SPRAT

THE JOURNAL OF THE G QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

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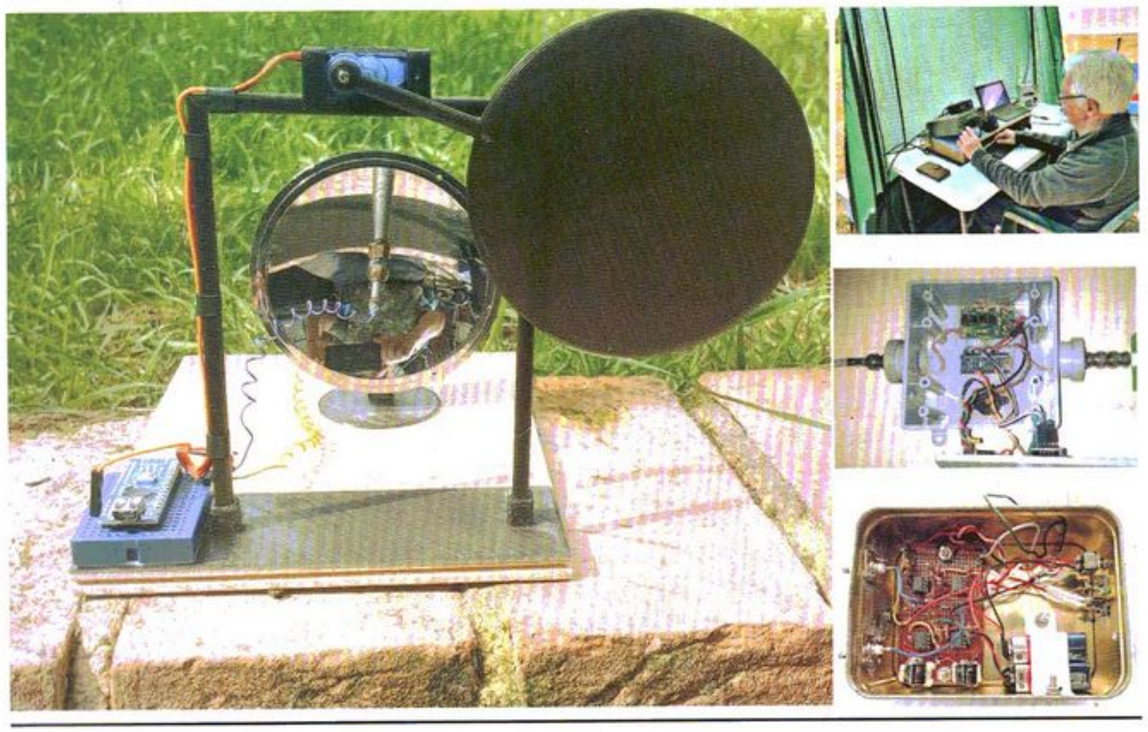

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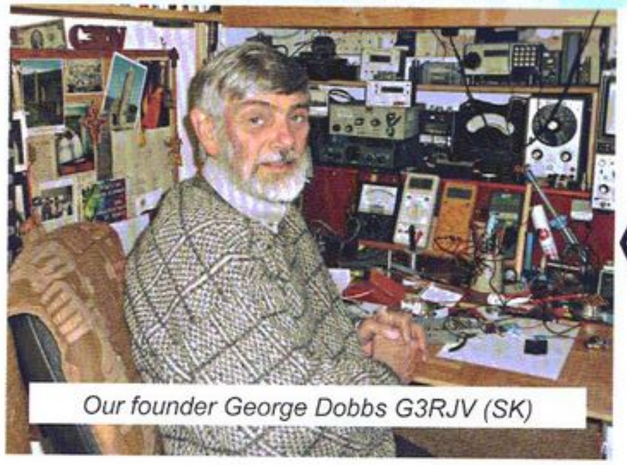

Our founder George Dobbs G3RJV (SK)

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EDITORIAL

Since *SPRAT* 192, I have been extraordinarily busy. In August, I received news that the on-line platform used for the Bath-Based Distance Learning was to close. With just 6 weeks' notice a mad scramble to find, test and deploy a new platform was set in train. We switched over with a week to spare; a great example of team work and the willingness of volunteers to help out.

Then we had the annual Club Convention (see report later in this *SPRAT*). That too was a great team effort. Shortly after Telford, Jane and I had a short break on Alderney, where we met Club member **Chris, GU3TUX**, who lives on the island. Alderney is not the easiest of places to get to, but it is a lovely location.

Then we had some G-QRP team changes to arrange. In the last *SPRAT* we asked for volunteers for a new QSL manager. A number of members expressed an interest but **Hugh, M0HMS**, was appointed by the committee; Hugh did some time with the RSGB QSL Bureau. The Club website has been updated and for anyone who does not use the internet, Hugh is QTHR in the RSGB Yearbook. Our sincere thanks go to **Dave, GM3VTH**, who did the job so efficiently for many years and we wish him a long and happy retirement.

We also needed a new USA representative. **Bill, K7WXW**, should be well-known to many Club members, he is the man who has kept our *SPRAT* index up to date for many years. I first met him (on-line) when organising our Virtual Convention in 2020 and have always valued his input. I was most pleased when I heard that Bill had agreed to be our man on the left side of the pond. His contact details appear elsewhere in *SPRAT* and on the Club's website. Again, we must thank **Dave, W7AQK**, for his service to the Club; three cheers for Dave!

Looking towards the horizon, 2024 is not too far away and that will mark 50 years of the G-QRP Club. We will be organising some special events during 2024, so keep an eye out for the announcements, and if you have any ideas for how we might mark our golden anniversary, please do not hesitate to let me know.

Have a great 2023 and enjoy cycle 25 as best you can!

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

Annual Convention 2022 report

Steve G0FUW

After two years of virtual Conventions the G-QRP annual Convention returned as a 'real' gathering in September. The good people who run the Telford Hamfest at Harper Adams University hosted us again for a Saturday Buildathon and social gathering and a programme of talks on the Sunday. Club Sales joined other vendors for the Hamfest on the Sunday too.

The Buildathon kit was a Convention special edition of the Kanga UK Half Wave End Fed Wire Tuning Unit. Starting earlier than in previous years to allow for more socialising afterwards. 16 building stations were set up and everyone who took part seemed to enjoy the experience. Thanks go to **Paul at Kanga** for supplying the kits.

The social gathering was well attended, so much so, that the buffet food had all but gone by the time the Bath Buildathon Crew made it to the bar. We have made a note to order more food next year! Luckily, the drinks did not run out and the chatter continued until quite late.

Sunday's talks went down very well, not only with those in attendance at Telford, but also with a number of members across the globe as we managed to stream them live via Zoom.

First up was **Martin, GM5JDG**, talking about the microprocessors and microcontrollers that are becoming more and more common in QRP radios. I followed with a report on the Club's Scratch Build Group project; an 18MHz version of the N6QW Sudden SSB transceiver. After the talk, six new members joined the Group and one has already reported working across the pond with his scratch-built Sudden. After lunch **Mick, Mi5MTC**, delivered his talk on the Writings of the **Reverend George Dobbs**. Mick has compiled a comprehensive bibliography of George's work and brought along some examples of George's projects. The talks were recorded and are now available to all on the Club's YouTube channel.

It was great to meet so many members in person, and hear lots of positive feedback about the event; considering we had not done this for three years, there were very few issues. We had one report from a member who did not enjoy the venue, mainly due to a lack of public transport to and from the University. We have noted this and will include more information in our calling notice in 2023.

The Club Committee extend their sincere thanks to all those involved; the **Telford Team**, the **G-QRP volunteers**, the speakers and everyone who attended, either in person, or on-line.

If you want to join in the fun next year, the Convention is booked for the weekend of 2nd & 3rd of September, at the Harper Adams University.

30THz QRP – simple and affordable

Remi M0LRH, Hieronim M7HBL

The 30THz band sounds very exotic. This frequency is at around the top of the terahertz gap (300GHz – 30THz); below there are well-developed microwave bands and above are optical frequencies. Even while the terahertz region is in its infancy, it is still accessible for amateur experimentation. As defined by Planck's Law, any object with a temperature above 0 Kelvin emits wideband electromagnetic radiation with a peak frequency defined by its temperature.

Fig. 1. 30THz Transmitter

Fig. 2. Transmitter antenna (left), Receiver antenna (right)

For 30THz, any object with a temperature of approximately 200 degrees Celsius (392 degrees Fahrenheit) will work, which could be anything from a candle to a ceramic heater. 30THz waves behave similarly to light, so they can be reflected by mirrors or focused by lenses, but the biggest practical difference is that glass is opaque at these frequencies, so mirrors need to have metal surfaces and lenses require unusual materials (e.g. Zinc Selenide, Germanium or Polyethylene). Several inexpensive detectors are available (pyroelectric and thermoelectric). In this article, I would like to demonstrate a simple and inexpensive experiment in the 30THz band.

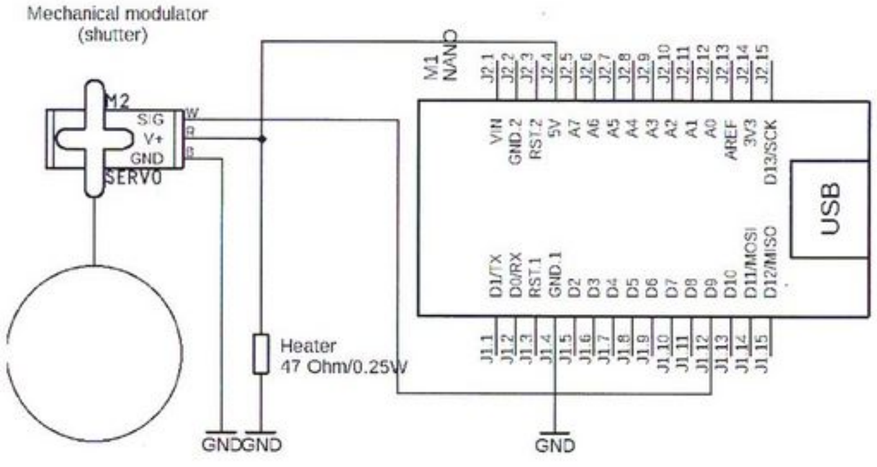


Fig.3. Transmitter scheme

Fig. 4. 30THz Receiver

The transmitter consists of a transmitting antenna and a shutter (Fig. 1). The directional transmitting antenna (Fig. 2 - left) consists of a resistor 47 Ohms/0.25W mounted in the focus of the concave mirror - the mirror is part of a "Solar fire starter" (eBay, about £3). The resistor is connected to 5V DC, which exceeds its specification and heats it to about 200 degrees Celsius (depending on the exact brand of the resistor, using a variable power supply may prevent resistor damage if you slowly increase the voltage).

For safety reasons, connect the resistor to a power source only for a short time; when experimenting, do not leave it unattended in case of overheating. Alternatively, a small ceramic heater (MCH heater) can be used, but this would be costly enough to possibly double the cost of the experiment. The signal emitted by the antenna is modulated by the shutter, made from a "paddle" attached to a mini servo motor (type SG90), and is controlled by the Arduino Nano (Fig 3). The shutter, controlled by software, is able to produce various modes of communication including: simple on – off, cw mode with a carrier frequency and phase modulation/phase shift modulation.

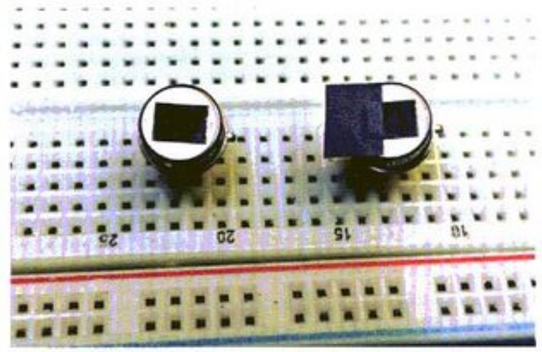


Fig. 5. PIR sensor (left), plus another with half of the window disabled using black electrical tape (right)

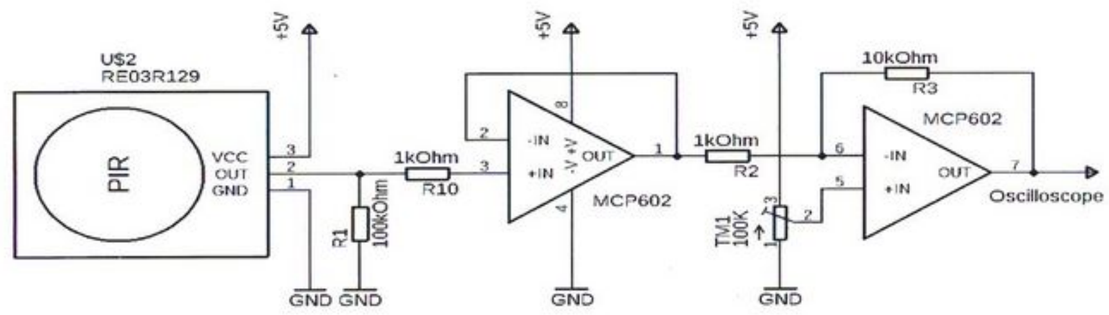


Fig. 6. Amplifier scheme

The receiver (Fig. 4) consists of a receiving antenna, a basic amplifier, and an oscilloscope. The directional receiving antenna is made from a concave mirror and a PIR sensor (Fig. 2 - right) Alternatively to a concave mirror, Zinc selenide lenses can be used but due to their toxicity and price a concave mirror is preferred. The receiver mirror focuses the 30THz radiation onto the PIR sensor.

These PIR motion sensors (Fig. 5 - left) utilise the pyroelectric effect, containing at least two pyroelectric crystals inside. If there is no movement in the sensor's field of view, the two signals from the crystals cancel out, but when an object moves in the field of the PIR sensor, they produce a differential signal. To use the PIR sensor as a 30THz detector, one of the

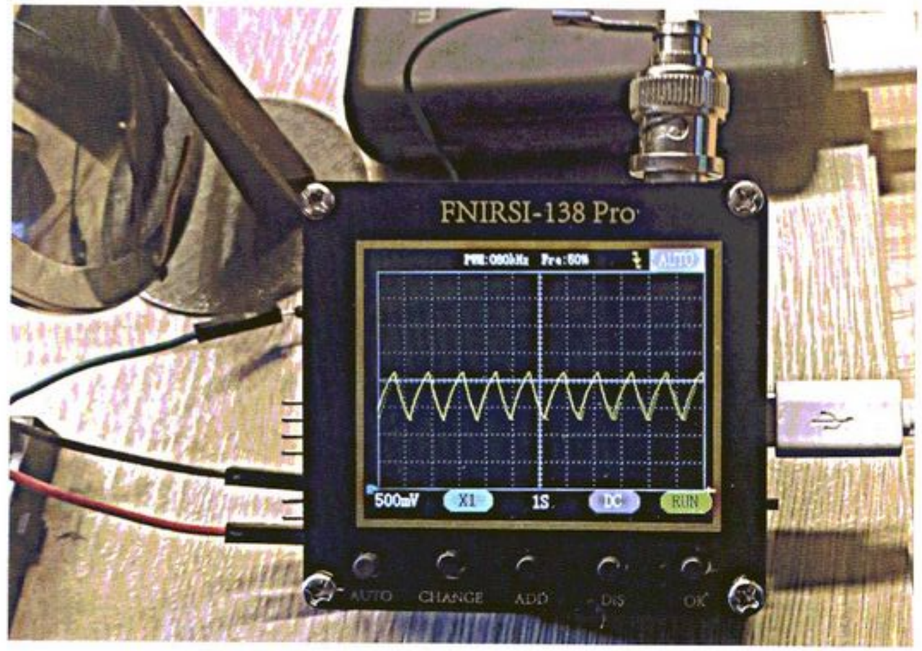


Fig. 7. Signal displayed on the oscilloscope

crystals needs to be disabled; the simplest method is to use black electric tape to cover half of the infrared transparent window (Fig. 5 - right). The signal is then amplified by an op-amp, the MCP602 (Fig. 6), and displayed on an oscilloscope (Fig. 7).

The mechanical parts of this project were 3D printed and the total cost of this project (including the oscilloscope) is estimated to be below £50.

The description above is one of my first experiments on the 30THz band. After some iteration, this evolved into the system presented in Fig. 8, which recently achieved a distance of 75 metres on 30THz with 5W transmitted power. The video from my recent experiment at Samphire Hoe can be found at:

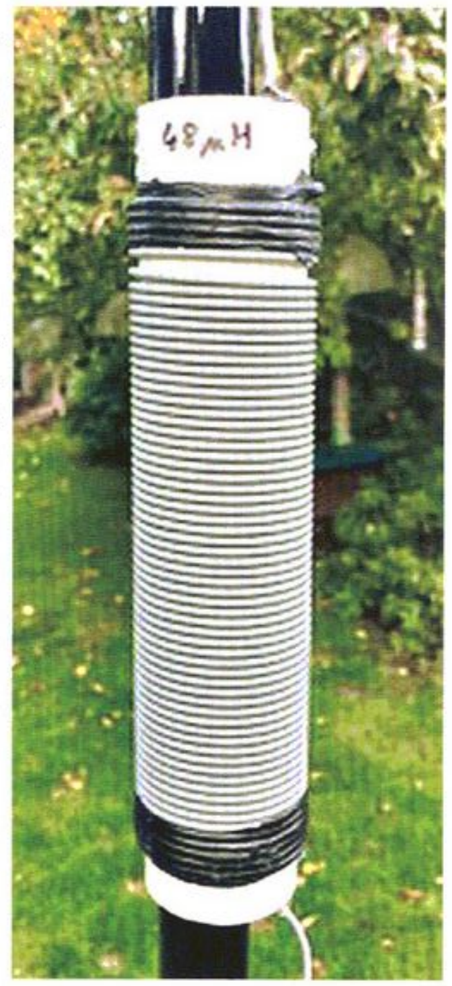
Youtube: https://youtu.be/GKiRo0Hqu04

Please to not hesitate to contact the authors if you need the Arduino sketch or the stl files for the 3D printer.

Fig. 8. 30THz system used in the Samphire Hoe experiment

A coil-shortened 80 m vertical aerial

Philip Miller Tate M1GWZ email: m1gwz@icloud.com



I was recently perusing some old amateur radio newsletters when I came across one that described a design for a short, loaded vertical monopole for 3.6 MHz. The total height above ground was eight feet! The suggestion was to support it with garden bamboo canes lashed together, and my immediate thought was, "I can do better than that!"

Like most amateurs who dabble in aerial design and portable operating (even if only from the garden), I possess more than one fibreglass telescopic roach / windsock / antenna pole. Both extend to about 9 metres but for practical reasons I limited the total aerial length to 8 m. Obviously, this is considerably less than the approximately 20 m needed for a quarter wavelength, and so the aerial needs to be "electrically lengthened" with the aid of a suitable coil.

The calculations needed to find the necessary inductance of such a loading coil involve only normal algebra, but are extremely complex (see, for example, https://dxc.wc2l.com/QST_Sep_1974_p28-34_58.pdf) and require a spreadsheet or other computational method – I for one would not like to attempt them on a calculator, although, in principle* it could be done. [*from the French, "En principe, oui" meaning "Non".] Luckily, all problems can nowadays be solved by the merest touch of a keyboard and somebody has very kindly provided a suitable on-line calculator at:

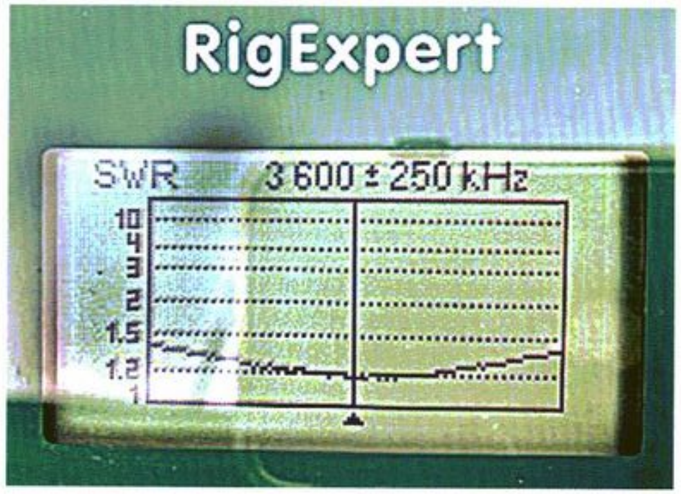
https://www.66pacific.com/calculators/coil-shortened-vertical-antenna-calculator.aspx

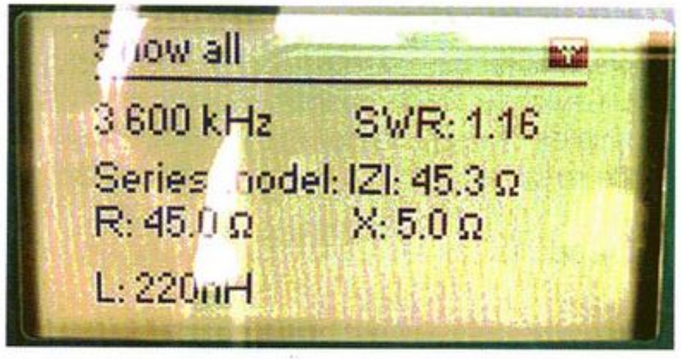
The only downside of this nice piece of programming is that the person who wrote it appears to believe that the world still works in Imperial units of measurement. How quaint!

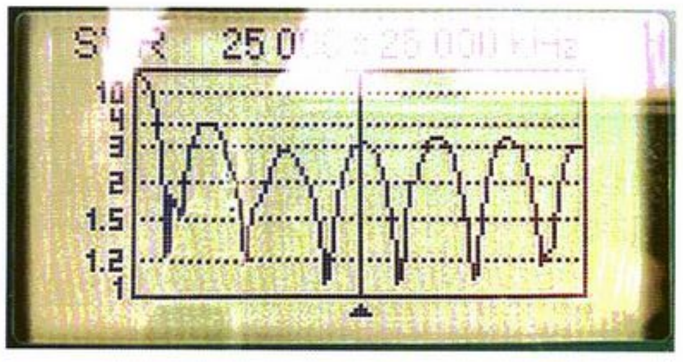
The calculation is complicated by a trade-off; namely, that the value of the inductor required depends on how far from the feed point it is inserted in the wire. The smallest value (with the biggest effect) needs to be right by the feed point; unfortunately, in a quarter-wave antenna, this is where the maximum current flows and the most signal radiation occurs. Putting the inductor here greatly compromises the ability of the aerial to radiate. Putting it further along the aerial overcomes this problem but requires a much bigger coil; placing it roughly half-way along the desired length is a reasonable compromise. However, there may be other pertinent factors, as I am about to explain.

For my first attempt at using the 66Pacific calculator above, I assumed a total length of 26 feet and placed the inductor half-way above the feed point at 13 feet. I was using insulated

multistrand wire of about 0.1" diameter and wanted the aerial to resonate at about 3.6 MHz. The calculated inductance is 60.2 uH. Before I went looking for the plastic water pipe, wire and accessories to make this coil, I looked in the "experiments" box and found such a coil from a previous experiment labelled "64 turns, 48 uH" (see figure 1). This is almost close enough to the target! The trick now was to use the online calculator in "what-if?" mode and find the point to insert the coil in the wire where 48 uH would be appropriate. Since this is less than 60.2 uH, the coil must be positioned closer to the feed point, so start reducing the position value until a result close to 48 uH is achieved; this comes out to be at about nine feet six inches above the feed point. (Notice, the position is to the centre of the coil which is about six-and-a-half inches long. However, I usually tweak the resonance with an AMU so I'm not being that critical in this case.) I measured out the wire with my usual lack of care and attention and constructed the radiator.







[The coil I found consisted of 65 turns close-wound of 2.5 mm plastic-covered wire on a 200 mm long, 42 mm diameter plastic former, of which the windings occupied 170 mm.]

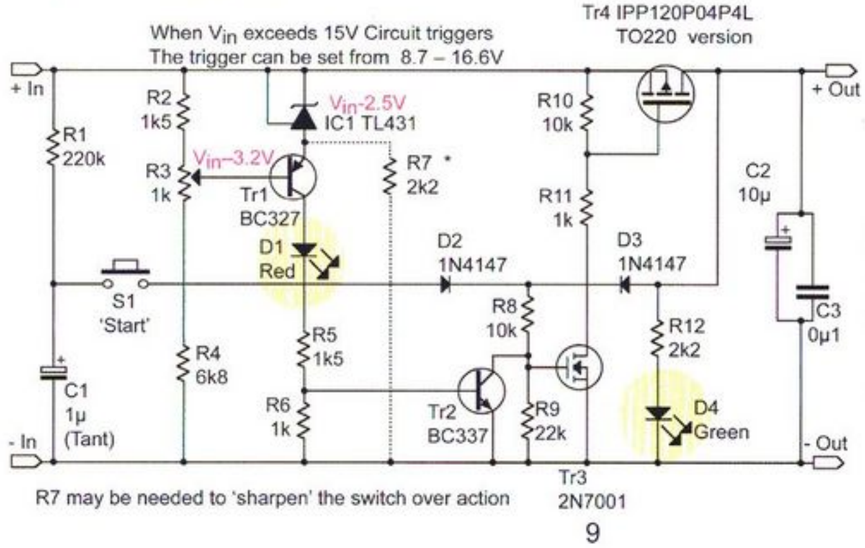
But hold fast! This aerial is a quarter-wave vertical and so requires a mat of radials beneath it! Or, slightly more practical, we could try a single quarter-wave counterpoise. Remembering that I have read that an elevated counterpoise is better than one lying on the ground, it was fortunate (ahem) that the feed point of the vertical element is about one metre above the ground when held aloft by a nine metre pole. Thus with the aid of a dead pot plant and four garden bamboo poles, I held another 20 m (approximately) of wire roughly one metre above the ground while meandering about the lawn (the wire as well as myself). No earth connection was made and laying the counterpoise on the ground made little difference to the resonance.

So, what of the results? I connected up my trusty RigExpert AA54 analyser. The resonant frequency was rather low, so I ended up trimming about 50 cm off both the vertical and the counterpoise. VSWR at 3.6 MHz was less than 1.2 (figures 2 and 3). The SWR is low across the entire band. Of course, this means that the aerial is low Q but the convenience of avoiding needing an AMU is a benefit. The aerial also has other useful resonances, the best being in the 15 and 10 metre bands (figure 4), and although I have not made any QSOs up there, North American stations have been heard clearly in those bands with this aerial. A brief WSPR on 80 m at 200 mW around dusk brought me Western European coverage (figure 5) and 5 W SSB has yielded successful QSOs from Scotland to Hampshire via the Midlands. No tuner / matcher / coupler was required, nor an earth connection.

One question remains in my mind; given the relative lengths of the vertical and counterpoise wires, is this a coil-shortened vertical with counterpoise, or a quarter-wave radiator one metre above ground with a short vertical counterpoise?

Mea Culpa – Over-V protection unit

In the diagram on page 4 of Sprat issue 192 (Autumn 2022) I rather got myself mixed up with the orientation of the two LEDs used in the circuit . A diagram is shown here with corrections to the two offending LEDs.



My apologies to all concerned my thanks to Jens Dehlendorff OZ6ABZ for pointing out my mistake.

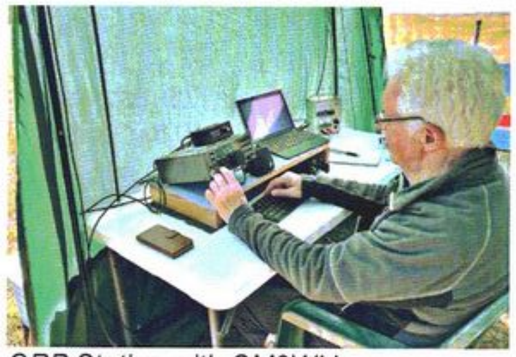
tex (G1TEX)

QRP Portable operation with solar power

Graham GM4OBD Email: gm4obd@btinternet.com

Introduction:

The idea of powering a station from solar panels had been something that I been considering but it wasn't until a local amateur appeared at one of our Aberdeen Amateur Radio Society field events with some panels that I became sufficiently interested to give it a go. I took the plunge and purchased three 100W panels.



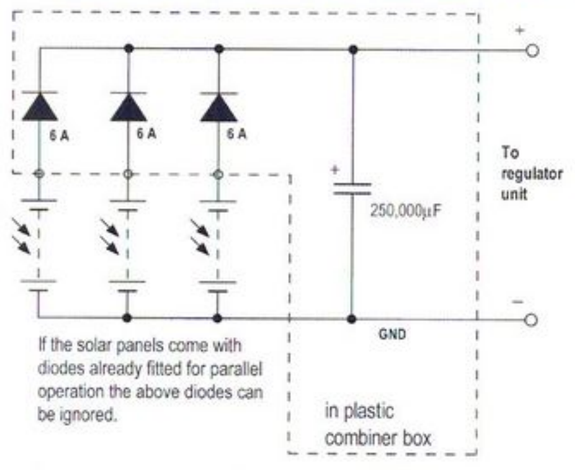
QRP Station with GM3WIJ

Testing:

On the first sunny day a panel was exposed to direct sunlight and I checked the output, a voltage measured off load, and found to be 22V d.c. This is consistent with the manufacturer's data. The other two panels giving very similar outputs .This meant that wiring them in parallel would be straightforward and the output current capability would be enhanced.

Planning:

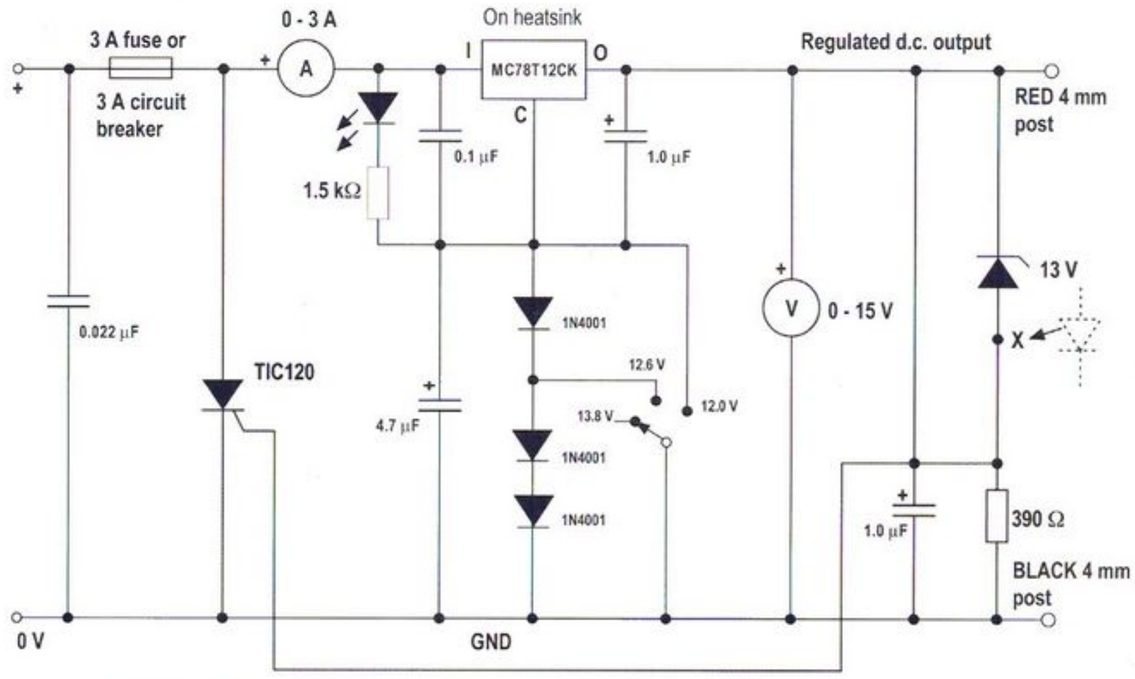
However, the output voltage at 22V is too great a value to apply to any of the rigs on the market and this voltage will vary with light level and load conditions. A regulator is needed to ensure a fixed output voltage which could be 13.8V.



There is a serious issue with some of the regulators on the market. While they regulate well and efficiently they can generate considerable noise making it difficult to copy weak signals. One of the main reasons for portable operation is to get away from noise sources!

Dedicated QRP rigs draw a current of less than 3A at 13.8V. With this requirement in mind, a prototype regulator unit was constructed using a 3-pin metal-cased (TO3) regulator IC in the 7812 series. The continuous output current rating was 3A. By using a few silicon diodes in the common line and a 3 way switch, a choice of 12, 12.6 and 13.8V outputs can be built in. The 12V level would mimic a lead acid battery and 12.6V could power valve heaters.

To keep the rig safe from possible over voltage, a crowbar circuit was added either to blow a 3A fuse or activate a 3A circuit breaker. To give an indication of the output from the system,



If the crowbar is being triggered too near 13.8 V a silicon diode can be added to point X

and monitor the electrical conditions two analogue meters were fitted to the regulator box. There is a voltmeter for 0–15V and an ammeter showing 0–3A.

To help with the regulation, a plastic box was used to combine the outputs from the panels and within it was placed a large electrolytic capacitor of some 250,000µF. This was very effective at smoothing out any rapid fluctuations in source voltage. This large value was chosen as it was the largest capacitor in the junk box and might well be useful for future tests with a 100W rig.

Circuitry:

The circuits for the regulator and combiner unit are shown above. Construction was done on tag strip where necessary. Leads after the regulator were kept as short and as thick as possible. A 3-way wafer switch was used in the prototype but a two way, centre off toggle switch would take up less space.

The photographs show the panels in use, the regulator box inside the tent and the station in operation on QRP Field Day. A mark II version of the regulator, using a LM338 adjustable 5 A regulator is currently under construction.

In full sunlight the system was capable of powering a TS130V, which takes nearer 4A on transmit.

My thanks go to:
Jonathan, MM0ICX, for his initial demonstration of solar panels,
Fred, GM3ALZ, for his encouragement and taking the plunge with me,
David, MM0MVX, for his help in setting up and dismantling the station.
Norman, GM3WIJ, (in picture) for testing the system on QRP Field Day by working 100 contacts on CW in 2021 and around 170 in NFD, 2022, using a K2, 10 watt transceiver

A bandpass audio filter

Frank J Lotito K3DZ

Need a reasonably tight bandpass audio filter for a project? You may be interested in this 1000Hz Q=40 filter that uses easy to obtain components, four inexpensive 8-pin DIP op-amps, and is amenable to simple point-to-point wiring‡1. I needed such a filter to enhance the output of a recent addition to my small collection of somewhat esoteric test equipment, an ESI Model 290A Impedance Bridge‡2.

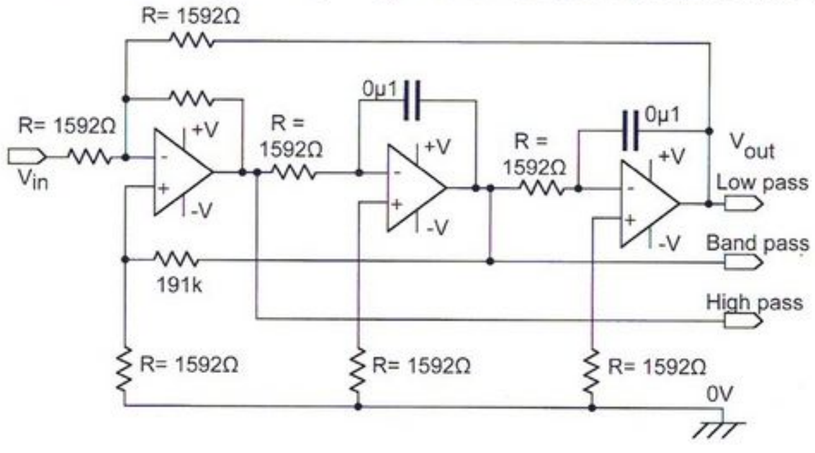
At balance, there was some residual power line hum sneaking into my detector, a solid-state sampling oscilloscope. Someday this 1KHz filter may also become an external add-on to my interests in antique amateur and military radio receivers. It may enhance an old receiver design's limited CW selectivity under certain band conditions.

The design is boiler-plate, easy to build. I used a blend of rat's nest and dead-bug construction on a 1/10th inch pitch perfboard. You can tidy-up the construction if you have the ability to fabricate printed circuit boards and use SMT resistors, capacitors and 4-pin op-amps. The enclosure is a Christmas Holiday candy tin box roughly measuring 5¼x4x2¼ inches.

Using a small rotary grinder I removed the protective coating inside the box only where reliable chassis grounds are required. After assembly and testing I daubed any exposed metal with coloured nail polish to forestall corrosion at the unprotected areas.

To preserve the design's inherent performance I made the 1592Ω resistors from the series combination of ±1% 1500 and 92 ohm ¼ watt resistors. I was able to find a ±1% 191KΩ resistor. For the 0.1uF capacitors I purchased 10 ceramic axial lead 100 VDC rated 0.047uF ±10% capacitors, tested all using my ESI Bridge, and paired the best fit caps with a third junk-box smaller ceramic capacitor to get reasonably close to 0.1µF The filter can be scaled to another frequency and/or band-pass using the design equations shown in Chapter 7 of reference‡1.

I chose battery power, using two 9V alkaline transistor radio batteries in lieu of using a mains operated symmetrical positive and negative power supply. This minimized the possibility of introducing additional mains hum (60Hz in my part of the world.)



Remember, the primary purpose of the filter was to minimize AC hum appearing at the impedance bridge's output. Battery current is 5.1 mA. A mains operated power supply should be adequate if you elect to use this filter to sharpen up a low-performance radio receiver for CW reception. Not shown on the schematic are:

1. A DPST miniature toggle switch to disconnect both batteries from the filter circuit when the filter is not in use.
2. As an ON/OFF indicator on the circuit board side of the switch two low-current LEDs each in series with a 3300Ω current limiting resistor to ground.
3. The junction of the two batteries goes to chassis ground (required for the op-amps' + input to ground through the 1592Ω resistor and each LED indicator.)
4. A 4th 741 op-amp as a x1 inverting output buffer amplifier. It uses 10kΩ resistors.
5. 0.2µF ceramic capacitors to decouple DC at both the input and output ports. (The input capacitor also acts as a 500 Hz high-pass filter, further enhancing the filter's mains rejection.)

The graph illustrates my filter's voltage gain (output ˜ input voltage). I used a HP 204A signal generator and oscilloscope with a 10X probe connected to the filter's output. My filter peaked at around 958 Hz.

Bottom line – Constructing the filter was worth the academic exercise. It provided much needed exercise for my 4-score old gray matter. And, for many C and L measurements I seem to be able to "better tweak out" the 4th significant figure‡4. I was pleasantly surprised with the filter's performance to sharpen the received audio for CW. The filter did not ring or smear the signal! During a contest I was able to copy 25+ wpm with no problem.

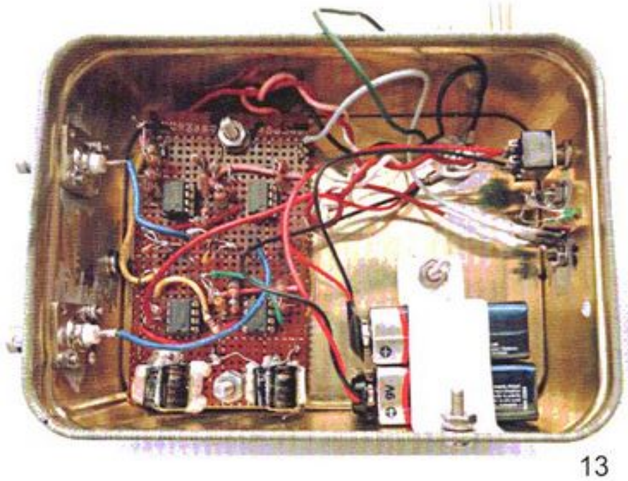
Footnotes:

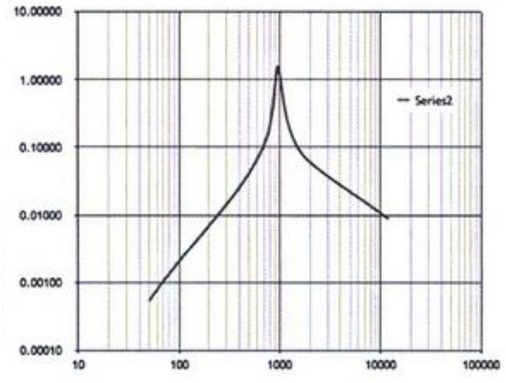
‡1 *Frank P. Tedeschi,* "The Active Filter Handbook," *Tab Books, ISBN 0-8306-9788-8, 1st ed. 1st printing, June 1979, Fig 7-15, page 182 (1000Hz, Q=40 band pass filter)*

‡2 *The ESI 290A impedance bridge is 6 different front panel switch selectable bridges that measure R, L and C at power line frequencies through 10kHz (plain resistance is measured at DC.) The Bridge is part of a 3-unit measuring system, ESI 292A(3). I only own the 290A Bridge. I had to cobble-up my own exciter and readout devices. The Bridge output, for DC and AC measurement is single-ended, not floating. For DC resistance measurement I use an inexpensive digital VOM on its 200mV DC range.*

‡3 ***https://archive.org/details/TNM_292A_universal_impedance_measuring_system_-_E_20180307_0216.***

‡4 *Admittedly, for all practical purposes my electronic hobbies do not require component accuracy beyond 2 significant figures!*





Pleasing phasing filter?

Philip, G4HOJ@yahoo.co.uk

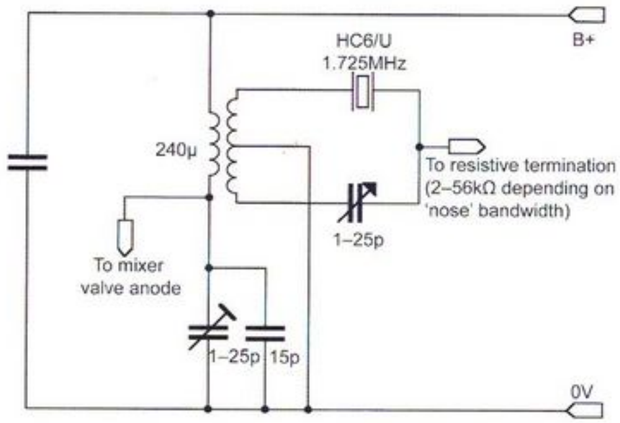
Background

For my interest and perhaps your amusement, I have been doing my best to measure the performance of the single crystal, phasing' filter I used in my SimpleHet.RX design and this write-up is to share my observations and findings.

Now I cannot claim that these tests are absolutely accurate by any means but they are my best shot at measuring and understanding the results of my experiments with, possibly, the simplest single-signal superhet.

A single-crystal filter?

Why use a "phasing" filter? It is also referred to as a 'bridge' filter because the crystal in one side and the small value (phasing) capacitor in the other side of the circuit form a bridge, where the capacitor is set to pass an equal amplitude signal of opposite phase to that flowing through the crystal's capacitance.



The equal amplitude and opposing phases in each leg offers significant attenuation of the signal that would pass through a crystal used without the bridge.

Change the phasing capacitor value a very small amount either way and the resulting phase change slightly shifts the frequency at which maximum cancellation (the notch) occurs in the I.F. passband. There is a little more to it than that, e.g., series versus parallel resonances, etc., but I hope the brief description above is sufficient!

The why? Well, it has a simple elegance and I am a minimalist! As is suggested by the heading, this filter requires only one crystal. You might use another crystal, slightly offset, for a BFO although, in most cases, an LC-type BFO is fine. As it happened, I wanted to try an 80m and 40m, band-imaging, design for my SimpleHet receiver, so an I.F. of somewhere around 1.7MHz would be ideal.

I found a 1.725MHz crystal and also some 1.735MHz ceramic resonators that could be pulled down in frequency for a BFO. With a band-imaging design, one often has to move the BFO from one side of the filter frequency to the other so I used the ceramic resonator in a simple VXO circuit. If band-imaging is not your goal, then pretty much any crystal you have available could be put to use (see 'Bandwidth'), subject to mixing schemes, harmonics, etc

Bandwidth:

In simple terms, at its series-resonant frequency, a crystal has a low(ish), rising rapidly to high, impedance above and below that resonance. A lower termination impedance gives a

better match and the narrowest bandwidth at a given frequency. A higher termination impedance will broaden out the response, usually all the way down the response profile.

The bandwidth of this single crystal filter is influenced by both resonant frequency and termination impedance. As best I can measure, in my SimpleHet.X, the 3 to 5dB down bandwidth of my filter at 1.725MHz, is actually around 1.2KHz –when terminated with around 56K. I found that I could narrow this down to about 300Hz by reducing the termination, (I tried 1M down to 2.7K) with a slight reduction in RX sensitivity, but I wanted to just squeeze SSB signals through too!

But what about the Measurement?

In my measurement setup, the filter was terminated with a lower resistance load than when in the receiver. A low-noise signal generator was used at the input, then a broadband amplifier before signal output measurement.

This plot of the average of several tests attempts to show (in blue – smooth line) the filter response without the impact of the phasing capacitor and (in orange – sawtooth line) the effect of adjusting the phasing capacitor to various points across the I.F. bandwidth available. In reality, the lower amplification of the RX and 80m/40m band noise render the parts of the graph beyond about ±3.5KHz pretty academic and audio tailoring would already be helping.

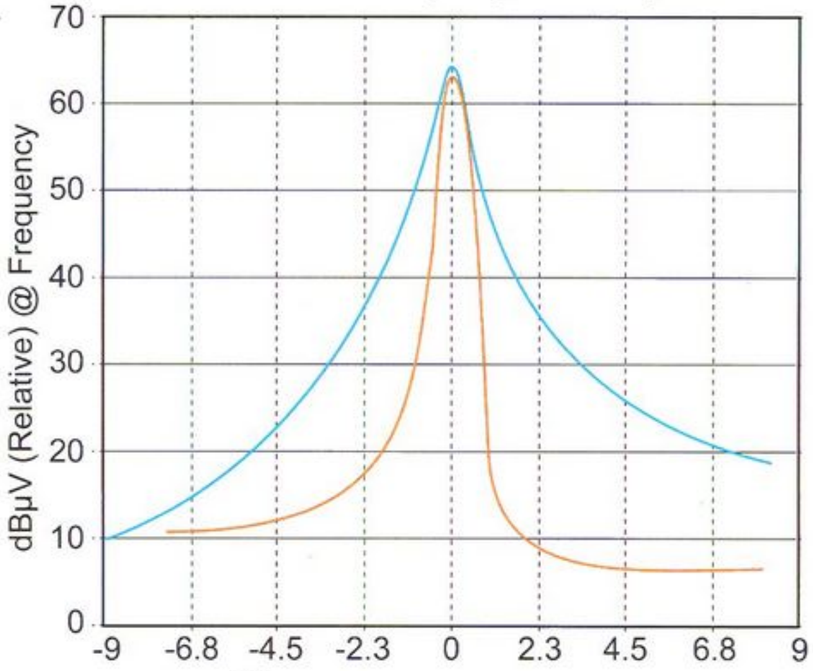
Measurement with a 455KHz crystal suggested that such a filter could yield a 80 to 100Hz 'nose', with a reasonably low impedance termination and calculation suggests that a 5MHz crystal may yield a nose bandwidth of around 800Hz. So, the lower the frequency the narrower the achievable nose bandwidth and vice-versa. I hope my graph makes sense!

Opposite Sideband Rejection:

With the notch suitably positioned on the high side and BFO set accordingly, it would seem that the opposite sideband (audio image) is around 40dBµV down for my preferred beat note of 500Hz or so. The closer the notch is to the series resonant frequency, the less rejection could be achieved.

With BFO and notch set for a 1KHz beat note, rejection is around 50dBµV down. Notch rejection on one side of series resonance was slightly less at any equivalent spacing (and ultimately) but the image is probably still a useful 37dBµV or more down.

Either way, at around 750Hz BFO offset and with the phasing capacitor set accordingly, there is no sign of the audio image in the headphones.



Notching out nearby Interference:

The inherent capacitance of a crystal placed in series with the signal path, without a phasing (or balancing) capacitor in a 'bridge' circuit, will allow a certain level of signal to pass either side of the low-impedance series-resonant frequency. Rejection either side might be considered still useful but might only be 18 to 20dB.

With the phasing capacitor included, that leakage is very significantly cancelled at all frequencies but particularly at the frequency at which the anti-phase/amplitude are balanced. This is known as the notch frequency and an adjustable phasing capacitor allows that notch to be tuned across the I.F. passband. In my measurements,

I found that, on the high side of resonance, interfering signals that are relatively close-in (e.g., 1.5 to 2KHz) could be reduced perhaps a further 28 to 30dBμV from the un-notched filter response. On the low side, at 2KHz spacing, and interfering signal could be reduced perhaps 20dB from the un-notched response.

This is useful additional reduction beyond the shape factor achieved by the bridge circuit anyway but, perhaps as I have no real problem using direct conversion receivers and, in particular, regens, I have not really felt the need to use this ability very much. For me, the main reason for experimenting with the SimpleHet.RX was to make a relatively minimalist (two valve) superhet that would offer single-signal reception on 80m and 40m.....and, of course, to encourage others to have a go too!

And finally?

I still want to do a little more experimentation to see how much change, if any, there is with different construction techniques and better input/output shielding for the filter. I feel that leakage around/across the filter could adversely impact the bandwidth and ultimate rejection further from the centre of the filter response.

I think it is possible to achieve greater stop-band rejection with good screening (my filter examples were not particularly well screened, apart from the use of a toroidal inductor). Of course, there is still opportunity for experimentation with input and output matching, but, basically, the crystal series-pass impedance characteristic is low (for my crystal example, I think around 2-3K?) at resonance, rising quite rapidly either side as further removed from that frequency.

A higher impedance input impedance and/or output load broadens the response, while lower values allow the potential nose selectivity to dominate.

In an empirical sense, I also noticed that the filter works much better with some capacitance in the termination (in fact I am not certain it would work at all correctly if there was none?). I haven't quite understood this yet but it seemed that performance improved with the input capacitance of the product detector valve in circuit, rather than just a resistor termination.

I sensed that there was further, perhaps even more noticeable, improvement when I used a short coax link (with its associated capacitance) to couple the filter to the product detector. This certainly could do with more investigation but I only have relatively simple test gear and I am not sure I could properly measure things here. If any of you out there have experimented with this type, or similar, simple filters, and have developed a good understanding, I would really be very interested to hear about your findings – drop me an email :-).....every day should be a learning day!!

In practice?

I have been pleasantly surprised and pleased with this phasing filter's performance in my simple superhet receiver design – it might easily be thought of as "old-school" and not of much use nowadays. I find that my simple filter will clearly separate/define the CW signal I wish to hear, while knocking back all signals around it to a really useful point where I still have a feel for the band (rather than total "brick-wall" isolation) but yet what I want to hear stands out well.

The notch might just be left set to provide strong audio image (opposite sideband) rejection and to deal with any signal that might be on that frequency too or, if made fully tuneable, it will provide a good rejection notch for interfering signals anywhere in the audio passband and seems able to make audio image or interfering signals audibly non-detectable. The single crystal is also capable of providing narrow but (to me) acceptable SSB reception when using higher termination impedance for when I wish to tune up the band.

So, having now experimented with several crystal filter types, I really do feel that this may be one of the best in a CW receiver. This one has a simple elegance about it and it offers an interesting, and I feel a good, listening experience. I accept that filter performance and choice can be subjective but, for the moment, I say this regardless of simplicity or cost.

Requested Members' List update

Steve, G0FUW

From time to time, the Club Committee receives requests for a list of members to be published. Years ago, we used to publish a Members' Handbook, which listed all members and provided some Club information. That was discontinued, mainly due to increased postage costs. Now we have the internet, some members have asked for an on-line list of members.

The Committee have discussed this on a number of occasions and have decided against publishing such a list. There are practical issues in producing and maintaining an accurate list, and there are on-going concerns over data protection, the need for members to opt in to sharing data and the growing number of members who are listed as 'details withheld' in the RSGB Yearbook.

The Committee position is, therefore, that if members want to know if a station they work is a Club member, they simply ask during the QSO. Exchanging membership numbers is much as you would do in a contest, requires no effort from the Club volunteer workforce, and the data is shared with the full consent of the sender.

This is seen to be a very G-QRP KISS solution. I hope that explains the rationale behind our decision.

73, Steve, G0FUW Chairman

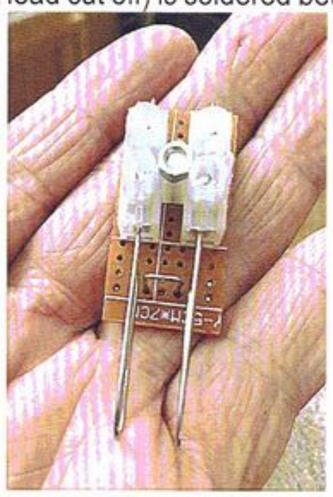
Building the Paper Clip Key

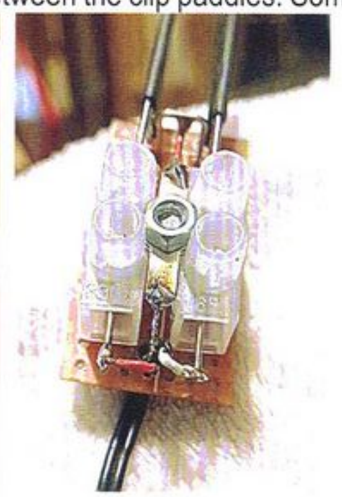
Ron G4FBC email: finebiz4@gmail.com

I was reading the latest SPRAT, in particular looking at another version of a paper clip paddle key. I wonder of you'd be interested in my version too. I was inspired to make a miniature keyer for my new truSDX radio (the orange one). I thought it may be suitable for a construction article in a future Sprat.

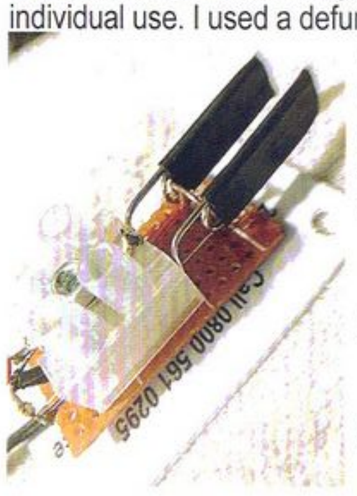
I am an avid portable QRP operator, always looking for effective but lightweight & minimalist kit. The paper clip keys featured in Sprat inspired me to make one of my own. This clip key I believe fits the bill. Take two sections of 'choc block' strip, two paper clips, and a 40 x 20 piece of perf board. The long side of the paper clips are bent back to fit into the choc block sections.

A bridge of bare wire (component lead cut off) is soldered between the clip paddles. Some



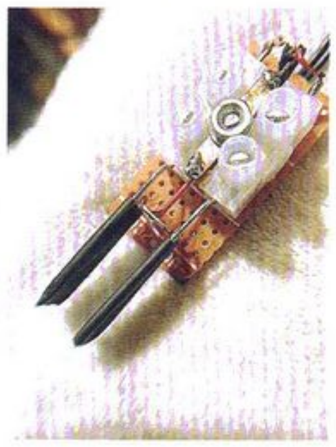


slight bending & squeezing of the clips is required to get the right distance & 'feel' to suit individual use. I used a defunct headphone lead to make connections to the clip ends on the rear of the choc block. A small nut & bolt holds the choc bloc, and solder tags to connect the lead braid & another cut off lead to the bridge for the 0v line.



My finished key is fixed to an old plastic key fob with some 'Blu Tack'.

Finally, Some shrink sleeving is fitted over the paddles.



Membership Secretary News

Daphne G7ENA (g7ena@gqrp.co.uk)

Hello and welcome to membership news, another year has flown past. We have had a couple of changes to our overseas team this year. Norm VK5GI has stood down as our Australian rep and Dave W7AQK has stood down as our USA rep. I would like to thank both Norm and Dave for their invaluable hard work over the years.

I would like to welcome onto the team Terry VK5TM and Bill K7WXW.

As usual, this is the issue of Sprat that reminds you it is time to renew your subscription. Please go and find that label on the Sprat packaging and see if it says "expires end of 2022". For the various membership rates and method of payment please refer elsewhere in this issue to the "Subscriptions for 2023 are now due" page (or look on www.gqrp.com).

UK members with existing standing order arrangements with their banks need do nothing until your Spring Sprat arrives. If your expiry date (on the label) hasn't incremented by then, assume something has gone wrong and contact me. Your standing order mandate must quote your membership number or we won't know who has paid.

In the UK you send your payment to me. If you write by post please always include a stamp (or an email address) if you expect a reply. If you send insufficient funds you will receive only one Sprat in 2023 with an underpayment notice on the label. You will receive nothing more until you make up the shortfall.

All members should be aware that the club will not accept payments that take your subscription beyond 2023. PayPal will be returned less charges, cheques will be destroyed and excess standing order payments will be assumed to be donations - but will be returned on request (at your cost).

UK Members: All cheque payments should be to "GQRP club" and not in the name of any club officer. For UK members who wish to switch to automated payment there are details on how do this in the autumn issue of Sprat (page 25). The form should be sent to your bank (and not me) in time for your payment which must execute on the 15th January 2023. As well as ensuring the continuity of receiving SPRAT you also help reduce the thousands of letters which I will otherwise have to open in the New Year.

As always please no stapled cheques in letters. They do not get lost in the envelope if you don't staple - but they do stick in my fingers while removing them. Also quote your club number as well as your name and callsign in all correspondence - it really does help.

Overseas members: Please refer elsewhere in this issue to the list of DX representatives to whom you can pay in your local currency. For the remainder of the world without PayPal access you can pay by international bankers draft (in UK Pounds) or cash in UK Pounds (to me). Only local currency to your local rep - and I can't accept Euro or U.S. Dollars. Cash is sent at your own risk.

You can also save me much work if you pay using PayPal. Please see www.gqrp.com/paypal for more details. We do automatically add a little to cover PayPal administration charges- but only what it would have otherwise cost you to buy a stamp to post your subscription.

Club Information – Who Does What

(email & postal addresses are on the club website)

Sprat

Editor	G1TEX
Any non-membership comments & queries	G0FUW
Members news for news column	G4BUE
Communications news	G3XJS
VHF news	G8SEQ
Sprat Delivery	G7ENA
Sprat Index	K7WXW
Sprat advertising	G3MFJ

Membership

Membership queries, subscriptions (+ any QTH & call changes), Sprat distribution.	G7ENA

General

Secretarial	G0BPS
Chairman	G0FUW
Treasurer	G3MFJ
EUCW representative	M1KTA

Sales

General items & back issues of Sprat.	G3MFJ

Services

QSL Bureau - in, out & sorting	M0HMS
Antenna advice	G3VTT
Awards	G5CL
Circuit & construction advice	G3ROO
Club Trophies	G0EBQ
Internet GQRP club reflector & web site	G4WIF

Thank You

My sincere thanks to all the overseas representatives who give up their time to deal with local members throughout the year.

Daphne – G7ENA

SUBSCRIPTIONS FOR 2023 ARE NOW DUE

Your SPRAT label tells you your current status. Your receipt is the updating of your status code on your Spring 2023 SPRAT address label. The labels for your SPRAT are printed 4/5 weeks ahead of publication so if you pay promptly your Spring Sprat label will be correct.

SUBSCRIPTIONS FOR 2022 – please see options below.

UNITED KINGDOM	EUROPE	DX
• £6.00 Cheque / Postal Order sent to G7ENA (payable to "GQRP") • £6.00 - Standing order • PayPal	• £12 sent to G7ENA (Cash in GBP [no Euro or Dollars] *2, Cheque or money order*1) • €15 (to Euro rep.) • PayPal	• £15 to G7ENA (Cash in GBP [no Euro or Dollars] *2, Cheque or money order*1) • Send to DX rep. (see list) • PayPal

PayPal - (**Mandatory**) - only use www.gqrp.com/paypal.
Notes: (*1 Payable to "GQRP"- drawn on a UK bank).
(*2 At own risk)

*You can pay by direct transfer but you **MUST** provide your membership number as a reference. Our bank account details are:- G-QRP CLUB NO. 1 ACCOUNT, NATIONAL WESTMINSTER BANK PLC, ROCHDALE BRANCH (SORT CODE 01-07-44 a/c 04109546).*

UK *members can use the form from the website or from the membership secretary if they would like to pay by standing order or to amend their existing standing order for the 2023 subscription rate of £6.00. This payment must be in place with your bank to execute on the 15th January.* ***If your standing order does not quote your membership number then your payment can only be treated as an anonymous donation and your membership will expire.***

All UK cheques must be made payable to "G-QRP CLUB"
EU & DX cheques – see "Overseas Subscription" page.

✂- -

Please **enclose this form with your payment write your callsign & number on the cheque do not staple your cheque to this form. Send to GQRP Club, 33 Swallow Drive, Louth, LN11 0DN**

Membership Number ____________ Callsign ____________

Name ______________________

Number and road ______________________ Name used on air ____________

Town ______________________ Post code ____________

Country ______________________ Email ______________________

NOTE - by joining, or renewing your membership, you are agreeing to the Club Constitution, which is available on the website, or in hard copy, upon request to the Secretary.

Changes or additions

. . . .

. . . .

Checklist for UK Cheques:
- Did you make your cheque out to the GQRP club?
- Did you date it correctly?
- Did you sign it?

OVERSEAS SUBSCRIPTIONS FOR 2023

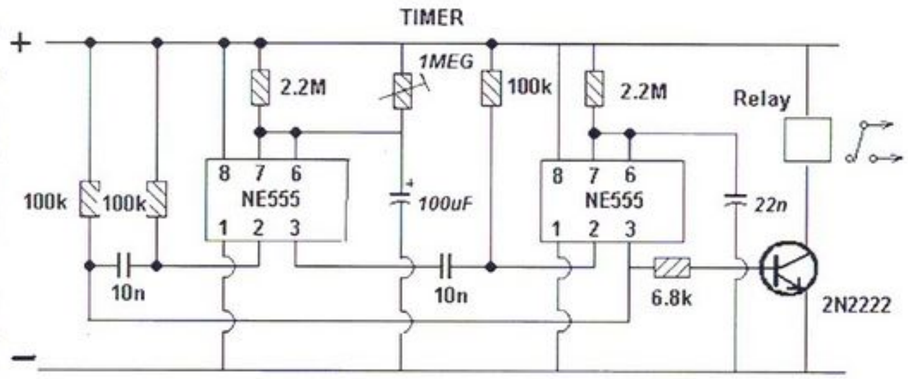
Please send your subscriptions to the following overseas representatives:-
(for representative email addresses see www.gqrp.com – membership renewals page).
Please provide your email address and club number to overseas representative with payment.
Also check the GQRP website for updated information on renewals/subscriptions.

Country & Representative	Amount
U.S.A Bill Hulley K7WXW, 2943 SE Salmon Street, Portland, Oregon 97214, USA. **Cheques to be made to "Bill Hulley".** Checks should include a call sign and member number if you have one.	$20
Germany: Dirk Krause, DL1GKD, Hauptstraße 4, D-78597 Irndorf. Konto: Sparda-Bank Baden-Württemberg, Dirk Krause. IBAN: DE17 6009 0800 0107 9124 16 BIC: GENODEF1S02 In der Zeile Verwendungszweck bitte unbedingt angeben: NAME, VORNAME, CALL, GQRP Nr. Schecks und Bargeld werden nicht entgegen genommen!	€15
The Netherlands Henk Smits, PE1KFC, Storm Buysingstraat 30, 2332 VX Leiden, Nederland. Tel 06-13267146. Maak voor 1 Januari 15 Euro over op rekening ABN NL62 ABNA 0450 4063 34 t.n.v. H.W.Smits te Leiden. Vergeet uw call en uw G-QRP nummer niet te vermelden! Een email ter bevestiging wordt op prijs gesteld.	€15
Belgium Jos Warnier ON6WJ, Kalendijk 28, B-9200 Dendermonde, Belgium. Tel. 052 220996. Vergeet niet Uw call en clubnummer te vermelden! N'oubliez pas d'indiquer votre indicatif et votre numero de membre! Contributie/cotisation: 15 Euros voor/avant le: 1 Jan op nummer/ au numero: BE21 9796 3930 7403	€15
Austria Johann Auerbaeck, OE6JAD, Kirschenhofersdlg. 120, Bitte den Beitrag bis Ende Jänner A-8241,DECHANTSKIRCHEN, Tel: 3339-23335 IBAN: AT82 3804 1000 0001 5156 BIC: RZSTAT2G041 In der Zeile Verwendungszweck	€15
France. Richard Sayer, F5VJD, 408 Vignouse, 35380, Paimpont, France (cheque perso [SAYER Richard] avec votre indicatif, numéro de membre et adresse E-mail indiqué au verso).	€15
Denmark. Ole Rasmussen OZ1CJS: Fornyelse af abonnement af GQRP: Venligst foretag en kontooverførelse af 115 Kr. senest d. 1. Januar til : Ole Rasmussen Danske Bank, Haslev Reg. nr. 0575 Konto nr. 3531127749 Venligst vedhæft følgende information: navn, call, medlemsnummer Undgå venligst at fremsende kontanter og checks. Har du et problem mht. bankoverførelse, så kontakt mig så vi kan finde en løsning. Nyt abonnement af GQRP: Ønsker du at blive medlem af GQRP og modtage medlemsbladet SPRAT, så send mig venligst en email med dit navn, adresse og evt. kaldesignal. Så skal jeg med glæde sørge for at du bliver kontaktet.	115DKK
New Zealand, Phil Tarrant ZL2NJ, 77 Romilly Street Westport 7825 New Zealand. cellphone 0224031096. Account details :– Kiwi Bank -Account name:- P Tarrant G-QRP, Account No 38 9003 0186315 02	NZ $30
Australia Terry Mowles VK5TM, PO Box 599 Tintinara, South Australia 5266. Phone: 0412 226 083 Account name: Bendigo Bank, Keith, SA 5267 Australia. Account name: Terry Mowles. BSB number: 633-000 Account number: 189 951 429.	AUD $28
Italy. Fabio Bonucci - IK0IXI. Via Umbria 4, I-00053 Civitavecchia Italy. "La quota annuale per l'iscrizione al GQRP Club dall'Italia è di 15 Euro. I pagamenti possono essere effettuati tramite: 1) Direttamente sul sito GQRP tramite PayPal. 2) PostePay - €15.00 3) Diretto (contanti €15.00). Rischio di smarrimento a carico del socio. Si può effettuare la ricarica PostePay in ogni Ufficio Postale al costo di 1 Euro, oppure tramite le ricevitorie Lottomatica al costo di 2 Euro. Per informazioni inviare email a Fabio fabiobonucci68@gmail.com oppure SMS 320-4839771	€15
España. Jon Iza, EA2SN, A. Gasteiz 48-7 izq, 01008 Vitoria-Gasteiz. Cuota: 15 euros. Ingresar en: BBVA IBAN ES05 0182 1629 8802 0151 3020 BIC BBVAESMM. Envía email con la info o pon como concepto tu indicativo y número de socio.	€15

Any other overseas to Daphne Newsum G7ENA, GQRP Club, 33 Swallow Drive, Louth, LN11 0DN, England [Europe: £12 GBP / DX: £15 GBP]

Timed CQ calls

Peter G4UMB



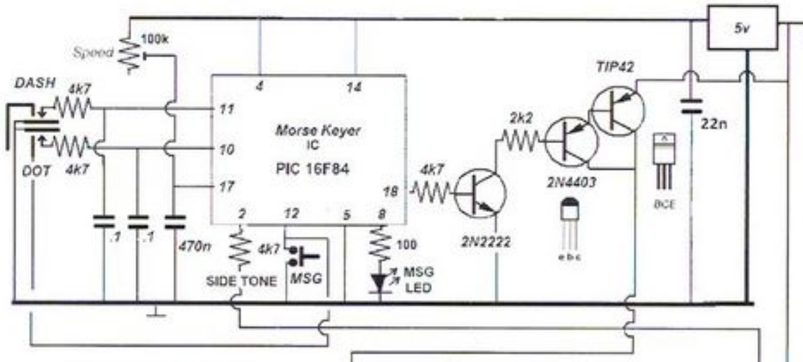
Relay switches on for *1* second every *25* seconds

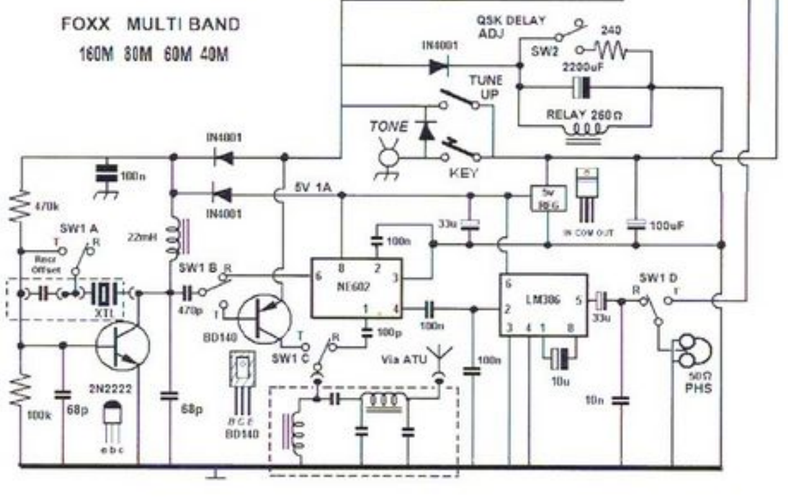
I find that QRP takes a lot of patience to get a contact especially if you are using a simple crystal TxRx.

So I have made this timer circuit to switch on my keyer, with memorised CQ call about every 30 seconds.

This can be varied by the 1MΩ variable resistor. That gives enough time to send the details and wait for a reply. The relay has to switch on and off quickly to prevent the keyer thinking you are wanting to record a different message.

I am using this timer with the keyer in *Sprat* 174 page 9 and also with my TxRx.





The relay N/O contacts are across the 'MSG' switch. So you can sit back and listen to your CQ call repeated until you switch it off when using a QSK TxRx. or another receiver.

Latest FOXX with relay QSK and Keyer

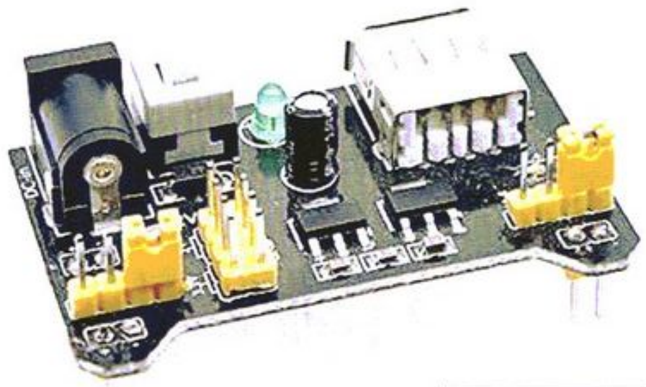
My build of the QRP Power/SWR 'meter'

Wes Effner, KN4NPH email: kn4nph@gmail.com

It's the Same...but a bit Different

I wanted a low-power (up to 10 watts) power/SWR meter to enhance my QRP operations but such equipment is rather scarce and what is available can be expensive. Then along came Tex, G1TEX, (in the guise of M3NGS) with his Audio/Visual Power & SWR 'meter' in SPRAT #192. An elegant and minimalist solution in hardware and a clean, functional sketch to make it all work. However, I added and subtracted to/from his design to more suit my needs. Of course, 3D-printed parts were necessary as my machining skills/equipment count is low.

I am powering my meter from a 5-volt/3.3-volt buck module (Pix 1) normally used on a breadboard/protoboard.



Pix 1. 5-volt/3.3 volt Breadboard Module: USB and 2.5mm inputs and multiple voltage and ground outputs.

These are available from several popular e-commerce sites for a few dollars. I chose this module because I need two, 5-volt lines and four, ground lines to make everything work. See diagram below.

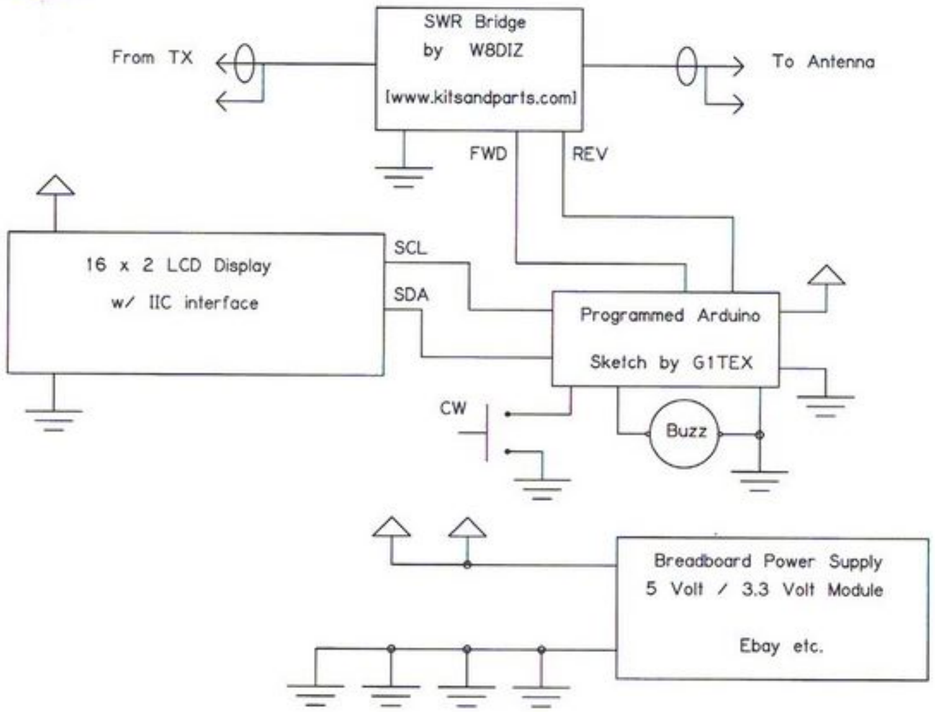
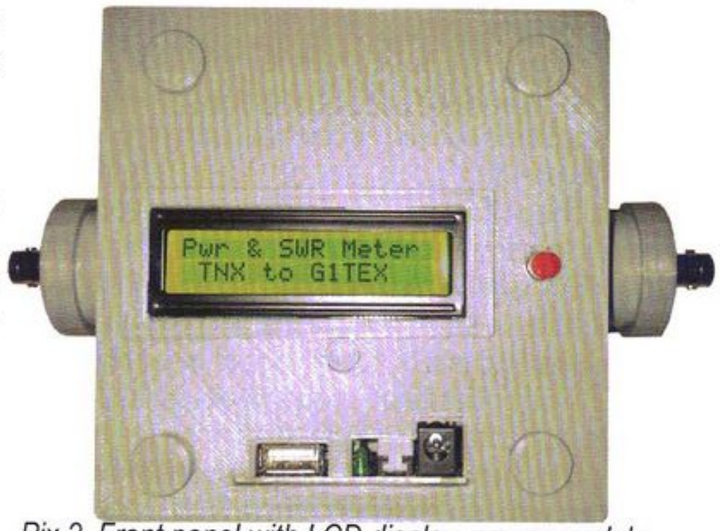


Diagram 1. Block diagram of components.

The breadboard module is epoxied into a 3D-printed top cover, as is the LCD display. See below.

The SWR Bridge is a design by Diz, W8DIZ and available from www.kitsandparts.com, Cost was a few dollars and an hour of assembly time.

Pix 3. SWR Bridge Coax and wiring not shown.

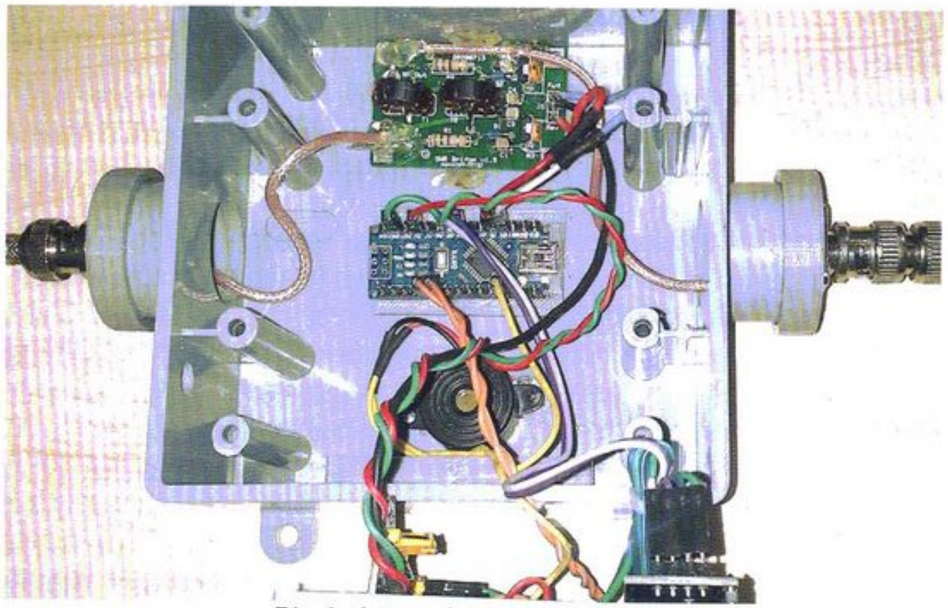


Pix 2. Front panel with LCD display, power module and 'CW' button.

The sketch that was supplied required very little poking and prodding to get it to play nicely with this bridge. My current QRP radio is a Minion Mini. Its output power varies between 3.5 and 8 watts across the 10m to 160m bands. By fine-tuning the sketch, power readings are within .2 watts of the radio's actual power.

While bench-building the meter, I connected the 'CW' and 'Tone' functions. However, I couldn't find a nice-sounding speaker I would happy with to include in the final build. Instead, I opted for a small piezo buzzer to be used with the 'CW' function and I left the 'Tone' switch out, see below.

I'm very happy with the functioning and accuracy of the meter. Parts are few and the sketch works very well.



Pix 4. Internal component layout

ON-Air Activity Manager

Peter Barville G3XJS email: g3xjs@gqrp.co.uk

I've received very little input from members recently, hence this is a little shorter column than normal. In early September the Club held its annual Convention and we had organised a **CONVENTION ON-AIR ACTIVITY PERIOD** to coincide with the event, but with the provision of suitable pauses within the period in order not to clash with any of the talks. Although I invited participants to submit logs to me, unfortunately I received none. I was unable to get on the bands myself during that weekend and was therefore not able to judge activity levels but it is a pity that, seemingly, support for the event was very low.

I'm sure that our ever-popular **Winter Sports** (26th December to 1st January inclusive) will provide its usual high level of activity, and opportunity to make plenty of QRP contacts. The HF bands have been buzzing recently offering the real prospect of some juicy QRP/QRP Dx QSOs – keep an ear on those HF QRP COAs! At the same time, 60m and 40m are likely to provide good propagation for inter-G contacts. Activity on 60m has been extremely low over the last few months, despite the good propagation, and if you are in the UK I can only suggest you make full use of 5262kHz (+/-).

Remember, Winter Sports is **not** a contest (there are no points scoring systems to worry about) but is an event to enjoy using QRP on as many bands as you wish and to meet others doing the same. As always, the success of the event is dependant on us all. Put quite simply: No on-air activity means no fun!

I received an interesting note from Richard **G3OTK** regarding his activity in the Spring and Autumn RSGB 80m CW Club Contests. He was using the Club call sign G5LOW and this is his report:

"I've entered most of the Spring and Autumn RSGB 80m CW Club Contests over the past ten years, mostly operating QRP – either 5W or less, or the RSGB power limit of 10W – and entering as part of the Itchen Valley ARC team.

I have never heard G5LOW in any of these contests and I thought that I could give G5LOW an outing in the first of the Autumn series of CW contests this year, on the 14th September. I am sure many G-QRP members enter these contests, perhaps in the 100W sections rather than the 10W QRP sections, and so G5LOW might attract more contacts than using my own call.

I used my home-made CW transceiver, which has conventional analogue signal processing. I don't have a permanent antenna and just put up a temporary dipole with an average height of about 3m – rather low for 80m. As I was representing the G-QRP Club I set 5W output rather than my more usual 10W. I always operate in the "unassisted" QRP section.

The contest lasted for 90 minutes and I made 85 contacts, mostly UK. I worked the RSGB HQ station (GM6XX for this contests) for an additional 4 points, giving 825 out of 1000 points. This put G5LOW in 5th place (out of 15 in this section). Conditions were good for the whole of the contests. I missed the 2nd CW contest of this series but I hope to be able to enter the 3rd (and last) contest towards the end of November."

Our thanks and congratulations to Richard for giving the Club call sign a very successful contest outing, and our good wishes for the 3rd part of the contest if he is able to enter.

Chelmsley Trophy 2022.

At the end of December you will be able to compile your entry for this trophy. There are not normally many entries and therefore a good chance your entry could be successful. The rules are perhaps a little involved and I therefore suggest you refer to the Club website (under Club awards and trophies) for full details.

In the meantime please keep the QRP flag flying and I hope to meet many of you on the bands soon.

72 de QRPeter G3XJS
Felucca, Pinesfield Lane, Trottiscliffe, West Malling, ME19 5EN.

These are the International QRP Calling Frequencies:
CW: 1836, 3560, 5262 (UK Only), 7030, 10116, 14060, 18086, 21060, 24906, 28060
SSB: 3690, 7090, 14285, 21285, 18130, 24950, 28360 kHz
But they are "Centres of Activity" so please spread out if activity levels are high.

CQ-DL meeting update

Oliver DF6MS, Manuela DL2MGP, Alois DL8RAM

G-QRP-DL-TREFFEN 2023

Das traditionelle DL-Treffen für Mitglieder des G-QRP Clubs findet im kommenden Jahr 2023 vom 5. bis 7. Mai in Waldsassen und Konnersreuth (nahe Cheb/Eger OK) statt. Unsere QRP-Freunde aus anderen Ländern wie OK, OE, HB, etc. sind herzlich willkommen.
Weitere Infos, Fragen, Anmeldung von Vortragsthemen und Beiträgen bitte per E-Mail an Manfred email: ***DK4NQ@t-online.de***
Vy 72 es hpe cu Oliver DF6MS, Manuela DL2MGP, Alois DL8RAM

G-QRP-DL meeting 2023

The traditional DL-meeting for members of the G-QRP Club in 2023 will be held from 5th to 7th of May in Waldsassen and Konnersreuth (near Cheb in OK). Our QRP friends from other countries like OK, OE, HB, etc. are very welcome.
For further infos, questions, offers of lectures and articles please contact via e-mail Manfred ***DK4NQ@t-online.de***
Vy 72 es hpe cu
Oliver DF6MS, Manuela DL2MPG, Alois DL8RAM

Valve QRP Report Nov. 5&6th 2022

Colin Turner G3VTT email: g3vtt@aol.com

Thanks to all of you who operated during the event in November. All of the usual suspects were on, thank you, and I appreciate your input. Reports as follows.

G3TYB Hello Colin, I hope you are well and here is a valve activity report for you. In total I had 13 contacts over 40, 80 and 160m. They were pretty evenly spread between 40 or 80 except one with G4HMC on top band. I seem to have an array of valve gear to use on these events and it all was dusted off and fired up. Annoyingly both my VFO transmitters refused to play properly, probably because they are both over twenty years old, one developed a nasty parasitic in the PA, the other had a seized VFO drive. So back to being rock bound! Receivers here ranged from homebrew regenerative or superhet to a 50 year old Eddystone 830.

YU7AE Hello Colin, it's another valve QRP day and on the Sunday evening I decided to play with my AN/GRC-9 collection with "traditional" chirping and drifting signals. I managed to make six nice QSOs, five on 80m with OK-2BEI, YO2CJX, YO9CMC, HA3IS and DO5WI and one on 40m with ON4PQ. I also used my new toy for the first time, an MFJ 828 power, SWR and frequency meter which is a very useful thing indeed. After the valve weekend it remained to eliminate the flaws that have appeared a BFO problem on one and transmitter problem with another AN/GRC-9. Using an AN/GRC-9 I use 5W output with reduced high voltage on power supply and the antenna is a W3DZZ inverted vee. Until the next valve day 73 de YU7AE Kare and remember REAL RADIOS GLOW IN THE DARK AND KEEP THE SHACK WARM!

G4MAD Hi Colin, a very short report on last weekend's activity. This was my second Valve QRP weekend and again I borrowed a 80m homebrew transmitter from Rich G0GGA. My homebrew transmitter is coming along slowly. So far I've completed 'The Widow Maker' HT power supply. The activity was limited to just five QSOs; all inter-G with the best 'dx' Liverpool about 190km away. During the evening there was some very deep QSB which was a little challenging but all fun. The station set up is a three valve 80m rock-bound CW transmitter based on design from Practical Wireless of February 1994 giving 4watts output. The receiver was a Trio 9R-59DS and the antenna an Inverted L top about 5m above ground here in rural Warwickshire. I really MUST start on the build of my own transmitter!

Derek **G3NKS** was busy on the Saturday so was QRV only on the Sunday, making 10 QSOs, mostly with other Filamenteers, split between 80m and 40m. He used his usual CO/PA (2 x 6V6 valves), a Drake R4C receiver and a G5RV antenna with one leg only a few feet above ground level due to roofing work on his bungalow. Unfortunately, receiver problems meant he couldn't appear on 60m. He offers thanks to Colin for organising another fun event and looks forward to the next one.

G4ALG was active on 80m and 40m and found goof conditions albeit with rapid fading. He made 37 contacts the highlight of which was hearing the lovely T8 tone and steady Morse code from G4ZXN's Paraset. He also worked GB2SPY in Dover operated by Ian G3ROO. Ian was using one of the museum spy sets as the transmitter, and an Eddystone 830 receiver. The lowlights were way too much disruption of normal two-way communication on 40m because of contesters hurling numbers at one another, while showing no respect for low impact users of the amateur bands, or the 40 m QRP centre of activity. He also observed that we've lost another 2 or 3 kHz to data modes. Steve's station was the FL50 and FR50 combination, ETM 8C keyer or a T1 straight key. Since the last session Steve has fitted improved AGC characteristics to the receiver and a switchable 1000Hz CW filter to the 455Khz IF. The change-over system and receiver muting is now a low voltage type which is an improvement over the 150 volt version. Further work includes a modified PA tank coil in the FL50 to improve PA efficiency. Further work is needed on both the FR50 VFO to improve stability. The internal band-switched VFO still needs a lot more work to improve frequency stability and a DDS VFO has been developed for the FL50. The whole improved system yielded 37 contacts with 16 two way valve QRP contacts. The FL50 and FR50 are becoming a very effective QRP station and well done to our Steve for carrying out this development work. Steve mentions publicity for the event and in 2023 the dates are, during the traditional **GQRP Winter Sport in December and January, April 15th and 16th, July 15th and 16th and November 4th and 5th**. Make a note in your diaries now and these dates will appear on the GQRP website.

G0GGA For this Valve Activity Weekend Rich used a single valve, (well envelope really), ECL82 MOPA, (Master oscillator and PA) with a triode oscillator and pentode PA running about 5watts out with grid block keying. For a receiver Rich used a recent Telford Rally purchase. This was a 1954 Admiralty CAT RX, freshly realigned specifically for the weekend. He has tried various valve receivers for the Valve Activity Weekends, both homebrew and off the shelf, but always struggled with the bandwidth being too wide. The CAT RX has a nice sharp CW filter although I did have to use the CODAR valve preselector. He used separate antennas for reception and transmission due to a very high VDSL noise floor. For transmission he used a non-resonant Delta Loop, (about 10m across the horizontal top wire, 7m above ground, and fed from the lower apex about 2m off the ground). This was used via 10m of 450 Ohm Balanced line with a homebrew balanced link coupled tuner in the shack. On receive he used a homebrew active loop on the apex of the house rotated to null the VDSL noise. Despite an old call sign Rich only has only been back on the key for a couple of years so is still building confidence. He worked G4ARI, G4BLI, G4ZXN, G4ALG and G3NKS. For the next weekend he is working on a VFO using a 6AU6 and 2E26 combination.

Paul **G4GXQ** decided to dust off some of his old valve gear for the event. He could not make any shack time available on Saturday or most of Sunday but managed a few 80m contacts mostly on Sunday evening. His transmitter was a fairly standard 1960's CO/PA circuit using an EF91 and a 6V6 with a handful of crystals penned down to frequencies around 3.560MHz. The octal based PA let him try a variety of valves with the same pinouts that he has. Despite the simplicity the circuit uses grid block keying and a keyer with only relays and capacitors was used. The receiver was a WW2 vintage TCS, a radio with excellent stability but with an IF passband wider than the proverbial barn door. This has a couple of easily reversed, (vintage radio police please note), mods to make it a useful CW receiver. The PSU powering both transmitter and receiver uses an EZ81 valve, so a truly all valve station. The

antenna on the day was a somewhat convoluted low 80m dipole. No valve to valve contacts that Paul knew of but at least one more vintage all valve station on the air.

Despite the inordinate amount of space this all takes up on his bench he is inspired to explore some VXO ideas and intends keeping it all set up for occasional but regular use.

Finally, John **G0UCP**, Hello Colin, I hope you are keeping well. Just wanted to say the recent valve weekend was very enjoyable and quite well supported. A snag is that these events creep up on you and in my case trigger a series of mods and improvements that are never quite complete at the start. No exception this time but delighted to meet three valve stations: G4ALG with a beautiful slightly modified FL50B on 40 one day and 80 the next, G4ZXN's redoubtable one valver on both bands and Ian, G3ROO, undercover as GB2SPY from Dover on one of the B2 sets and his Eddystone 830 receiver. Power from my battery valves was 1Watt on 40 and almost but never quite, 2W on 80. I think G4BLI, and G4TPJ may have been using valve rigs but my Morse is a bit unreliable on receive. G4HMC, G0IIK, M0NYW, G4HWK were all good QRP contacts. I heard Paddy, G4MAD, G3TYB and G4ARI's Codar valve transmitter but did not raise them this time.

That wraps it up for this season. Thanks to everybody for partaking in the event, the next one is during the Winter Sports and again throughout the year starting on April. Please send me a few lines about your contacts and experiences during the event in Word if possible and details of your transmitter or receiver used particularly if they are homemade.

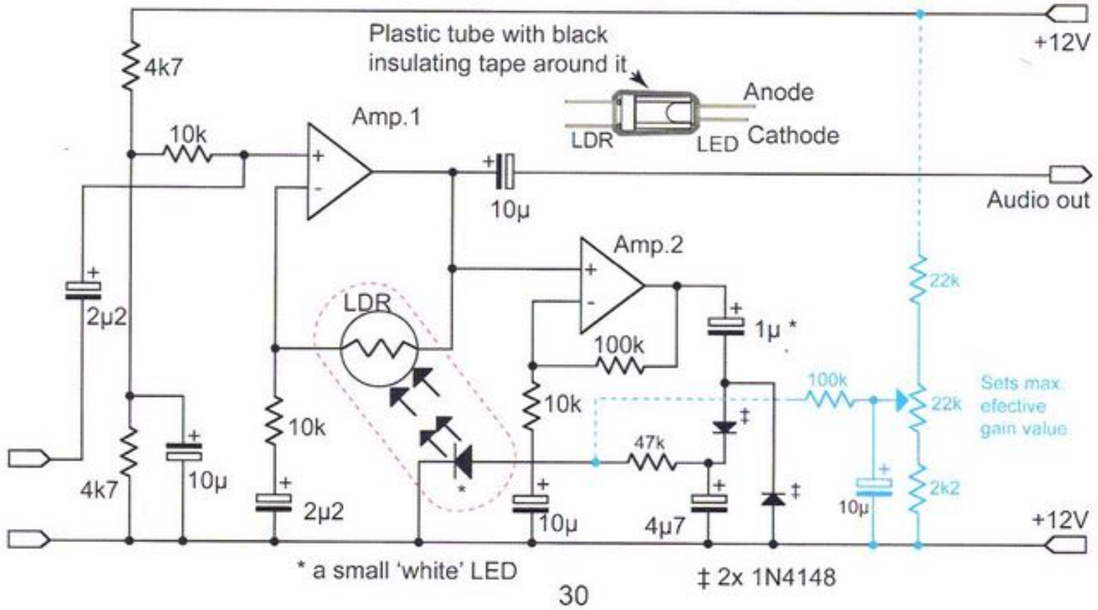
72 Colin G3VTT
84 Gravel Hill Way Dovercourt Harwich Essex CO12 4XN

Light audio AGC control

M3NGS email: m3ngs@me.com

Just an idea for a 'noiseless' audio AGC circuit using a dual op-amp, a small white LED and a small light dependent resistor. The overall control can be as much as 50+dB. The LDR and white LED are available from the supplier ***bitsboxuk.com*** – as well as others of course!

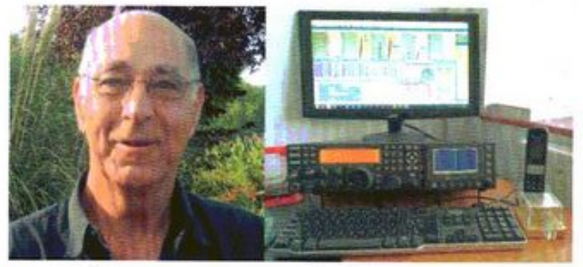
The output level is controlled by the gain of the second op-amp – more gain less output.



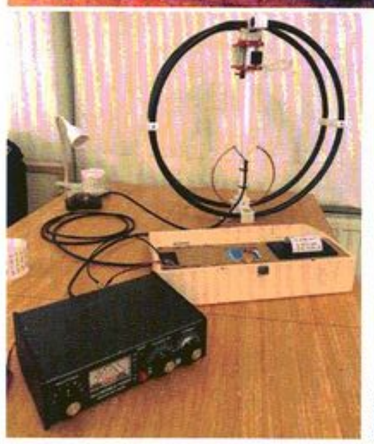
MEMBERS' NEWS

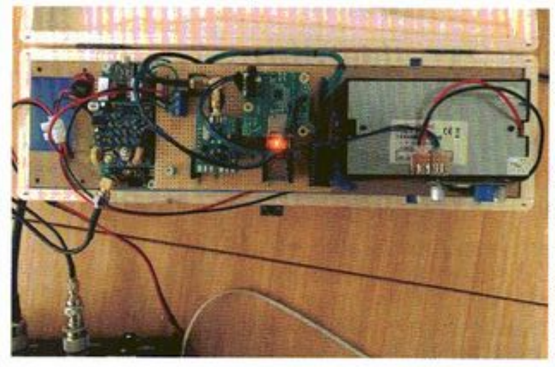
by Chris Page, G4BUE

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



GØKVK sent the picture left of his single-valve regenerative RX for 80m he built using the circuit designed by **G4HOJ** in *Sprat* 189. Geoff says, "It was a joy to build and simple to operate, and is ideal as a first time valve receiver by using low voltage, so no nasty shocks". **N2CQR** writes, "Although it has been suggested that perhaps Bill has been sniffing the glue, the truth is that he has been throwing away the adhesive and using the glue stick case as the core of some permeability tuned oscillators. PTO mania was sparked by **VU2ESE** and **WA1MAC** added fuel to the glue stick fire. **MØNTV** has done a video on the subject, and we hear **G3RJV** wrote about this technique some time ago. So we're in good company".





Pictured left is **OH2XAB**'s stand-alone FT8 RX and decoder with a **2EØERO** mag loop. Alistair (who is also **MØLNT**) says, "I've been trying to learn more about the inner workings of the FT8 protocol, and construct a device that can not only receive the RF, but also decode the audio into the readable messages, and all without any computer (in the 'traditional' sense) in the loop. Inspired by the ticker-tape telegraph machines of old, I added a thermal receipt printer as the output 'display' for the decoded messages. It is based around the QRPLabs Receiver Kit and uses the Teensy 4.1 with audio board as its CPU. So far it reliably decodes CQs, which I think is amazing given the susceptibility to noise from the power circuits, printer electromechanics and digital systems. It's packaged in an old wine bottle presentation box and is fun to pack in the car to get an instant feel for band and propagation conditions at a location - and a fun thing to show non-ham friends and family what it's all about. Longer term I want to add the QRPLabs PA and develop it into a full two-way FT8 communication 'appliance'".

MØNTV has his 'Shelf 17' SSB TCVR built *al fresco* on a wooden shelf, but says it is not QRP though! Nick writes, "I have been playing with an idea from **WA1MAC** and popularised recently by **N2CQR** - building a PTO (Permeability Tuned Oscillator) and experimenting with it in a simple all-analogue DC RX for 40m (pictured right - is that the same tin **GØKVK** used for his 80m RX, above?). The PTO is very stable with a

variable inductor constructed from a glue stick! The PTO schematic comes from **VU2ESE** (from his 'Daylight Again' TCVR) and the glue stick version works surprisingly well. More details on my *YouTube* channel at <https://youtube.com/@M0NTVHomebrewing>".

Congratulations to **G4FBC** who achieved 1000 miles with 79mW on the RBN with his single (2N2222) transistor TX on 20m, and is going to go lower still to see what can be achieved. Ron has just acquired a (tr)uSDX radio (far right) and made his first CW QSO with it with **GW3TMP**, using a low PP3 9V battery for 500mW into a homebrew ZM-2 (copy) ATU feeding an 84ft antenna. He built an EFHW 64:1 balun in a TicTac mint box (above), the flap opens so he can clip on a counterpoise, if needed. Ron says, "Whilst the SDX is not as good as the FT-817, as some have critiqued, but for a five-band multi-mode rig that fits in a shirt pocket, and doesn't cost a packet, I call that a winner!".

A first for **G8UKT** was taking part in six 160m DF events in the space of a month last year (right). Geoffrey thanks the organisers who helped him to a personal and probably national record, and says, "Top Band DF really is a QRP activity, using 5W output TXs with a long-wire draped over the trees, the radiated power is a lot less".

GU3TUX's best DX for October (if not the year!) was a 30m contact with **VK3XU** while running 3W from his MTR4Bm (bottom shelf in picture below right) into an EFHW at just 12ft. Chris said, "Whilst Drew had 100W, his antenna was a modest dipole. Drew is the author of the excellent project books available from Club Sales. All in all, a special day for me and a reward for putting away my QRO (well, 20W) transceiver which I had been using to test a theory that there's less QRP activity nowadays due to many ops having high noise levels at their QTH. Sadly, my 20W was no more successful than 3W. Perhaps FT8 is to blame?".

VE3IPS will be QRV in November in Florence and Venice as **VE3IPS/I3** or **I5** with his FT-818, and also /P in Tuscany and attending local club meetings. John has been busy with JOTA and POTA operations, playing with the **GM6DX** phased vertical array, acquired a **K9AY** antenna array and is building some beverage transformers in preparation for the winter DX season. He says, "The JOTA event (below and top of next page) had many boy scouts engage in HF comms with **W8EDU**, and received Winlink emails to their smartphones, used Echolink to communicate with Columbia and learn the

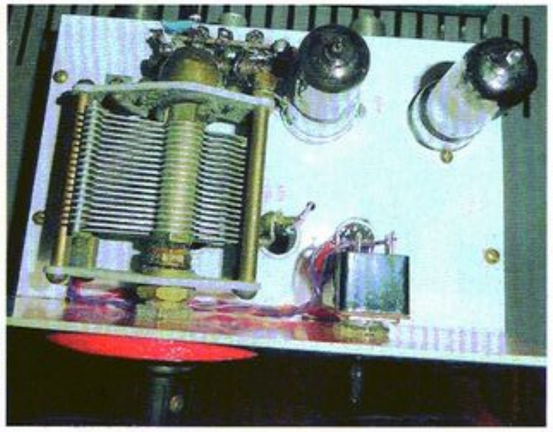
NATO phonetics. As a bonus, the kids helped create pile-ups for being a POTA activator as well. Using the Rybakov antenna shows great promise as a 'grab and go' antenna".

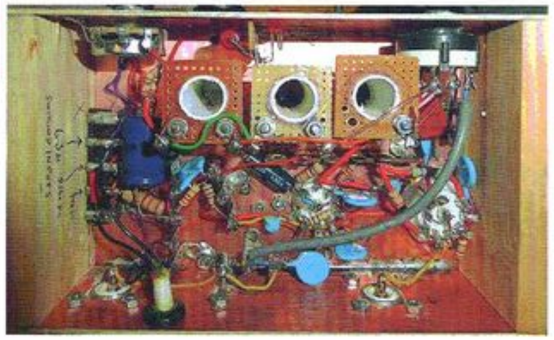
GM4UBJ finished designing and building a rotatable 40m dipole (above right) on 29 October and tried it with 5W SSB in the CQWW Contest, and was very impressed with the results. Bill made 122 QSOs and finds it is about three S points up on his 40/80m OCF dipole. His garden is only about 36ft wide, making commercial antennas too wide, so his had to be under 32.8ft wide making it half-size. It has inductive and capacitive loading, but still with a 2:1 bandwidth of about 175kHz. **MØNTV** writes, "For those who sometimes use more than QRP power levels, see my video at<https://youtu.be/mvciVYVwZBA>. This completes the build of my 17m SSB rig and the next video will show the whole thing in action!".

Pictured above right is **GØBXC**'s new shack and work bench after he recently returned to the hobby after retiring and, "being dragged screaming into the 21st century with email and the internet!". Paul is building the Sudden 160m RX that he may submit for *SPRAT*.

GØDJA/P has been QRV with his KX3 at 10W to a base-loaded vertical on the roof of his car for Parks On The Air (POTA), as evidenced by a 30m QSO with your author on 26 October. Dave's antenna is a coil with a 9.3ft tank whip screwed into the top and the tuning is achieved by sliding a shorting ring up and down the coil until the best match is found. **G4TGJ** has continued with his regular SOTA activations with his homebrew QRP CW rig and his highlights were working VK and ZL from his local summit early one morning in October. Richard says he is now regularly working into VE and the USA on 15, 12 and 10m in the afternoons, and worked LU from one summit. Recently he has returned to building his superhet that he left over a year ago and says getting the IF amplifier to amplify and not oscillate has been a challenge!

Pictured right is **GØAYD**'s Omega, a nine-band all mode TCVR designed by **G3WPO** and **G4JST** and published in a 1983 edition of *Ham Radio Today*. Dave bought it for repair and spent a long time sorting it out, and says it is now an, "awesome CW radio with full QSK and brilliant CW filters". He is currently building a KX1 and needs four 4.136MHz crystals, if anyone can help him. His main station is now a SDR, variable from 15W down to 1W, and his antenna is an off-centre-fed by G Whip. Dave's claim to fame is working 1850 miles with 300mw on 40m with a 579 report.



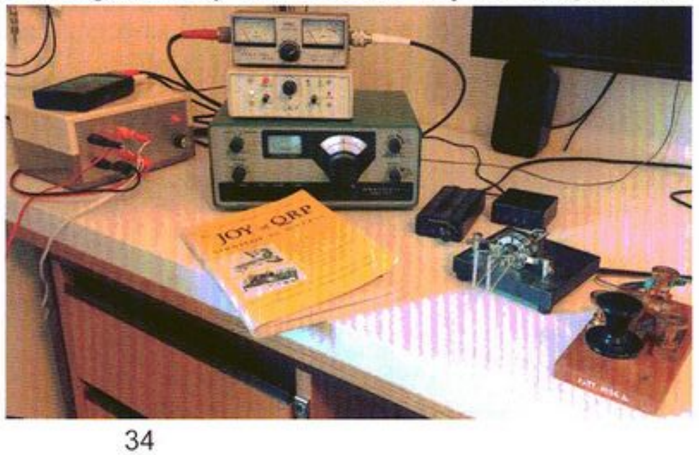


G3TPV was recently given an old Trio 9R59 RX in part working order and, discovering it needed some form of preselector, found a suitable valve circuit in a January 1962 edition of *Practical Wireless*. Alan says it, "proved very successful on this particular type of receiver, greatly improving reception up to 21MHz and to a lesser degree on 27-28MHz during a recent lift" (pictures above) - *thanks G6MNL*.

Running 1W from his Xiegu G90 to an inverted **G5RV**, **GWØVSW** has 43 DXCC during the last three months, the best being on 20m to **N1MX**, on 17m to **R85RTO** and 10m to **RGØA**. The ATU in Carl's G90 failed on 16 October and after installing the latest firmware, it is working fine again. Pictured above is the QSL for his QSO with **N1MX**. **GØEBQ** writes, "The higher bands are really buzzing especially 12m which has always been my favourite. As usual, using 1W in competition with the usual suspects is hard work, but I have managed as far as the Canaries and Madeira on 12 and many pleasant QSOs round Europe. I've a half-finished **N6QW** Paesano for 20 and 80m, thanks to me being the lucky winner of the very last G-QRP Club 9MHz crystal filter! One for the cold and wet winter months to finish".

GØXAR writes, "Those of you interested in PCB design might like to consider designing inductors that can be etched on the board. I've only ever seen this done a couple of times, both by **NMØS** on kits he designed for the excellent 4 States QRP Club. I stumbled on this design tool for doing this <http://www.circuits.dk/calculator_planar_coil_inductor.htm>.

G4JQT hs been /P in Reading with a, "pretty meagre setup" (pictured right), an HW8 which he



modified for a separate RX antenna input as the 20m random end-fed antenna was too noisy. Ian uses a Datong active dipole in a quieter place at the bottom of the garden, fed with coax to the separate RX antenna input. He says, "I wouldn't necessarily recommend this simple mod as it requires drilling a hole, but this one already had a number of 'ham holes' in the back. They're still great little rigs and both of mine have a minimum discernible signal of less than 0.1uV. Even with the poor TX antenna and earth system, I pop up occasionally in the USA on the higher bands on the RBN. I recently worked **SV8ANW** on 15m who recorded the QSO while testing video software, see <https://youtu.be/lVAIIGhWpZw>. The HW8 only has 1.5W on 15m. Incidentally, I'm re-reading *The Joy of QRP* by A Weiss, an enthusiastically written detailed reference book that explains, amongst other things, why QRP is such fun".

Smiling faces (right) at the G-QRP Club stand at the Galashiels Rally on 30 October (l to r), Graham, **G3MFJ**, Graham's wife Pat, and Roy, **GM4VKI**) - *thanks M5POO*. **MØKTZ** has also found frequent openings on 15, 12 and 10m to USA plus UAØ and VK, and nice surprises were **NA8V** and **V31XX** on 40m and **TF3DC** on 30m. Enzo has started experimenting with a home-brew base-loaded whip, switched taps as on the **G4FON** (SK) webpage, with a built-in SWR bridge and variable capacitor for fine-tuning. He used it twice for /P operations from nearby parks and his best QSO was **TF/K5KG** on 40m with just 3W into the 4ft whip. He was QRV as **EA6/MØKTZ** in October with a Norcal doublet on his tiny hotel balcony and made several QSOs with DL and I.

KA9P spent the summer improving his radio pack with a homebrew strap-on antenna bag and a pack insert that holds most types of QRP radios in either a front- or forward-facing orientation for in-the-pack operation (pictures right). The bag is a roll-top, variable length design that can easily carry a SOTA beam 7000hdi mast and a 2m/70cm Arrow or a Buddistick Pro vertical system, and includes PALS webbing for easy mating to many pack styles. The pack insert includes a sling for FT8x7 and IC703/6 radios. IC705s can bolt directly to the shelf, and KX-series radios, and Xiegus can be held on the shelf by an adjustable clamp from a GPS mount. Construction details are available at <ttps://scottysfunkwerks.blogspot.com>. Scott plans to be QRV 11/25 February from the beach as **ZF2SC**.

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