SPRAT

THE JOURNAL OF THE G QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

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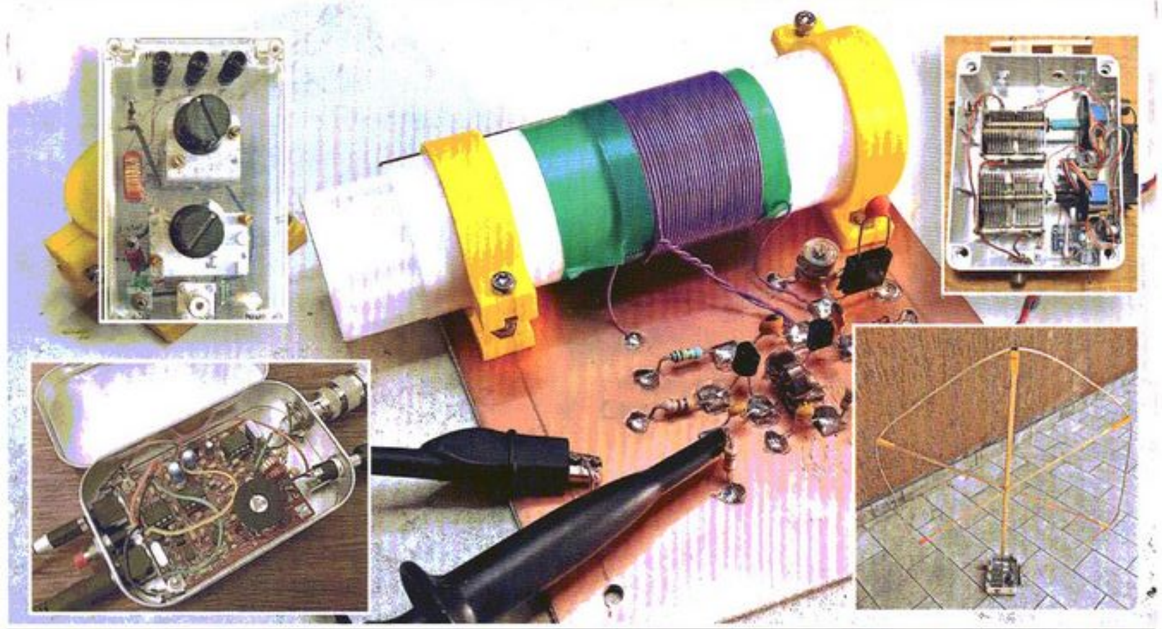

Contents

This could be your last SPRAT. Check your delivery label, and please read the Membership Secretary's notes on p19 in this issue.

JOURNAL OF THE G-QRP CLUB

Our founder George Dobbs G3RJV (SK)

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EDITORIAL

Peter, G3XJS, is standing down, for the second time. He was 'Communications Manager' for about 10 years, handed over to Dom, M1KTA, who did it for about 10 years, and then Peter came back for another spell in 2020, rebranded as our On-Air Activity Manager. Peter has done a fantastic job in adjudicating logs for the various operating trophies we award and promoting on-air activity, but he has decided it is time to retire from his role. Three cheers for Peter and all of his work over many years!

It follows that we should welcome Peter's successor and wish him good luck. Enzo, M0KTZ, has been very active since joining the Club and has featured in SPRAT a number of times. He is thrilled to be taking over the role, full of enthusiasm and we thank him for volunteering.

The Winter Sports generated a fair bit of activity on the bands and there was much chatter on the G-QRP IO Group about doing more such events. Well, we do have the Summer Sizzler coming up; linked to World QRP Day, which this year is on Saturday 17 June. So, you will have some good mid-year opportunities to work other members. See the On-Air Activity page for full details of forthcoming activity periods, a report on the Winter Sports, and more.

On the subject of on-air activity, we would really like the Club Call to be activated in every Region of the UK during the Summer Sizzler, and in particular on World QRP Day. If any member would be willing to activate it for a couple of hours, or all day, from England, Northern Ireland, Wales, Scotland, IoM, Jersey or Guernsey, please drop me a line and we will sort out a rota. Ideally, the Club call will be on many bands, using several modes, giving members the opportunity of a 2-way QRP contact and promoting QRP activity.

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

Club Trophy Winners 2022

Steve G0FUW email: g0fuw@gqrp.co.uk

I say this every year, but looking through all the amazing articles members have shared during the previous year is a real pleasure. Sorting out who should win trophies, is never an easy task, but after much deliberation, here are our winners for 2022:

- The **G2NJ Trophy** is sometimes awarded for a really good technical article, and sometimes for an outstanding contribution to international QRP. This year's winner described a Cross-coupled Double Balanced Product Detector in *SPRAT* 191. The winner is **Cor, PA3COR**.
- The **Partridge Trophy**, awarded for the best antenna article, goes to **Philip, M1GWZ**, for his piece in *SPRAT* 193 about his Coil-shortened 80m Vertical.
- The **Gordon Bennett Trophy**, for the best practical article, goes to **Olivier, F5LVG**, for his Modern Simple Regen Receiver in *SPRAT* 190.
- The **W1FB Trophy** is awarded for the best simple article, and this year's winner is **Niall, M3NGS**, for his Simple Charge Regulator in *SPRAT* 191.
- The member who provided the best log for operating on World QRP Day, 17 June, was once again, **Val, RW3AI**, who wins the **Suffolk Trophy**.
- We have two more awards, the **G4DQP Trophy** for the Winter Sports and the **Chelmsley Trophy** for best log for the whole of 2022. Details of those are in Peter's final On-Air Activity column.
- The Club has made a nomination for the **RSGB G4STT Trophy**, which recognises significant contribution to QRP. As it is their trophy, the winner will be announced by the RSGB at their AGM in April.

Congratulations to all of our winners and three cheers to everyone that took part.

CQ-DL Treffen Update

Manfred DK4NQ

The G-QRP-DL meeting 2023 announced in SPRAT No.193 (pg. 27) has to be postponed by one week for organizational reasons. **The new date is May 12-14, 2023.** More information via *DK4NQ@t-online.de*

Terminänderung!

Das QRP-Treffen in Waldsassen/Konnersreuth musste leider verschoben werden.
Der neue Termin ist 12. - 14. Mai 2023.

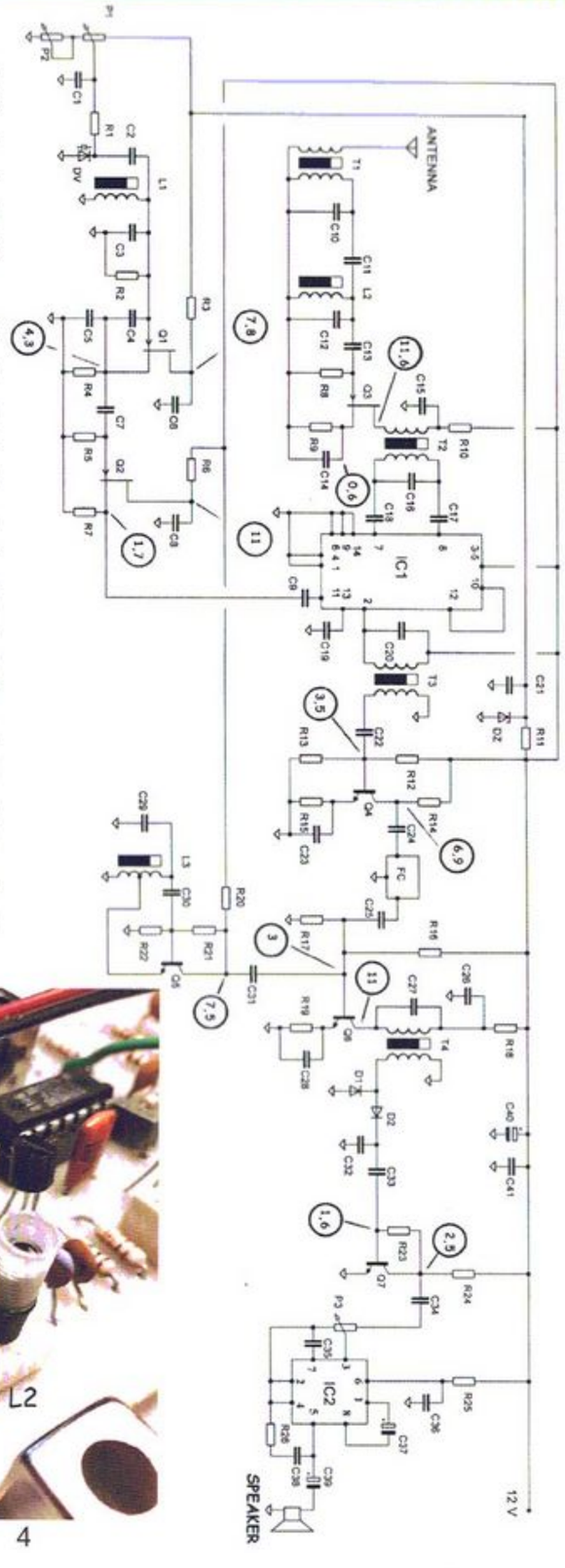
Weitere Informationen
und Anmeldungen
via
DK4NQ@t-online.de

Simple Superheterodyne Receiver for 40m

Giovanni Lorenzi, IT9TZZ email: tzzlorenzi@tiscali.it

This project was born in a time of pandemic, with the consequent difficulty in finding the components necessary to carry out a project, I proceeded in two directions: developing ideas by relying on the things present in the junk drawer and designing circuits that are easy to make.

The circuit diagram shown here is simple: on the far left the front end, whose signal, filtered, is amplified by Q3 and sent to IC1, which constitutes the mixer. This IC was recovered in the drawer and proved its worth by inspite of those who felt it was obsolete. Below, on the left, is the VFO which in superheterodyne devices is called the local oscillator (LO). The circuit is the usual and tested Colpitts followed by a buffer that guarantees excellent stability from the first seconds of starting. The signal emitted by the LO mixes with the one coming from the antenna and there is always only one at 455kHz. This is the value of the average frequency set for which the LO must oscillate between a maximum frequency of 7655kHz (7200 + 455) and a minimum of 7455kHz (7000 + 455).



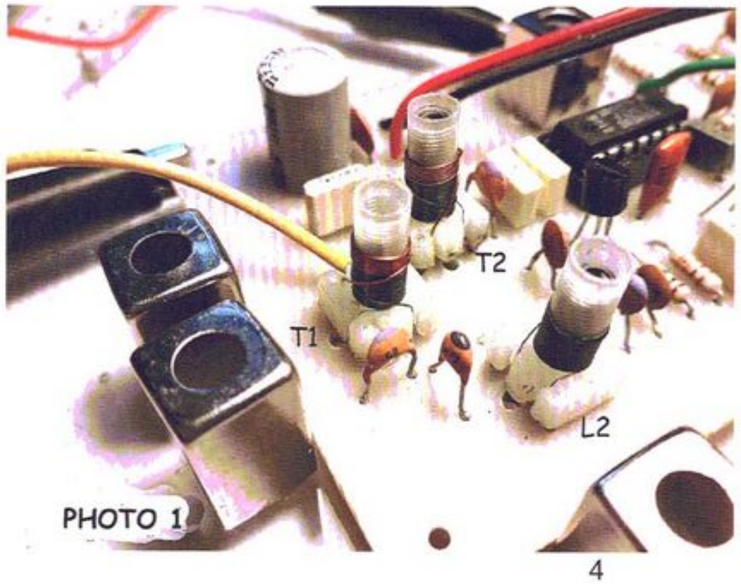
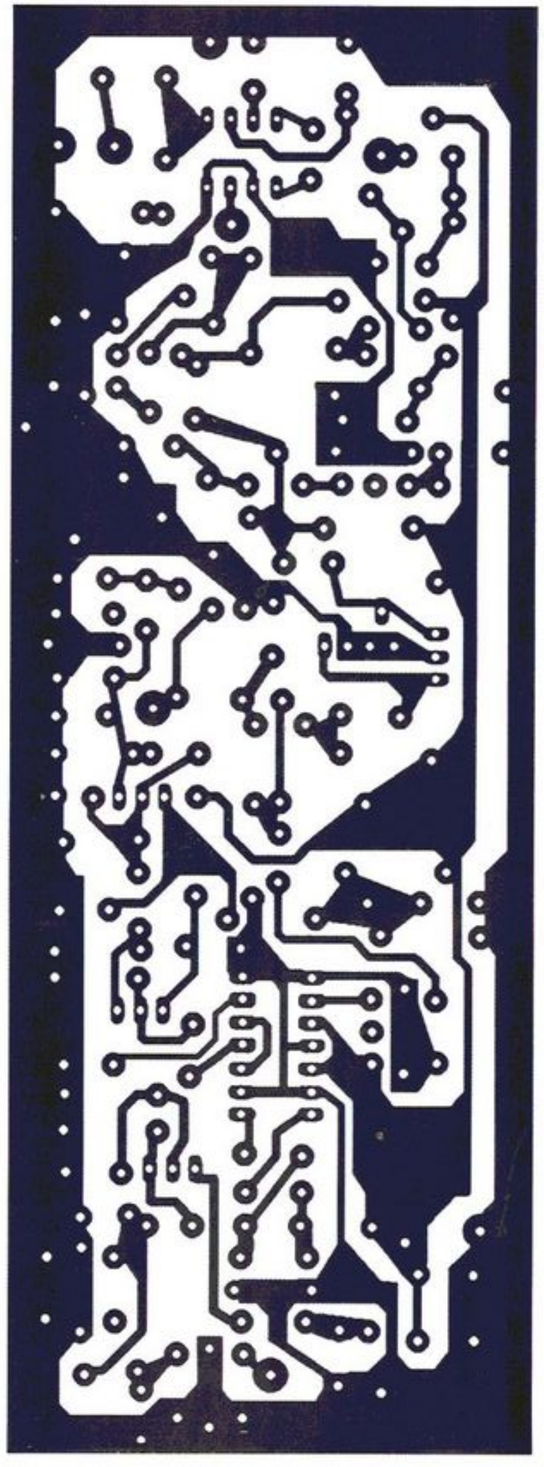


PHOTO 1



The T3 medium frequency coil, calibrated on 455kHz, contributes to this first filtering.

For the medium frequency filter, instead of the desirable quartz crystals that make up a reliable and highly selective ladder, I used a Murata filter of the type CFW 455 with 5 pins, extracted at the time from a cordless telephone. However, I have designed a printed circuit that can also include a very common ceramic filter from Murata with three pins. This possible component in the layout is indicated with hatching.

Finally, a second amplifier-mixer stage follows in which the 455kHz signal mixes, as a product detector, with that generated by the BFO, at the bottom right of the diagram, composed around L3 and configured as a Hartley oscillator.

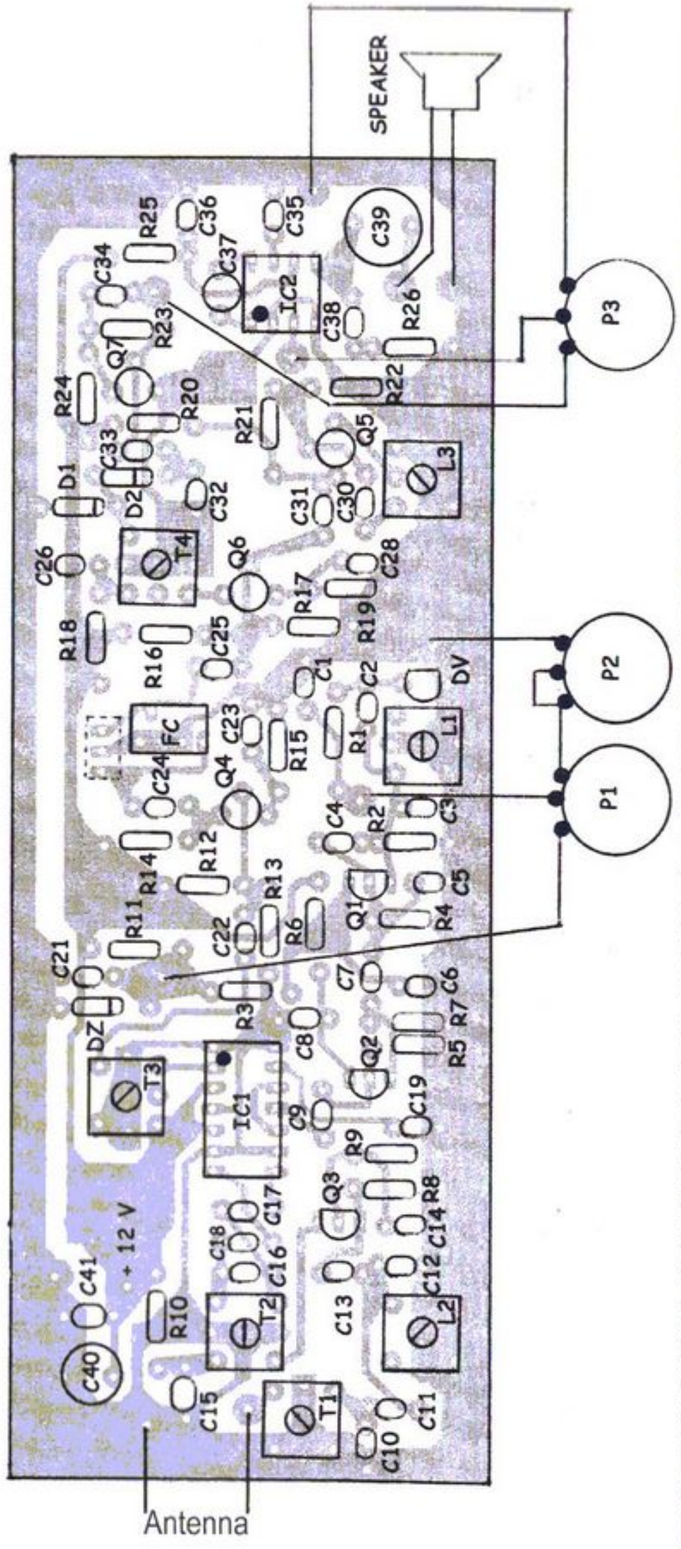
The detection of the audio signal is entrusted to a pair of Germanium diodes followed by a low value capacitor which serves to remove any residual high frequency signals.

Finally, the usual AF amplifier stage suitably and wisely pre-amplified which ensures a robust signal and a discreet presence effect.

To set up the device it will be necessary to make the two transformers T1 and T2 and the coils L1 and L2 using plastic supports of 5mm in diameter with an adjustable ferrite core and metal screen. I recommend a meticulous and almost maniacal construction of these coils: the performance and success of the receiver depend on them. As a friend of mine usually says: "Don't be in a hurry to do a bad job."

For L1 and L2, wrap 30 turns with 0.16mm diameter enameled copper wire. For T1 and T2, perfectly identical, wind the secondary with 30 turns of 0.16mm enameled wire (towards C10 and C16) and then the primary (towards the antenna and C15) with 6 turns of 0.2mm enameled wire. Photo 1 makes the construction clear.

To set up, check the supply voltages of the various integrated circuits and transistors: in figure 1 I have reported the measurements made and which represent a certain indication. In the second time, the LO will be raised to the frequency by turning the cursor of P1 to the maximum and adjusting the core of L1 to read the value of 7655kHz. I remind the reader that the varicap diode returns the value of the minimum capacitance at the maximum voltage and vice versa. With the values of the components indicated in the C2-DV group and the voltage



Components

Resistors

R1= 22 k Ω
R2=R5=R8= 1 M Ω
R3=R6=R10=R18=R25= 100 Ω
R4=R7=R14=R15= 1 k Ω
R9= 220 Ω
R11= 330 Ω
R12=R16= 10 k Ω
R13=R20=R24= 4,7 k Ω
R17= 3,3 k Ω
R19= 470 Ω
R21=R22=100 k Ω
R23= 220 k Ω
R26= 10 Ω
P1 = 100 k Ω tuning potentiometer
P2= 1 k Ω fine tuning potentiometer
P3= 10 k Ω volume potentiometer

Capacitors

C1=C14=C23=C28=C34= 10 nF
C6=C8=C19=C21=C22=C24=C25 =C26=C33=C35=C36=C38=C41= 100 nF
C2=C3=C5=C10=C12=C16=C31= 68 pF
C4=C7=C11= 27 pF
C9=C13=C31= 47 pF
C15= 4,7 nF
C17=C18= 2,2 nF
C20-C27-C29= inside T3-L3-T4
C30= 560 pF
C32= 120 pF
C37= 10 µF Electrolytic
C39= 470 µF Electrolytic
C40= 100 µF Electrolytic

Semiconductors

Q1=Q2=Q3= BF245 or similar FET
Q4=Q5=Q6= 2N2222
Q7= BC109 or similar
IC1= SO42P
IC3= LM386
DV = BB112 Varicap diode
DZ = Zener diode 8.2 V

Various

L1-L2-T1-T2 = see text, T3 = 455kHz medium frequency coil black core
T4 = L3 = Medium frequency coils 455kHz yellow core, FC = Murata CFW 455kHz ceramic filter (see text)

of 0-8.2 V there will be a range of capacitances from about 40 to 80 pF.

Subsequently, bring the cursor of P1 to zero to verify that the oscillator covers the frequency of 7455kHz, which guarantees the reception of the lower limit of the 40 m range. To test the BFO beat oscillator it will be sufficient to listen to the generated signal, rotating the core of L3, with the aid of a continuous coverage receiver tuned to 455kHz. With the same receiver you can monitor the signal emitted by the LO by inserting a piece of wire with antenna function in pin 11 of IC1.

At this point, connect a good antenna and adjust T1, T2 and L2 to receive maximum signal with minimum noise. Slowly adjust T3 and T4 to achieve the ultimate. Receiving the CW will not entail any difficulties whatsoever; instead, for the SSB, adjust the L3 core as specified above, once and for all, until the modulation is clear. In both reception modes, the P2 potentiometer will allow a fine tuning to better center the signal.

My prototype extends the reception capacity up to 7500kHz by at least partially including the adjacent broadcasting band of 41m. As usual, I didn't want to exclude my BCL soul, which is alive in my heart along with the radio one.

The project is complete with printed circuit board (fig. 2), real dimensions 16.3x6 cm, layout of the components (fig. 3) and a photograph that will guide you in the realization. Three Youtube videos will give an idea of the receiver's performance:

CW reception: *https://youtu.be/SszDpd08ijI*
SSB reception: *https://youtu.be/mf0QuTqS2JQ*
AM reception: *https://youtu.be/uolca3kCQnQ*

G.Lorenzi, IT9TZZ

30THz Project – DX Record Increased

Remi M0LRH, Hieronim M7HBL

Further to the 30THz project that appeared on pages 4–6 of *SPRAT* issue 193, I recently increased the distance between Tx-Rx to 109m. I also updated the receiver - it is "fully digital" with direct 24-bit sampling – see the recent video below:

https://www.youtube.com/watch?v=Coo5u3XPHcs

My plans for this year include the following:

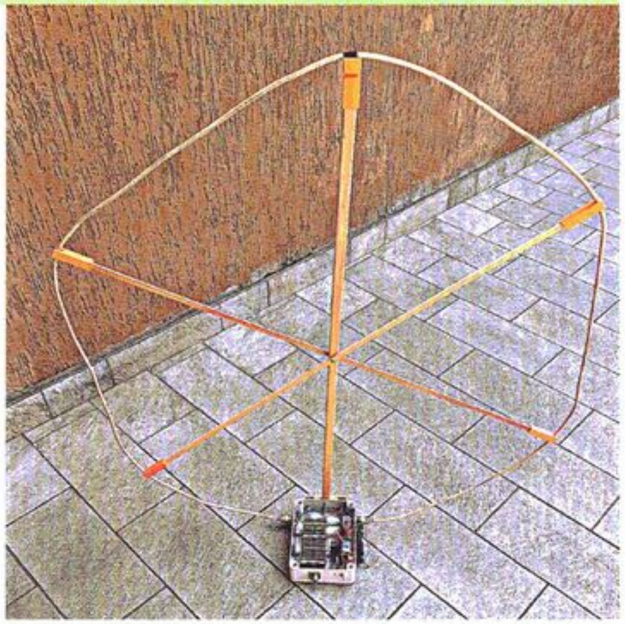
- *Basic experiments at 70THz - QRP, opposite to 30THz, both transmitter and receiver will be narrowband - I just found the inexpensive source of narrowband filters for 70THz. Additionally, the 70THz band may allow using of AM voice modulation.*
- *I plan to explore frequencies between 118-320GHz. Very low power, less than 1mW; unfortunately, Si Ge technology is unpleasantly expensive. I already started a VCO for 120GHz*
- *I am exploring the possibility of building a spectrum analyser 10-100THz - sounds exotic, but with optical techniques, it looks realistic. (it is a difficult 3D printed project but likely very affordable - estimated cost in the range of £30+)*
- *I also plan some exotic experiments in Exahertz (EHz)*

I will keep you informed about my progress.

73, Remi M0LRH

WI-FI remote controller for a loop antenna

Franco Trainini IK2NJV email: ik2njv@gmail.com



During the pandemic we have all been affected, with small or large restrictions, I took advantage of the fact of staying at home for longer than usual, to create a magnetic loop antenna, easily transportable in a bag, to be used during the summer holidays. I decided to make it with a diameter of about one meter, so that it could be used for 30, 20, 17 and 15m.

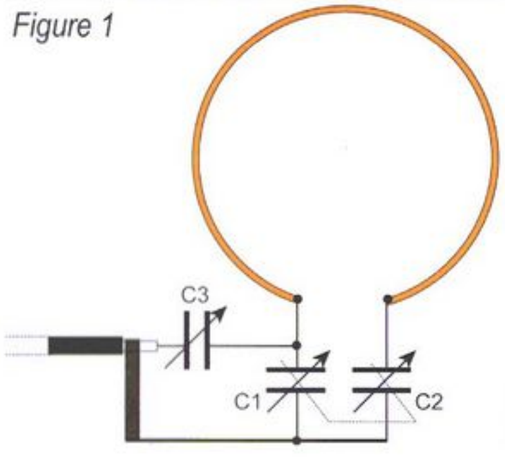
It had to be easily mountable on site and without much effort to make it work, so I decided not to use coupling via the small internal loop, nor to mount the capacitor in the middle of the resonant loop, but to use a tuning circuit through two capacitors as shown figure 1.

It is a classic scheme that can be found in many documents concerning magnetic loop antennas, I found it at the link:

http://webclass.org/k5ijb/antennas/Small-magnetic-loops-Army-loop.htm

I made the radiant loop using a TV coaxial cable with two PL259 soldered at the end and screwing on the SO239 mounted on the control box. Radiant cable of the loop is short-circuited between inside and shield, inside the box. See heading shot and figure 2.

Figure 1

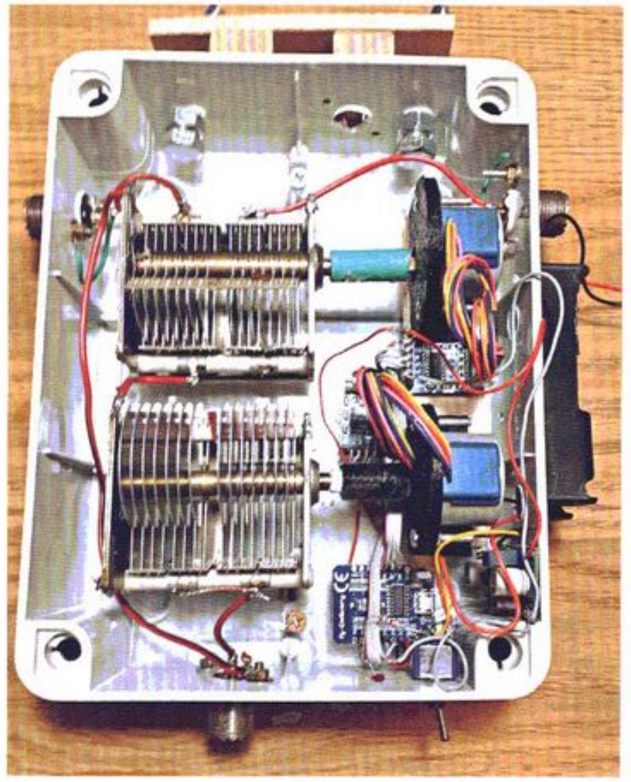


The function of the box is also to support the structure of the antenna, made with wooden strips as shown in figure 2 , in this way it can be placed on a table during use. Since I noticed the difficulty of tuning typical of magnetic loops, and above all I noticed the variation of the resonance when you are close to move the tuning capacitors, I thought of motorizing everything and controlling it remotely via WI-FI.

To do this I used an ESP8266 board that drives two stepper motors through two driver boards easy to find and at low cost. The power supply in this case is provided by two LI-PO 18650, and a 7V to 5V reducer is necessary for operation. The diagram is shown in Figure 4.

By connecting with any browser to the system (IP=192.168.4.1), you have the possibility to connect the antenna system to the local network or directly to the PC, phone or tablet in Peer to Peer mode.

The graphical interface is easy to understand, there are buttons to move the motors forward



or backward and to set the parameters of any local WIFI network to which you would like to connect. A possible addition could be to insert a SWR meter and to report the value on the graphical interface, this my first realization is quite simple, without 'bells and whistles' but it could be a starting point to being expanded with a few hardware and or software changes. I hope I have been helpful and if anyone needs to have the software, I will be happy to provide the source files via email.

A last word, of thanks to **KG5CWB, Janet**, who encouraged and helped me to write this article.

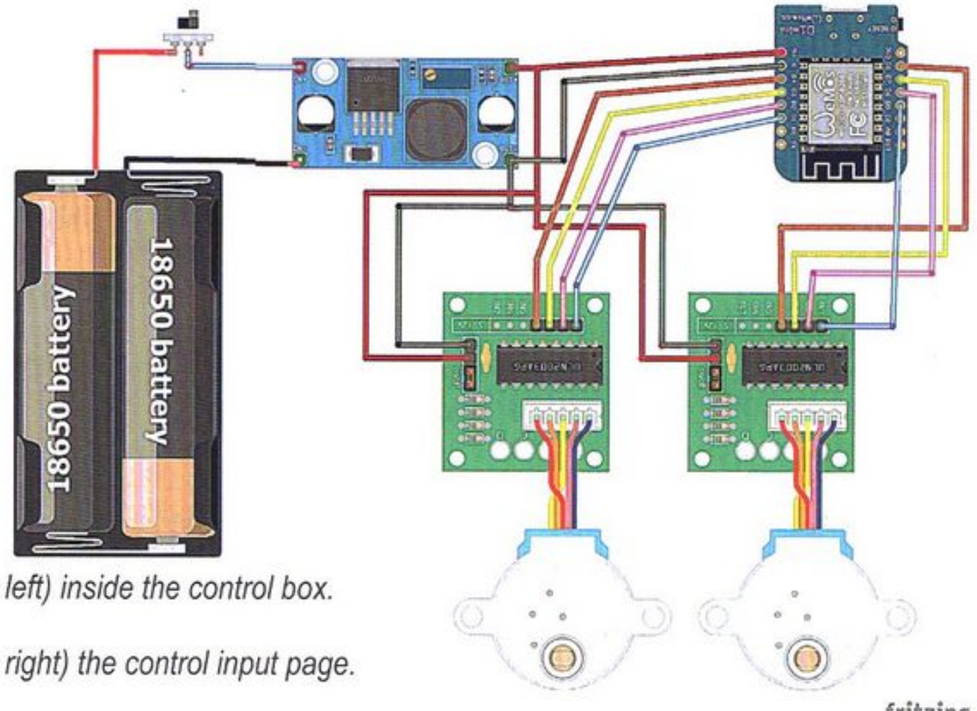


Figure 2 (top left) inside the control box.

Figure 3 (top right) the control input page.

Figure 4 (above) The schematic layout

Measure transistor gain bandwidth product

By Bob G4VSO

Background

First some background. So what is fT? This is the point where the gain of the device drops to 1 and is also called the gain bandwidth product or cut-off frequency. Now for frequencies below the fT the gain increases at a constant rate of 6dB per octave. The result of this is that the product of current gain and operating frequency is constant.

So if we want to design an amplifier at 30MHz and have a transistor with an fT of 200MHz the theoretical current gain (without losses) could be fT / f = 200/30 = 6.67.

So what is the problem? Just 'look up' a datasheet for the device you are using. The typical fT for a device like a 2N3904 is between 150MHz and 300MHz, so the amplifier could have a variation in current gain hfe of between 5 and 10 at 30MHz. Greater accuracy and certainty may well be desirable.

OK, so you have been to a rally and got a bargain batch of unmarked transistors, bought some devices online from a potentially unreliable source, or had a look in your junk box and found some transistors that have strange markings or are of dubious origins, so no chance of knowing what the real fT is.

One approach would be by testing a bipolar transistor in an oscillator circuit and establishing the smallest value of feedback capacitor with which the circuit would oscillate. It is then possible to derive a approximation for the value of fT. This approach is used in the RSGB book "*Test Equipment for the Radio Amateur*", first edition, by H.L. Gibson G8CGA.

Another approach is described in the Freescale Semiconductor (Motorola) application note AN139. This approach is also used by KN5I and is called "*Measure Transistor fT, Gain Bandwidth Product*", see link Transistor Ft (***kn5l.net***) This method uses a neat trick by which you can calculate the fT. This Is done by measuring the frequency at which the device current gain hfe has been reduced to 70.7% (or -3dB) of its low frequency value.

Different articles and books use slightly different abbreviations for the various gains which can be confusing. The approach used in AN139 lists the meanings of a host of different abbreviations. This is the approach I decided to use.

What you will need:

Adjustable power supply 5–20V at 100mA, DMM for voltage measurement, Signal generator from 100kHz to 10MHz, Oscilloscope (50MHz) or diode probe.

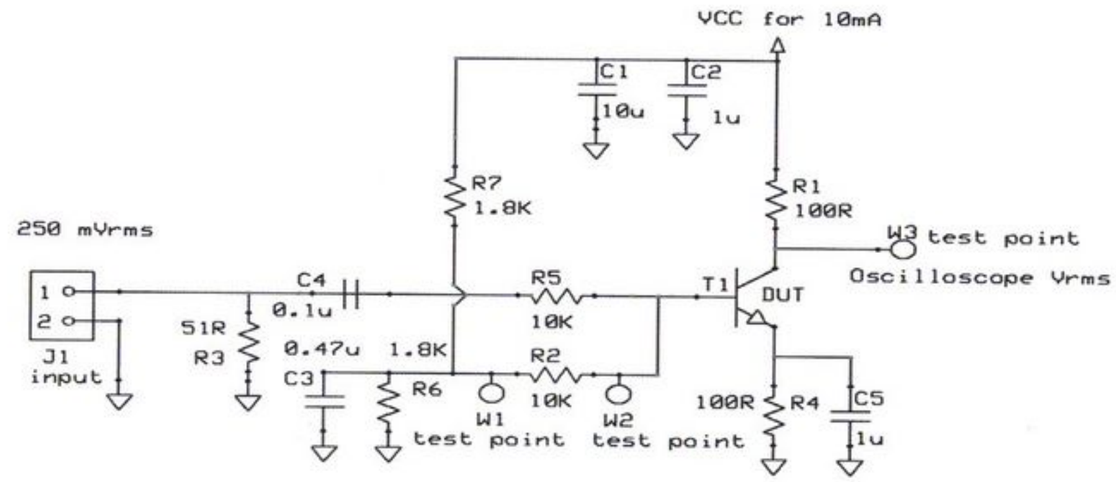
Test jig as shown below:

Note: keep connections between R5, R2 and T1 base as short as possible, extra capacitance here could reduce the measured fT. I used a simple single-in-line socket to fit T1.

Set up and Measurements:

Part 1 DC measurements:

1. Without any RF Input to J1 and the device under test in place, adjust Vcc so that the voltage across R1 is 1.00V. This corresponds to 10mA collector current.



2. Now measure the voltage (V1) between test points W1 and W2, the voltage across R2 10K.
3. Calculate the DC current gain, T1 DC base current = V1/10,000mA. Device DC gain = 10/T1 base current.

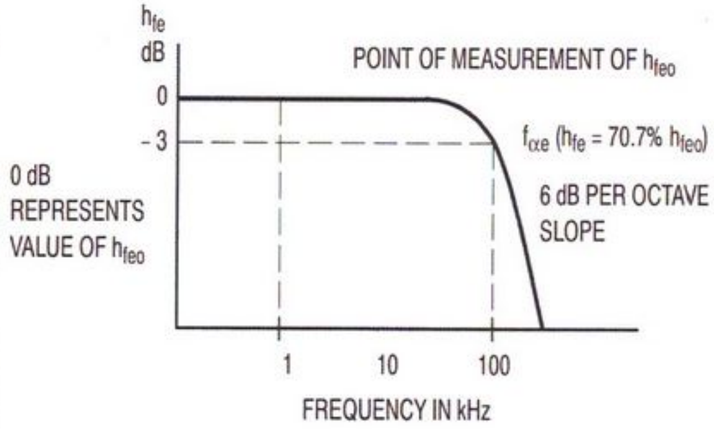
Part 2: AC measurements

1. Apply approximately 250mVrms to the input at 100kHz.
2. Measure the output on the oscilloscope (or using the RF probe).
3. Adjust the oscilloscope gain so the waveform is full screen i.e. 10 graticule units peak to peak.
4. Adjust the frequency of the signal generator higher (keeping the input level constant) to the point where the output amplitude is reduced to 7.07 graticule units.
5. Make a note of this frequency (Fαe) in MHz.

Part 3: Calculation of fT

- fT = fαe x DC gain in MHz.
- Some Typical Results
- **BC107**
- Voltage drop across R2 for 10mA collector current is 0.371V
- I Base = 0.371/10,000 = 0.0372mA
- hfe = 10/ 0.0371 = 269
- Measured Fαe 0.7MHz
- fT = 0.7 x 269 = 188MHz
- Data Sheet value minimum 150MHz.
- **2N2219**
- Voltage drop across R2 for 10mA collector current is 1.031V
- I Base = 1.031/10,000 = 0.1031mA
- hfe = 10/ 0.1031 = 97
- Measured fαe 1.7MHz

- fT = 1.7 x 97 = 164MHz
- Data sheet value minimum 250MHz.
- **BFY51**
- Voltage drop across R2 for 10mA collector current is 1.763V
- I Base = 1,763/10,000 = 0.1763mA
- Hfe = 10/ 0.1763 = 56.7
- Measured fαe 1.4MHz
- fT = 1.4 x 56.7 = 79.8MHz
- Data sheet minimum value 50MHz



Further Note

You could use the same approach to measure common base fT, but see refences for a simple calculation to do this.

The assumption is that the "low frequency" gain at 1kHz is the same or very close to gain at 100 kHz.

You can use the same jig to measure *PNP* devices, but you will need to reverse the polarity of any electrolytic capacitors (and Vcc).

Giving the IC-705 feet

Ian, G3ROO

The desire for feet for my IC–705 was solved when I saw **Nigel G4JYU**'s Answer. They are perfectly stable, very cheap and if you lose one, the set is still stable with the remaining foot. Best of all they are very small to store in the portable equipment bag.

With everything available from junk box parts, or if not available easily obtained.

- 2 x 4mm bolts 30mm long plus 2 x 4mm metric nuts
- bit of heat shrink to make it tidy, but not important
- Two old equipment feet to save scratching the table top. It's a lot cheaper, lighter, and very quick to attach than available commercial answers.

PowerPole Cap for LiFePO4 Batteries

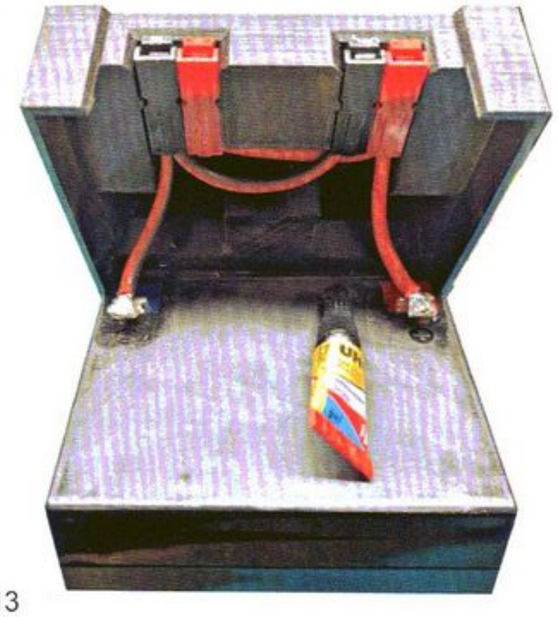
Michael Clemens, DK1MI, sprat@qrz.is

In search of a compact, lightweight and affordable battery that has enough capacity for hours of portable ham radio operation, I came across the infamous Miady 12,8V 7,2Ah LiFePO4 battery which comes with an integrated battery management system (BMS) and can be bought for less than 40€ (about £36).

After some initial testing I decided that this battery fits my needs but I was not happy with the idea of having cables soldered to the battery hanging loosely around. I wanted the battery to have two connectors which are integrated into the battery.

The solution was a custom designed 3D printed cap with two pairs of integrated PowerPole connectors glued to the top of the battery.

You can download the 3D sketch here:
https://dk1mi.radio/miady-powerpole-lid/



Noise on 80 Metres

Tim G4ARI email: g4ari@btinternet.com

Over the past year it has been difficult to use the 80m QRP and FISTS frequencies after dark, due to Over the Horizon Radar. But then sometime in late November I started to notice that the noise level had become worse, and it now spanned the entire 80 metre band and the fact that it was also present both day and night made me think it was from a local source.

Initial thoughts were directed towards the possibility that this was due to the proliferation of outside Christmas decorations in the village where I live, as I had come across a similar type of interference two years previously, which turned out to be a neighbour's Christmas lights. However, by January 6th, when decorations had been taken down, and the noise continued it was clear that something else was causing this wideband noise which was making copying signals below S8 or S9 virtually impossible.

Noise covering the entire 80 metre band

Tracking down the faulty Christmas lights was done with an 80m ARDF receiver which was built from a kit about 10 years ago. The method used is to "sight along the length of the ferrite rod aerial" at the signal, and rotate for a null i.e. the weakest signal, which is quite sharp and deep, so that the signal is now either in front or behind, after which the receiver is rotated through 90° whilst pressing the small red button to activate a "vertical sense aerial", which is then able to tell if the signal is behind or in front. This works very well, and is used by ARDF competitors all over the world. More info can be found on the RSGB ARDF website.

http://www.nationalradiocentre.co.uk/ardf/technical.html

80m ARDF Receiver

For me there was a real sense of urgency to get this interference issue resolved, because I was planning to enter the RSGB CW AFS Club contest the very next day. An S8 noise level across the whole band would mask lots of the QRP and weaker stations, and would undoubtedly have an impact on my individual score and also that of my club's score.

Using the ARDF receiver, I tracked down what I suspected to be the source of the noise to a large domestic garage about 120 metres from my antenna.

Because the garage in question bordered on a public footpath, I was able to move along the wall of the garage with the ARDF receiver and found a very pronounced spot

where the noise peaked, so I felt reasonably confident that something in the garage might be the source. At this point I contacted the RSGB EMC team for advice how to proceed, and got some really helpful and rapid guidance from Ken, G3SDW.

Making the initial contact with the garage owner, Stan, went well; I explained who I was, I asked if he was experiencing any slow internet access problems, based on the previous issue with Christmas lights, which he was, and then I asked for his help. This gentle and non-judgemental approach worked, because the owner invited me into his garage where we found a 12-volt Smart Charger which was causing the issue. Having the ARDF receiver with me turned out to be a bonus, because the owner could hear for himself that the noise stopped when he switched off the charger. To be doubly sure a quick phone call to my wife confirmed that the panadapter on my transceiver was not showing the QRM anymore, and the S Meter was now reading between S2 and S3.

The garage owner let me take the charger away back to my shack so that I could examine it. When I opened it up, I could see that filter components were missing, see below, which I found surprising as it did have a CE mark.

There's a review on Youtube of the same charger

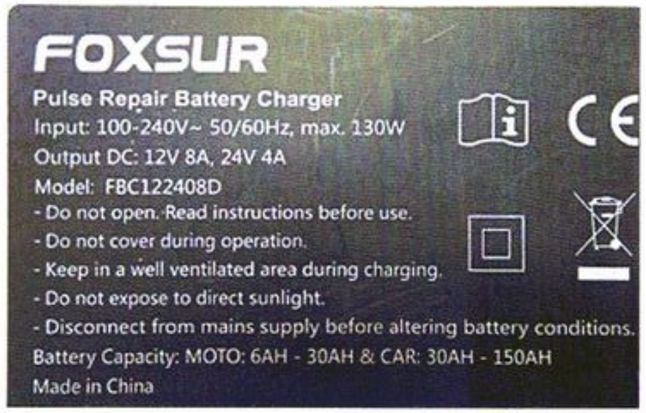
https://www.youtube.com/watch?v=mW6kPzSr91U

Inside View of FOXSUR Charger – with missing components arrowed

in which the reviewer examined two specimens, and found one to have filter components, and one which did not have these components. Also during my own inspection, I discovered that the Live and Neutral in the mains plug were the wrong way round, which is something that the Youtube review also reported. I found the 13 amp mains plug didn't have a fuse, and there was no earth connection.

After further communication with the RSGB EMC team, I learned that this particular charger was well known to cause interference, and that Dr David Lauder, G0SNO, had published reviews of very similar chargers in June 2020, and April 2021 Radcoms, so given all the evidence, I had no hesitation in following advice of the EMC team not to make any attempt at modifying the charger.

It was now Saturday 7th January, and with the CW AFS Team contest only hours away I decided to replace the charger with a Halfords Smart Battery Charger 6A, which had very

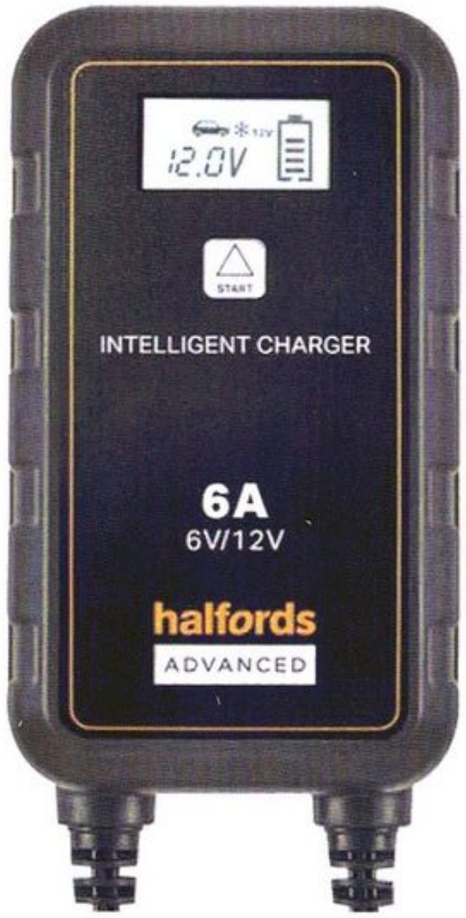


similar functionality to the faulty FOXSUR, and which when tested did not create any noise whatsoever.

Halfords Smart Battery Charger 6A

Finally, the garage owner, Stan, also let me have the faulty charger. This was a real bonus, as it definitely prevented him unintentionally and unwittingly using it in the future.

The success in resolving this interference issue was down to a number of factors -:



- *Having the appropriate tool to be able to detect and accurately locate the noise source.*
- *Prompt support and advice from the RSGB EMC Helpdesk, thanks Ken.*
- *Taking a gentle, non-accusatory approach, and avoiding radio jargon.*
- *Ascertaining if the owner was experiencing slow internet access.*
- *The ability to let the owner hear the noise, and then hear it stop when the charger was switched off.*
- *In this specific case, being prepared to replace the faulty charger.*
- *Finally, after replacing the charger, the ability to then obtain the faulty device.*

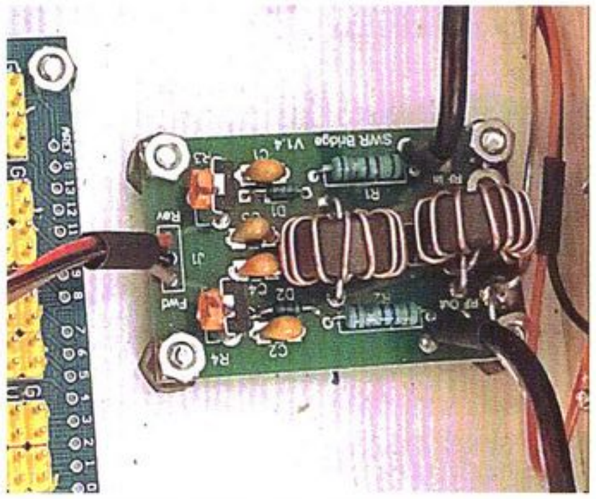
I left Stan's house at 12:00, just one hour before the start of the AFS contest, with the confidence that I would now be able to hear stations calling me. That's cutting it fine!

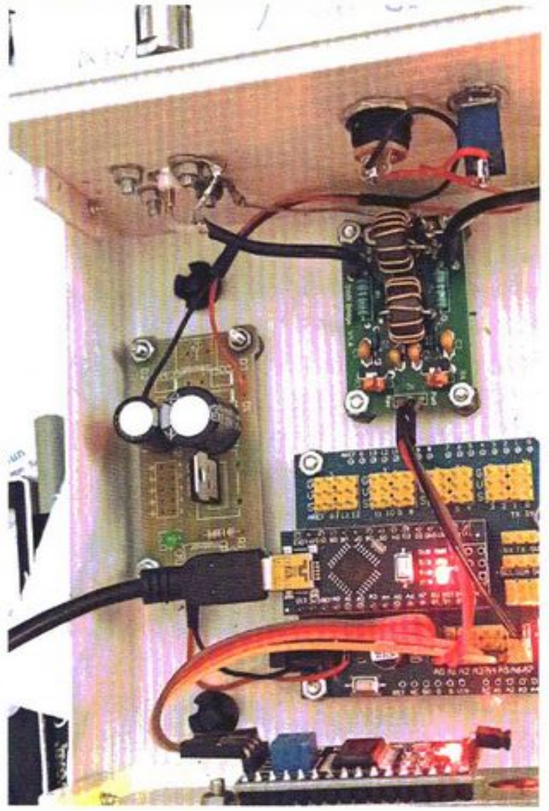
Stockton Bridge Error

John 4760 G8LJO QTHR email: hermes11@gmx.co.uk

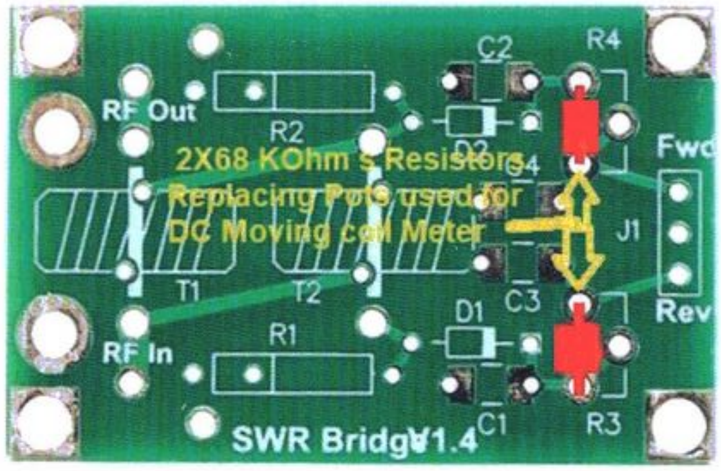
Having built the arduino-based automatic power and SWR unit in *SPRAT* issue 192 (p34), for the bridge part I used an ebay Stockton Bridge kit. This kit seems to be based heavily on the ***kitsandparts.com*** project. But it has various names and is primarily used to drive one (or two) microamp meter. Having allowed for this by replacing the 2x50kΩ pots with 68kΩ resistors in series with the output.

Things still would not work correctly, the SWR calculation would not work. This I traced to the pcb board markings on the Stockton Bridge with the outputs transposed.





After swapping the pins A0 and A1 over at the Arduino Nano things started to work correctly . The markings are shown wrong on the original PCB from kits and bits. com also. This project was to try the Nano Shield and Dupont connectors.



Reverse

Forward

Switch-mode PSU Extra

Andy Eskelson G0POY

In Sprat Issue 192, on page 6 is an article titled *A £15 3D printed 13.8V 50 Amp PSU Case* by **David Holland G4LDT**. It was interesting as I'm building a new station supply with this type of PSU happened to be a project I was working on. Here is a little more information that others may find useful.

I was using the DPS-1200 module, which would give approx. 100A output. There are AT LEAST 3 different control boards used in these PSUs, and so far only two have been successfully hacked to give 13.8V

Of course it was my units that did not use the boards that could be modified. This is not really an issue for me, as the Rigs are quite happy running at 12.5V Just that the max output power is slightly less.

There is a Youtube video, which presents a few seconds of video, showing the basic modification and views of the two common control boards, and where to make the modifications. You can find this video here:

https://m.tube2.me/view/F0QWQntPkO4.htm

Be aware that the output caps on these power units are quite low voltage about 16V so DO NOT adjust the output voltage too much!

The control board in the PSU's that I have are very different,. and can be identified easily as they have 5 pots along the top edge of the control board spaced fairly evenly, unlike the earlier control boards that have three of the pots grouped together.

A photo of my control board is here:

https://www.flickr.com/photos/g0poy/52505968292/in/album-72177720303783383/

I have identified the voltage adjustment pot, which you can adjust to give 12.5 to 12.6 V output. I also used a small breakout board from eBay and a set of cables, this allows the PSU to be changed easily.

BUT, this particular board DID NOT WORK, there was something a problem with the switch arrangement. As I was going to install and external switch this did not bother me, so I just desoldered the switch on the board, and added a switching system consisting of a 22kΩ resistor from pin 36 to pin 37, and an output on/off switch from pin 33 to the 0V (ground) lines. You can see the rest of my build here:

https://www.flickr.com/photos/g0poy/albums/72177720303783383/with/52505968292/

The panel meters show Volts and Current another cheap buy, this time from Amazon. (These are also available on ebay and elsewhere.)

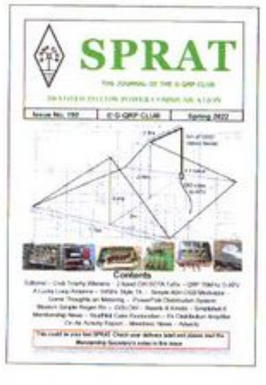
The voltage was reading spot on, but the current reads 0.5A high, even with the adjustment turned right down. A large shunt was provided with each meter, maybe they are a bit "off" I will be treating them as "for indication only" for the time being. Maybe I will add a little more resistance across them at a later date to bring the reading into spec.

The power unit is sitting on the bench at the moment making some resistance wire rather hot, at about 25A. The fan is barely moving, and the output is very clean and free of switching noise.

Membership News

Daphne G7ENA, 33 Swallow Drive, Louth, LN11 0DN

Welcome to the first *Membership News* for 2023. It was nice to get out and about again and meet some of you at local rallies and at the National Hamfest. A big thank you to everyone that sends me their used stamps, I am still collecting them for the local horses' home.



Your last Sprat?

This will be your last *Sprat* if your wrapper label says "membership expired" or "underpaid". Please check your wrapper and contact me (or your overseas representative) if this applies to you. Please do not assume if that if you are a UK standing order payer that it can't be you.

If I could not identify your payment then your membership has lapsed. Please everyone, check the wrapper now. If underpayment applies to you – there will no further issue of *Sprat* until you send the balance.

Providing information with your payment.

Astonishingly our overseas representatives and I receive payments with no information about the member paying. We have no special gifts of prescience, so please, for the sake of your *Sprat* subscription, take the trouble **to include your name, callsign, membership number and address**. An email address is also very helpful if we need to contact you about the payment.

Privacy.

This is to remind you that the club holds a database of all our members' names, callsigns and addresses. It is implicit that every time that you renew your subscription, you are giving us active consent to record this activity in the club database. We only use your data to confirm your membership to send you *Sprat*, QSL cards, or fill your order in the club component store.

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72/73 Daphne

Valve QRP Report Winter Sports 2022

Colin Turner email: g3vtt@aol.com

I was out having my daily cycle ride along the beach promenade to the Harwich Quay the other day and our Graham G3MFJ rang my mobile to ask if I was writing anything for Sprat this quarter. I had to cancel ship spotting and think about radio! There was no official valve QRP activity over the Winter Sports period and I have only had two reports but with the new QTH *(see footnote)* there have been a couple of ideas to mention that might be of interest to readers perhaps encouraging those with limited gardens to become active on the bands.

My new home has a very small easy to maintain garden but, undefeated, I've put up a couple of antennas that might be of interest to readers with limited space and they work well so I'm back on the air QRP most days. My first antenna is a low loop running around the garden fence at between four feet and six feet completely covert and invisible to the neighbours. It is supported by electrical fence insulated hooks obtainable from a farming hardware store and the two ends disappear into the garage and then into a 4 to 1 balun, transforming the higher impedance of the loop ends down to 50Ω coaxial cable, and then across the garage via the roof space into the shack.

The SWR is low on most bands from 40m and above and the noise level on all bands is substantially lower that the other wire antenna, a W3EDP. The NVIS qualities are startling. I work G4ZTF regularly every couple of days, giving him CW tuition, and he is located some 40 plus miles to the south of me across the Thames estuary to the North Downs in Kent. John can be inaudible on a horizontal wire antenna but perfectly audible, often at S9, on the low loop. I've even tried using an SGC 231 auto tuner to feed the loop and this works on all bands 80m to 10m but proved difficult to tune on 40m funnily enough.

The tuning problems were resolved by inserting a 500pF high voltage capacitor in series with the loop which detuned it enough to be accommodated by the SGC. I've even had contacts across to the US with QRP with this loop on HF. If you want to make contacts with QRP with a covert antenna then a low hidden loop could be for you. My other antenna is a traditional W3EDP which is an 84 foot long wire and a counterpoise of 17 feet fed with a link coupled tuner.

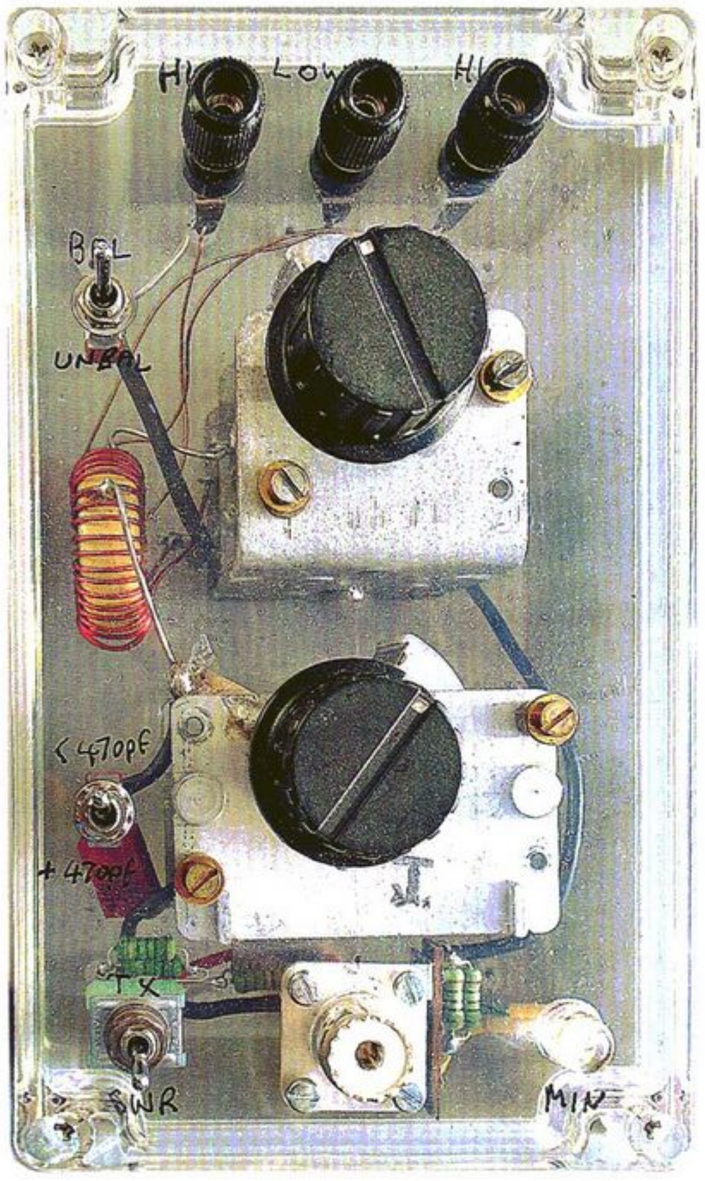
My counterpoise wire is actually in the bungalow and this wire runs from the ATU, which is my home made version of the 'Sudden' kit albeit using slightly larger components, up to a 20 foot pole on my garage and down to the garden fence. As the photo shows, the ATU is a 'see through' version with an inbuilt resistive SWR bridge so tuning is quick and easy but you must remember to switch the bridge out of circuit after tuning.

Note I use the high impedance terminals of the tuner as my view is that there should be no galvanic or direct connection between the tuner tank circuit and the link with the W3EDP and I certainly don't approve of the counterpoise being tacked on to the ground connection of an ATU. A 4 to 1 balun should work too as reported by other users but the original article from 1936 shows a separate tank circuit for the antenna.

I think we should emulate the coupling link of the original circuit in some way. Performance with QRP has been excellent. During the FOC Marathon contest I worked five US stations on 80m who gave me true reports of 559 instead of the usual 5NN with one station engaging in a

traditional QSO enquiring about the dimension of the antenna. I also worked OX3XR through a pile up on 17m so it worked well on HF.

This antenna has worked for me portable, static from home, high, low and once at sea maritime mobile with the counterpoise lying on the steel deck. Now, on to a report regarding the Winter Sports. Chris G3XIZ wished me well for the new QTH and he spent the time dusting off various bits of homemade equipment and trying them on the air. His activity was limited to the final weekend for his valve equipment working on 160m, 80m and 60m where G4HMC and G3XJS figured greatly in his log. G4XUV popped up on 80m on the final day.



Chris laments a high noise level at his QTH which is normally present but disappeared over the last couple of days of the Winter Sports, perhaps as a neighbour went away for the holiday. I've also had a note from Steve G4ALG regarding his excellent idea for a listening guide for QRP operation where he suggest times throughout the hour where frequencies be checked for activity, (and boy do we need activity). Take a look at his website:

http://www.alg.myzen.co.uk/radio_g/qrp/operating.htm

Steve's QRP All Band Listening Guide is an excellent way forward to promote activity. From this you know where and when to listen for contacts now it just needs you on the other end operating. Finally, the next Valve QRP Day is April 15th and 16th with reports to me the week after. I don't need a log just information about contacts or the valve equipment you used even your latest antenna details. Please send your files in *Microsoft Word* format and send to the above email address.

72 Colin G3VTT

Note my new address:

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

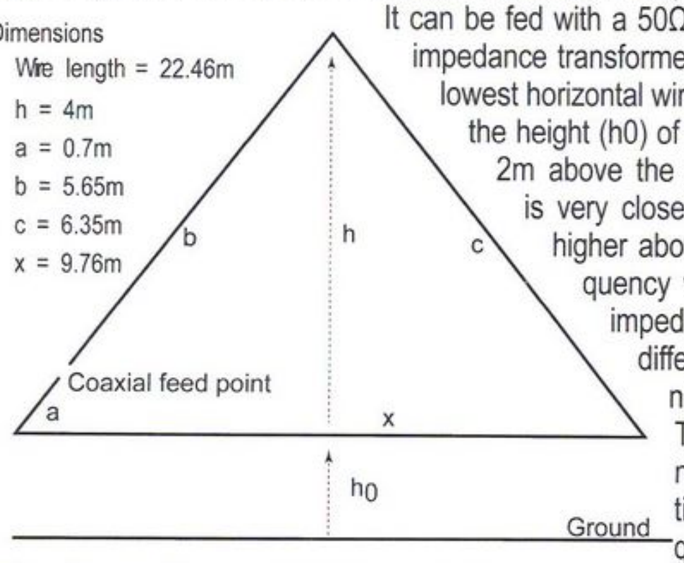
Delta loop antenna for 20m band

Tuomas Talka OH5JJL email: oh5jjl@gmail.com

I must say that the delta loop presented here is not my own design. It is based on an idea of DL4AAE, which has then been tested by DL3TU when he has been operating SOTA QRP. I have been using it for some years now and I have been very satisfied with it so I wanted to share my experiences with other group members as well. I also want to note that I really enjoy playing with simple antennas. My antennas have always been very basic and limited by the usual suburban space problems. But to me it is always thrilling to have QSOs with just simple antennas.

As the name says, delta loop antennas are full wave antennas but instead of a rectangluar shape - they're triangular. The 'tip' can be up or down, and a traditional delta loop has the delta pointed towards ground. The position of the feedpoint determines the polarization of the antenna. For example, in a traditional form of a delta loop, the antenna is fed from the middle of the delta (the lowest point of the antenna), whereupon it is horizontally polarized. However, horizontally polarized delta loop doesn't have omnidirectional pattern and the elevation angle is not low enough unless it is raised high enough. I did not want to hang my antenna very high and wanted that it must have as low elevation angle as possible, so I decided it must be vertically polarized. It must be noted that flat, nearly omnidirectional radiation is only possible with vertical polarization. When the delta loop is vertically polarized, main lobe elevation angle is about 20-25° depending on, for example, ground conductivity which needs to be very good for QRP DX (we want our low power to be radiated as far as possible).

Dimensions
- Wire length = 22.46m
- h = 4m
- a = 0.7m
- b = 5.65m
- c = 6.35m
- x = 9.76m



It can be fed with a 50Ω coaxial cable; no need to use an impedance transformer. When the distance between the lowest horizontal wire and the delta tip is about 4m and the height (h0) of the lowest horizontal wire is about 2m above the ground, the feedpoint impedance is very close to 50Ω. If the antenna is raised higher above the ground, the resonance frequency will increase as will the feedpoint impedance too. There would not be big difference in radiation angle unless significant increase of height is made. That's why the feedpoint doesn't need to be higher than 2m. Elevation angle increases with worse soil quality but not very much. A salt water location can have much lower main lobe radiation but how many of us are living in such kind of places?

Quite often vertically polarized delta loops are fed on one of the lowest corners of the antenna. However, it is not the best possible place for a feedpoint because we can decrease upward radiation with different feedpoint placement. However, it is not very critical: If "a" is between 0.6 and 0.8m, it provides over 40dB attenuation upwards. On 20m we try to minimize upward lobe

and instead, try to 'aim' it as low above the horizon as possible. Feedpoint impedance and gain are changing only slightly, so 0.7m has been chosen as a good compromise.

The measures for the 20m version are as shown in the drawing. Other bands can be scaled from these measures. With these optimized dimensions, the main lobe elevation angle is <25° and radiation directed vertically upwards is attenuated by more than 40 dB. Also, an antenna is almost omnidirectional. I am not experienced in antenna modeling so I leave that for you. With above dimensions an experienced user should model this antenna very easily. I drew a SWR curve (see picture) based on my own measurements. You can see it covers quite a wide range of 20m band. SWR may change little bit due to weather changes but not that much.

The choice of the antenna wire is left to you. I used 18 AWG insulated, multi-strand wire. Insulation of the antenna wire lengthens conductors electrically so please be aware to trim the length slightly. In my case I had a luck with me - an antenna did not need any trimming. A mast must be a non-conductive fibreglass pole. Otherwise the pattern and overall operation can be seriously disturbed. There are support ropes in each corner which hang the lowest wire high enough above the ground. It is directly fed with a 50 ohm coaxial cable. I have a common mode choke on the feedpoint to be on the safe side.

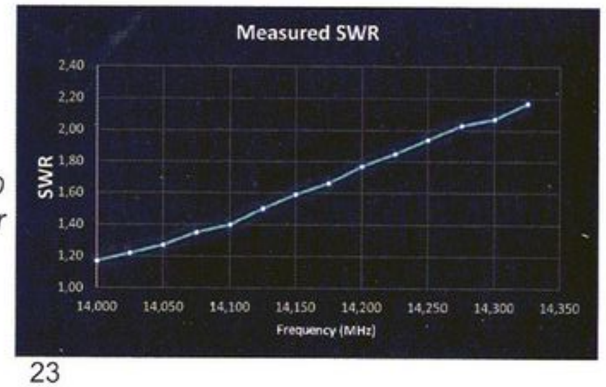
The details of the construction may vary depending on parts available. I myself used egg insulators on the top delta tip and on both corners. The feedpoint can be a commercial dipole centre insulator with the SO-239 female connector, a piece of plastic with holes drilled for the coaxial cable and the antenna wire etc.

How well does it work? I have been very satisfied with it. However, I haven't had much experience with delta loops before. I once tested a 10m horizontally polarized delta loop but I wasn't very satisfied with it. It was hanging too low back then and it could have been better antenna if had been higher. Nevertheless, because of the closed loop construction, it is very quiet antenna. One might say why not just put a dipole or a vertical instead. Well, a vertical needs a good earth mat or raised radial wires to work well. A dipole must be at least half wavelength above the ground to work DX. On 20m this means 10m about above the ground. This is true with an inverted-V version as well. I can only compare my antenna with my 30m and 80m verticals, but better comparison should be done with the antenna for the same band. It is not any surprise that delta loop outperforms both 30m and 80m verticals on 20m band.

Because this antenna is nearly omnidirectional and it has low radiation angle, long-haul QRP is possible no matter from which direction your contact comes from. A delta loop described here would be ideal for portable operation (eg. SOTA/POTA), too, for the reasons described above. I hope you will enjoy this kind of antenna as I do.

A short summary of the advantages of a vertically polarized delta loop:

- *Low radiation angle.*
- *Doesn't take a lot of space.*
- *Needs only one higher support.*
- *Antenna is almost omnidirectional.*
- *Wide bandwith - if the antenna is tuned to the middle of the 20m band, it will cover both cw and phone parts of the band.*
- *Easy to erect by one person.*
- *Low cost of materials.*



Boxcord Tin Foil Vertical Antenna

Paul GU4YBW email: paulwfreeserve@gmail.com

Background

I came across a YouTube video by Calum of DX Commander about a Vertical antenna challenge to make an emergency vertical antenna for 14MHz building it from scrap materials/ wire.

Construction

As I haven't got much in the way of scrap wire so I decided to use tinfoil for the element (not a new idea). After raiding the kitchen cupboards, I cut myself a length of box cord about six meters long and got hold of some 'Tin foil' , this came in a handy length of five meters long and was cut into two 25mm wide strips.

The method I used to wrap the tin foil around the box cord was to take the box cord tie it between to objects to keep it taut then attach tin foil around the box cord.

I found it best to start at one end, wrap the foil for about 30cm move a meter along the box cord pull the foil tight wrap another 30cm of foil over box cord then wrap tin foil between these two points this was repeated along the 5m length of foil and also for subsequent lengths of foil.

A loop was tied in the box cord at either end of the element as attachment points in my case a fibreglass pole but if necessary could be strung over a tree branch or high object.

Photo left: show's box cord and first 5m strip of foil ready to wrap around the box cord.

Photo right: finished element

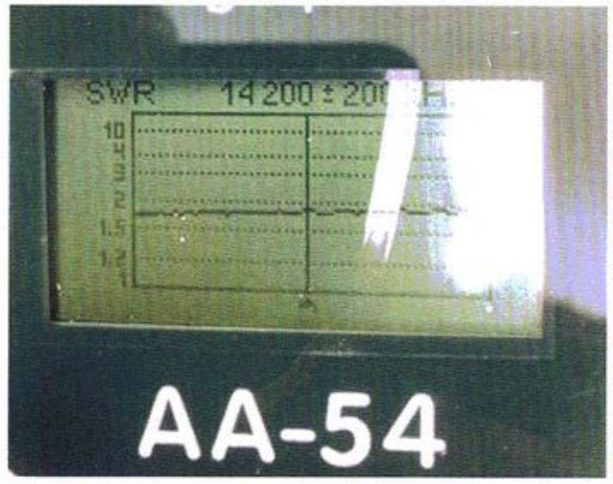
Set up and tuning

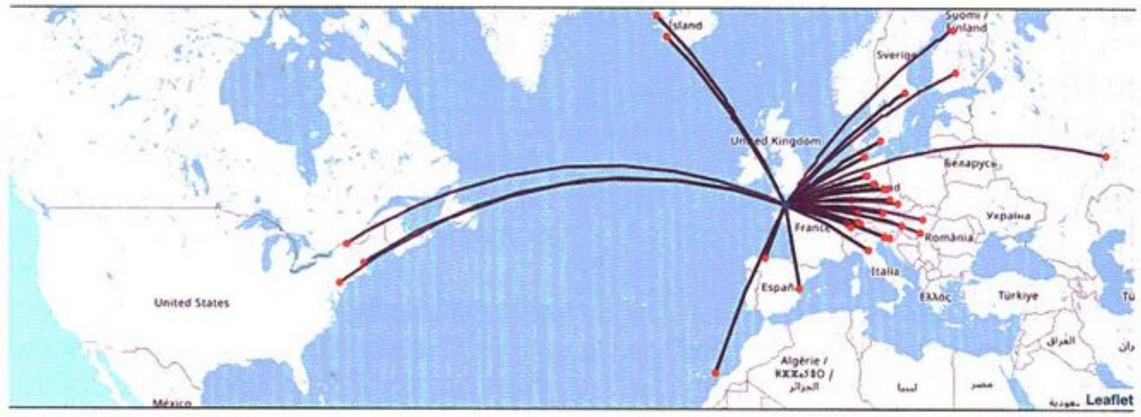
I fitted a terminal connector to tin foil element at the base I also connected a wire and banana plug to enable me to fit the element to a BNC male to banana plug adaptor along with 4 with pieces of wire of 5m long for radials

Tuning was carried out on the five meter tin foil element by removing foil from around the box cord at the top of the element. An interesting point with tin foil element should you take to much off it's easy just to add some more tin foil.

Final measurement for the foil element in my case was 4.72 meters long and best result I could achieve is shown on the antenna analyser photo below set on 14.200MHz ± 200kHz. I suspect a better radial system than I had would have improved the measurements.

Photo Right: connection at base of vertical
Photo Below: VSWR reading.





Above is the screen shot from Reverse beacon network of stations who received my station

Notes

If I find the time during the warmer weather using the tin foil and box cord method shown I might also create radials for the vertical or even an emergency dipole antenna.

As for the Vertical antenna challenge my effort made the top ten out of over forty entries so very pleased

Link to Results video on YouTube

https://www.youtube.com/watch?v=S7Vf3CL8ldk&t=2184s

Test Results(over about 45min)

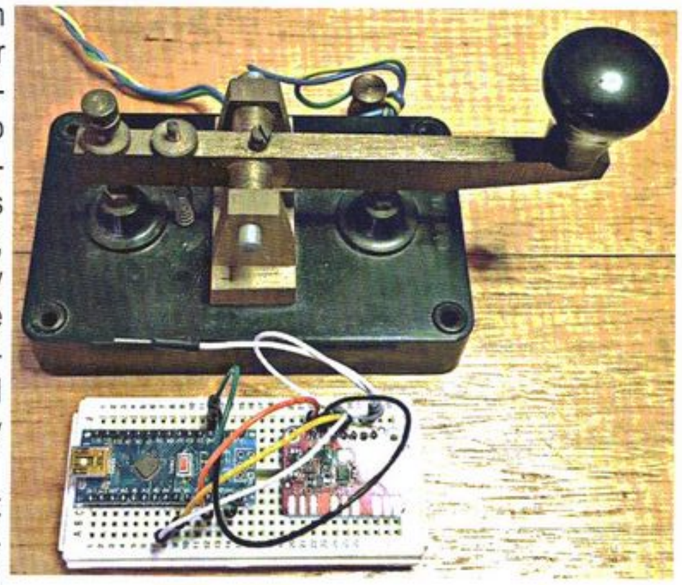
Radio TX/RX. Yaesu FT817
PWR 5watts Mode CW
12v Gel Battery
Fibreglass pole to attach antenna

Stations worked

14:48. IK7FPU Tony sent 559 report to me he was 599 with me
14:50 HB9CEV/QRP Arthur s ent 579 report to me he was also 579 with me
15:00. OE6SGD/QRP. Bernard sent 579 report to me he was 339 to 559 with me

Digichirp! CW nostalgia in the digital age

Paul Taylor, VK3HN email: prt459@gmail.com

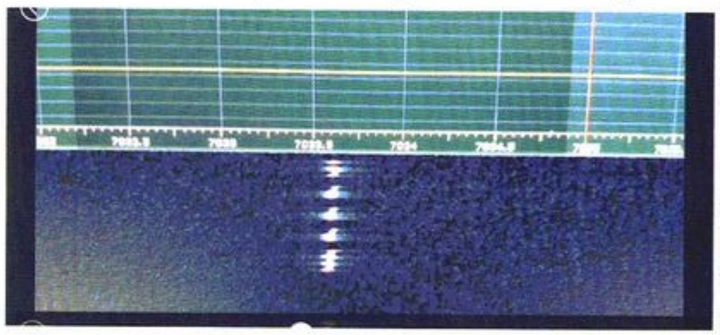


The bottom ends of 80, 40 and 20m are not what they used to be. For starters, the busiest part is the digital segment where computers talk to computers. Then there's the CW segment. When there are CW signals to listen to, all are frequency stable, chirp and click-free, generated by more computers from deep inside rigs that are more computer than radio. These shining examples of digital CW perfection have traded efficiency and quality ... for personality.

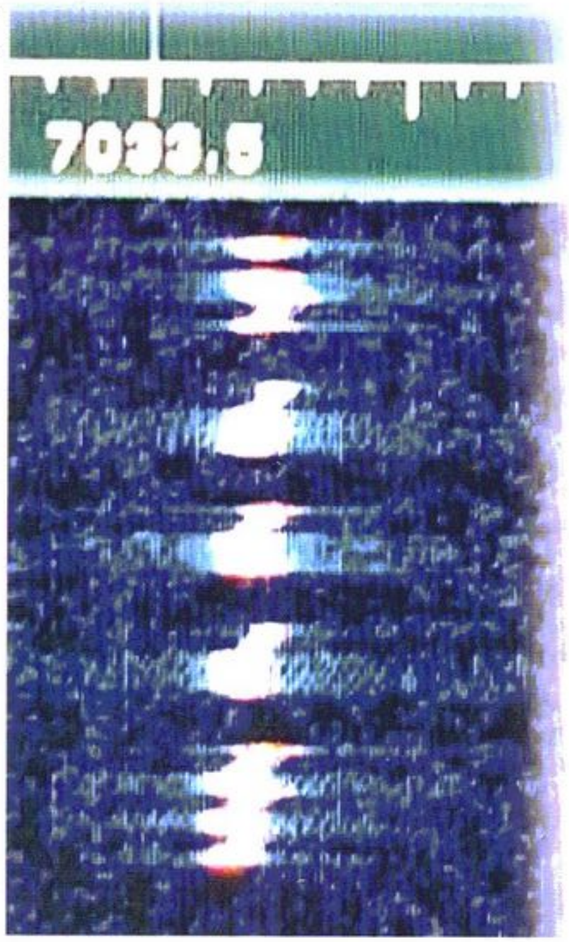
In 1979 as a teenager, I spent countless hours scanning the menagerie of good, average and bad sounding fists, warbles and tones. Some of the basic homebrew and creaky old war surplus transmitters had to be heard to be believed — sloppy, chirpy, drifty, and gloriously messy CW. It was possible back then to tell where a station was from before hearing the callsign by the combination of signal strength and quality.

The key to this was variety. The CW segment was a rich technical and cultural melting pot of sounds and styles, like the marketplace in some kind of global village populated only by fanatical radio enthusiasts, the ham equivalent of the bar scene from Star Wars 4. In those days, sending a CW CQ gave me butterflies -- you could be answered by absolutely anyone, or anything!

The loss of imperfect, analogue CW struck me again when watching one of Peter VK3YE's videos on a two transistor CW transmitter, in which he tries different values of the VXO to PA coupling capacitor. 1nF gave ample drive but pulled the oscillator when keyed, whereas 470pF gave lower drive but less chirp. The CW sound was evocative, and several viewers commented that they would always answer a chirpy CQ because it was likely to be a boat anchor or homebrew rig, something exotic. The thought of a chirpy CW signal being irresistible to some, a feeble flickering flame to which the morse moths are helplessly drawn, began to form.



Using digital technologies to simulate analogue predecessors for continuity is not new. Melbourne Trams sound a digital facsimile of a 1920s bell, a sound synonymous with the city's central shopping district for 120 years. Some electric vehicles include computer-controlled engine sound simulators to alert pedestrians. So, with tongue in cheek, I set about writing some Arduino code to simulate an old analogue VFO's chirp and drift, using the ubiquitous si5351. All that is required to try this out is an Arduino Uno or Nano connected to an si5351 breakout board (Arduino A4 to si5351 SDA, A5 to SCK).



As coded, the script operates like a beacon, banging out a chirpy message every CW_IDENT_SECS seconds. The speed, chirp and drift parameters are all set in code. I had some enjoyable hours playing with these parameters, while monitoring the signal on a nearby receiver.

If you want to use this as a proper keyer, comment out '#define CW_IDENT' at #28. Connect paddle right and left to Arduino D11 and D12, and the keyed line (0..5v) will be on D2. D3 will be a PTT line to control transmit/receive. Pushbuttons to ground on D9 and D10 will send pre-coded messages. A 'straight' sidetone is available on D8.

These first simulation attempts may be overly simple, as a typical analogue oscillator's chirp does not pull the frequency as a linear function of time, but rather, might pull hard, then ease off as the oscillator and subsequent amplifier stages settle. The corresponding mathematical function might be a complex polynomial. The same with drift -- most of my analogue oscillators have drifted in one direction, then reached some kind of equilibrium, thereby stabilizing. Some old transmitters have their own chirp and drift signature, how else would you recognize them when you hear them?

I leave more sophisticated CW simulations of nostalgic CW as an exercise for the reader. Same for the many ways you could use this CW party trick. For example, why not arrange for a switch that disengages the chirp and drift. You could call a chirpy CQ to attract attention, then when you snare someone, turn it off for computer-perfect CW. The options are endless.

If you are brave enough to use this, I ask only three things: use 'digi-chirp' mode sparingly, don't drift out of the band or segment, and don't blame me for your bad signal quality reports!

Blog post:
https://vk3hn.wordpress.com/2021/08/21/digi-chirp-digital-synthesis-of-nostalgic-cw/
YouTube video: ***https://youtu.be/vVERCpG92Ms***
Arduino script: ***https://github.com/prt459/Digichirp***

My thanks to **Jason Milldrum NT7S** for his si5351 library.

Portable Antenna Mount and Groundrod

John VE3IPS email: ve3ips@gmail.com

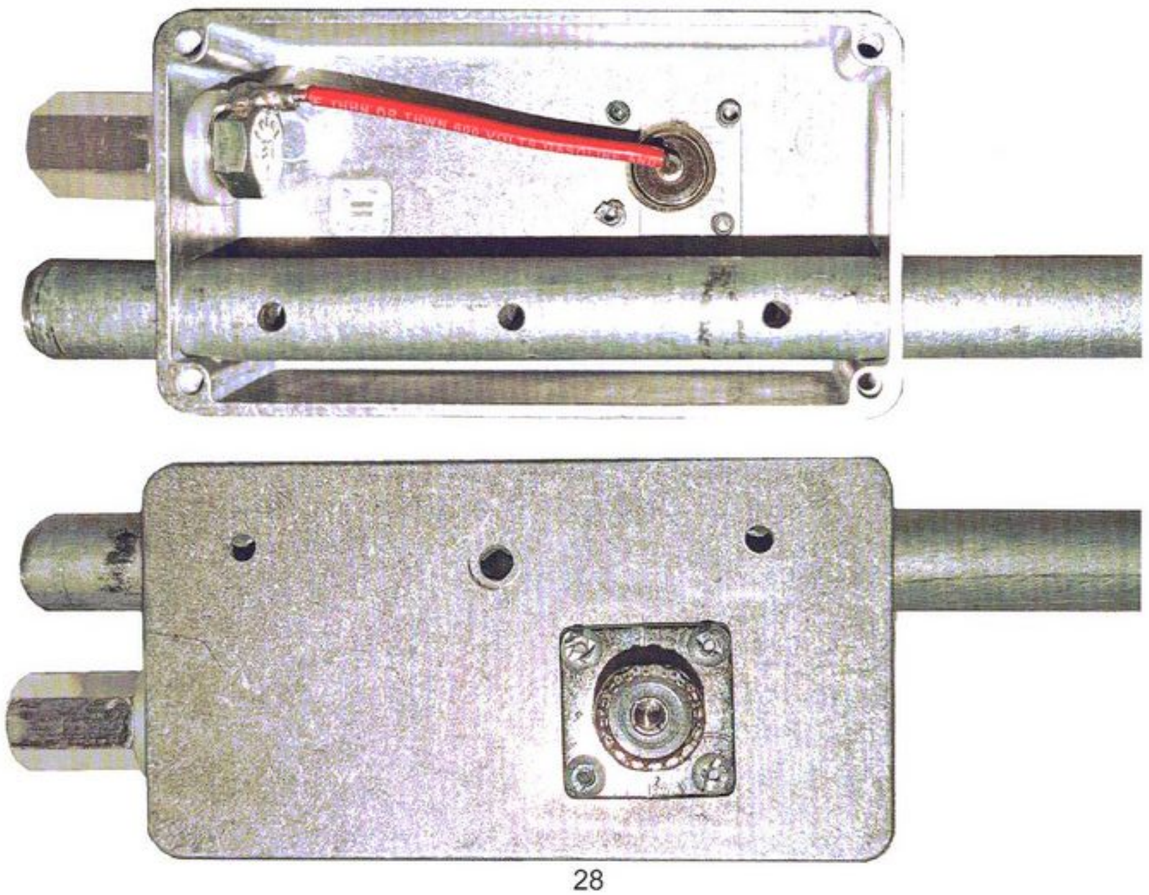
I recently saw a retail version of a portable antenna mount and was disappointed to find out that the cost of shipping and tax exemptions made it too expensive for me to purchase. However, I didn't let that stop me from creating my own version using materials I already had on hand.

Using a leftover grounding rod from a previous project, a metal Hammond box, and some connectors from my parts bin, I was able to hacksaw the ground rod to a shorter length and drill holes through the box and rod to secure them together. I chose to use a 3/8"-24 threaded stud mount to make it easy to attach my Buddipole or Chameleon Antenna.

After an hour of work, I had my own homemade ground rod and portable antenna mount ready to use. The great thing about the amateur radio hobby is the DIY aspect that allows us to create our own solutions to problems. I've even decided to add a ¼'-20 bolt and butterfly nut for an additional wire ground connection. I left the top of the ground rod exposed so I can easily hammer it into the ground when needed.

Overall, I'm happy with the outcome of my homemade antenna mount and I'm excited to put it to use in the field.

73 John



A Simple Transistor & FET Tester

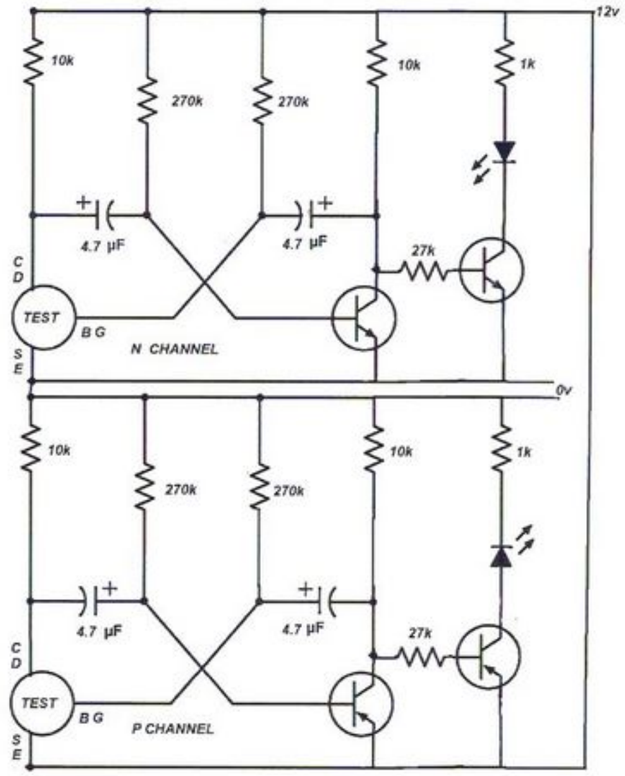
Peter G4UMB email: pahowd@gmail.com

I was given a lot of transistors. Some used and some vintage types. They all needed testing so I made this universal transistor tester to quickly do the job.

It surprised me that it worked with all the basic *NPN* and *PNP* types whether small signal or power types. It works for JFET types and MOSFET ones too.

A plus point is that it never damaged them when I connected them incorrectly. The LED flashes a bit faster than every second when a good transistor is tested. By building it with two separate circuits for *N* and *P* Channel types it made it simple without the need for any switching.

Old Germanium transistors also were able to be tested and I also found that it worked when I tried an in circuit test using the plug in hook leads.



Circuit Update

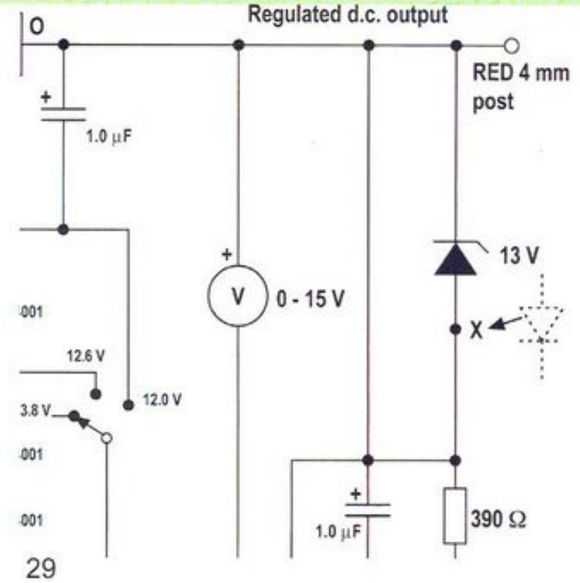
Graham GM4OBD email: gm4obd@btinternet.com

This is embarrassing but I am grateful to **Jim Moar, GM4EFR**, for pointing out an error in my circuit diagram on page 11 of ***SPRAT* issue 193**. There is a wire in parallel with the 13V zener diode which shorts it out.

This link, highlighted here on the right, does not exist in the working version of the circuit! My apologies go to readers who were no doubt puzzled.

73 Graham, GM4OBD

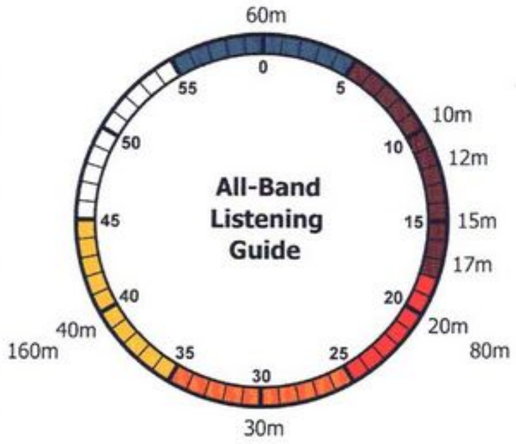
You're not thhe only one that's embarrased Graham, I missed it too! G1TEX



All-Band Listening Guide

Steve G4ALG email: steve@alg.myzen.co.uk

The QRP Centres of Activity have served us very well, over many years. But knowing where to listen is not always enough, especially when activity is low. The increased number of bands available; increasing sources of QRM; and the broadening range of interests and modes are reducing the chances of making 2-way QRP QSOs.



The Centres of Activity help us to know where to listen, but not when to listen. At times of low activity, this often results in unanswered CQ calls.

It seemed to me that QRPers needed a scheme that associated the Centres of Activity with the time of day, so I started to create a list of requirements.

The five popular QRP bands 20/30/40/60/80m are the bands where I tend to have the most memorable 'ragchew' QSOs; and where I find people operating simple equipment, with much of it home made. So I developed a simple, easy-to-remember schedule that worked well for the five popular bands, and yet accommodated the other HF bands also. The All-Band Listening Guide was the result, helping to bring QRP operators together on a given band, at the same time, when activity is low.

This is how it works. Those interested in a 10m QSO listen (or call) at about 10 minutes past the hour. Those seeking a 15m QSO listen at about 15 minutes past the hour, and so on.

Although the scheme appears to break down for 80m and 160m, if we keep working our way around the clock for these bands, and use the remainder, 80m corresponds to 20 minutes past the hour; and 160m corresponds to 40 minutes past the hour.

Having 80m share with 20m, and 160m share with 40m, seem to be compatible outcomes because QRP operation on 20m usually happens during the day, whereas operation on 80m usually takes place at night. A similar situation arises with 40m and 160m.

Although the spacing (time-wise) isn't great for 12m and 17m, I figured that any simple, easy-to-remember scheme, as with most things in life, is going to be a compromise. In the end, I decided not to mess with it.

These are not intended to be precise listening/calling times. As with the Centre of Activity frequencies, the times are intended to be flexible. And it probably doesn't need to be said, but I'll say it anyway: Operators seeking to operate on a specific band there and then, should continue to do so — regardless of this guide!

The All-Band Listening Guide is fully supported by a range of graphics and other documents that can be downloaded from my web page at:

http://www.alg.myzen.co.uk/radio_g/qrp/operating.htm

I fully expect this schedule to help us, as QRP operators, make the most of our limited operating time. I'd be pleased to learn of your results when using the guide.

Steve, G4ALG G-QRP #10574

The miser's variable loading coil

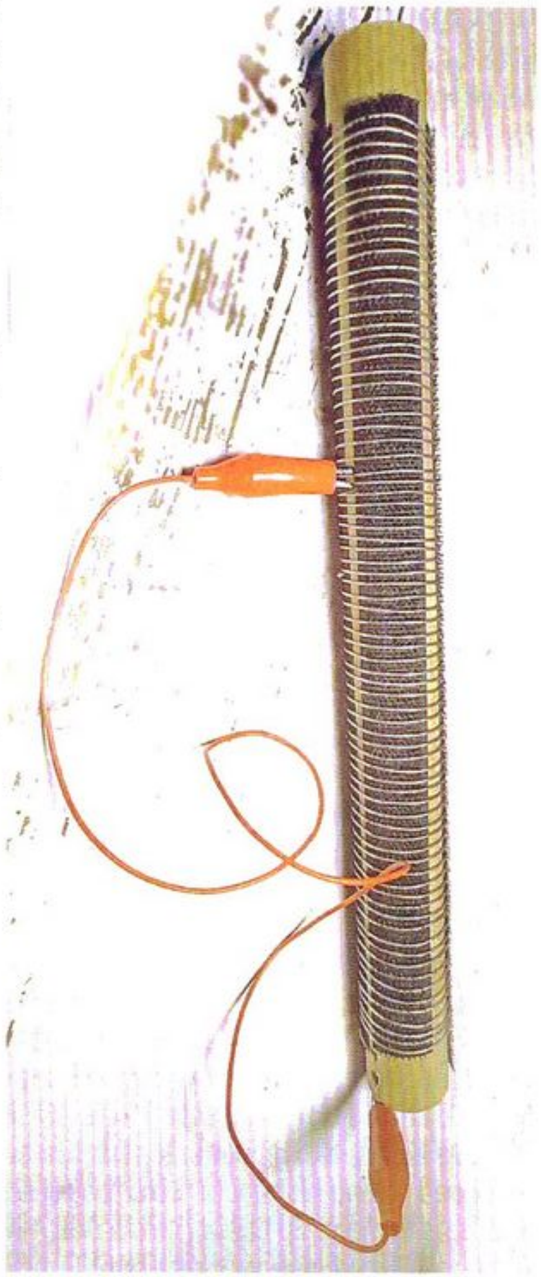
Enzo M0KTZ email: m0ktz@katolaz.net

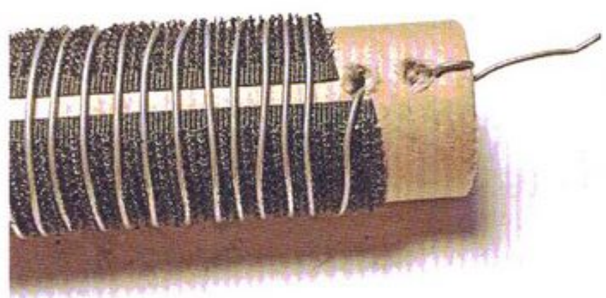
After discussion on the Club reflector, I decided to build a naked-wire variable coil for PAC-12-look-alike antennas. The main issue with those coils is that you really want the turns to remain well separated to avoid undesired shorts. There are dozens of tips on how to achieve that using ad-hoc-sawn perspex formers, 3D printing, molded plastic, or an existing slinky spring, but I wanted something really simple and cheap.

I decided to use Velcro(TM) strip. As a proof of concept, I stuck the "loop" side of 3 self-adhesive Velcro strips of about 30 cm each on a strong cardboard tube (PVC tube is recommended for outdoor use).

The tinned wire is fixed through two holes on a side and then wound on the strips keeping the turns tight on the former and leaving about 3mm between turns (right). The resulting structure is quite stiff, the Velcro strips keep the wire in place, and the space between strips is just enough for crocodile clips(below). The depicted sample has 78 turns, and gives a maximum inductance of over 140µH at 7MHz, and can be used as a base loading coil for short verticals on 40m and above.

Construction time 5 minutes, total cost £3.
Tinned wire and Velcro strip from eBay.





BEWARE: do not raid your XYL's sewing box for a supply of Velcro strip. I've been there - done that, and I now have more chores to do to repay my debt! *HI.*

ON-AIR ACTIVITY Manager

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

Winter Sports

A Bumper Bundle year! Activity levels were high with excellent support from members, and even the sun joined the party by giving us some decent propagation. In all I received 31 logs, which is amongst the highest (if not THE highest) number of WS logs I have ever received. As you may have read, Enzo **M0KTZ** will be taking over from me after this issue and we have collaborated closely in the preparation of this month's column. He informs me that the combined total number of QSOs from every WS log received is well in excess of 1000. Wow, I think we can say that the QRP Flag was flying!

My thanks to all for their participation and to the following for their logs: **G0AXQ**, **G0BPS**, **G0DJA**, **G0EBQ**, **G0ILN**, **G3MCK**, **G3NUA**, **G3YMC**, **G3YPZ**, **G3ROO**, **G3XIZ**, **G4ARI**, **G4COL**, **G4CWS**, **G4GHB**, **G4GIR**, **G4HMC**, **G4HVC**, **G4XUZ**, **GM0EUL**, **GW0VSW**, **GW4ALG**, **M0RON**, **MI0BPB**, **MW0IDX**, **M5AML**, **DM4EA**, **IK1RDN**, **IW1PAG**, **IT9/M0KTZ** and **RW3AI**.

As ever, much as I'd like to include comments and details from everybody, limited space dictates that I can only include a few. For Chris **G4CWS** it was his first WS but he says he will join the fun again next year. Ian **G4COL** is back on the air after 16yrs having been inspired by the chat on the G-QRP Reflector to join the WS activity. Other members for whom this was their first log entry for a Winter Sports include Doriano **IW1PAG** and Pier **IK1RDN**. Our thanks and congratulations to all who entered WS for the first time, and we hope to see you every year from now on! Bill **G4GHB** was defeated by his local noise and sadly pronounced his WS as a "disaster". As usual David **G4HMC** submitted an interesting log which this year included a 160m QSO with me while we were both running a K2 at 100mW. Paul **G0AXQ** is another member who has to contend with a high local noise and so spent some of his time /P with his MTR-4B and halfwave working (amongst others) IZ3AYO who was running 100mW on 20m.

Ian **G4GIR** dispensed with his normal WS policy of using as many rigs as possible, on as many frequencies as possible, and concentrated on trying to work Crozet Island with FT8, but with wire aerials at both ends it wasn't proving easy! Tom **DM4EA** managed to have at least one QSO on all HF bands and ended up with a good number of QSOs, plenty of nice chats, and thoroughly enjoyed **flying the QRP flag**! From his location on Sicily, Enzo **IT9/M0KTZ** had 58 QSOs including 24 DXCC. Valery **RW3AI** used his G90 and vertical aerial to compile his usual high number of QSOs across the HF bands. Andy **M0RON** was pleasantly surprised to find his regular solar panel noise had gone (the local school was shut!) and so was able to make 20 QSOs, all on SSB 40/20m. Andrew **MI0BPB** used his QCXmini on 20m running 200mW and worked IZ3AYQ who was running 100mW. Roger **MW0IDX** finished building his 20m QCXmini on Christmas Eve and enjoyed using it from home and out /P. John **M5AML** submitted a log containing SSB, SSTV and KGSTV QSOs, some of which were on 2.4GHz via the QO-100 satellite.

As you may remember the Club awards a separate prize for the best all-digital mode log which, once again, goes to Dick **G0BPS**. About 30% of his aerial is in the house guttering with the highest point only 8m up. Despite his need to keep the aerial as invisible as possible

(he lives in a retirement village where outside aerials are not allowed!) he still managed 221 QSOs, including 41 DXCC. Our congratulations to Dick for successfully flying the digital QRP flag, resulting in the **Winner's Certificate for the digital section** of Winter Sports.

Ian **G3ROO** had a great time with his new IC705 and with the aid of an 80m dipole slung between two 60ft towers worked into KP4 on 10m, and broke a 30m pile-up to work into VK. Similarly, Andrew **G4HVC** had a super time with 5 watts from his K3 into a choice of 80m dipole, 40m dipole or 3 ele yagi and made 81 QSOs on all bands (excluding 60m) from 80m to 12m raising (amongst many others) OX, XE and 5B4. It was impossible for Enzo and I to separate these two logs and therefore both **G3ROO** and **G4HVC** will receive a joint **Runner Up Certificate** with our congratulations.

There could be no doubt about the **G4DQP Trophy winning entry** this year which was from Chris **G3XIZ**. The variety of different homebrew rigs used (including an ancient Alinco DX77 with outboard h/b attenuator to bring the power down to 5 watts, a 'universal' DSB WSPR TX which gives about 100 mW of 'useful' sideband, a 40m DSB WSPR TX (200 mW) from his Sprat article of years ago, and his new(ish) valve TRX), and the variety of modes used (CW on 136/473kHz, DSB on 160/80m, and even a smidge of FT8!) demonstrates his commitment to supporting the event, and the fun he had. Well done Chris, very many congratulations.

Turning to **Chelmsley**, logs were received from **Chris G4BUE**, **Peter GM0EUL**, **Carl GW0VSW** and **Enzo M0KTZ**. In normal circumstances the log from Enzo would most certainly have been in the running for one of the top spots but in view of his new role within the Club he has classed the log as a check log. **Carl GW0VSW** had 508 QSOs throughout the year (CW and SSB combined) across 8 bands, working a total of 60 DXCC which included plenty of 'juicy' prefixes spread around the world. Carl's excellent log wins him the **Runner Up Certificate**.

However, the entry from **Chris G4BUE** was truly outstanding, as members will be able to see for themselves when his article (based on this entry) is hopefully published in Sprat later this year. As you may know, Chris has recently moved into a QTH which has far more limited aerial possibilities than those he was used to at the previous location. The solution to his new aerial limitations was a "wet noodle" antenna. Before you go looking for the "wet noodle" in an antenna book it is actually, as Chris eventually discovered, actually the description used by G3FXB (SK) for "a poor wire antenna"! At the G4BUE QTH it consists of a 132ft centre-fed inverted vee doublet, fed with 450ohm twin feeder through an Elecraft BL2 balun to a K3 running 5 watts CW.

The centre of the antenna is 32ft high supported by a fibreglass 20ft pole tied to an extension aluminium ladder leaning against the south side of the house. The installation was meant to be temporary but proved so successful that (like all temporary installations) it is still there! The ends are bent at 90 degrees in order to fit the garden with the last 30ft or so of each leg laid along the top of a hedge. Chris has worked an extraordinary amount of Dx with this "wet noodle" (4045 QRP QSOs, 137 DXCC, 675 band slots inc 6m, and 32 CQ WAZ) which clearly shows us all that QRP, even into a compromise aerial, can and does work wonders. His achievements (far too many to quantify here) are an inspiration to us all, and I hope you will be able to read (and see) more information about them when his Sprat article appears. The 2022 Chelmsley Trophy goes to Chris G4BUE – many congratulations.

Suffolk Trophy. A reminder that this takes place on International QRP Day (June 17th each year) – rules to be found at *https://gqrp.com/awards.htm#Suffolk* – and once again the event will mark the beginning of Summer Sizzler (*see below*).

Summer Sizzler. As last year, the event will start on Saturday June 17th (International QRP Day) but this year will run until Sunday 25th June, thus offering the possibility of /P operation over 2 weekends. In all other respects the event is run along the same lines as Winter Sports. That is to say, no rules other than to use QRP, and no points scoring. Just enjoy using QRP on the bands and fly the QRP flag while making plenty of QSOs. Logs to be sent to *Enzo m0ktz@katolaz.net* by 17th July 2023 please.

Gx5LOW. The Club would very much like to maintain a high QRP presence on the bands, particularly during the International QRP Day, and perhaps into Summer Sizzler. Steve **G0FUW** is also very keen for the Club to have a 'network' of ops for 2024 and to make available a 50th anniversary activity certificate along the lines of 'worked all LOWs'. In the meantime, we should all do our best to utilise the call sign in the same manner this year. The only tricky one will be Jersey, as at last count we only had 2 members living there. If it means taking a team to mount a mini dx-pedition (this year and/or next) Steve is willing to give it a go, but perhaps you would like to spend a couple of days (or more) on Jersey operating as GJ5LOW. There's no reason we can't have every Regional Locators operating as Gx5LOW on June 17th so please give this your serious consideration and get in touch with Steve if you would like the opportunity to wave the G5LOW flag on the air from any of the possible UK 'countries'.

Richard G3OTK operated in the 3rd and last RSGB Autumn Series CW Club contest using G5LOW. Inter-G propagation was variable but he managed to maintain a good QSO rate for most of the time, working 83 stations in the 90 minutes of the contest and achieved 4th place in the 10W unassisted section using his h/brew 5W rig and low dipole. This series of 9 contests also includes SSB and data and although G5LOW operated in just 2 of the contests it still achieved 18th place out of 35 clubs in the General Club category. Having then just moved to Somerset, Richard used G5LOW and a temporary 40m dipole to enter the Affiliated Societies CW 80/40m Contest. He managed 65 QSOs on 40m and 5 on 80m where the aerial should really have had a matching unit. The G-QRP Club achieved 23rd place (out of 29) in the General Club category and 19 out of 28 in the individual results. Well done Richard – a fine achievement!

This is my last ever Sprat column, as I am handing the reins over to Enzo M0KTZ who I know is very enthusiastic at the thought of taking over the role and I am sure he will have plenty of good ideas to promote on-air activity amongst Club members and QRP operating in general. Please welcome him to the role by giving him all the support you can because by so doing you will be supporting the Club and helping to keep its QRP ethos at the forefront of amateur radio. All future correspondence (and logs) should go to him: *m0ktz@katolaz.net* .In the meantime, my sincere thanks to you all for the support you have given me over the years. I have very much enjoyed my stay!

Keep the QRP flag flying and hopefully we will meet on the bands soon.

72 de QRPeter G3XJS

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, 28360kHz
But they are "Centres of Activity" so please spread out if activity levels are high.

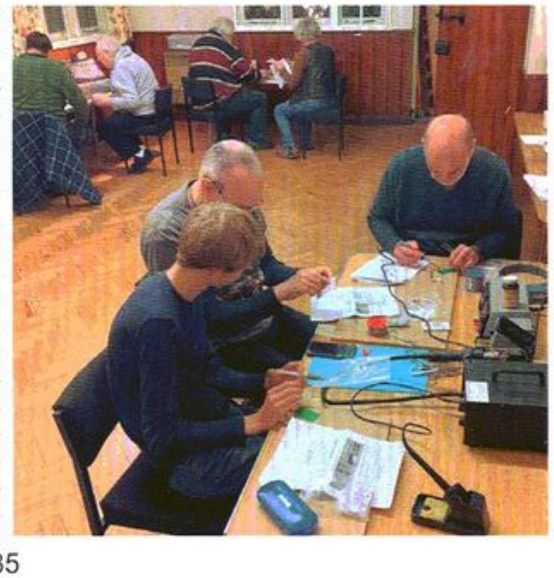
MEMBERS' NEWS

by Chris Page, G4BUE

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

Pictures (right) from **SV1/G4UDG** in November at Loutsa with his KX-2, Emtech ZM-2 tuner and helically wound 66ft EFHW antenna on a small (13ft) flag pole fixed to the balcony rail. Kris' first CQ at 2W resulted in **YU7QF** on 20m, a good start. He made 108 QSOs, 32 DXCC and 13 two-way QRP QSOs, the best being **K1RX** at 4708 miles. **G4EFE** has created 'a scrappy web page' containing all the weblinks in *Sprat* 193 to help those who have difficulty copying long, seemingly random URLs, see <https://martinpeters7.wixsite.com/sprat-weblinks>. **G3VTT** has moved to a bungalow with limited space, but has put a **W3EDP** 84ft wire over his garage and has been active extensively on QRP/LF. During the FOC Marathon contest, Colin worked five US stations on 80m with 5W, one of which was a 'proper' QSO with conversational CW. He says, "It took determination, patience and timing to make the contacts, which is normal for QRP."

OH5JJL has been busy with several QRP projects: a FOXX-3 and a Rockmite (pictured right) both for 30m, and has several other projects in the queue, including a Limerick Sudden RX, TX and ATU. **GØFUW** reports the talks given at the 2022 GI-QRP and G-QRP Conventions are on the Club's *YouTube* channel at <https://www.youtube.com/c/GQRPClub/videos>. **G8TMV** has re-started work on version 2 of his Quartzmite QRPp TCVR and found he still has a couple of Qmite V1 kits if anyone is interested in building one. **N2CQR** was in the Dominican Republic for all of January with a uBITX. Bill is now working to boost output on the higher frequency HF bands. With **KK4DAS**, he is teaching high school students how to build a simple DC RX, see the *SolderSmoke* blog for more details.



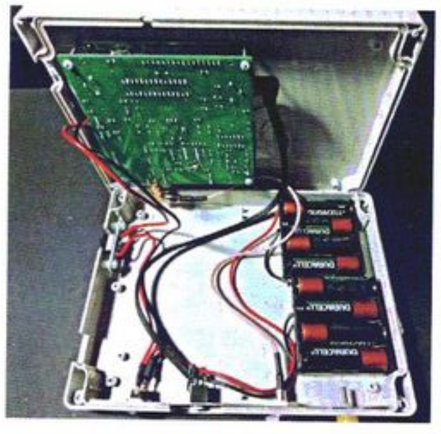
The October meeting of the recently formed Surrey Electronic Maker and Radio Club (SEMARC), that meets 1930-2130z third Wednesday of the month at Grafham Room, Horsham Road, Grafham GU5 0LJ, (l to r foreground) William, **2EØRWR**; Rob, **G8ZAX** and Russell, **G4CTP** (background l to r) Rich **M7GET**; Al, **G8YKM**; Andy, **G4YXW**, and Steve, **G4SDM**. **G4NMD**, who runs the club with **MØREQ**, says it is a hub for home-brewers, and in October they offered the construction of a 20W SMD dummy load as sold by Kanga.

November's meeting was about VNAs and nanoVNAs. The club callsign is **G8KVU** and email is <hamradiobuilders@gmail.com>.

VK3YE's main operating has been HF pedestrian mobile on 20m. Peter writes, "Several contacts made in our early mornings LP to USA and occasionally Europe on 30m. I use a ¼ wavelength wire supported on a fishing pole in a backpack. An L-match coupler and metal strap to make contact with salt water provide good results 30-6m. I use 5W from an FT817, internet search 'Wadetenna'. I've been tinkering with VHF super-regenerative RXs. Hissy but a lot of fun. It's worth experimenting with the quenching for best results. A BFO can also allow CW, SSB and even WSPR reception. Details on my *YouTube* chanel. Have also assembled the FETLer HF regen RX as in a recent *Sprat*. Good results but still not in a proper box yet."

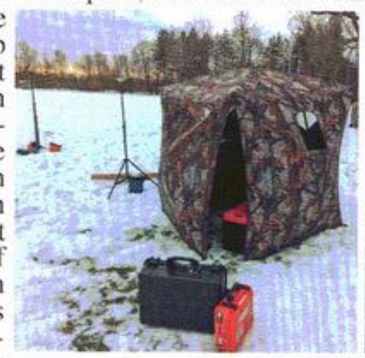
G4MAD's beloved TS120V has developed a fault (randomly slightly jumps frequency) and in the mean time his little SW-3B has been doing sterling service mainly on 40 and 30m into an inverted L antenna. Best DX is **SV5TH** on 40m with 4W at nearly 2485 miles. Paddy enjoyed the last two Valve Weekends with a borrowed valve TX, and is now making a DC HT supply using a salvaged valve RX transformer (above right). He says, "The PSU design is based on the *Practical Wireless* February 1994 *Valve Transmitter For 80m,* giving around 350V DC off-load, and I've also added a -VE bias output. Thanks to a labelling error I put 240V AC into the 115V primary and let the magic smoke out of the main HT smoothing capacitor - quite spectacularly. It sure got my attention! Thus, with tongue in cheek, I've named it The Widow Maker - much to the XYL's horror (above left). I'm now pulling together the parts to make the TX from the same article."

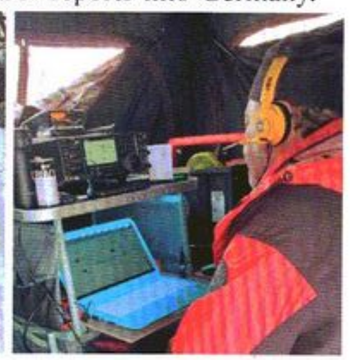
PH2LB got inspired by **VU2ESE**, *Soldersmoke* and **MØNTV**'s video about the PTOs (Permeability Tuned Oscillator) and is enjoying it. Lex says, "It brings me back to the days of the crystal radios I built with my kids." He has plans to build a new crystal radio and a 40m DC RX with PTO based tuning. The picture right shows the PTO glue stick held in place with 3D printed clamps he designed (there is also a front panel mount), and when everything works out, the designs will be published on his website. **MØNDE**'s Arduino controlled HF auto tuner/aerial switch, that featured in *Radcom Plus*, has been halted temporarily due to the high cost of the latching relays (G6EK-134P). Nigel needs 19 and cannot find them for less than £100! His camper is awaiting a new clutch then he hopes to be out and about with the IC-705 in Staffordshire and Derbyshire.



After a break of 30+ years, a random event got **GMØHYY** back into building and he was further stimulated by a **WB2CBA** article about WSPR beacons. Jon then saw his uSDX PCB design and decided to build one, and says, "The 20m one (pictured left) worked great for FT8 but the 40m one destroyed itself twice and being

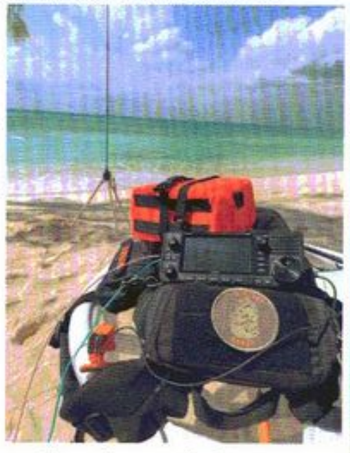
surface mount, and having a collection of PCBs, I decided to build a fresh unit that has worked ok. Since May I've over 950 FT8 contacts with these two TCVRs with a very simple and very folded up loft dipoles. I tried the 20m version portable while visiting Anglesey for CW with a very low half-wave end-fed dipole, and could see RBN reports into Germany."





VE3IPS participated in the Skywide Amateur Radio Club POTA/WFD event in January at Colonel Samuel Smith Park. With over 200 POTA and 60 WFD contacts on 40m SSB, he was with the Heil trigger switch and staying warm with the tent heater (pictured). John used an inverted-vee dipole at 18ft with a IC-7410 using 200aH of LifePO4 battery and a PowerFilm solar panel to keep the batteries happy. Club participation was excellent with many braving the sub-zero weather. **VE3PLJ** had his FT-818 parked on 10m with a 66ft end-fed and was thrilled to make contacts into the UK, Italy and Germany. Club members were surprised at the power of QRP and how a simple set up could enable contacts across the Atlantic.

G6PYF's first build for over 40 years is **N6QW**'s DCR project from *Sprat* 187. David contacted Pete last year and was able to get the Digital VFO working after a little tweak to the code Pete gave him, as it didn't work on first power up. He was very pleased at his first foray into the world of Arduino and module usage using the SI5351 module. David has finished the audio amp, though not yet tidied up, and is in the process of building the DCR itself on some modified veroboard from the junk box. He has also been in touch with **G4IRX** and **G4WIF** who have also built Pete's DCR.



As of 15 February, **ZF2SC** (**KA9P**) reports lots of great QRP QSOs from the beach, with many European stations on 10 and 12m, but no G-QRPers yet. Scott will be there until 24 February. The tripod (pictured right) is home-brew with hollow PVC legs that penetrate several inches into the wet sand at the water edge, filling with sand and water to stabilise the vertical in the 20 to 30 MPH winds. It is over 20 years old, light, inexpensive and easily backpacked. **W2APF** was due to be QRV 2 January-29 March, CW/SSB 80-10m as **VP2MDX** with his KX2, and also from J6, J7, FG and **V47JR**.

GW4JUN has been doing some experiments with 5mW TX on HF (QRPp) and was trying to find a suitable circuit for an SWR/RF output meter that will register a meter reading for such low power levels. **G8JNJ** suggested using the output from a AD8307 to drive an analogue meter to give a nice logarithmic scale, **G4JBE** suggested the books *Test Equipment for the Radio Amateur* by **G4FCL** and **GM4FZH** that contain examples of easy to build milliwatt meters and **GW6NGR** suggested the RF milli-voltmeter described at <http://techlib.com/electronics/detect.htm> that Peter says, "is very useful and cheap to implement as a general station accessory for jobs like this." **GØFTD** said, "The trick for achieving accurate QRPp measurements is using a decent low capacity diode. Forget your crappy 1N4148 or germanium rubbish 1N34s etc, BAS70s are ideal." In my 'microwatting' days, I used an RF attenuator to achieve accurate transmitting power levels.

GØJXX sent this picture of the Worthing Radio Events Group (WREG) 'Codar Test and Repair' day on 28 January when they had nine AT5s, as well as a CR70A RX and a 160/80m TX made by **G3WCE**; (l to r) Nick, **GØPBV**; David, **MØHVD**; Chris, **GØGMC**; Martin, **G7RQD**; Colin, **MØTKK**; Bill, **G8AQX**, and Paul, **G3SXE**. Mike says, "One AT5 came to Mike from a local amateur who thought it was scrap, it wasn't! Actually it was on an 'unusual' frequency and as this part of Sussex was a hot bed of MW pop pirates in the 1960s, you can guess what it was used for! All were tested and there are now nine more working Codar AT5 in service!"

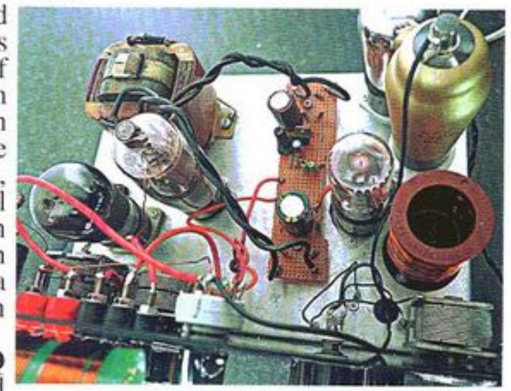
K3DZ recently developed an interest in collecting 'somewhat esoteric laboratory grade test equipment' and one of his recent finds, with a full set of manuals, was a Model 8687 Leeds and Northrup Voltage Potentiometer (pictured left). Frank says, "Wow, what a find! Bringing this instrument back to life has totally distracted me from my first love, QRP home brewed HF radio! Much to my surprise, the potentiometer's plug-in Model 2436 very sensitive sub-micro ampere light beam galvanometer 'actually works'!" To power it, he made the 'battery eliminator' (pictured above) of three separate low-power regulated floating PSUs with a LM337 regulator and small low-current 6.3 or 12.6 volt filament transformers whose output is full-wave rectified bridges made from 1N4004 diodes. The three PSUs are housed in a 4x5x6 inch salvaged aluminium box and tethered to the L&N Potentiometer using DB-9 serial connectors and cable.

Pictured right is **G8YXR**'s 'lash-up 630m QRP TX'. The VFO is an AVO all-wave oscillator, followed by a BD139 buffer and a K1119 MOSFET PA producing about 5W. The antenna is 180ft of wire up a 30ft pole and led round two sides of the garden with a 300uH base loading coil. Ed says, "First contact from Dover to **G4CLO** in Cromer on 473kHz using an RA17 RX. MF is fun!" On 6 February, **K8ZT** did a program for the RSGB on QRP and the video link is <https://youtube/fjaB3r-TXuU>. **GM4VKI** will be at the Blackpool and Glasgow rallies with the 'usual goodies' and will have a presentation video running on QRP talks. Roy has been rebuilding an Eddystone S504 from 1946 with two RF amps and 2 IF. He says it is a very sensitive RX linked with a Codar AT5 TX on 80m.

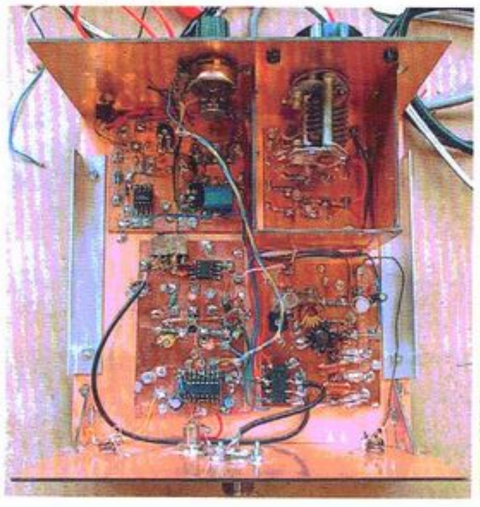
MØKTZ was QRV from his parent's QTH in Sicily over Christmas using a Norcal doublet strung on a balcony and a MCHF clone at 5W on 80-10m. Enzo made QSOs with Asia and USA as well as around Europe. Back home, Enzo built a **G7FEK** antenna for his small garden and says it works much better than the indoor doublet and loft loop he had. He has been experimenting with cheap formers for variable coils for base-loaded whips, and found the

Velcro-on-cling-foil-roll seems to be the most successful so far. **G4TGJ** has continued SOTA activations with his home-brew QRP CW rig and completed his superhet in SMD form for 30, 20, 12 and 10m. Richard is now working on the TX board that will include the BPFs for the RX, designing and testing the filters with the nanoVNA.

GØEBQ has called a halt to building to spend more time on the air, and is finding the higher bands continuing to improve. Even though the output of Nigel's Sierra clone drops below 1W on 12 and 10m (due to using cheaper 2N3819s rather than J310s in the driver, he thinks), he can still QSO USA, the best so far being St Louis, MO on 12m. He says, "I've also completed a copy of the Eddystone All World 2, which is working well with the Skeleton valve TX (pictured right) from a previous *Sprat*, on 80m, and am now raiding my wife's cosmetics for a bottle cap I can use as a tank coil for the TX on 160m, a band I've never previously tried."



A different form of home-brewing from **IW3SQQ** who sent the picture right of his home-made wood *Sprat* binder that holds about six years of magazines. **GØPOY** built the **G4LDT** PSU in *Sprat* 192 with a DPS-1200 module for 100A output. Andy says, "There are at least three different control boards used in these PSUs, and so far only two have been successfully hacked to give 13.8V. There is a *YouTube* video, which presents a few seconds of video, showing the basic modification and views of the two common control boards, and where to make the modifications, at <https://m.tube2.me/view/F0QWQntPkO4.htm>. See also <https://www.flickr.com/photos/g0poy/albums>, click on '100A-station-PSU'.



GØFUW has been updating the QRP chapter in the *RSGB Radio Communications Handbook* that involved him building the 80m CW TCVR the editor included in the chapter (pictured above). Steve says, "Good news is that it is still buildable in 2023, and works. A report of my project work was in the March *RadCom*. I have since added semi-break-in and am testing a few CW filters, with some success. Ages since I have been on 80m CW from home, seems the noise levels have dropped a bit and I have made some contacts with the project rig." **MØNTV**'s last video of 2022 at <https://youtu.be/xYY_rAS8cyk> is about modifications he made to his recent all-analogue DC RX.

Thanks to all the contributors. Please tell me how your spring goes for the Summer 2023 edition of *SPRAT*; what you have been building, who you have been working, and any other information about QRP, by 12 May. 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 summer and autumn months, so I can let members know to listen out for you.

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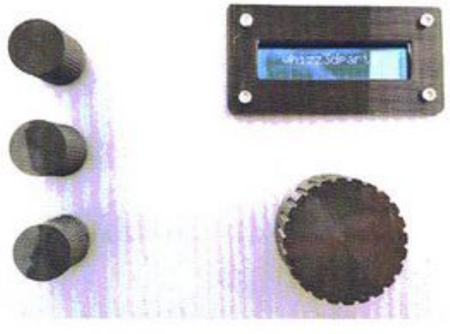

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