SPRAT

THE JOURNAL OF THE G QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

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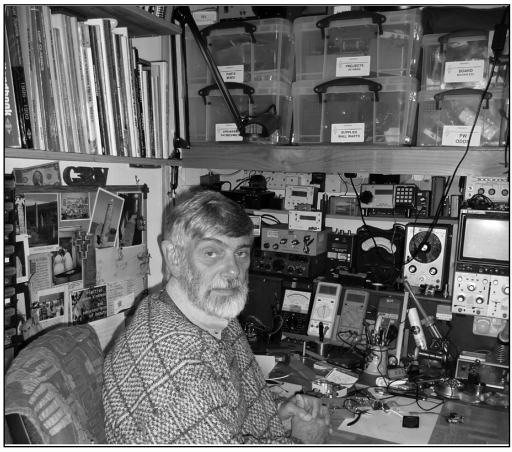
Angus (Gus) Taylor, G8PG, SK

G3VTT 6V6 Regenerative Receiver

In This Issue:

JOURNAL OF THE G QRP CLUB



Rev. George Dobbs G3RJV

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Homepage : www.gqrp.com

Rishworth Convention 2011 – An open invitation

Because of circumstances beyond our control, we are no longer able to use the laboratories where we held the Buildathon and Equipment Display. Currently we plan to move these to the Friday evening before the convention and have a **"Constructor's Evening".**

We have secured the use of a church complex some 5 miles from Rishworth. It includes a comfortable room for a Buildathon and display of homemade equipment, it also has a lounge area for people to meet and share ideas (we could organise PowerPoint presentations if desired). There is a separate bar area and we plan to arrange a light buffet during the evening. The idea is to have an evening for anyone interested in radio construction – showing their projects, sharing ideas or joining the buildathon. The buildathon project will probably be a Z Match ATU. If you are interested in being part of the Constructor's Evening let George (g3rjv@gqrp.co.uk) or Graham (g3mfj@gqrp.com) know (postal addresses are also in SPRAT) so we can go ahead with our planning.

72/3

G3RJV

The W1FB Memorial Award 2010/2011

The award for 2010/11 goes to Pat Smith, GW0VMR for his Plasma Nuller design in SPRAT 145. A plaque will soon be on the way to Pat. The next challenge for the award will be announced in the next issue of SPRAT

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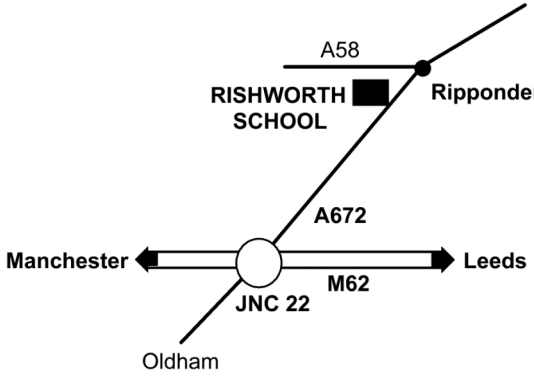
THE G QRP CLUB
MINI-CONVENTION

(in conjunction with the Halifax Radio Society)

Saturday 22nd October 2011
The Rishworth School, Ripponden



OPENS AT 10.00am
ADMISSION £2
DOORS OPEN 10am
TALK-IN S22
LARGE SOCIAL AREA
LECTURES ON
QRP SUBJECTS
BRING & BUY - SURPLUS
JUNK - COMPONENTS
KIT TRADERS
FOOD & DRINK ALL DAY
WITH THE FAMOUS PIE AND PEAS

The Rishworth School is on the A672 (Ripponden) road from Junction 22 on the M62. [Postcode: HX6 4QA]

Look for the G QRP Sign on the left after you have passed all the sheep!

LOCAL ACCOMMODATION:

The Hobbit Hotel has closed and is no longer available. We can suggest

The Premier Inn, Milnrow. Junc 21 on the M62 (Tel: 0871 527 8936)

http://www.premierinn.com/en/hotel/ROCTHE/rochdale

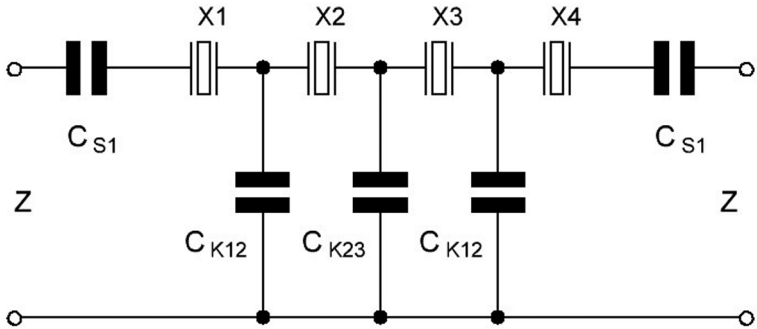
The Malthouse, Rishworth. Almost next door to the school – only 5 rooms (Tel: 01422 822382) www.malthouserishworth.co.uk

The Turnpike Inn, Rishworth, excellent but quite expensive. (01422 822789) www.turnpikeinn.com

The Premier Inn, Huddersfield West, is also close to the venue.

The GQRP Club 10 MHz SSB filter

Jack Hardcastle G3JIR 8 Norwood Grove, Rainford, St Helens, WA11 8AT



-3dB Bandwidth		Ripple	Z	C_{K12}	C_{K23}	C_{S1}
Design	Measured	dB	Ohms	pF	pF	pF
2400 hz	2311 hz	0.3	150	100	120	120

A batch of six of the 10.006MHz crystals which are available from Club Sales have been tested in a 4-pole SSB ladder filter. It was designed using the Dishal program available from the Warrington ARC web site. (www.warc.org.uk/projects). The design is shown in fig.1, but so you may design your own filter I am listing the input parameters for the program, in the order they need to be entered.

Cm=20.1fF Fs=10002.166kHz Cp=7.6pF BW 2.4kHz Ripple=0.301dB. Xtals=4.

Hitting the 'Calculate' button presents you with a full set of component values and the frequency response of the filter. Go to 'Table' in the tool bar and you have the option of a numerical listing of the insertion loss at salient points throughout its response. Also, a comprehensive help file is provided so I do not need to give extensive instructions in the use of the program here. There are, however, several things I can tell you which will help you to interpret the output from the program.

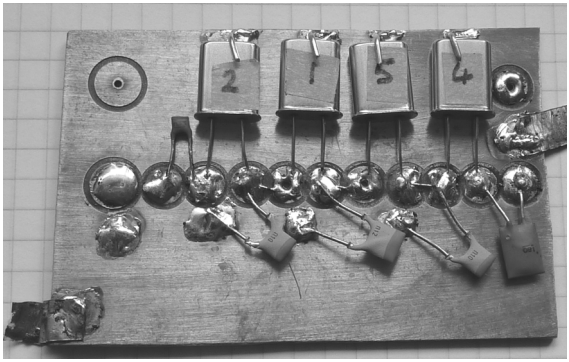
Firstly, you need to check the frequency of each crystal in your batch. In an ideal world these would all be identical, and if you find this to be the case go and buy a lottery ticket immediately. Obviously its your lucky day !!! For the rest of us mere mortals the simplest way to do this is to test them in an oscillator and organise them in descending order of frequency. Separate the highest and lowest specimens; these will be suitable for carrier oscillators in the finished rx, or tx. Next select a pair of crystals which are as close to the same frequency as you can find; preferably near the bottom of the list. These are X2 and X3 in my 4-pole filter. You will see that all the capacitors are preferred values. This is not a fortunate accident. They were arrived at by using Dishal in an interactive mode. Initially the input parameter for ripple was 0.1dB and this value was slowly varied until the

present output was obtained. You can play the same game with bandwidth. Both of these values can be increased slightly without imperilling the final performance. Because the crystals have a finite 'Q' the passband will always become rounder than the design value, so this will mask the increased ripple. At the same time it will reduce the -3dB bandwidth. For instance, my 2.4kHz has become 2.311kHz in the final product and the ripple is over twice the design value.

X1 and X4 together with Cs1 required rather more work. If these two crystals were identical with their two neighbours you could just fit the designated value capacitor and the job would be complete, but in my case I needed to select these capacitors to suit the crystals. Firstly measure the effect the coupling capacitors have had on the series resonant frequency of X2 and X4. Putting a capacitor in series with a crystal raises its series resonance so you need to check this by temporarily putting X2 in series with Ck12 and Ck23 and measuring the resonant frequency. Then do the same with X3.

Now you know the target frequency for X1 and X4 tune them to the same frequency by selecting suitable values for each Cs1. Remember that the smaller the capacitor the greater the frequency increase will be. For example, my input and output series capacitors were 330pF and 180pF instead of the calculated 120pF. It may even be possible to find a crystal which is so much higher in frequency that no series capacitor is needed. This is why I suggested that X2 and X3 should be from the lower end of the range.

Finally, to design more ambitious filters using 6, or more crystals, the Dishal program needs this number to be entered as an input parameter. All the information for design and testing of these filters is available on the WARC website in the selected articles from the amateur radio journals which have been included with the permission of the RSGB and ARRL. To save space in Sprat additional details of the test filter are being held over for inclusion on the GQRP website.



G3JIR Prototype Filter

From G3MFJ –

We have had a fortunate purchase of a large number of the above mentioned 10.006MHz crystals and we can offer them in batches of 10 for £5 plus postage. Sort out the best for the filter, others for BFO etc. Postage will be as for components as listed on the back page.

ZL2BMI DSB 80m Transceiver – Correction & Update

Eric Sears ZL2BMI, sears@xtra.co.nz.

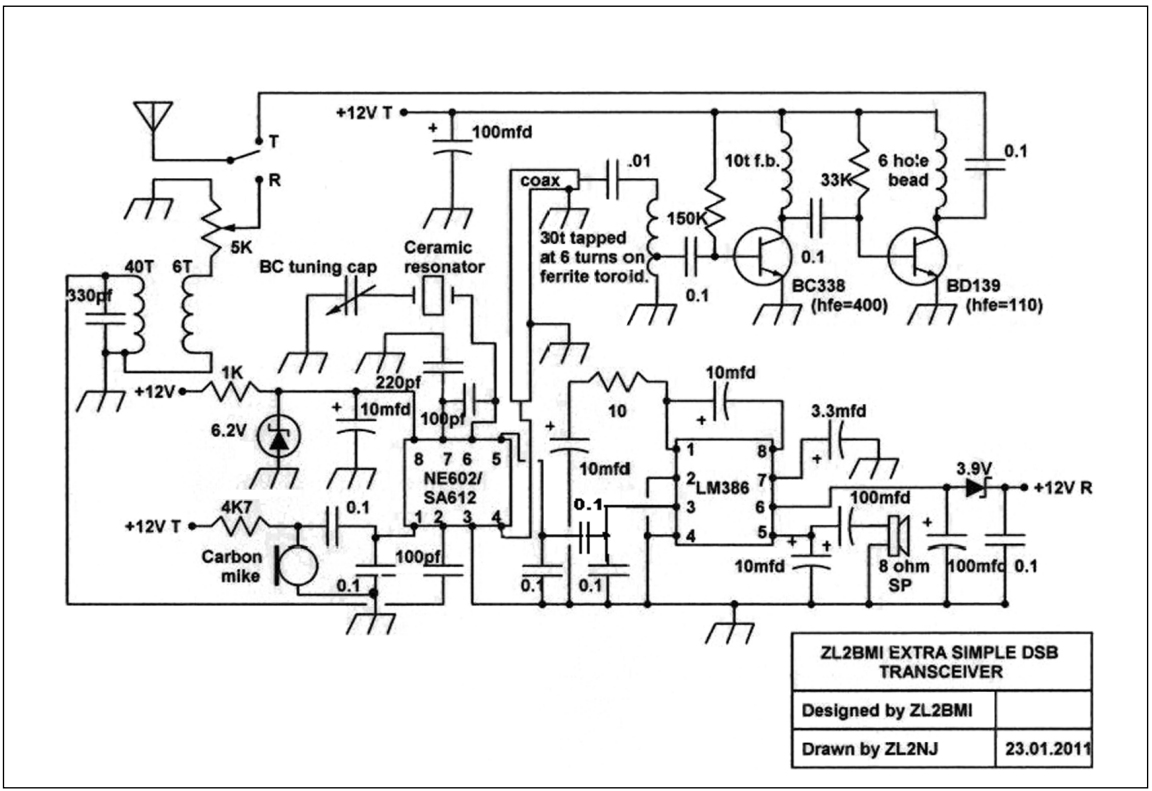
Despite my best checking, one small error crept into the final form of the circuit sent to George for the last Sprat. Basically the connection to the resonator or crystal should come directly off pin 6 (not 7 as shown).
Phil (ZL2NJ) has kindly redrawn the circuit, together with another modification, so perhaps it might be best just to show the complete circuit again.

Although we had realized that the oscillator frequency (when running with a resonator) was being pulled when the NE602 was modulated; it was still usable and besides this, we were mostly using fixed frequency (crystal) for our contacts when in the bush.
However, Bob ZL2ASO, had fitted a cw mod (which means just shorting pin 1 or 2 to ground via a 10k resistor), and we found that the shift was up to 500Hz, depending on which end of the resonator band was tuned (in some spots it was more like 100Hz), and depending which pin was grounded.

Subsequently I did some tests and found that if pin 4 was used as the dsb output (with pin 5 bypassed), this reduced to less than 30 Hz shift. Since the NE602 is symmetrical I still don't understand why this should be so, but it occurred for any 602's/612's that I tried. So we have reversed the connections – pin 4 is now the dsb output and pin 5 the audio and this gives great improvement to the modulation.

A further mod (which I am less confident about) follows Peter VK3YE's modification of my original rf output of many years ago. For the bias of the BD139 he uses 10k to the +ve line and 330 ohms to ground. Not surprisingly, this cuts off the BD139 and it draws only 1mA with no modulation. Amazingly, when modulated it sounds fine and puts out a better signal – drawing over 350mA on peaks and with reports of much greater signal strength. In fact I have tonight been working Bob (ZL2ASO) portable with his rig so altered, while he is in Hawke's Bay, a distance of about 400km from here. At times he was 5/7.
Bob says that on the scope the signal looks fine – but I would expect some harmonics to be generated – so its even more essential to fit some sort of filter! Try this mod at your peril!

There is also a possibility that when the rf gain is up full, some rf seems to be fed back into pin 2 during transmit and can cause a large residual signal to be transmitted. This happens particularly if (like me) you are using a bulb as a load close to the set – which sets up quite a large rf signal close to the set. Ideally some sort of diode switch might short pin 2 to ground during transmit. This doesn't seem to occur with all rigs – possibly due to layout.
Phil ZL2NJ's idea of a shielded can around the aerial coil (or maybe the use of a toroidal coil), is very likely helpful here. Actually the standard coils that Phil uses would be very helpful to those who like to use ready-made components.
Thanks also to Rob PA3EQB who has done a lot of valuable experimenting with the circuit.


+12V T
100mfd
T
R
5K
40T
6T
330pf
BC tuning cap
Ceramic resonator
coax
.01
30t tapped at 6 turns on ferrite toroid.
150K
10t f.b.
33K
6 hole bead
0.1
BC338 (hfe=400)
BD139 (hfe=110)
1K
+12V
220pf
10mfd
100pf
6.2V
8 7 6 5
NE602/ SA612
1 2 3 4
10
10mfd
10mfd
LM386
3.3mfd
3.9V
+12V R
100mfd
4K7
+12V T
0.1
Carbon mike
100pf
0.1
0.1
0.1
10mfd
8 ohm SP
100mfd
0.1
ZL2BMI EXTRA SIMPLE DSB TRANSCEIVER
Designed by ZL2BMI
Drawn by ZL2NJ
23.01.2011

The DCR4 Experimental Short-Wave Receiver

Rev. Keith Ranger, G0KJK, 144 Newton St. Macclesfield SK11 6RW
keithcath@ranger144.fsnet.co.uk

For many years I have derived huge pleasure by operating on the amateur bands with the simplest of home-built equipment - a three stage transistor transmitter capable of up to 3 watts output, a regenerative receiver covering nine HF amateur bands and a 33 or 66ft end-fed wire aerial plus home-brew ATU, giving me in good conditions CW contacts with West Africa and South America, but this article represents a quite recent interest, the experimental design of a Direct Conversion Receiver. It makes no claim for sophistication or excellence, there is no Attenuator or AF Filter, but using only a one metre long telescopic aerial mounted on my shack desk it pulled in three VK2 stations, 9V1YC and 9M6/VO1AU in a matter of minutes in the Spring 2011 BERU Contest, all at good strength and indeed peaking at 589 (maybe conditions are at last perking up!!). All three Cyprus prefixes (P3, C4 and ZC4) were also available for the receiver's log the next morning! SSB and CW are both easy to resolve with this circuit and there is plenty of AF amplification. I only use an 8 ohm Loudspeaker with the DCR4 although a quick test of both magnetic and crystal earpieces gave good results, so almost any pair of headphones could probably be used. I prefer to do all my DXing with a loudspeaker!

So, why the DCR4? DC stands for Direct Conversion; CR stands for Ceramic Resonators; 4 transistors are used and four harmonically-related amateur bands are available - 80, 40, 20 and 15 metres. The first station I received on the prototype after its completion was calling CQ on 15m SSB.. The final AF stage is the well-known LM386 chip. The long-suffering XYL frequently pleads for the volume to be turned down, so if like me your eardrums are aging you should hear well with this circuit!

Design considerations were:- (1) overcoming the typical DC Receiver problems of excessive hum and AF microphony (both achieved in the DCR4) (2) Adequate sensitivity avoiding strong BC station breakthrough especially after dark, achieved by using only a 3ft long telescopic aerial followed by a high-gain RF stage, which also gets rid of hum, and (3) Four amateur bands with at least nearly complete SSB and CW coverage using two switched Ceramic Resonators (3680 and 3580 KHZ, both available from G QRP Club Sales, the 80m SSB allocation being the difficult challenge). Selectivity is reasonably good despite the absence of AF filtering and attenuation of very strong signals can easily be attained by de-tuning the peaking filter between the RF stage and the Mixer.

Circuit and Construction Notes

(a) Three miniature toggle switches are used in the DCR4. These are all 1P2W but SW 2 used in the Peaking Filter must be a centre-off type. This is deliberately an experimental receiver so the two positions on SW 2 are to enable an appropriate value of inductance (say, 3 microhenry) and capacitance (say, 100pf) to be placed across the T-68-2 secondary (which should cover 40m) to bring in respectively 15 and 20 , and with the extra capacitance, 80. With some cut and try effort the filter should then give coverage of all four bands. This is worth the time to get it right, it makes a massive difference to the DCR4's ultimate performance.

(b) Do not be tempted to reverse the positions of the RF stage and the Peaking Filter. Hum eradication depends on the sequence shown.

(c) The FT80 ferrite core specified for the Mixer is available from the always helpful Will Outram of Bowood Electronics and is listed as item FRA220 on Will's Catalogue. It is considerably larger than a FT37 or 50 ferrite ring, in fact it has a diameter of 22mm, but it makes a superb heartland for the all-important trifilar-wound Mixer. For ease of winding it's possible with this large ring to use twisted windings of three different-coloured plastic-covered bell wire, making winding separation easy to spot when the trifilar windings are subsequently soldered up. Of course, a smaller ring will work but I prefer ease of circuit assembly! Will's price for the FRA220 in March 2011 was 45p.

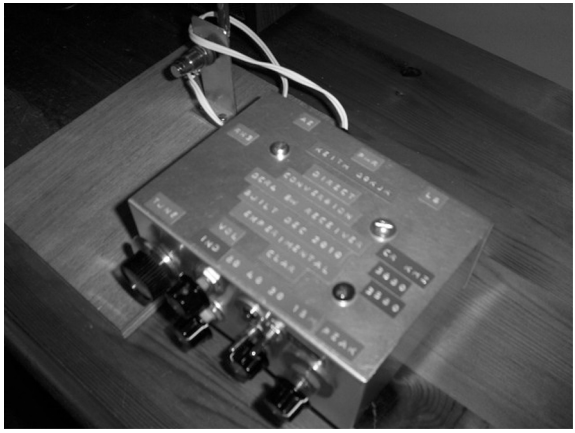
(d) Do not omit the 2.2 microfarad capacitor from pin 7 of the LM386 to ground or the 10 ohm resistor across the loudspeaker socket. Both these have been found to contribute to crisp and clear audio, especially the note of CW stations.

(e) As to performance, the total volume possible from the four amateur bands covered decreases with frequency and is loudest on 80. This is because harmonics of the oscillator are used in conjunction with the Peaking Filter to give 40, 20 and 15 metres. However, the circuitry of the oscillator stage ensures powerful harmonics on these higher frequency bands and room-filling volume is available on them all. Ask my XYL!

(f) Whatever layout you use, it is of the utmost importance that AF-Stage wiring is kept away from RF and Mixer Stages. My prototype is 100% stable and the AF volume control can be fully advanced on all frequencies without microphony.

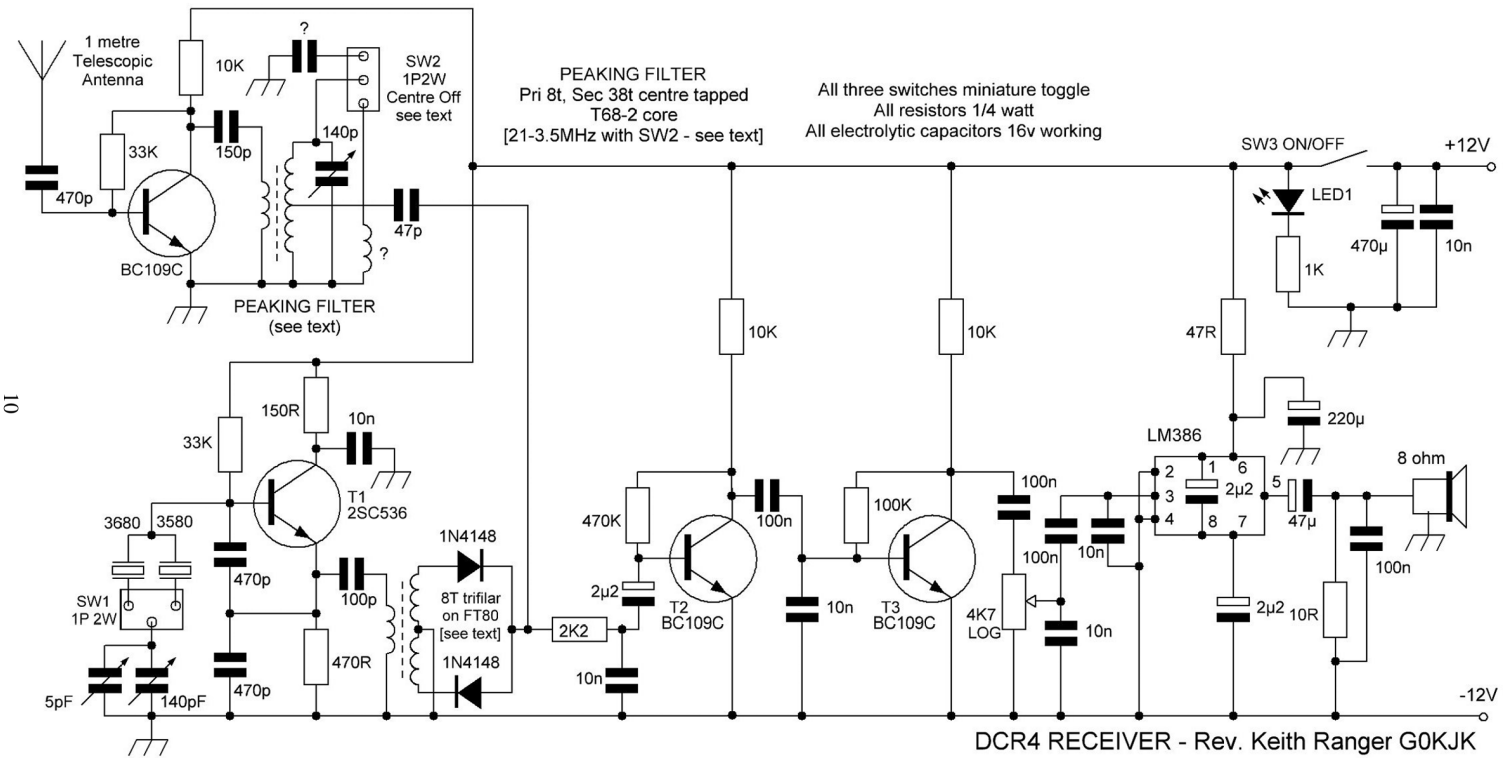
(g) Component values can be considerably varied and satisfactory performance still expected. This is an experimental receiver - be prepared to experiment! You may need to increase decoupling values in the AF and especially LM386 Stages. Persevere! A really usable DX receiver using only a telescopic aerial really is achievable. I really enjoy using the prototype!

Experimenter's Note – A 10uH axial choke can be placed in series with the ceramic resonator SW1 center pole, if desired, to extend the 140pF capacitor's tuning range.



May I wish you good success! Please feel free to contact me by email if you wish, at keithcath@ranger144.fsnet.co.uk. I would like to know how you got on!

The prototype receiver


1 metre
Telescopic
Antenna
470p
33K
BC109C
10K
?
150p
140p
?
SW2
1P2W
Centre Off
see text
47p
PEAKING FILTER
(see text)
PEAKING FILTER
Pri 8t, Sec 38t centre tapped
T68-2 core
[21-3.5MHz with SW2 - see text]
All three switches miniature toggle
All resistors 1/4 watt
All electrolytic capacitors 16v working
SW3 ON/OFF
+12V
LED1
1K
470µ
10n
47R
220µ
LM386
8 ohm
2µ2
47µ
100n
10R
4K7
LOG
10K
100K
T2
BC109C
T3
BC109C
470K
2µ2
10n
100n
2K2
T1
2SC536
33K
150R
10n
3680
3580
SW1
1P 2W
470p
100p
470R
1N4148
8T trifilar
on FT80
[see text]
1N4148
5pF
140pF
-12V
DCR4 RECEIVER - Rev. Keith Ranger G0KJK

My Version of the FOXX Transceiver

Peter Howard G4UMB, 63 West Bradford Road Waddington Clitheroe Lancs

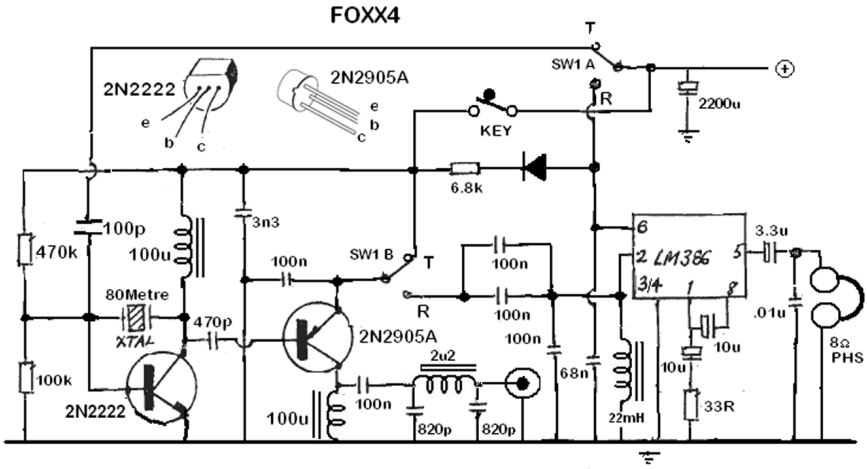
This is my version of a well known transceiver the Foxx. Several circuits of this are to be found in Sprats. The circuit I have made here deals with some of the problems I found with Direct Conversion receivers in general.

(1) Mains hum, so I added a simple LC filter.
(2) Offsetting the oscillator so you don't zero beat your transmitter to the receiver when using the same crystal for both.
(3) Higher audio amplification. With DC receivers the main amplification is done at audio frequency hence the need for adding the extra components to the audio IC to increase it's gain.

The output power using 13volts is 2 Watts . The rig uses the standard cheap club crystals for 80 metres. To fit them I made a simple socket by wrapping wire around the pins. Wire ended crystals can be fitted into a section of an IC socket

A 12v piezo sounder could be added if a sidetone is required.

All the inductors were bought ready made. I made it on stripboard.



FT817 Tip

To owners of FT817's; DVD player thick fabric cases just nicely fit the transceiver and the PSU (plus EU adapter) with a pocket for leads, antenna adapters and simplified operating book. I got some in Huddersfield Saturday Market £1 each. Even have carrying handle and optional shoulder strap. David L G3PTU, Halifax R S.

Multi-banding the GW0VMR Plasma Nuller

David Oliver G4HMC, Chalk Lodge, Peters Lane, WHITELEAF, HP27 0LG.
jdoliver500@aol.com

Over the years I have suffered various forms of qrm from neighbour's electronic devices, including pla adapters and wireless router power supplies. Most if not all of these have been dealt with at source either by me speaking directly to the householders or with the assistance of BT or Ofcom.

For some months I endured qrm from my immediate neighbour's plasma TV. Unlike most noise sources which predominate on the lower bands, the harmonics of this TV were a real nuisance on the hf bands too, and of course there is no easy fix other than changing the TV!

I was therefore very interested to try Patrick Smith's Plasma Nuller circuit published in Sprat Nr 145. The circuit was built initially for 80m using Toko 3334R 10k coils which I had in my stock, and a 240pF polyvaricon capacitor. The coupling links on the 10k coils were used for both aerial input and output to the amplifier stage instead of the capacitive coupling in the original design.

The device worked so well on 80m that I decided to multi band it using 3335R coils. The two sets of coils give coverage from 80 to 17m. A further set of 3333R would give top band coverage.

Reducing 12pF top coupling capacitor to 8 to 10pF is a fair compromise for multi band coverage so as to avoid a 'double humped' response on the higher bands.

As I didn't have a band change switch with sufficient wafers, I used miniature relays for coil switching with a single wafer band switch on the front panel.

The polyvaricon tuning capacitor is used without a slow motion drive, and although a bit fiddly, it is manageable enough. As I use the nuller with a transceiver it was necessary when on transmit, not only to ground the noise antenna input but also to isolate the nuller output. This was done in both cases by means of a reed relays activated from the transceiver timing circuitry.

I am very impressed with the performance of the circuit which kills various noises including switch mode power supply birdies stone dead.

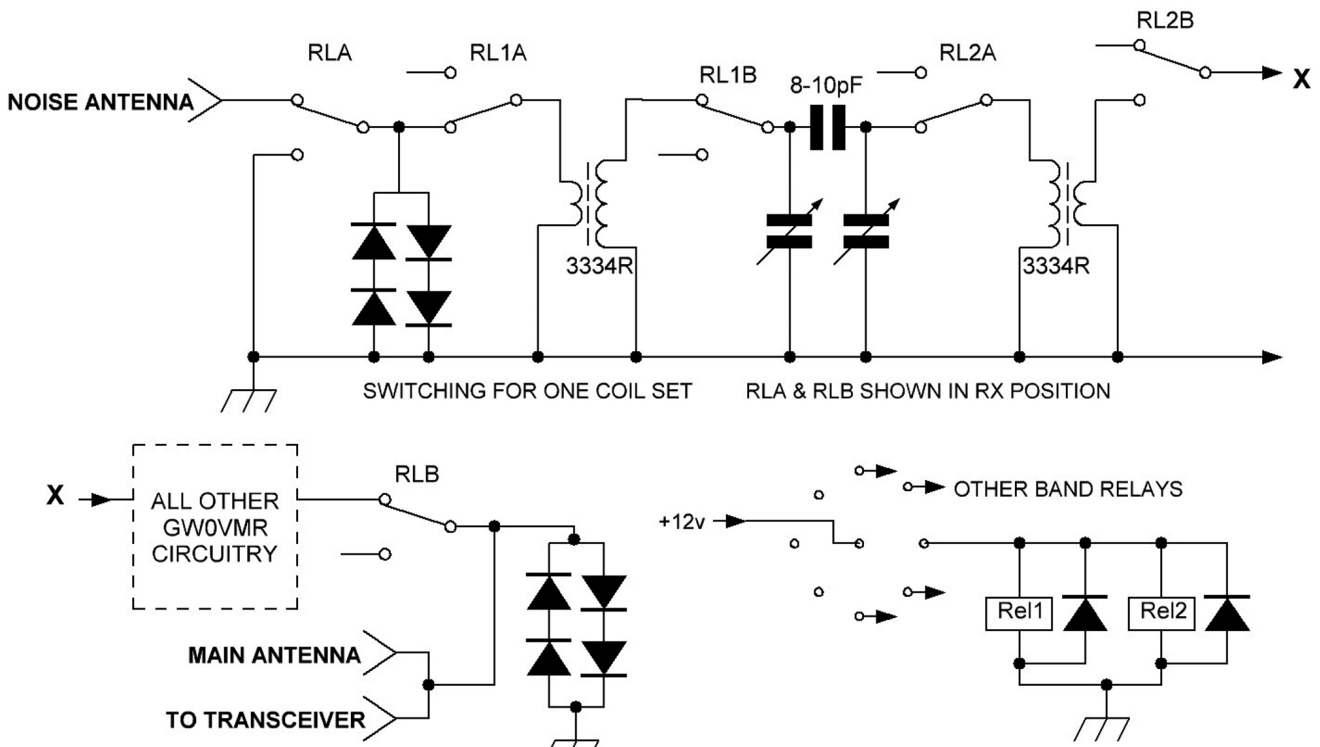
The amplitude and phase controls are adjusted sequentially until the offending noise is reduced or eliminated. An indistinct null indicating phase reversal is required using the phase reverse switch.

10k coils and FT-50-43 toroids are available from GQRP Club Sales as are twin 140pF polyvaricon capacitors which could be padded with 100pF polystyrene or silvered mica capacitors for the lower bands.

Patrick has referred to the importance of the noise aerial, and it cannot be emphasised too strongly, particularly for a low gain device like this.

Some commercial designs use higher gain requiring smaller aerials but with the risk of cross modulation in your receiver.

A portable receiver would come in very handy in identifying the location of the noise source and placing of the noise aerial.


RL2B
RLA
RL1A
RL1B
8-10pF
RL2A
X
NOISE ANTENNA
3334R
3334R
SWITCHING FOR ONE COIL SET
RLA & RLB SHOWN IN RX POSITION
X
ALL OTHER
GW0VMR
CIRCUITRY
RLB
MAIN ANTENNA
TO TRANSCEIVER
+12v
OTHER BAND RELAYS
Rel1
Rel2

The Class D Gold Mine

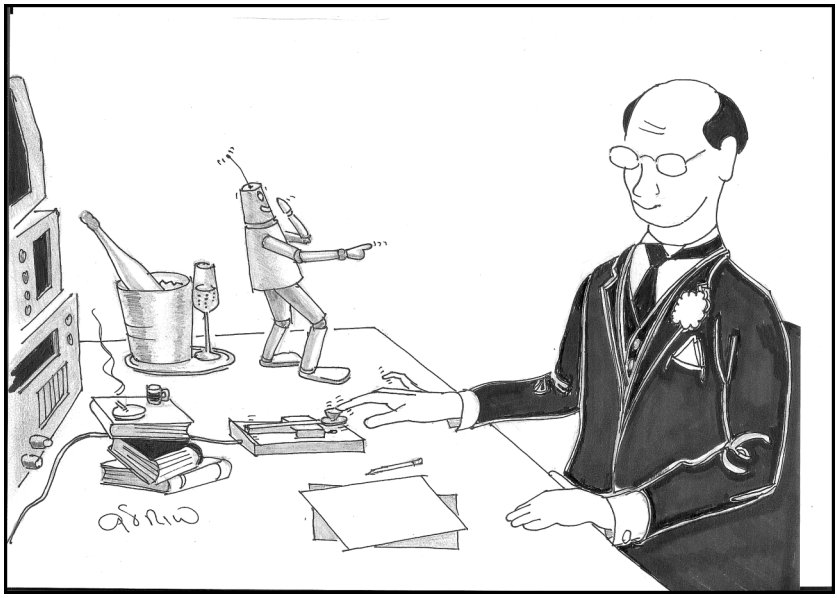
Geoff Wooster, G3YVF

Have you ever thought to look at one of these in a different light? You might after reading this.
The Class D wave meter was designed to measure and generate frequencies between roughly 1.5 to 9Mcs (to 1kcs) and contains a variable oscillator on roughly 3.5 or 6.5Mcs as well a crystal controlled one on 100 or 1000Kcs. It has a built in 6v vibrator power supply. I take my hat off to the designer, as it is a very clever piece of apparatus indeed.

They contain the following:

1. A silver double bearing tuning capacitor with a 0 to 100 dial and mounting assembly. This dial can be married to any number of home made coils to give a 0 to 100Kcs exactly calibrated dial with a read out to 1Kcs….wave meter accuracy. Who needs digital readout?
2. It has two coils and a three way yaxley wafer switch (not to mention air spaced silver trimmers) in a tuning heart which can be easily manipulated to read 3.5 to 3.6 or 7.0 to 7.1 or 10.1 to 10.2 exactly……with the flick of a switch !
3. The coils come with a feedback/coupling winding so for a start it is easy to make a trf covering the above bands or a multi band vfo.
4. A nice project cabinet with chassis having three or four octal valve holes punched in it.
5. At least three international octal valve holders.
6. A 1Mc/s and 100Kcs crystal.
7. Three individual “banana sockets” of the type used in a Paraset for the crystal holder/antenna/earth connections.
8. A wonderful small potted (valve type) very high to low impedance output transformer.
9. Bakelite knobs and jack sockets and a rather substantial bakelite mains type switch.
10. Brass sheet and numerous little brass right angle brackets some of which are threaded.
11. A potted dust iron rf choke around 5mH

12. A paxolin coil former with a rather handy “80m” size coil wound on it.
13. A large brass antenna type terminal.
14. Two 6K8 mixer valves.
15. Two six-volt vibrators and a 6v to 150v vibrator ht transformer.
16. Lots and lots of little nuts and bolts.
17. Small pieces of paxolin
18. A good selection of brass spacers…some of which are nice and tall.
19. Unwanted holes in the chassis can easily be filled using solder. Once rubbed down and sprayed the result is a professional looking chassis.
20. 50k trim pot.
21. A 150v metal rectifier…oooerrr!
22. A wealth of parts and they are cheap…yours may even come with its set of DLR5 headphones as well. And at generally for a fiver…. what more can one want! The infamous Bodge-it and Scarper construction company has built many-a-thing using one of these as the starting point.

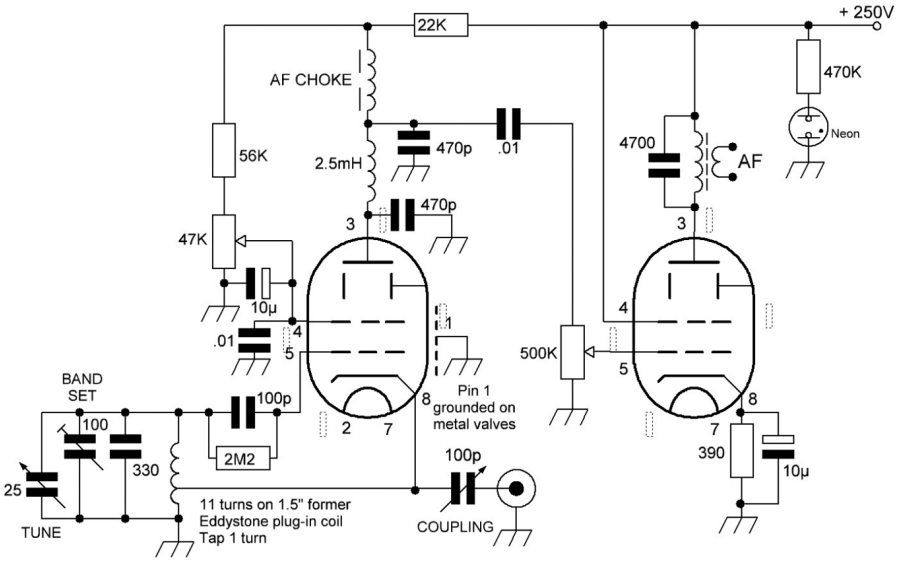


Harris took the “CW with Style” Contest very seriously (G8RIW)

Stable Regenerative Receiver using the 6V6

Colin Turner G3VTT 30 Marsh Crescent High Halstow Rochester Kent ME3 8TJ
G3vtt@aol.com

I've read somewhere on the Internet that the 6V6 makes a pretty good regenerative detector, giving low distortion at low plate supply volts, and a pair of them give good audio amplification, good enough to power a loudspeaker. I was also sent a magnificent article from 'Electric Radio' by WU2D on the suitability of various valve detectors by the G3MCK, G4GDR magazine circulation route and aided by some prodding by Bodgit and Scarper at G3YVF I decided to give the circuit below a try. The results have been magnificent and are worth trying particularly if you use a simple passive audio filter to remove any noise or hum. Incidentally the WU2D article points out that the 6AQ5 also makes a good detector along with the 6K7 and other low mu valves. Steer clear of those high gain types and while you are at it try plenty of tank capacity and a cathode tap very low end of the coil!



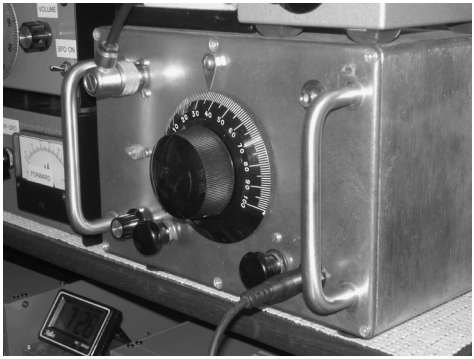
I used a plug in coil with the option of trying higher bands so if you want 40m or 30m you will need to juggle the turns and tank capacity. That whopping great 330 pfd across the tank along with the trimmer and low value tuning capacitor give good bandspread, (mine covers the first 80 KHz of 80m - what more do you want?), and there is little pulling of the received frequency by the attenuator trimmer in the cathode tap circuit.

The only awkward component is the audio frequency choke in the anode circuit of the detector which I lifted from a BC221 but any high value, (30H?), choke should do the trick. You may need a 100k resistor across some chokes to give smoother audio and

regeneration but my circuit didn't giving high level audio and CW response with the '221 component. The 22k resistor in the detector HT should be 2 watt component.

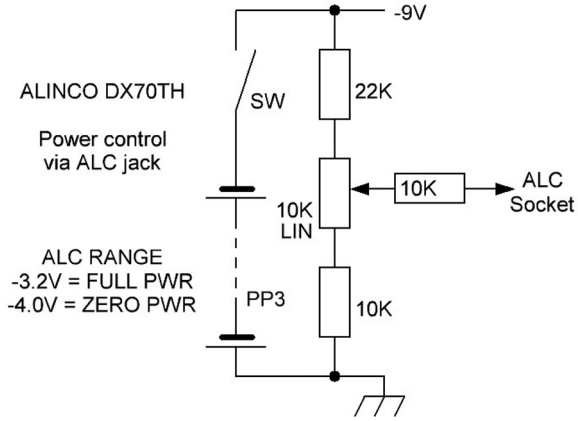
By using a well decoupled screen circuit there is little electrical noise from the wiper of the regeneration control and the audio output really can drive a loudspeaker, in fact sensitivity and overall gain make for a readily usable receiver. The only short coming is selectivity so on contest weekends its perhaps a good time to check out the garden. For general day to day activity the receiver is quite pleasing.

The usual G3VTT/G3YVF QRP operations dictate all home brew QRP rigs must be capable of 12 volt DC supply operation permitting beach operation so the two 6V6 heaters are wired in series and the HT supply comes from an inverter. Google 'Invicta QRP' for more information on transistor inverters. The receiver is built in a large die cast box bought at a rally for £5 and has the usual pretty 'crash bars' on the front. It looks, works and feels just like a real wireless set.



Alinco DX70TH Power Control

Graeme Jackson G4CKH 86 Lloyds Ave. Kessingland, NR33 7TR



In past issues of SPRAT this type of power control, using the ALC line, has got a mention but not for the Alinco DX70TH. One of which I have just acquired ready for the caravanning season.

The 'Zweier' and the 'Super-Zweier'

First steps into minimalist radio design

Peter Buchner/DL3PB email: DL3PB@yahoo.com

I was always fascinated by low-part-count minimalist radios e.g. Mike's/AA1TJ Reggie [1], the FETer and others but never considered them for myself, since I'm little handicapped having no permanent antenna. In order to find out what such a simple radio could do with nothing but a 10m-temporary vertical on the balcony, I decided to start my own approach rather than tearing down an existing design.

Well, what was the minimum required? Obviously a mixer for RX - given the good experience I had with the George's, GM3OXX, famous OXO transceiver, I decided for a balanced mixer, since many, more simple, designs e.g. the pixie suffer from severe AM-breakthrough. Of course one can use a single oscillator for both receive and transmit, but using a straight key, it would need at least one more transistor, to provide a sidetone. So we'd better use that second transistor for another (local-)oscillator, that will allow to monitor your own signal on TX und also provide a RIT, so one can change the pitch and the sideband in case of QRM from adjacent channels on receive. Drawback is the need for two QRP-crystals and a second variable capacitor. Cheap in-band crystals for 30m at 10.111Mhz can be found here [2].

Since the receiver has no gain, but approximately 8 dB conversion loss, a sensitive (sound-powered) headphone is a must, else an additional AF-amp is recommended. Those, who are not a lucky owner of an old British DLR No. 5 headphone, can buy Racal 27187 sound powered elements here [3] , with some milling work they fit just fine into a standard 2x 2000Ohm headphone-holder. Out came, what I named 'Zweier' (German for double or pair), 'Twoer' had been used before and obviously I'm not that poetic.

Sidetone is provided by stray-capacitive coupling, so you can tune the transmitter quietly on receive, with little or no change in pitch, when you switch to transmit, at least as long your antenna is properly matched to 50 Ohms as well. Since the transmitter is keyed and has no buffer, care has to be taken with the pulling range of the transmitter, but even on 40m-band 10kHz should be possible – if the TX starts chirping, you won't miss that due to the true sidetone.

The two ferrites in the collector are binocular junk-box finds, any -43 ferrite will do. I used a homemade auto-transformer with 8x70 turns on a RK20 ferrite to match the 600 Ohms headphone impedance to the 50 Ohms IF-port, the 470nF across the headphone will result in some audio-peaking. Output power depends on the emitter resistor of the TX, your crystal, and the inductor value, with a 12…15V supply it's in the 50…100mW region. I built mine on plastic-prototype board, which allows quick changes – only the band-pass filter was soldered on a small PCB, so it could be swapped easily.

It works as a low-pass filter on TX as well, I stole it from Mike's reggie-transceiver, values (see table) are not critical, as long as the inductor can be adjusted for resonance. Of course its insertion-loss, will lower your output-power by a 20 or 30%, but nobody will hear the difference, else you can put it into the receive path only and build an additional (low loss) low-pass filter for the TX-path.

	20m	30m	40m
C1,C11	150p	220p	270p
C2,C12	620p	680p	1n
L1,L2	1.1µ	1.1u	2.2u
C3	1n	1.5n	2.2n

You prefer QSK? – No problem, just replace the DPDT switch by a relay, with its coil spanned from positive supply to the keyer-port, but make sure to have free-wheel diode across, else your TX-transistor might give up soon, due to reverse voltage from switch-of transients.

What can one expect from such a simple radio?
On 40m sensitivity is good enough to copy QRP stations, while on 30m that becomes more difficult – transmit with 50mW or so requires some tenacity in any case.

I suggest use of the reverse-beacon-net (RBN) [4], which allows you to check, whether or not your signal has been copied anywhere, just call CQ for a while and then use the 'dx-spots/spot search' menu to search for your callsign. The RBN consist of some dozen stations around the world automatically monitor and decode(!) all the CQ-calls in the CW-sub-bands by SDR and provide that data to the net – great tool for QRP(p)-er.
Well, beside some local QSO's I managed some contacts up to about 700km into UK and Italy and found myself spotted on the RBN at distances up to more than 2000km (TF/Iceland on 30m) once or twice.

But many contacts got lost due to QRM/QSB on either side, although that OM's were really trying hard, just as an example Zoltan/HA2PP, about 1000km from here, gave his very best – in vain, at last I was the one to lose his 50W-signal on the 30m-band!
When propagation is good, which is for sure the best time, to play with such simple radios, lot of stations are on the air and listening with a DC-receiver with little or no audio-filtering is somehow exhausting.

Experiments with Rick's/KK7B binaural approach [5] helped a bit, but on expense of a second mixer along with another dozen components.

Its stereo-effect is really amazing, the signals seem to come from all different directions,
which helps your brain to sort out the desired signal, often called the 'cocktail-effect'.

I asked myself, how a low-part-count superheterodyne receiver with a crystal-filter could look like, again it was Mike/AA1TJ, who sent me the schematic of two single transistor converters some weeks ago.

While the bipolar version was a bit tricky, the dual-gate MOS-FET mixer worked fine as

a BFO following a crystal-filter – so with an additional transistor had a ‘single signal’ receiver, the ‘Super(het)-Zweier’ so to say.

I used standard crystal frequencies for the 40m version (LO at 11.059MHz/IF at 4.032MHz). The now three-transistor rig was also more sensitive on receive, obviously the gain of the MOS-FET was more than enough to compensate the additional losses of the crystal-filter. What a luxury to listen to a single signal at a time instead of three or more!

To adjust the BFO, simply tune the collector circuit to maximum amplitude first and then adjust the coil at the crystal-filter output for highest AF-output – you can to do that with your own TX-signal, if you make sure that the limiting schottky-diodes across the output-transformer are out of work, they prevent the sidetone being too loud and such will flatten the maximum somehow.

In case, you find the pitch to low or high, just insert a small capacitor or inductor in series with the BFO-crystal. The tuned collector circuit will also change the pitch a bit, but we want the highest possible amplitude of self-oscillation for best conversion gain.

Encouraged by the increased sensitivity I decided to give 20m band a try again, changed the LO-frequency again to now 18.096MHz with a much smaller inductor in series, while the IF was still at 4.032MHz and quickly assembled a 20m band-filter.

The first test on 20m band proofed I could copy QRP-stations now pretty good, while the output was measured to be around 70mW with a 15V supply.

Next morning I found the waterhole at 14060kHz not in use and started calling CQ. Within less than fifteen minutes, OM Ivica/9A6CW from Split/Croatia came back to my call with a 529 report and made my day with a new ODX at 1140km for <100mW QRPp.

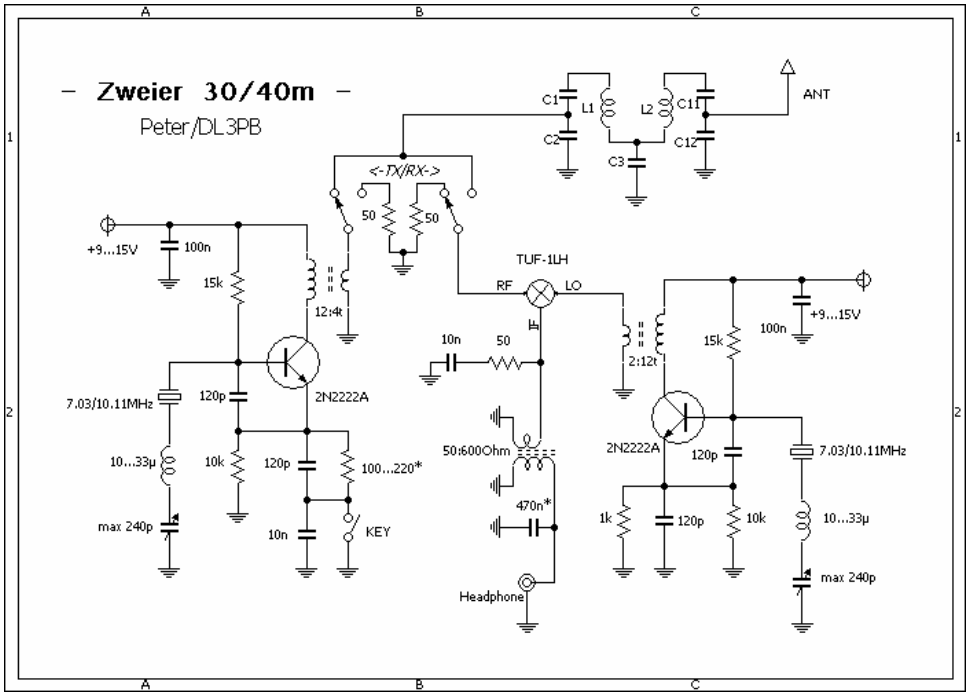
Better even, he was running 4W from his KX-1 into a FD3 only, so that little two-transistor superheterodyne receiver had proven it was worthwhile building it.

Usual disclaimer at last: Dealing with minimalist radio is highly addictive, once you found your flea-power signal spotted far away from home or made a QSO with this little two- or three-transistor rig, it may be too late, so better think twice…

Else I’d be glad to meet you on the band e.g. for the ultimate challenge, a two-way minimalist QRPp QSO, the MAS-contest[6] or whatever.

Any suggestions, comments etc. are welcome at my email above.
72!
Peter/DL3PB

[1] http://www.aa1tj.com/reggie.html
[2]www.pollin.de
[3] http://www.roehrentechnik.de/html/detektor.html
[4] http://www.reversebeacon.net/
[5] http://www.kangaus.com/Documentation%20files/BIQR/biqr.pdf
[6] http://www.qrpcc.de/


– Zweier 30/40m –
Peter/DL3PB
C1
L1
L2
C11
ANT
C2
C3
C12
<-TX/RX->
50
50
+9...15V
100n
15k
12:4t
TUF-1LH
RF
LO
10n
50
2:12t
15k
100n
+9...15V
7.03/10.11MHz
120p
2N2222A
50:600Ohm
2N2222A
120p
7.03/10.11MHz
10...33µ
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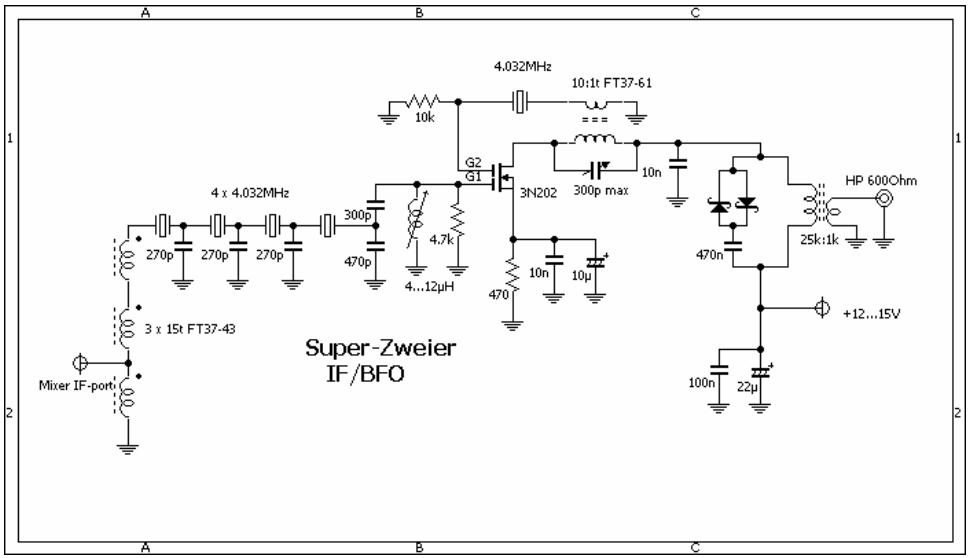
1k
120p
10k
10...33µ
max 240p
10n
KEY
Headphone
max 240p


4.032MHz
10:1t FT37-61
10k
G2
G1
3N202
300p max
10n
HP 600Ohm
4 x 4.032MHz
300p
270p
270p
270p
470p
4.7k
4...12µH
470
10n
10µ
470n
25k:1k
3 x 15t FT37-43
+12...15V
Mixer IF-port
Super-Zweier
IF/BFO
100n
22µ

Don't have a memory keyer?
Then use this simple tone-operated keyer!

Ian Liston-Smith, G4JQT, Fakenham, Norfolk. ian.ls@hotmail.co.uk

G7WHM's article in Sprat no 145 describing his "Morse Talker", using the voice to key a transmitter, reminded me of a similar design I came up with about 25 years ago. However, my original circuit was driven by a cheap recorder playing an endless three minute cassette of a sequence of CQ calls. Last year I updated the design so it could be used with an inexpensive MP3 player.

How can an MP3 player be "programmed" to key a transmitter? Well, there are a number of websites where text can be played back as Morse Code, ostensibly for Morse-Code training. I found the best website for this is **http://lcwo.net/text2cw** (Thanks to Louis, MU6FER for bringing this particular site to my attention.) An MP3 player loaded with Morse Code and used with this circuit, provides a simple "memory" keyer.

As far as I know all players will repeat a "track" endlessly, certainly my £12 Tesco one does. (Very basic MP3 players can be bought much cheaper than this on the internet.) Alternatively, why not be very "retro" and record your CQ on an endless cassette! (Endless cassettes ranging in length from 30 seconds to 4 minutes are still available from sellers on ebay.)

Apart from using this circuit to call CQ, it can also be used for keying a QRSS transmitter. I couldn't find a website for generating QRSS that didn't require downloading some software. However, at **http://www.winmorse.com** a simple 483kb program is available where dot lengths from 1 millisecond to 60 seconds can be generated! The program allows the text-generated audio to be saved as a .WAV file which my cheap MP3 player (and presumably most other MP3 players) could replay. The Winmorse program allows all the timing elements of Morse Code to be adjusted so some readers may find it more versatile than the Text2cw website mentioned above.

Circuit

The keyer circuit is in some ways similar to that of G7WHM, but amongst other things does not have the microphone pre-amp.

MP3 players have a stereo headphone output, and although the recording will be mono, it is bad practice to combine left and right channels by just shorting them together. This is avoided by using R1 and R2 to combine the channels and R3 acts as the low impedance load similar to the headphones. Capacitors C9, C10 are RF decoupling, although for QRP use they could probably be omitted. According to the LM380 spec sheet, the unused input may be terminated with a similar impedance to that of the source. This is achieved with R4.

The Zobel network R5/C3 maintains stability into the inductive load presented by the transformer. When there's RF floating about I always like to add a disc ceramic capacitor across decoupling electrolytics so I have included C8.

The output from the LM380 is fed to the low-impedance side of the LT700 audio transformer, i.e. the winding where the speaker would normally be connected. Almost any old transistor radio output transformer can be used here, but the LT700 is still available from various sources on the internet (and ebay in particular) for a couple of pounds.

I did try a diode arrangement similar to G7WHM without the transformer to drive the transistor, but found it to occasionally "hang" for a few extra milliseconds. I think it had something to do with the audio coupling capacitor not discharging fully, but I never did get to the bottom of it. Anyway, the transformer and full-wave rectification of the audio waveform gives smooth, reliable operation and completely cured this. The diode bridge can be almost any silicon diodes. I used 1N4001 diodes rather than the smaller 1N4148 which may run a bit hot here.

One idea I have borrowed from G7WHM is to use an LED in the base circuit to act as a keying indicator. Capacitors C5 and C6 remove most of the ripple from the rectified DC without slowing down the transistor switching. If the capacitors are too high in value they will lengthen the dots and dashes as they discharge. D1 prevents relay back EMF from damaging the transistor. Remember, some types of relay operate with the energising current flowing in one direction but not the other!

It is probably possible to use the transistor to key a QRP transmitter without using the relay by connecting the collector directly to the keying line if - as is usually the case - the keying line requires an earth.

Construction

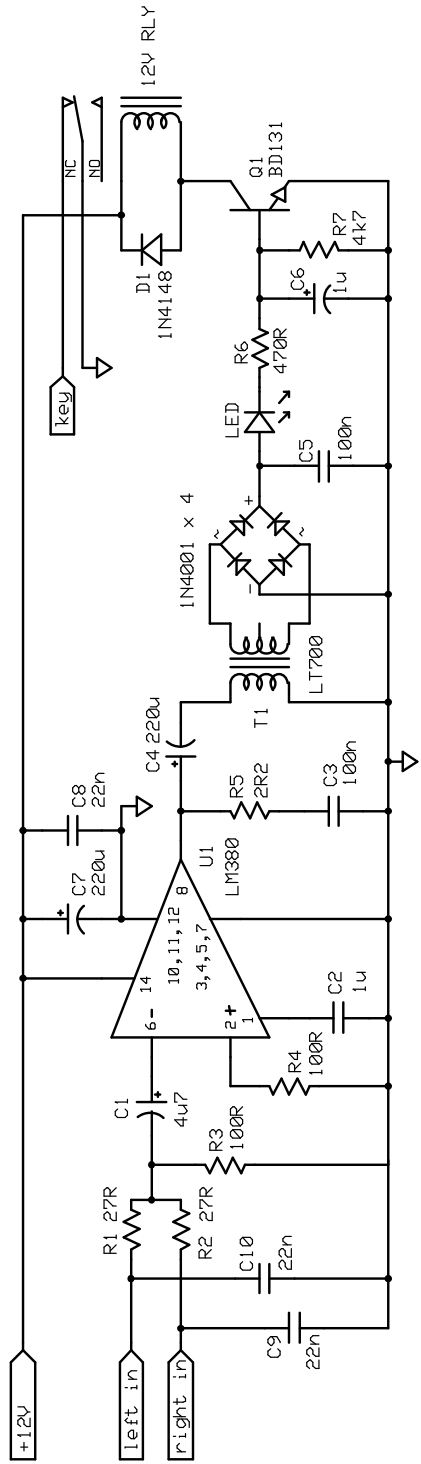
This is not at all critical, although component leads to the LM380 should be kept short. I use single-sided board and use the copper as the earth plane on top and countersink all component leads that pass through to be wired underneath. The LM380 earth pins should be soldered to the top copper layer to act as a heat sink.

No components are particularly critical in value, but the NPN keying transistor should be reasonably substantial so as not to overheat if you are using a low-resistance relay, or be able to carry the keying current if the relay is not used.

Use

Connect the MP3 player and increase the volume until the LED flashes, although the LED may start to flash before there is enough current through the transistor to activate the relay. Keep increasing volume until the relay is reliably operating, but no more. One of the features of the design is that it does not need too much volume, thus reducing the battery drain on the MP3 player.

Of course you cannot easily adjust the speed or weighting like you can on a proper memory keyer - this is done before transferring the audio file to the MP3 player. Neither will it do any of the other fancy tricks of real memory keyers. Nevertheless, at a fraction of the price it's more than adequate…


12V RLY
NC
NO
Q1
BD131
R7
4k7
C6
1u
D1
1N4148
R6
470R
key
LED
C5
100n
1N4001 x 4
LT700
T1
C4 220u
C8
22n
R5
2R2
C3
100n
C7
220u
U1
LM380
8
10,11,12
3,4,5,7
14
6
2
1
C2
1u
R4
100R
C1
4u7
R3
100R
R1 27R
R2 27R
C10
22n
C9
22n
+12V
left in
right in

How to make a simple base for a Morse key.

George Burt, GM3OXX, Clunie Lodge, Netherdale By Turiff. AB53 4GN

Having decided to build some vintage gear to take part in the club vintage weekends, I first needed a Morse key to key the valve PA that I could use, to save me having to build a relay keying unit for my keyer. I still built one just the same.
First I had to buy a hand key as I don't have one and cant use a hand key very well, neither can I use a paddle without the same problems Hi, but it is a wee bit easier with the paddle.

A quick look on ebay brought a lot of memories back as the first key I looked at was the one I had in my first station over 50 years ago, an old American key from world two, see picture.
The next problem was to find a suitable base for it, so a quick trip to the ebay smoking pages and two ash trays were picked one being a nice red one, a Jasper Stone and a large round Onyx ashtray. I picked the Jasper one for its nice shape and colours. It was just what was needed for the job.

The next task was to mount the key on the under side of the ashtray leaving the bowl side down. I started to try to drill mounting holes using a masonry drill, then realised that I would not live long enough even to drill one hole in the jasper it is pretty hard stuff, a quick trip to one of the junk boxes brought out some old double sided sticky tape which was cut to size and held the key very nicely job done, might fit some green felt on base some day, but the key does not move on the bench.
If you hear me on the bands using the hand key please excuse my CW… Hi.

ANGUS (GUS) TAYLOR, G8PG

It was with great sadness that I heard of the death of Gus on April 23rd at the age of 91. Sadly I was away at the time and missed the announcement and the funeral.

Gus was one of the founder members of the club. When I first wrote to the old Short Wave Magazine asking if there was any interest in forming a UK QRP Club the first replies I received were from G2NJ, G3DNF and G8PG; they became members number 2, 3 and 4.

Gus was very influential in the growth and style of the club, becoming the Contest and Test Manager within a few weeks of the birth of the club. His first of a long series of antenna articles appeared in the second edition of SPRAT and for many years he wrote the Antennas Anecdotes and Awards column. Gus devised, and for many years ran, the club awards scheme and was the instigator of the G QRP Club Winter Sports; perhaps the most popular of all QRP operating events.

The G8PG Morse Tapes, produced by the club for several years, helped many people pass their Morse test or improve their CW speed. Gus is especially remembered by many members for the personal advice he gave to newcomers. He was (unofficial at first – then official) Antenna Adviser to club members and spent many hours in correspondence with individual members.

Many of us will recall Gus sitting at a little table at the Rochdale QRP conventions offering one to one advice and encouragement. Gus had been a sea-going radio officer and was a keen and skilled CW operator frequently heard on the bands until prevented by poor health in his latter years. He was an early member of FOC.

All who knew Gus will remember him as a gentleman in every sense of the word, sharing his valuable knowledge and experience in his gentle, quietly spoken, manner. Since I wrote this item, I have received many emails and letters from club members expressing their sorrow at the passing of Gus. Most told of the personal help he gave to them.
His passing is a great loss to the club, QRP and amateur radio.
George Dobbs, G3RJV

Note from Tony, G4WIF.

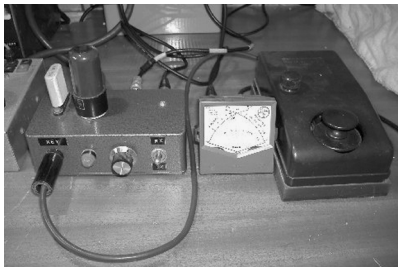
I'm still selling Gus's Morse tapes (on CD now). The proceeds go to Cancer Research in honour of Gus and I'm guessing that hundreds have been raised so far.
See http://www.gqrp.com/sales.htm.

G QRP Valve Day

Report by Colin Turner, G3VTT

Once again I am indebted to those that took part in the latest GQRP Club event on April 24th and who have contacted me since. This event is designed to get the QRP gang on the air with valve equipment, be it home made or commercial, and this quarter I was pleased to see an increase in activity. That's what its all about, activity, plus the incentive to make something using technology you may be more familiar with

'The Valve Day has re-ignited my interested in building a QRP valved rig for 80 and 40. I dug out my single-valved 6V6 xtal controlled transmitter for Easter Sunday's Valve QRP Day and used it in conjunction with a Drake 2C receiver and a 100ft doublet at 15ft. Running just 1W on 7030kHz I worked 6 stations in two half-hour sessions - G4TZX, F6AGQ and G3GXQ in mid-morning, and 2E0BFJ, GI4GNT and G4VHM late in the afternoon. Much enjoyed and pleasantly surprised at the good reports I received with such low power. The photo attached showing the 6V6 CO tx and the Type D Morse key used - in case of interest. Please carry on promoting SKEs and Valve Days and I will do my best to support them. I also make sure they are mentioned in the Cheltenham club's newsletter (membership = 80)'. **G3NKS**



I used my old TS530S with the wick turned down - not a valve-only rig of course but it does sport a 12BY7A and a couple of 6146Bs in the business end of the transmitter. The most interesting station worked was that of G4PKW in Bromsgrove who was using a rock-bound valve tx and a 2-valve regenerative receiver. I did have a look at 80m but it seemed rather dead during the day and very noisy late in the evening.Regards,'**G3XMM** Operation was very casual and spasmodic, I missed the early evening lift on 80m because of family commitments and when I did get back on, the static crashes were terrific which made things very difficult. I could hardly hear you through the racket! On 80m I used my new rig, supergainer Rx and MO/PA Tx producing 4.5 watts to the antenna which was 260 ft odd of wire at about 40ft up. On 40m I went all upmarket with an Eddystone 830/9 Rx and a VFO controlled Tx with a 807 in the output maladjusted to produce 5 watts. The 40m antenna was an inverted Vee doublet at 40 ft. On 80m ON5AG, G3VTT, G3YHO, G3GXQ, on 40m G3GXQ, 2E1RAF, G3XMM, DL4OCE/P 73 John **G3TYB** Hi Colin, Just a note about my experience on this years Valve QRP Day. I had been prepared by building a one valve transmitter (61BT) on 40metres putting just over one and a half watts out and then decided on a one valve receiver which then became two valves for a bit more audio. On Saturday afternoon I was disappointed to hear a contest and sure enough there it was filling the 40metre band on Sunday. Switch off. I tried later, switch off again. On Monday the band was full of noise. With the contests and noise I think the rig might be re-tuned to work on 80metres where it seemed quieter.72 de Bill, **G4GHB**.(It's all part of the fun on the wireless Bill!) At **G3VTT** I was using the Paraset lookalike rig with a pair of 6SK7's as a regen receiver and its companion 6V6 crystal controlled transmitter. For details look at **http://www.darleys.pwp.blueyonder.co.uk/paraset/iqrp_2.htm**. I also used a two valve 6V6 receiver, featured in this Sprat and a 6L6 crystal oscillator with a hurriedly design full relay control system. Look out for further operating days in AAA

Antennas Anecdotes and Awards

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G3vtt@aol.com

My thanks to those members who have contacted me with their experiences of antennas this last quarter. Vertical antennas seem to be the theme again and let's jump straight in with the experiences of a local radio club here in Kent.

The Brehurst Radio And Transmitting Society (BRATS) has been a premier radio club over the last two decades leading the field in this area of the UK in licence training, operating and providing club members, and the wider world, with suitable homebrew projects. These projects include an ATU, 160m AM equipment and antennas. I received an e-mail from Geoff G3YVF who along with G4VSZ lead the construction nights and put the projects together. With members clamouring for another antenna project they came up with this idea.Geoff writes:

'Hi Colin! A batch of cheap roach pole fishing rods prompted a request for Bodge-it and Scarper, my two tame gnomes, to come up with a design to make it perform as an antenna on 80m and 160m so members of the local BRATS Radio Club could have some fun on the 1966 KHz AM net.

This project goes nicely with our 'Ozbox' 160m receiver and transmitter. The design started on the back of a fag packet and a great deal of thought went into this sophisticated, state of the art, top secret, stealth antenna. No guys are needed just a wood stake banged in firmly and some electricians tape to hold it up. Scarper says *do just that* and if it falls over? - *act as if you know nothing!*

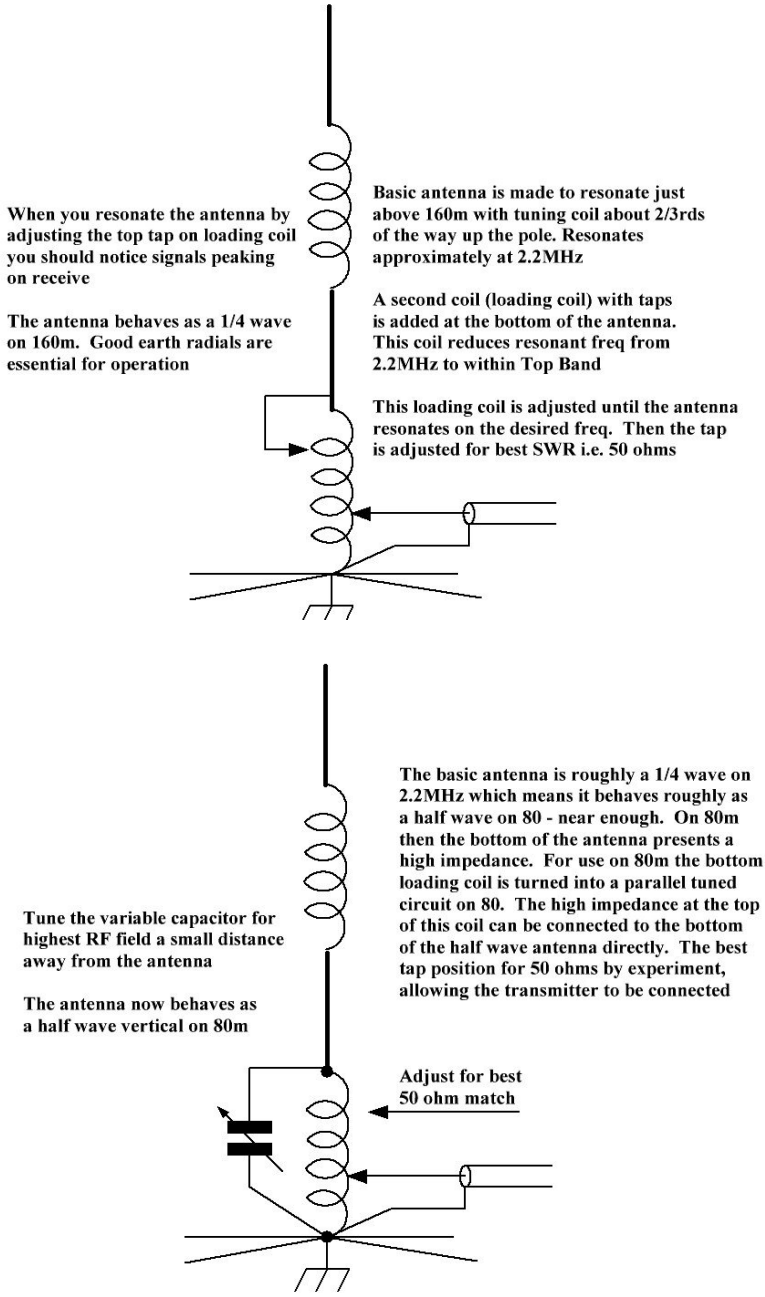
The pictures tell it all. Bodge-it says start by understanding how it works on 160 and get it to work there first. The top coil is approximately 120 turns on 2" diameter former close wound. The bottom coil is 30 turns with taps each turn. After tuning the system on 160m go to 80m and have a play with the variable capacitor and the lower coil taps.'

The diagrams make the layout fairly clear and in due course it is hoped further information will appear on the BRATS website.

Harold G3UYM has had some success with a commercial vertical and informs me, 'I have also found the short vertical can be a very effective antenna. I use the single band base loaded 4' telescopic whips available from Waters and Stanton and these are ideal for portable use. Recently I went out portable and worked 13

stations in the Commonwealth Contest including VE, VO, VK2 and 5H3 in Tanzania. Not bad for a few hours operating and the FT817 running at 5 watts!'

BRATS VERTICAL ANTENNA FOR 160 & 80M



Another source of vertical antennas has been found by Jerry G0AED who tells me that ‘Poundland’ are selling fibreglass poles nearly 8 ft long which may be useful for small quads or whatever’ He has also been experimenting with the famous ‘Upper and Outer’ antenna of the 1930’s in a modified form.

‘I have just put up an Up and Outer antenna and am writing to tell you the success I have had. The legs are 30 feet of 2.5 wire taped to a fibreglass pole and 30 feet run horizontally. Fed with 40 feet of 450 ohm feeder from a homebrew 4 to 1 balun and then coax into the shack. I first tried this antenna from a suggestion on the web by fellow member Patrick GW0VMR. It used 22 foot legs and 32 feet of 450 feeder and a 4 to 1 balun. This worked well but I am surprised at how well the 30 foot legs perform. It does not do well on 80 but has worked well on all bands from 40 up to 10. Tuned with my IC703 inbuilt ATU I have had contacts all over Europe, a few USA and one in Brazil. With no coils to wind, an easy system to set up and its easy to hop band to band I am going to keep experimenting with this as I think there is more to be gained with this design. I would like to hear from anyone who has experience or ideas for this antenna’
Regards Jerry G0AED # 912

'As a follow up to my last article, *writes Walt KF4YJQ*, on electrically shortened quarter wave antennas, I would like to pose a question to you. Having recently purchased an Outbacker electrically shortened quarter wave vertical, (the "Joey" QRP model) I am amazed at the performance of this little gem. It is only 4 feet long and the "stinger" is 12 to 14 inches long (the radiating portion). Having made QRP contacts to Arizona, over 2000 miles away with only 5 watts to the little Outbacker, and with a fairly decent signal report. Knowing that this may fly in the face of "conventional wisdom", is it possible that our QRP rigs can perform better using shorter antennas? Does it not take more power to energize a long antenna than it does for a shorter one? My signal strength meter strongly suggests that such is the case. I am aware that most of the antenna gurus would suggest otherwise but my own experiments with these little antennas do not support their thinking. Your comments would be appreciated'. Here at G3VTT I still think you need the best antenna you can arrange using the highest efficiency you can achieve in terms of tuning and resonance. The sensitivity of modern equipment is also a factor but over to you members – any thoughts?.

Awards

George **GM3OXX** has been awarded with his certificate for 1580 members worked with QRP. John **G3SAO** has been awarded his certificate with 25 countries worked with QRP. Well done to you both.

Finally. I am very sorry to have to report the death of Gus G8PG who originated AAA in Sprat when the GQRP club started over 30 years ago. The concept of 'Antennas, Anecdotes and Awards' was intended by him to give a practical and constructive input into amateur radio based around antenna experimentation, operating and the promotion of activity through an awards program for the benefit of old timers and newcomers alike in the QRP field. Gus was a pre and post war member of the First Class Operators Club and regularly promoted QRP within the ranks of what was essentially a QRO organisation. Gus did a good job at getting folks on the air from difficult locations with low power and I would like to think we can all honour Gus by continuing operating and experimenting with antennas as he would have liked. Gus was 91 years old and had seen marine service as a young man being highly adept at using both CW and the naval signal lamps of the day.

COMMUNICATIONS AND CONTESTS

Peter Barville G3XJS, Felucca, Pinesfield Lane, Trottiscliffe, West Malling, Kent ME19 5EN. E-mail g3xjs@gqrp.co.uk

As usual, I will include the results for CZEBRIS 2011and the 2010 Chelmsley Trophy in this issue. I was hoping for good support for these two events, following the high number of logs received for Winter Sports, but sadly my hopes were unfounded.

CHELMSLEY TROPHY 2010

I'm sorry to say that only three entries were received this year, from Ryan **G5CL**, from Peter **G3JFS** and from Carl **GW0VSW**. My thanks got to all three for their interesting logs.

Carl **GW0VSW** aimed to work 100 DXCC on CW and 50 DXCC on SSB during 2010, and to operate on all band 160m to 10m. With the exception of the CW target, he succeeded in his aims, which was a little surprising as it wasn't until late in the year that Carl realised his FT817 was set for 2.5W and not 5W as he had presumed. A total of 1551 QSOs (all made with QRP, of course) resulted in a DXCC score of 88, and 39 2-way QRP DXCC. He also made 12 2-way QRP QSOs when operating GB50RNARS in November. All in all, Carl enjoyed a "fun year" on QRP CW/SSB/PSK using his FT817, FT857 and Index QRP+ tcvr .

Ryan **G5CL** won the Runner Up Certificate last year, and once again submitted a full and interesting log. He worked a total of 116 DXCC countries, using all bands from 160m to 10m, and made 27 two-way QRP QSOs. His station consisted of an FT857, Elecraft K1, various homebrew tcvrs for 20m and 40m, all with a maximum CW power of 5 watts output, and a 66ft end fed (highest point 8.5m).He also briefly tried a 20m half wave dipole.

Highlights of Ryan's log include a 40m QSO with VK3EGN (his best ever 40m DX), his first ever 30m Stateside QSO, and 13 all time new DXCC countries. Amongst those 13 was a 15m QSO with JT5DX which "took all morning to get in the log!".

Peter **G3JFS** was last year's winner, and another stalwart supporter of Cub events. He comments that he found conditions generally poor making it difficult to raise the rarer stations with QRP and simple wire antennas. As is often the case these days, as soon as anything vaguely like DX appears then (usually as a result of a 'spot' on the DX Cluster) the EU KW wolf pack descends. Consequently, much of Peter's DX were 'got-aways'. As Peter says, the secret to making contacts under these difficult conditions is to regularly monitor the bands and catch brief openings, and (hopefully) the DX as soon as it appears.

Peter's antenna was a 120ft bent end-fed (matched with a remote Smartuner), and the rigs used were an IC706, FT1000MP and a single valve xtal controlled 80m Tx. His DXCC

score was 96, spread across CW (90), SSB (48) and data (23), and between 160m to 10m.Like Ryan, he worked into VK. In fact, there wasn't much between the two entries (rather like last year), but on this occasion Ryan managed to come out ahead.

The 2010 Chelmsley Trophy goes to Ryan **G5CL** and the runner-up certificate to Peter **G3JFS**. My thanks and congratulations to them both.

Why don't more members give these three a run for their money? Answers on a postcard!

CZEBRIS 2011

Well, if the support for Chelmsley was poor, where does that leave CZEBRIS? For the first time, I believe, there were no entries – with the exception of those from OK/OM. There will be those citing poor conditions as a reason for not participating, but the event lasts for more than 2 days and I defy anybody not to make at least one or two QSOs in that period. Bear in mind that in order to win the UK section of the event this year, you had only to submit an log containing **one** entry! How difficult is that? :-)

In contrast, Karel **OK1AIJ** received 7 OK/OM entries, their logs totalling 100 different stations from 21 DXCC countries. Conditions can't have been that bad, then!

The top placed station was **OK1DEC** with 118 points from 56 QSO's. **OK1DMZ** scored 85 from 42, **OK1DKR** 40 from 20, **OM6FM** 26 from 12, **OK1FKD** 20 from 9, **OK1FLT** 12 form 6, and **OK1HCG** 6 from 3.

How will we fare for entries from the UK next year? You decide! With no UK support, it will be hard to justify continuation of this (once very popular) event.

SUMMER SPORTS?

In view of my comments above, could we justify a new G-QRP event? Perhaps something very similar to Winter Sports, but held during the summer. **G0AED** suggests one of the Bank Holiday weekends, thus giving the opportunity for stations to enjoy potentially 3 days of operating, and even for some to operate portable. Unfortunately, UK Bank Holiday dates don't necessarily coincide with public holidays elsewhere, of course. **GM0NTR** picks up on the suggestion in a recent Sprat from **RV3GM** that we have a summer time "QRP Olympic Games" but run in a non competitive way, just as we do for Winter Sports.

By restricting any new event to a 3 day period over a particular Bank Holiday weekend we run the risk of 2 of those days coinciding with an HF contest (hardly a weekend goes by without at least one), and all that that entails! My inclination is to have an activity period of one week, much like Winter Sports. The question is, of course, "When?".

My proposal, then, is that we adopt the Saturday of the weekend of the UK Summer Bank Holiday as the start date for a **new annual event**, to be called:

**** SUMMER SIZZLER ****
27th August to 2nd September 2011 (inclusive). Just like Winter Sports – no points, no rules other than to call CQ QRP (on the usual frequencies) on as many bands as you like and HAVE QRP FUN. Please send logs to G3XJS by 1st October.

INTERNATIONAL QRP DAY (17th June)
I hope you made (or will make) plenty of QRP contacts on this special day, and that you send your logs to me. Rules as per Members Handbook.

RSGB LOW POWER CONTEST
I am reminded by Frank **GM3JKS** that I ought give publicity to this event, to be held this year on Sunday 17th July, 0900-1200z and 1300-1500z. There are 4 sections: 10W fixed, 3W fixed, 10W portable and 3W portable. Bands are 80m and 40m. Maximum antenna height 10m. Full details are to be found on the RSGB Contest Website. I must remember to include this annual event in future on the QRP Calendar!

QRP IN THE COUNTRY
Tim Walford's very enjoyable and successful event is to be held this year on 17th July. It's the same date as the RSGB Low Power Contest, but I'm sure you'll find a way to somehow fit both into your summer diaries! An added incentive for you to join the fun is that Steve **G0FUW** will be running a Buildathon during the day. Full details can be found at "http://www.users.globalnet.co.uk/~walfor".

So whatever the conditions, we have an exciting summer in prospect, and a new Club activity period to look forward to. There's no excuse not to have plenty of **QRP Fun**. Don't forget that the closing date for the next issue is the beginning of August.

72 de QRPeter

NANOBUG - Super small CW Iambic Memory Keyer
Special Offer to Members from OK1CDJ

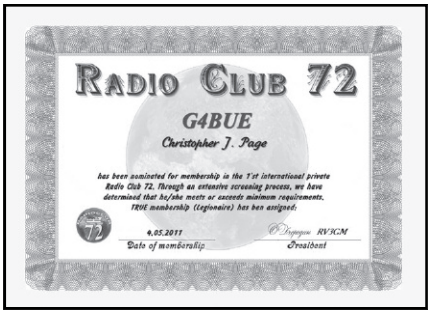
Hello all cw fans,
I would like to offer programmed MCU for a small iambic memory keyer.
Memory is in EEPROM and maximum is 100 chars. Control is done by 2 buttons (1 for CW speed and second for memory).
Minimum external parts is needed (3 caps and 5x 1k resistors).
MCU is in a standard DIL8 package.
More info: http://naprodej.ok1cdj.com/home/ke-stazeni
Special price for G QRP members is 5 EUR/pcs + 1.5 EUR shipping worldwide...
Payment can be done by paypal to ondra@ok1cdj.com

MEMBERS' NEWS

by Chris Page, G4BUE

Highcroft Farmhouse, Gay Street,
Pulborough, West Sussex RH20 2HJ
E-mail: chris@g4bue.com

I received a nice surprise on 4 May - membership of Radio Club 72. **RV3GM**, the President of the Club, sent me an email telling me of my membership and attaching my membership certificate, see below. The Certificate says I have, "been nominated for membership in the 1'st international private Radio Club 72. Through an extensive scanning process, we have determined that he meets or exceeds minimum requirements. TRUE membership (Legionaire) has been assigned". My sincere thanks to Oleg and to whoever nominated me for membership. Full details about Radio Club 72 can be found on their web-site at <http://club72.su/>. The site includes Activity Tables showing the number of DXCC and locator squares worked with different modes with QRP and on two-way QRP submitted by all QRPers (not just Club 72 members). Some of the totals are very impressive indeed, including our own **GM3OXX** who leads the CW two-way DXCC scores with 115 worked and confirmed – well done George.

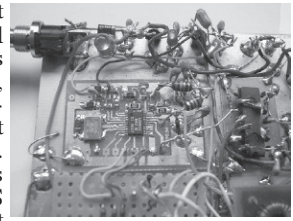


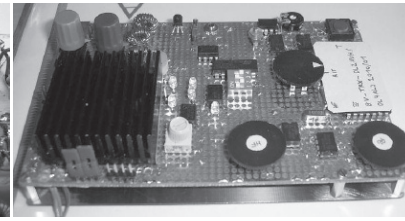
GØNSL says anyone interested in portable operation might just find the telescopic mast they are looking for at Wind Creations in Aylesbury, <www.windcreations.co.uk/>. Brian says their prices are reasonable too. **GØFUW** gives details of upcoming Buildathon events: 17 July building a Cary regenerative receiver at the QRP in the Country <http://www.southgatearc.org/news/august2010/qrp_in_the_country.htm>; 21 October (eve of the Rishworth Convention), G-QRP Club Friday night Buildathon and social supper, see *SPRAT*. **GWØVMR** has put a small video of his plasma nuller featured in a recent *SPRAT*, on *YouTube*. Pat says, "Type into the *YouTube* search box 'plasma nuller' and up it pops".

The picture on the right shows **IK1ZYW**'s FT-817 external key-pad from *SPRAT* 138. Paolo says, "It has evolved into a display-only and fully featured key-pad and display accessory ('interactive frequency reader'). Both include 'math' for operators using FT-817 in conjunction with microwave transverters". "Back to basics", says **G3LPT** after he built an Acorn per *SPRAT* 131, circuit from **SM7UCZ**, in February and went on 3560kHz with **G3ZKZ** and **G4IZQ** with their one valve transmitters (using single 807s). Using lots of PP3s from the Pound Shop and a lantern battery, Geo says it was great fun and next is 40m and upwards.

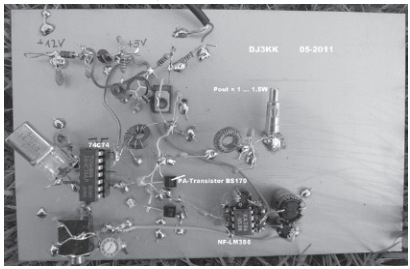
How many QSOs can you make from a single PP3/MN1604 battery? That was the challenge set by **LA1KHA** on the SOTA Reflector reports **G3CWI**. On 24 February Kjell had made 240 SOTA QSOs (on 30m CW, many using just 70mW output power) and his rig worked until the battery was just above 6V. Richard's own effort was 133 QSOs with his battery down to 8.3V. **G8SEQ/VK2** QSO'd **EI8GQB** with 5W SSB on 20m on SSB on 23 March, while using, "A simple yet sophisticated antenna", and was looking for Club members during his visit to NSW, Australia. At 1900z 29 March **G5CL** QSO'd **YU7EA** on 14060kHz using his K1 on its low setting, 66 feet long wire and a homebrew key made out of hack saw blades, an old nail and a piece of rough wood (true G-QRP style!). Whilst this is not DX by any means, Ryan later received an email from **W7CNL** saying he heard Ryan's signals in Idaho and came back to him when he called CQ shortly afterwards. Unfortunately, Ryan didn't hear Jack and has been kicking himself ever since, but was impressed that flea power got across the globe when conditions seemed absolutely dead. Ryan says, "I used low power as the key is difficult to use, jams easily and I didn't really want to be heard for sake of CW embarrassment!".

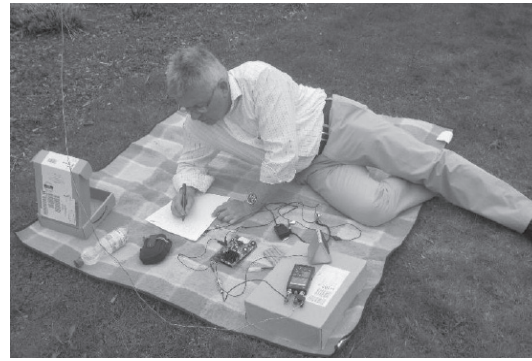
DL2BQD sends a report of the DL-QRP's annual meeting in April. Dieter says there was a lot of activity, including lessons, rig demonstrations and an excellent programme for the ladies. **DJ3KK** reported on his modules PIC based DDS TRX for 80 metres (right photo). Fred had built and tested it with Uwe, **DL7UWE**, during the weekly WaldSassen sessions on 80m in the evenings. **DL2AVH**, introduced and operated his new One board SSB low power transceiver (left photo) and Willi, **DK6SX**, tested it with Helmut's wire antenna (below).





DJ3KK sent the picture below of his, "Little ugly test item in credit card". Fred says, "I will use it for a lesson in the neighbour community. It follows **VE3MKC**'s idea in *SPRAT* 144. The BS170 used as an electronic switch, offers high efficiency. It is excellent for QRP using eight Mignon alkali cells. The receiver draws 17mA and the transmitter 230mA. The first QSO with it was with **DJ7JE** at 559!". WAØITP reports, "OzarkCon was a rousing success this year. It was held on 8/9 April in Branson, MO and set an all time record for attendance". Terry also reports that *QRPSpots.com* has passed the 100,000 hit mark with 118,461 on 6 April.





G4AKC has received lots of e-mails from members asking for more information on the equipment he uses for pedestrian mobile. Dave has put several pictures, voice recordings and information on his web-site at <www.qrz.com/db/g4akc> about both HF bicycle and HF pedestrian mobile. **GØBPS** will be QRV 15 June/6 July as **SV9/GØBPS** mostly 17 and 20m. **G3NUG**, Team Leader of the Five Star DXers Association's (FSDXA) 28 September/26 October **T32C** DXpedition to Kiritimati (Christmas Island), has asked we make members aware of their target of 150,000 QSOs as they will welcome calls from QRPers, especially towards the end. More details at <http://www.t32c.com/>.

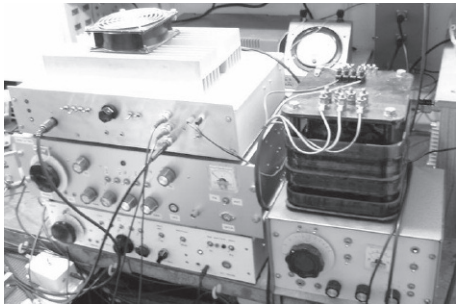
GØFUW made his first ever two-way QRP QSO (with **LZ2RS**) and his first SSB QRP QSO with VK, running 3W from his FT-817 during the Club 72 QRP Marathon in April. Nigel was pleased with his third position in this year's QRP-ARCI Pet Rock Contest held on New Year's day and says, ÓIt was worth sitting out in the freezing cold after all!".

Do you moan that you don't have the room to erect antennas that will enable you to work DX with QRP on the HF bands? If so, then you will be interested to know about **GØUCP** variable inductance loop that he has been using in the last few months. John says it is a magnetic loop which is fine tuned by altering the inductance instead of using a variable capacitor. With a 31.5 inches (80 cms) diameter loop about three feet above the floor in a downstairs room (see photograph), he has made CW contacts with the east coast of the USA on 15 metres using just one watt! John has sent more details to **G3VTT** for his *Antennas, Anecdotes and Awards* column.

The picture at the top of the next page shows GM4VKI behind the impressive Club banner at the Scottish Magnum rally on the 8 May. Roy was assisted on the stand by G3MFJ (centre picture behind the stand), 32 Club members signed in and they took eight renewals and three new memberships. A good selection

of bits and pieces were sold over the counter. The next Scottish appearance of the G-QRP Club will be at the Crianlarich Rally on 7 August followed by the Galasheilds Rally on 23 October. Roy says he has been invited to Northern Ireland for next year's rally so may possibly see members there in 2012.

I am writing this over the Dayton Hamvention weekend (wish I was there!) where Elecraft have announced their new KX3 transceiver, details will no doubt be on their web-site by the time you read this, http://www.elecraft.com/>. Hendricks QRP Kits announce three new kits for Dayton: the Super Tenna Dipper, the NADC 30 and the CPO Code Practice Oscillator, details at <http://www.qrpkits.com/>. Finally at Dayton, **WØRSP**'s new book *Ionospheric propagation, Transmission Lines and Antennas for the QRP DX'r* will be introduced in searchable-PDF format on CD. The Four State QRP Group are offering a new transceiver kit, dubbed the 'HamCan', priced at $30, details at <http://www.wa0itp.com/hamcan.html>. **N8ET** reports a new kit designed by **AAØZZ**, an Si570 based VFO/signal generator that will work as a daughter card on the PICEL III, or as a stand-alone unit with a control board. Bill says, "The unit works between 10 and 157MHz with a 1Hz resolution. It can be used with a Quadrature Sampling Detector on 80-10m or with a standard mixer on 30-2m. The control board has two push buttons, a rotary encoder, and a 2x16 LCD. The software source code for the 16F88 is available". Details at <http://www.kangaus.com/si570_project.htm>.



Since last November, **G3XIZ** has been transmitting regularly on VLF at the weekends, subject to obtaining Meteorological Office permission (that has only been refused once). Chris's usual frequency is 8.97666kHz which is derived from an oven controlled 10MHz crystal oscillator (OCXO) divided by 1114. The above photograph shows the LF transmitter he built capable of giving 150 watts feeding a large mains transformer, stepping up from the 10-0-10V to the 240V winding. This high voltage feeds his VLF loading coil, nominal inductance 1.3H, (second photograph) and thence to his main antenna, a 131 feet inverted-L at 33 feet. Chris says, "Occasionally I may launch a balloon or kite supported vertical of up to 197 feet (suitable wind permitting). My signals are regularly picked up by **G3ZJO**, **MØJXM**, **G3XBM**, **MØBMU**, **G3WCD**, **G3XDV** and **MØFMT** with my best DX reception being from Paul Nicholson in Todmorden at 135 miles. **G7NKS** also has a VLF NOV and lives 2.5 miles from my QTH. Jim now has all the equipment necessary to become QRV on VLF and we plan to attempt a two-way VLF QSO very soon". **G3XBM** has put a short video on the Internet showing his VLF set-up, <http://www.youtube.com/watch?v=UxEAhqPFBFE>. Roger has launched a new site entitled 'Sub 9kHz Amateur Radio' at <https://sites.google.com/site/sub9khz/> bringing together VLF information more accessibly and VLF DX records.

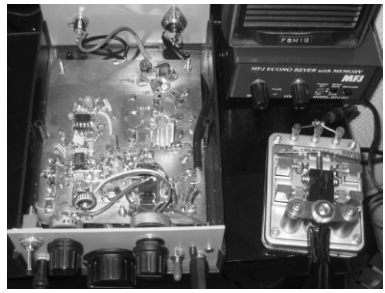
G3JFS says, "RTTY is a much neglected mode for QRP as it is surprising what can be worked 5W (my all-time DXCC is 90). I have also been active with the JT65-HF weak signal software. I often leave it in listening mode when I am doing other things whilst allowing it to report stations heard via the Internet to *PSK Reporter*. In QSO mode it is able to exchange basic QSO information but it is slow and can be a great 'time-waster'. However, used in conjunction with *PSK Reporter* it is a very useful tool for

the QRP operator to test propagation and antennas. In spite of its shortcomings JT65-HF is gaining in popularity all the time as more and more stations with poor locations/antennas find they are able to make contacts they might otherwise only dream about. It also helps that JT65 signals are rarely put on the DXCluster and the '5NN brigade' do not have the patience needed to make a JT65 QSO". Peter says it is interesting to see where your signals are being received in the world. Recently ZL3GA answered his CQ on 30m. Signals were -20dB, impossible for a normal CW contact with 5W, but no problem with JT65. Within a few minutes reports of his signal appeared on *PSK Reporter* from several European countries, the USA and VK3. **G0LWU** has been QRV since the New year using JT65-HF, mostly running 5W with his TS-2000 to an 80m dipole. Andrew's log includes W QSOs on 80, 30 and 20m.

G4EFE recommends WSPR to those who haven't tried it yet. Martin writes, "I've just re-entered the world of WSPR, having inherited the ex-family PC for use in the shack. I downloaded and installed the WSPR software from <http://physics.princeton.edu/pulsar/K1JT/wspr.html <http://> then connected the PC to the FT-817 via a **G4ZLP** interface. I went to work on 6 March and left the system running on 30m running 1W into a poor end-fed wire against radiator earth. I received several reports from around Europe and one from the USA east coat. Results can

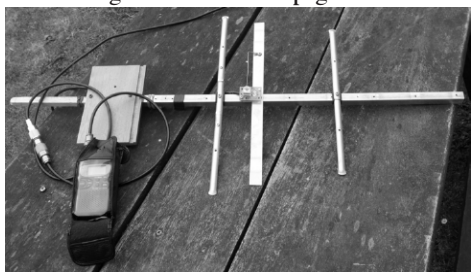
be seen in list or map view on the automatic reporting website <http://wsprnet.org/ <http://>. This evening I reduced the power to 100mW and went down to dinner and when I returned I had just received a report from **VK6XT** in Western Australia, a distance of 9200 miles".

The photo on the right shows **F6HIQ** operating with his latest home made antenna, a portable vertical whip (13 feet long) tuned through the classic MFJ 16010 box, with a short tunable counterpoise. Hervé has been running QRP from home and /P in France and England (**M/F6HIQ/P** in April from London) for two years and has logged over 1000 QSOs giving him 87 DXCC (latest was KP3 and BY) and 10 WAS. He plans to return to CW soon and has built a simple CW crystal controlled transceiver for 40 metres designed by **F6BQU** (see second photograph) that works fine giving one watt output. Hervé says his biggest fun is having good two-way QRP QSOs and the last exciting one was with a VE1 station using PSK 31.



The above right picture is the heading of a four page article from the *100 Watt Magazine*, published in Thailand, describing the Thai Version of NorCal QRP Club's Forty-9er (a 40 metre DC transceiver with 9V designed by Wayne Burdick, **N6KR**, of Elecraft). It was sent in by **HS2KSP** who has modified the Thai Version of the Forty-9er. The second heading is of another four page article from a different edition of *100 Watt Magazine* giving details of a 'Test all in One' that Sontaya has built.

The picture on the right shows **G4ICP**'s 'no-cost' yagi for 70cms that he recently built. Richard says, "This is something I concocted from a scrap UHF TV antenna. The existing elements were extended by doubling up the existing ones and it is fed with a gamma match mounted on the original boom. I chose three elements as a compromise of useful gain and ease of fabrication. It was optimised with a field strength meter and QRP from my Icom Q7 handheld. It provides a great im-

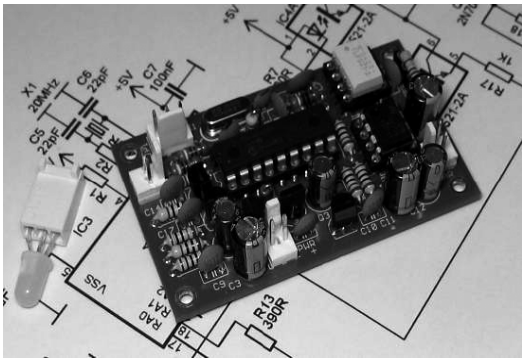


provement on a loft mounted Slim Jim allowing good access to the distant **GB3DZ** repeater, and is also useful for working the FM satellites when in handheld mode".

GØROT says he had a, "Brilliant morning on 15m using a half-wave end fed vertical described in a recent *Radcom*" on 10 April when he worked **RV9YP** (Siberia), **EA8CDG** and **UV5QL**, the latter two at 5W SSB.. Mike says, "It is days like this that the struggling to understand what I am doing with antennas makes the hair loss worth while!". **G3YMC** made two JA QSOs on 15m the same day, including JA7NVF at 1W, using his Butternut as a ¾ wave which Dave says is noticeably up on his long-wire antenna. On 10 April **G4ICP** QSO'd **PP2EG** on 10m and says, "Things must be looking up!". **GØEBQ** tested his stripped down version of the Cub (in preparation for the camper van season) and QSO'd W, VE and 10 stations in the EA QRP Contest with just 650mW.

Thanks to everyone for their contributions and pictures, this column cannot exist without them. My apologies to George for going over the four pages, I hope that doesn't cause him problems with the remainder of *SPRAT*. Please let me know how your summer goes, by 20 August, for *SPRAT* 148.

X-LOCK 2 - VFO GLUE



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Look on the webpage above or for leaflet write to G3RJV or email g3rjv@gqrp.co.uk

GQRP Club Sales

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

Antenna Handbook – 2nd edition – members £6.00, non-members £10.00 plus post } £1.50 (UK); or £3.60 EU
Radio Projects volumes 2, 3 & 4 – by Drew Diamond – members £5, non-members £10 } or £5.80 DX per book

6 pole 9MHz SSB crystal filter 2.2kHz @ 6 dB, 500ohm in/out **£12 plus post** } £1.40 (UK); £1.60 EU
Polyvaricon capacitors – 2 gang (A = 8 to 140pF, O = 6 to 60pF) c/w shaft ext & mtg screws - **£1.20 each** } £2.20p (DX)

Pair LSB/USB carrier crystals HC18U wires - [9MHz ± 1.5kHz] **£4 pair** } **All components**
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7.028, 7,030, 7.040, 7.122, 10.106, 10.116, 14,060, 18,096, 21.060, } **(ANY quantity)**
24,906, & 28,060 : DSB on 40m – 7.159MHz all are **£2.00 each** } £1 (UK),
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HC49 (wire) crystals – 3.500, 3.579, 3.5756, 3.5820, 3.6864, 4.000MHz } £2.20p (DX)
4.096, 4.1943, 4.433, 5.00, 6.00, 7.00, 7.6. 8.0, 10.0, 12.00, 13.50, 24.00MHz } If
25.00, 27.00, 28.00, 32.00, 35.50, 43.00MHz – **all 30p each** } ordered
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General Purpose silicon diode - 1N4148 10 for 10p }
Varicap diodes – **MVAM109** – 40pF @ 9v, 500pF @ 1v. **50p each** } max of 2 of } binders,
– **MV209** – 5pF @ 12V, 40pF @ 1V **35p each** } each per member } or
SA602AN - £1.50 (note – I may supply NE or SA, 602 or 612 as available. All are fully interchangeable. } filters,
MC1350 - £2.00 } use
PICAXE-08M – as used in Rex's kits – 8pin - £2 each } that
LM386N-1 - 4 to 15v, 300mW, 8pin **DIL** - **£0.40 each** } postage
LM386M-1 - 4 to 15v, 300mW, 8pin **SMD** [0.2" (4mm) x 0.25" (5mm)]- **£0.35 ea** }
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MPSH10 transistors (npn) fT - 650MHz, hFE 60, VCEO 25V **- 7p each** } add this
2N3904 transistors (npn) fT - 300MHz, hFE-150, VCBO +40V **- 10 for 50p** } postage
2N3906 transistors (pnp) fT - 250MHz, hFE-150, VCBO -40V **- 10 for 50p** } as they do
2N3819 N channel JFET – 12p each; 2N7000 N channel MOSFETs - 10p each } do not travel
IRF510 FETs - £1.00 } well together
10K 10mm coils still available as the recent issue - all 75p each }

Toroid Cores – **priced per pack of 5 – max of 2 packs of each per member**
T25-2 – 50p, T25-6 – 60p, T30-2 – 60p; T30-6 – 70p ; T37-2 – 75p; T37-6 – 80p; T50-1 - £1.00;
T50-2 – 90p; T50-6 – £1.10; T50-7 - £1.20; T50-10 - £1.20 ; T68-2 - £1.80 ; T68-6 - £2.20;
FT37-43 – 80p ; FT50-43 - £1.20 ; FT37-61 - £1.20 ; FT50-61 - £1.20; BN43-2402 - £1.20;
BN43-202 - £2.00; BN43-302 - £2.00; BN61-202 - £2.00
Ferrite beads – FB73-101 (3.5mm dia x 3.2mm long, 1.2mm dia hole) – 40p for 5
All toroids are plus postage – up to 5 packs = £1.00UK), £1.60 (EU), £2.20 (DX). Each additional 5 packs, please add 50% of the same postage. (Please note – if you order 2 packs of any type – you will probably get all 10 in one pack).

Magnet Wire – 20, 22 SWG – 3 metres for 60p; 24, 25, 27SWG – 4 metres for 40p; } postage
30, 33, 35SWG – 5 metres for 30p. This is solderable enamel insulated }
max of 3 sizes per member (I have to measure and wind this!) } as
Axial lead inductors (they look like fat ¼W resistors) these are low current – a few hundred mA }
4.7uH, 6.8uH, 10uH, 15uH, 18uH, 22uH, 33uH, 39uH, 47uH and 100uH - all 15p each. } components

Limerick Sudden kits RX (80 through 20m); TX (40m only) **£34.00 each plus post** UK - £2.50, Eu - £3.50, DX - £5.00
Binders for Sprat - the original 'nylon string' binding type! Black with club logo on spine **£3.75 each plus postage**
(one: UK – £1.40, EU – £2.20, DX - £3.00. More – add £1, £1.20, £2.00 each)

Sprat-on-CD V4 – 1 to 140 (see Sprat 140) – members price - £4 plus post: UK - £1.00, Eu - £1.60, DX - £2.20

Please note - I only have stock of the above items – I do not sell anything else. Anything in previous advertisements and not shown above (except coils) is out of stock – if it becomes available again – it will be in the next magazine. The PDF on the sales page of the club website is usually up-to-date (check the date at the bottom!)

Cheques (UK) and payable to G-QRP Club. Sorry, but cheques in other currencies are uneconomical to us due to bank exchange charges!

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