frequency spread out a bit if you can.
It is usual for operators to exchange their G QRP Club membership number when making QSO but it is not essential. Those taking part are invited to submit logs and comments to the G QRP Club Communications Manager, Dominic Baines, M1KTA, email at m1kta@gqrp.co.uk, Dom Baines, M1KTA, 34 Bury Road, Stapleford, CAMBRIDGE. CB22 5BP.

These I know might interest some GQRP members in no particular order:

RSGB Low power contest 17th July http://www.rsgbcc.org/hf/rules/2016/rqrp.shtml
ARRL FD 1800 UTC, Jun 24 to 2059 UTC, Jun 25, http://www.arrl.org/field-day
IARU HF World Championships 1200 UTC, Jul 8 to 1200 UTC, Jul 9
http://www.arrl.org/iaru-hf-championship
Marconi Memorial Saturday 1400 UTC, July 1 to Sunday 13:59 UTC, July 2,
http://www.arifano.it/contest_marconi.html
RSGB IOTA – 29th12:00 UTC - 30th July 12:00 UTC quite a few will be off to various places for this annual contest and you will see some rare and not so rare IOTA islands activated this summer. There is a QRP category to this contest which makes it interesting and it's both SSB and CW. If you are off somewhere this summer, please drop me a note or let Chris G4BUE know about it, especially photos. I am sure some might also manage to operate and pick up a few of the other GQRP awards this summer.
http://www.rsgbcc.org/hf/rules/2017/riota.shtml I am sure many including me will be QRV whilst hanging onto the antenna pole and log sheet in the wind from some remote beach.

I expect YOTA and JOTA (Scouting) will pop up on air too during the summer.

Valve QRP Day April 2017

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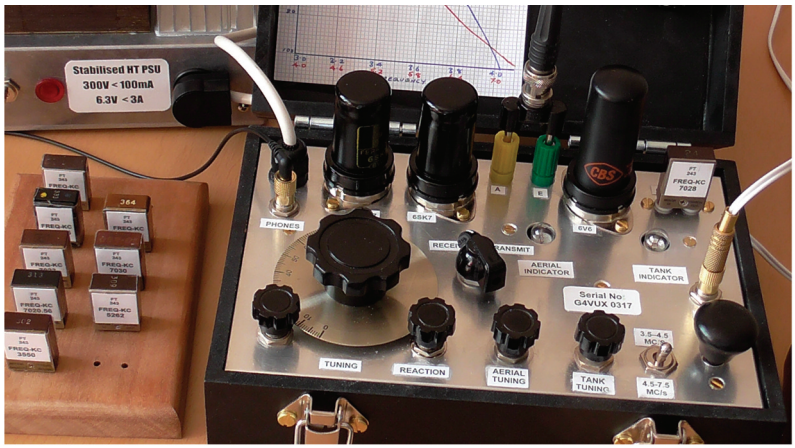
Thanks you to all of you who operated during the April Valve QRP weekend, particularly those of you who built a transmitter for the event. Reports this time were as follows. Hello Colin, it was another enjoyable valve activity weekend and despite the generally poor conditions I worked most of the regulars. My log shows a total of 21 QSO's with 16 stations; 11 QSO's with 7 stations were valve to valve. As always 40m was wiped out by a contest but my local pal M0JXM took pity and gave me a QSO on that band closely followed by my only other 40m contact F5SGP. The 80m band proved best for me this time with 13 QSO's, only 4 were on 60m, 2 on 160m and the previously mentioned 2 on 40m. My rebuilt regen RX worked very well and its improved performance made life much easier. I'm looking forward to the November Valve Weekend and hope that conditions will have seriously improved by then. 73 **Chris G3XIZ**.

Hi Colin, thanks for organising the Valve QRP Day event. I made a few contacts with a Paraset 'Replica' which I built earlier this year. Martin G4ZXN made me smile when he described the note on 60m as 'almost flute like.' I will use it more frequently from now on! Look forward to the next event. **72 Graham G4VUX**.

Hi Colin I used an old tube receiver/transmitter called the Telefunken SEM-78 from 1955 which was used by the ex-Yugoslav State Security Agency (UDBA). This set uses modern E series tubes (ECH-81, EF-89 in RX and ECH-81, EL-84 in the TX), working on 3- 8MHz CW, MCW and AM, VFO or XTAL control of TX frequencies. The RX is VFO controlled and the output power is about 15W with 2 x EL-84 but in Valve Day activity I

used a single EL-84 in the PA giving 6W output. I made 7 QSO (2 on 40m and 5 on 80m), and 7 DXCC countries with XTAL controlled TX. During the weekend I had problems with a contest and the bands were very busy so my suggestion is that the valve day activity is on another working day in the week. **72 de YU7AE**



Hi Colin, Saturday – nil but Sunday was great fun and I made 10 QSOs on 80m spread throughout the day. I now have an extra crystal for 80m (3561kHz) thanks to Gerald G3MCK but still no VFO but getting closer to building one. Many thanks for organising another enjoyable event. More of the same please! **73 Derek G3NKS**

Hi Colin Adrian informs me you did very well in the Valve QRP weekend. Alas I struggled! I find inter "G" working at the moment not easy from my location plus my little Peanut Whistle (4 Watts) is rock bound. With the filter wide open on my FT 817 for receive you can hear other stations but you just can't work them. On Sunday morning I was on the air again with my Peanut Whistle and after a short time gave up and switched to my Vintage, (more like Classic!), TS530. It was cheating really but at least I did make a couple of contacts in OK1HCC and ON5AG. In the afternoon I entered my usual Fists Ladder activity FT 857 100 watts and managed (for me) quite a reasonable score. I don't think it is the power that makes the difference but being agile around the bands. If only the sun would help out a bit! **72 Richard G0ILN**

I worked 9 stations 3 DL and 6 G using a 6AG7 oscillator and 2E26 PA. That 6AG7 is recommended for crystal control. **G3MCK**

The weekend was a bit of a wash out mainly with conditions and I made 15 QSO's with 12 unique stations. I was using a Codar AT5 and an Eddystone EC10 RX, Inverted L 40' V 100' H. Have made a "reversible" mod to the AT5 to allow 40 and 60 metre operation! Despite the poor conditions I had a good time with the old gear and look forward to the next round. Thanks for your support with the event. **72/73 Ian G4GIR**

It was a great pity we had to struggle with the poor conditions but I note of late, as we progress through summer, that conditions improved a little and 60m is becoming more alive in the early evenings. What do you think about an activity day during the week as YU7AE suggests?

Thank you to the handful of members who keep the 60m QRP Activity periods going on Monday evenings by the way. What a pleasure it was to hear G4HMC, G3SES and G4ICP in a three way net a few days ago. QRP operators actually on the air making QSO's! G3MCK has been keeping an eye on the sun spots for me and reports little or no F layer propagation at times during the day but improved propagation in the early evenings on 80m and 60m.

Richard G0ILN is right and we need to be more agile around the frequencies perhaps with a VFO or VXO and remember to listen up and down the frequency. It might be worth checking 3570 and 3577 for contacts for those trying to escape the mayhem lower down or even work the Dutch boys with their surplus equipment on 3575.

I am sure we can continue to keep real LF and perhaps HF communication CW going in the poor conditions if we just stick with it.

Keep those soldering irons warm and those valves warmed up ready for the next session which will be in November on the weekend of Saturday and Sunday 11th and 12th. Don't forget you can call 'CQ Valve QRP' or 'CQ VQRP' around the regular QRP frequencies plus 3570 and 3577 if need be using your home brew creations or old equipment. Hopefully I will work some of you using the recently refurbished G3SYC co/pa transmitter using and HL2 and a PM22.

Antennas Valves and Vintage

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In the Valve QRP Day report in this issue and in previous reports in Sprat Chris G3XIZ has mentioned using a valve transmitter receiver with a regenerative detector and a simple crystal oscillator power amplifier transmitter. He has kindly described the receiver below and it may provide a stimulus for those of us who like to build old style equipment. But firstly, this note came from G0EBQ:

G0EBQ Experiences with an indoor Small Loop antenna

Hi Colin, Just a quick note about my antenna which may be of use to others in a restricted location.
I cannot put up an outside antenna and for years have made use of a bent G5RV in the loft which did make contacts but was basically pretty useless. The last straw was when I built a 40m band module for my Sierra only to find that it would not load up on that band. I consulted my GQRP Club Antenna Handbook (highly recommended!) and tried the Gus Taylor G8PG loop on page 59. It consists of an 8ft square loop that happens to be the size of my 1st floor spare bedroom/shack. To make it I took 32ft of wire, plus enough left over to make an open wire feeder section, and plastic mains connector blocks for insulators and connections. Crude but it does perform well and is fed in the centre of one leg in my case into a Z match. I am well pleased with it and I can make the LED on the ATU go out, *(indicating minimum SWR)* on all bands 12-40 with my Emtech Z match.
It will load less well with my Norcal BLT tuner possibly because it only uses a T106/2 rather than a T130/2 toroid for the tuning coil. My first contact with the Sierra on 40m was with Spain and Italy and I have just worked SO9 with 200mw out from my '49er' transceiver on 20m. I hope these notes may be useful to someone in a similar situation. 72/3 NigelG 0EBQ/3375
I know a local radio amateur who once made a frame antenna using a clothes horse and he worked 160m AM on that! I am sure there are members living in equally restricted conditions can take heart from these notes and get on the air albeit with low power on the higher frequencies with a small antenna. The loop can be fed either at a corner or along a side with open line and a balanced tuner.

G3XIZ REGENERATIVE RECEIVER REBUILD

I have spent many happy hours participating in the GQRP Valve Activity days but found the poor performance of my home brew receiver a real handicap which detracted from my enjoyment. The transmitter-receiver was made in 2012 and covered those parts of the 160, 80, 60 and 40m amateur bands around the QRP CW calling frequencies. The RX had 2 valves with 3 stages comprising a regenerative detector and two AF amplifiers but no RF stage. Hence frequency 'pulling' due to front end loading was a problem, especially if the aerial was swaying in the wind. It was a nuisance to change from band to band as plug in coils were utilised and the receiver drifted quite badly, especially on the higher bands.

After the last valve activity weekend I finally lost my patience and completely gutted the receiver. I made a list its faults and shortcomings and came up with a circuit which I hoped would address them all. The rebuilt RX now works fine and should more than adequately repay my efforts (and curses).

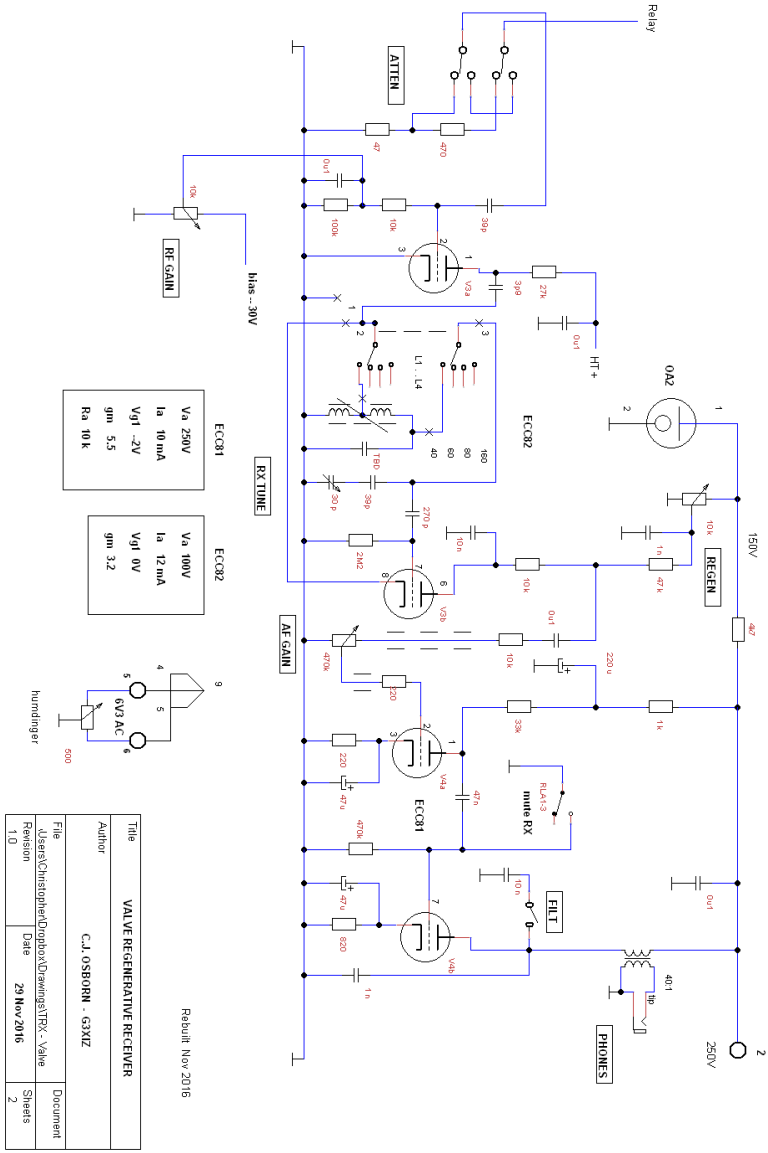
It has 2 valves: an ECC82 as RF amplifier and detector and an ECC81 for the two audio amplifier stages. As with the original circuit it drives low impedance headphones via a step down transformer but has significantly more gain. It now boasts band switching plus an RF amplifier with a front panel RF gain control, which is most useful under strong signal (e.g. contest) conditions. The RF amplifier is not tuned as such but utilises the selectivity provided by my external ATU. The detector's HT supply is stabilised by an OA2 regulator and the regeneration (reaction) control is a multi-turn, good quality pot which gives very smooth and fine adjustment. The frequency stability, even on 40m is now perfectly adequate.

A most useful addition was a 0–100 logging scale and each coil was adjusted such that the QRP calling frequencies for all of the covered bands occur at a dial setting of '30' The coils are enclosed in an aluminium box which as well as providing screening nicely reflects away the heat radiated by nearby valves which had previously caused drift. As a useful design feature I've made the coil pack assembly self-contained such that the removal of two screws plus one DIN plug allows the pack's complete removal for ease of modification.

As expected with such a simple receiver the audio bandwidth is rather wide so the simple expedient of switching a capacitor across the output transformer to cause resonance produces a 600 Hz filter. On-Air tests have been very promising and indicated a far superior performance to the previous receiver. I'm expecting great things of my new RX and impatiently await the next GQRP valve activity weekend.

Chris is a prolific constructor with an all home brew station. He is often heard on the LF bands supporting QRP activities and is a highly proficient CW operator. The receiver shown above is a fine example of his craft.

The circuit of Chris's receiver is on the next page.



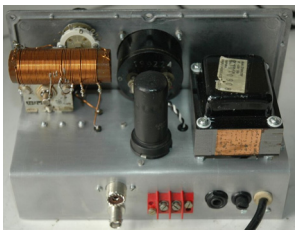
My thanks go to the contributors this issue. I have a major article for the Autumn Sprat from Chris IZ3CQI on a physically large valve transmitter delivering 5 watts but I am always in need of articles regarding antennas, valves and vintage equipment. Please send anything you have preferably using Word with any diagrams to me at g3vtt@aol.com. See you on the bands Colin G3VTT

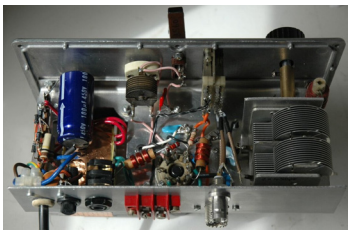
MEMBERS' NEWS

by Chris Page, G4BUE

E-mail: chris@g4bue.com

Congratulations to our Membership Secretary **G4WIF**, who received the Don Cameron, **G4STT**, Award for an outstanding contribution to low power amateur radio at the RSGB AGM meeting in Cardiff on 22 April (*thanks* ***GØFUW***). **G7VFY** has created another group on *Facebook* at <https://www.facebook.com/groups/1853639971550169/>: 'The Urban Radio Ham. Enjoy amateur radio where restrictions apply'. Stephen says, "Living in a flat or apartment with restrictions for amateur radio operating? Have you found a way to have a reliable indoor or covert HF antenna, despite antenna restrictions? Then this is the group for you. Mostly antennas, operating and some construction". **GØFUW** says the Bath Buildathon Crew will assist at the G-QRP Convention at Telford on 2/3 September, like they did at Rishworth.





The April Valve Day gave **G3XVL** 11 QRP contacts on 80m with **G3XIZ**, **ON5AG**, **G4ZXN**, **G3TYB**, **DJ5RE** (near the Czech border running a home-brew duplicated Spy TX/RX), **G3NKS**, **PA3ALX** (non-valve but 5W). Chris says 60m was dead on the Saturday but he did manage QSOs with **G4ZXN** and **G4XRV** on the Sunday and signals were peaking 599 at times. His TX was his single 6AG7 crystal controlled TX with 5W output (pictured above) and a CR150/6 or TS590 RX depending on QRM levels.

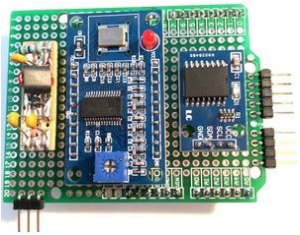
G1YWY has been QRT for a number of years and is trying to relive his construction golden years by putting together all those lovely construction projects he got from *Practical Wireless* (PW). Jonesy has built a PW dummy load in a syrup can and a PW FET GDO. **VK5TM** says the website <http://www.americanradiohistory.com/Practical_Wireless_Magazine.htm > has all the PW magazines up to 1989 on and **GM4VKI** adds, "Most of the plans and circuit boards are still available and there is a list in the back of most PW magazines, or you can e-mail the editor for info". **GØFUW** says **M1KTA**'s 'Being the DX, QRP' lecture at the 2016 RSGB convention is now available for members at <http://rsgb.org/main/publications-archives/video/rsgb-convention-lectures/rsgb-2016-convention-lectures/>.

Pictured right is the bay where **M1KTA**'s cottage was during his 17/18 January operation from Stewart Island (OC-203). As part of the High Altitude Bioprospecting (HAB) project, **MØLVR** developed a strong interest in amateur radio that has become a fascinating, distracting and intensely hard technical hobby! Oliver has an interesting blog at <Http://hf.h-a-b.net> describing his, "Increasingly fraught and longwinded attempts to *get the darned thing to work*. My dream is to finally make a long distance (DX) HF contact!" He says, "I now have a full amateur radio licence but have yet to ever make a successful contact outside the UK, especially on the HF bands". He adds, "This is a bit like having written a thesis on the *Kama Sutra* but never having had a girlfriend"!

OLED screen displays for some VFO modes.

MØIFA has made some progress with his aim to demonstrate the various digital modes CW, RTTY, PSK31, WSPR and JT65 to the Banbury ARS members. To do this he constructed a new VFO and decided to use the widely available AD9851 frequency synthesiser modules. Anthony says, "These are sine-wave output chips, as opposed to the Si5351 which are square-wave output. Sine-wave are good for normal VFO applications and the Si5351 square-waves are best for mixers (SA612 or diodes) and SDR quadrature detectors. The AD985x come in four varieties, a larger and smaller board, and a 50 or 51 option. The differences are two: the AD9851 has a 30MHz crystal reference and the IC includes a x6 multiplier to give an internal reference of 180MHz. This allows outputs from <1MHz to 70MHz, but the harmonic content rises a little above 30MHz. The AD9850 has a 125MHz crystal and no multiplier, and outputs up to 20MHz or 30MHz with increasing harmonic output. The second difference is the pin-out and the selector jumpers on the larger boards, which allow you to select serial or parallel addressing, DAC output current, LPF and a second output. In reality the larger boards do not provide any more functionality for sine-wave output VFO use. Both types have only one RF output via a LPF (at 70MHz) to filter out the DAC ripple frequencies. Additionally I added these to an Arduino shield together with a buffer amplifier using a ERA2-SM MMIC (+10dBm output) and a Real Time Clock module.

"My VFO is based around an Arduino UNO microcomputer board. For programming the AD9851 I have not found any correct Arduino libraries, so I have written my own (I call it ADS9851.h). The rest of the software is also home grown for each output mode. I use small OLED displays (1.3 inch available on *eBay* with a serial I2C interface). I have written an OLED header file of display functions for displaying bar graphs, text, numbers and frequencies. The basic VFO software giving outputs from 1-70MHZ allows a rotary encoder to step the frequency in 10Hz, 100HZ, … up to 1MHz steps. For WSPR and JT65 the library allows the frequency to be set in centi-hertz steps needed, as WSPR, for example, uses four steps of 1.46 Hz. If anyone is interested you can download these sketches and Arduino libraries at <www.dropbox.com/s/4m0xo4vrwb41bbp/M0IFA%20Sketches%20and%20Libraries.zip?dl=0>".



The Arduino shield with Buffer amp, Synthesiser and Real Time Clock.

Anthony soldered together the final VFO on 2 May.

Anthony demonstrated all modes at the BARS meetings with output RF signals received across the desktop on an Elektor SDR and decoded on his Macbook running HDSDR and a variety of digital decode software (WSPR, JT65-JH, etc) that can be found on the web. He says these transmission modes offer extreme QRP operation with signals received over thousands of kilometres with a couple of watts of power. In the process of development to a complete station Anthony has developed software for the Elektor SDR Arduinp shield, and an RF power meter capable of measuring 0.1uW up to 10W! In the pipe-line are a complete QRP transceiver on a single Arduino shield and a 2-3W PA with SWR and switched LPFs.

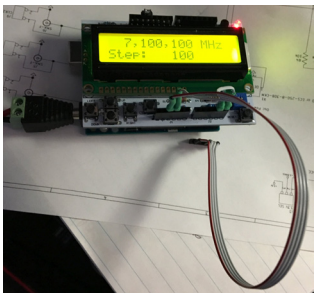
G4JQT recently asked on the G-QRP Mailing Group, "Is 5262kHz the centre of CW (CoA) activity for (UK full amateur licence holders) for the UK only, or wider in Europe (which seems likely)?". **M1KTA** replied "5260kHz is the CoA for CW and 5262kHz is CoA for QRP CW", and **G3XVL** added, "5262kHz CoA part of the band is used by UK stations and is not available to many other countries. European stations are mainly around 5350kHz and up while other stations around

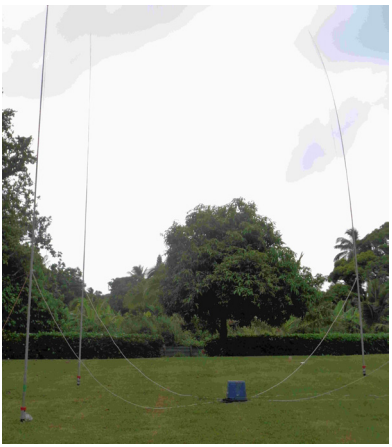
the world might appear anywhere up to the far HF end. I keep a chart of the UK band on my shack wall to help cope with where I can TX. Not sure how accurate it is but you can see all the different allocations on < https://en.wikipedia.org/wiki/60-meter_band>".

F5VLF recently put together two useful accessories for his 136 kHz experiments. The first is a 1:2 transformer with a centre tap on the secondary winding, wound on a N90AB ferrite ring from Maplin (right). The second is a tapped inductor wound on a bundle of seven LW/MW ferrite rods, probably from the same supplier (far right). John says, "Neither is state-of-the-art, but I have found both very useful when adjusting matching for my flat-top antenna, particularly when used in conjunction with a **MØBMU** Scopematch. It's also a way of reusing three ½ inch and seven ¼ inch floppy disk boxes". **GØXAR** says if you visit Budapest and need some parts, especially old parts, he recommends Milkrovill at Böszorményi Út 2, near Deli Station in Buda, <www.mikrovillkft.hu>. Steve says, "I just bought a new three-gang variable capacitor, including slow-motion drive, for £1.50. The lady behind the counter speaks limited English but reads schematics. Lacking the Hungarian for variable capacitor, I drew the symbol and value and she understood".

GØUPL says the new firmware version of the QRP Labs Si5351A synthesised VFO/SigGen kit now includes a quadrature output mode. **G4WIF** thanks **K7WXW** for updating the *SPRAT* Index up to edition 170, see <www.gqrp.com/sprat.htm>, and **G4EFE** says the weblinks for *SPRAT 170* are at <http://spratweblinks.blogspot.co.uk/2017/04/weblinks-for-sprat-170.html >. Are you suffering from HF noise and powerline RFI? If so, then **GW4JUN** suggests looking at <http://www.ifwtech.co.uk/g3sek/in-prac/> where there is, "A for a lot of good stuff on ferrite chokes used to eliminate this type of QRM".

KD4PBJ has been a Club member since 2010 and hasn't submitted anything to *Members' News* before, but on the far right is his SI5351 frequency synthesiser that he built using an Arduino Uno, LCD shield and Etherkits 5351 breakout board. Chris says it works great and the other picture is his BITX 40m TCVR. He QSO'd two VE stations on SSB the first time he switched it on. One year on from building his Pixie, **G4GHB** listened to a sound of what he expected a capacitor to sound like when charging and discharging. On testingit, Bill found the voltage swinging wildly around the LM386 and replaced it with no difference, so he opted to remove the electrolytic CP2 capacitor between pins 1 and 8 and found it was open circuit and showed no value of capacitance. He replaced it and everything was back to normal but screwing the ring nut on the headphone socket he thought he had stripped the thread, but then found the ring nut had split, never having seen this happen before! He then found Q2 was also not working and replaced it with a ZTX689 which he had to hand. The Pixie is now working again although the output power seems down with this transistor.





Pictured right is **M1KTA**'s 40m four-square system at his UK QTH. Dom used a two element phased array version when he was QRV as **E51KTA** in March and worked into the UK with it, albeit not with QRP. Too late for 2017 but **EA4OA** mentions the EA-QRP Contest held every

year on the third weekend of April, see <http://tinyurl.com/m2jsvbu>. Also **RV3GM** tells us about a new annual QRP Marathon, 'Look in the Horizon' also in April. The rules are on the *Club 72* webpage. **G3JFS** entered the Marathon this year and says conditions were terrible for QRP; at times it was very difficult to make any contacts at all. Peter persevered for third place with QSOs on 160-15m (nobody made any 12 or 10m QSOs) on all permitted modes: CW, SSB, BPSK and Hellscheiber with 5W maximum output, including 12 two-way QRP on CW, the best with **RV3GM** using his minimalistic 2W rig on 40m. His best DX was **PY2GTA** during a brief and unexpected opening on 15m. "What happened to propagation to the USA during April?" Peter asks, "I did not work a single North American station during the month or, for that matter, even hear one at workable strength".

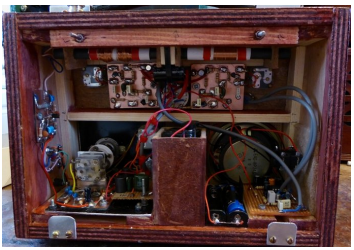
G3XBM 'discovered' 6m MSK144 a few months ago - RX on 50280kHz with just an FT817, V2000 omni vertical fed with CB coax, Roger can usually copy right across northern and western Europe on 6m irrespective of conditions. He says, "Signals come in by random MS trails and aircraft reflection. WSJT v1.7 supports this mode and is free. Even with my modest set-up (1W ERP) it has reached Spain. Otherwise I am on 10m WSPR and JT65 and go on the 2m and 70cms UKAC activity contests QRP. I can work out to about 125 miles most times on 2m even with 5W and a big-wheel horizontal omni antenna. Over the winter I was on 630m (5mW ERP) with my best DX being a report from LA over 625 miles using my earth-electrode antenna in the ground".

PA3GNZ writes "After a few years of building, I am not so active with home-brew, but my Iler20 project is ready (left). It produce 3.5W and I built in the DDS, so I receive the whole 20m band. In the case is a speaker to listen all the time on headphone, and on the back is a possibility to use the rig with 220V or 12V". Gose has used the rig for a few weeks and made SSB QSOs with **9H1FL/P**, **OE8NDR**, **SV9GPV** and longest distance **EM9WFF**, and has made a short video at <https://youtu.be/ECyypdea8Vk>. His antenna is a 2 x 24.6 feet dipole with open-line on his balcony. **GØEBQ** has just finished an old school version of the BITX, made up on breadboard to **VU2ESE**'s original design that is working nicely on 40m. Nigel has also finished band modules for 60 and 80m for the Sierra to complete all bands 12-80m. The indoor loop does load on 60 and 80m, though not very well and he suspects it is acting more like a dummy load! **N2CQR** put one of **VU2ESE**'s BITX Modules on 60m and built an Epiphyte-like SSB rig for 40m using NE602s. Bill says irate QRPers from around the world responded to *SolderSmoke's* entirely false April 1 report of Pete Juliano's expulsion from the QRP Hall of Fame (allegedly for excessive QROism)!

YU7AE isn't able to report much due to the bad conditions on the HF bands. Most of Kare's activity has been from his portable location (above left), either his working place or other flora fauna locations, with his new toy, a FT-817nd with LDG-817H ATU that he says works perfectly. He uses a 10-80m windom antenna, some time a **ZS6BKW** version of the **G5RV**, and has bought some monoband mobile antennas, but is awaiting improved propagation to try them. In less than a year, Kare has made about 1000 QSOs with QRP, including a few nice DX QSOs, but says his favourite is two stations from Antartica (**RI1AND** and **RI1ANR**) on 40m with the windom antenna and 5W CW. He has participated in a few QRP contest (EA, Original QRP test, etc) and in the Valve Day activity using an old SEM-78 spy set. He recently bought an old WWII German receiver Torn EB (top right), a 2-V-1 TRF receiver that is ready for the next Valve Day.

Pictured top of next page is **G3TPV**'s unusual new three-band battery portable receiver using separate LW and MW Mk484 copper pad modules. For 40m a DC circuit; 3580kHz ceramic VXO

(*SPRAT* 78); a polykov doubler mixer (*Practical Wireless*, June 2008); the audio filter is from the October 2008 *Practical Wireless* and LM386 audio output. Alan says he is quite pleased with the result (*thanks **G6MNL***).



GM4VKI reports the rally season opened with the Northern Rally at Blackpool on 9 April with **G3MFJ**, **GM3WIL** and himself attending the G-QRP stand where 30 members signed in. Then a new rally in Glasgow on 7 May that was a fantastic day with 34 members signing in and five joining. Roy says their next outing will be 6 August at the Crianlarich Rally followed by Galashiels on 22 October. If any Scottish rally would like them to attend, please e-mail him at <RKAVAMPSEV@aol.com>.

M1KTA was QRV from the South Cook Islands as **E51KTA** in March with his KX3. He took a **G3CWI** SOTAbeams WRPlite with him and put it on 30m with a GP antenna; 200mW RF managed to reach the USA East Coast. Dom used a four element four-square for 30m that later became a two element phased array for 40m. He also used an OFCD for 80m at 60 feet and worked lots of JAs with it, mostly with QRP. Dom says there was a RF black hole at noon when it was wet and so he tried some satellite operation. He built an Arrow antenna clone, no QSO but he did hear ISS (picture right). The total QSO count was 2734, including the BERU contest. He says, "Thanks especially for all the ATNO notes, I tried to get as many of you in the logs as I could in what were definitely trying propagation conditions. I never concentrated any effort on 20m SSB as that has been done so many times by so many ops, 20m CW likewise. Had I done so the QSO counts would have been much higher. 160m was a lot busier than expected at first, so was 40m CW. 17m SSB ended up being three short evenings of three hour pile-ups whilst the path to Europe was open. Only a few 30m QSOs (I was only running 15W on that band in the end). I left the two element 40m vertical array directed at Europe with **E51AND**, so I hope he will find some use with others".

Dom's E51KTA QSL card.

G3XIZ had, "A most enjoyable Valve Activity Weekend and was pleased with the performance of my recently rebuilt valve transceiver. The event is great fun but could do with a few more ops taking part". Chris's new home-brew TRX with 'low' VFO and crystal filter seems to be infested with 'birdies' so a re-design is in the offing. Better news is that his hitherto 24/7 local QRM has stopped, leading him to suspect that it is a neighbour's defective central heating appliance, resulting in him now being more QRV on 80m QRP than of late. The antenna at his /A location is now in situ thanks to the loan of a catapult from **G7NKS** and says, "This cunning device enabled me to put a line over a suitably tall tree". **SV3AUW** built the 'Five in One' tester described by **G1CXE** in *SPRAT* 170 (and *SPRAT* 160 by **G4UMB**) and says it is very helpful. Takis says, "Anytime I need to check a transistor, FET or LED, it's just 'Plug'n See'! I strongly suggest to build one".

Thanks to the contributors to this column. Please let me know how your summer goes for the Autumn 2017 edition of *SPRAT*; what you have been building, who you have been working, and any other information about QRP, by 10 August. Also, interesting photographs, 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 photograph to let other members know what you and your equipment look like. Let me know if you intend operating from somewhere other than home during the autumn and winter months, especially in the Winter Sports, so I can let members know to listen out for you.

QSL Cards from Nasko - LZ1 YE

LZ1YE has sent me details of some attractive QSL cards including the Club Log.
Members can make their orders by sending samples, explaining what they want to print, and sending the materials: photos, files...etc via e-mail: qsl@qslprint.com or qsl@kz.orbitel.bg or if no internet access via the postal address: Atanas Kolev, P.O.Box 49, 6100 Kazanlak, Bulgaria. Examples of cards and prices can be seen at **www.qslprint.com**
For people need QSL cards urgently LZ1YE dispatches three days after the payment is made. UK Members can pay via a UK address: Please send your cheque / cash via recorded delivery to: LZ1YE QSP Print service, c/o Melanie Rowe, St. Leonards House, 35 St. Leonards Road, Exeter, EX2 – 4LR, Devon. e-mail: m0mja@aol.com (make cheques payable to : Melanie Rowe)

GQRP Club Sales

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

Antenna Handbook – 2nd edition – members price £6.00 plus post } £2.00 (UK) or £5.50 EU
Radio Projects volumes 1, 2, 3 & 4 – by Drew Diamond – members price - £6 each book + post } or £8.00 DX per book

6 pole 9MHz SSB crystal filter (2.2kHz) £12 plus post (max of one) } £3.50 (UK); or
Polyvaricon capacitors – 2 gang (A = 8 to 140pF, O = 6 to 60pF) c/w shaft extension & mtg screws - **£1.75 each** } £3.80p (EU); or
– 2 gang – (both 8 to 285pF) c/w shaft extension & mounting screws - **£1.75 each** } £4.50p (DX)

Pair 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, 7.122, 10.106, 10.116*, 14,060*, 18.086, 21.060, 24.096 & 28.060 all are **£2 each** } plus **postage** } **(ANY quantity)**
HC49U crystals- 1.8432, 3.500, 5.262, 7.00, 10.006, 10.111, 14.00MHz – **50p each** } £1.20p (UK), or
HC49U crystals – 2.00, 3.00, 3.20, 3.579, 3.6864, 4.0, 4.096, 4.1943, 4.433, 4.5MHz } £3.50p (EU)
5.0, 6.0, 7.2, 7.6. 8.0, 9.0, 10.0, 11.0, 12.0, 13.50, 15.0, 16.0, 18.0, 20.0, 24.0, 25.0MHz } £4.00 (DX)
26.0, 27.0, 28.0, 28.224, 30.0, 32.0, 33MHz – **all 35p each** (Some of these are low profile) } Post free
Ceramic resonators – 455, 480kHz, 2.0, 3.58, 3.68, 4.00, 7.37, 14.32 & 20.00MHz **– 50p ea.** } if ordered with
Diodes - Schottky signal diode – 1N5711- 20p each; 1N4148 GP Si – 10 for 10p } with heavier
Varicap diodes - MVAM109 – 40pF @ 9v, 500pF @ 1v. **50p each** } things
- BB204 – twin diodes, common cathode, 15pF @ 20v, 50pF @ 1v **50p** } like binders,
SA602AN - £1.50 (note – I may supply NE or SA, 602 or 612 as available. All are fully interchangeable. } toroids
MC1350 - £2.00 These are getting in short supply now so max of 2 per member } polyvaricons
LM386N-1 - 4 to 15v, 300mW, 8pin **DIL - £0.45, LM386M-1 SMD – 35p** } or filters
TDA7052A - 4.5 to 18v, 1W 8pin **DIL** low noise & DC vol control – **£0.60 each** } Use just
TDA2003 - 10w Audio amp 5pin – **£0.25 each** } that postage
TA-7642 Radio IC – direct equivalent of **MK484** (& ZN414) – **75p each** }
2SC536 transistors (npn) fT - 100MHz, hFE-320, VCBO +40V **- 5 for 50p** } If ordered
MPSH10 transistors (npn) fT - 650MHz, hFE 60, VCEO 25V **- 8p each** } with books
2N3904 transistors (npn) fT - 300MHz, hFE-150, VCBO +40V **- 10 for 50p** } or CDs
2N3906 transistors (pnp) fT - 250MHz, hFE-150, VCBO -40V **- 10 for 50p** } add this
BC517 Darlington (npn) fT - 200MHz, hFE-30,000, VCBO +40V **- 13p each** } postage
FETs - IRF510 – 50p; 2N3819 - 22p; 2N7000 - 10p; BS170 – 8p - all each } as books
BF981 – dual gate MOSFET – 40p each } or DVDs
Pad cutter - 2mm shaft: 7mm o/s, 5mm i/s diam, gives a 5mm pad with 1mm gap **£6.00** } do not
10K 10mm coils – 0.6uH, 1u2H, 1u7L, 2u6L, 5u3L, 11u0L, 45u0L, 90u0L, 125uL – all 80p each } travel well
Magnet Wire – 18SWG – 2 metres – 60p; 20 & 22 SWG – 3 metres - 60p; } with parts.
24, 25 & 27SWG – 4 metres - 40p; 30, 33 & 35SWG – 5 metres - 30p. }
Bifilar wire – 2 strands - red & green bonded together. Solderable enamel. }
21SWG (0.8mm dia) – 2metres - £1; 26SWG (0.45mm dia) – 3metres – 70p }
Litz wire – double silk covered multi-strand wire 7/.04mm -12p, 14/.04mm. 25p. Both for 3 metres. }
All our wire is solderable enamel insulated. Max of 3 sizes per member per order }
QRP heatsinks - TO92 – 30p; TO39/TO5 – 40p; TO18/TO72 – 60p (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 and 1000 - all uH, all 18p each. }

Toroid Cores – **priced per pack of 5 – max of 2 packs of each per member**
T25-2 – 50p, T25-6 – 60p, T30-2 – 70p; T30-6 – 80p ; T37-2 – 80p; T37-6 – 80p; T50-1 - £1.00; T50-2 – 90p; } **Postage for**
T50-6 – £1.10; T50-7 - £1.20; T50-10 - £1.20 ; T68-2 - £1.80 ; T68-6 - £2.40; T130-6** - £2.40ea. FT37-43 – 90p } **toroids includes**
FT50-43 - £1.20 ; FT37-61 - £1.20 ; FT50-61 - £2.40; Ferrite beads – FB43-101 (3.5mm dia x 3.2mm long, } **postage for all**
1.2mm dia hole) – 40p for 5: BN43-2402 - £1.20; BN43-202 - £2.00; BN43-302 - £2.00; BN61-202 - £2.40. } **small parts**
All toroids are plus postage – up to 5 packs = £1.20 (UK), £3.50 (EU), £4.50 (DX). Each additional 5 packs, please add 50%
**** Except ** items** – they are heavy and each counts as a pack (ask for quote if you want more than 2 of the large toroids)
SBSS PCB clamps * – single - £12, two - £20 all plus post (£3.50 UK & EU : DX – order direct from Rex please)
MeSquares & MePads * - £6.50 each plus post (UK & EU as parts for up to 4) : will DX please order direct from Rex)
STIX board * – 3" x 1", 80 x 0.15 square pads plus 2 x SOIC pads. £3.75 each. Will post with parts for no extra postage.
QRPme Brass sets * – PCB feet to lift the board off the table - £10 plus post as for SBSS clamps - DX 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 - £5.40, DX - £8.00
Sprat-on-DVD – 1 to 160. Only £5 each to members plus postage, UK - £1.20, EU - £3.50, DX - £4.00
Sprat Binders – nylon string type – Black with club logo on spine -16 issues per binder – **new stock** - £6.00 each plus postage (one: UK - £2.00, EU – £4.00, DX - £5.00. More - add £1.10, £1.50, £2.50 each)

Cheques (UK) and payable to G-QRP Club. MINIMUM ORDER for cheque or PayPal payments is £5
You can also pay by BACS. The numbers you will need to do that are - sort: 01-07-44 and a/c: 54738210
I can accept cash in GBPounds, or US$/ €uros (at the current exchange rates) – but please send securely! You can order via e-mail and pay by PayPal - use sales@gqrp.co.uk – and pay us in GBPounds and you MUST include your membership number and address please. PayPal charge us about 4% so a contribution towards that is always welcome, or, send as a gift to friends/family - thanks