



# SPRAT

THE JOURNAL OF THE G QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

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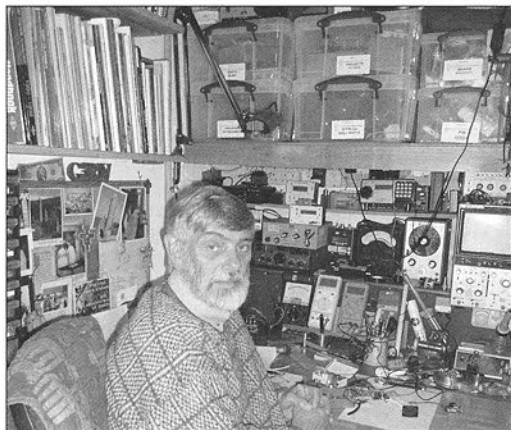
**Hans Summers, G0UPL, receives his QRP Hall of Fame  
Plaque from Dick Pascoe, G0BPS.**

**The Digi-Pot ~ IRT with QSK ~ Selectoject 2  
Audio Amps for Diode Mixers ~ Novice Keyer ~ Mini Loop Aerials  
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Meter Tester ~ G QRP Convention ~ Antenna – Anecdotes – Awards  
Communications & Contests ~ Member's News**

# JOURNAL OF THE G QRP CLUB



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Welcome to SPRAT 139. At last I have a current G3RJV “at home” picture for this page showing my new [and diminutive] radio area. I have also converted my garden summer-house [a shed with glass doors] into a workshop with my larger bench tools and some of the larger test equipment. It taking time to get used to reduced space but I am tidier than ever before and I nearly know where all my components are located.

Please don't forget that SPRAT depends upon you to send us you projects and ideas to share with our readers however simple you think they may be. We can accept most formats. If you would like a blank MS Word page formatted “SPRAT style”, just send me an email request.

72/3

G3RJV



## **The W1FB Memorial Award 2009/2010**

The project is to **Design a QRP station (transceiver or transmitter – receiver combination) using a minimalist approach. Produce a log of 10 QSOs** Significant improvements on existing designs could be accepted. Please submit your design to G3RJV within the next year, with circuit diagrams, all values and brief notes.

The projects will be published in SPRAT and the winner will receive an engraved plaque.

# The 'Digi-Pot'

Ron Taylor G4GXO, Cumbria Designs  
ron@cumbriadesigns.co.uk

With quality variable capacitors almost impossible to find new, many VFO designs now use variable capacitance diodes (varicaps) as the tuning element. The tuning voltage is typically generated by a multi-turn potentiometer or a standard 270 degree pot with a reduction drive to provide an adequate tuning resolution. The simple circuit described here offers an alternative approach. It employs a low cost rotary encoder, a small 8 pin microcontroller and a few sundry parts to generate a variable voltage suitable for driving a varicap. The result is cheaper than a new multi-turn pot and offers some extra features such as dual tuning rates and programmable tuning direction on power on.

## How does it Work?

If microprocessors and digital electronics are not your thing, persevere and read on. At the heart of the design is an interesting analogue principle that could find applications in many other design areas.

The Digi-Pot uses Pulse Width Modulation (PWM) to produce a variable DC voltage (**fig.1**). The duty cycle of the PWM output is controlled by a rotary encoder. As the encoder is turned in one direction the duty cycle increases, in the other direction the duty

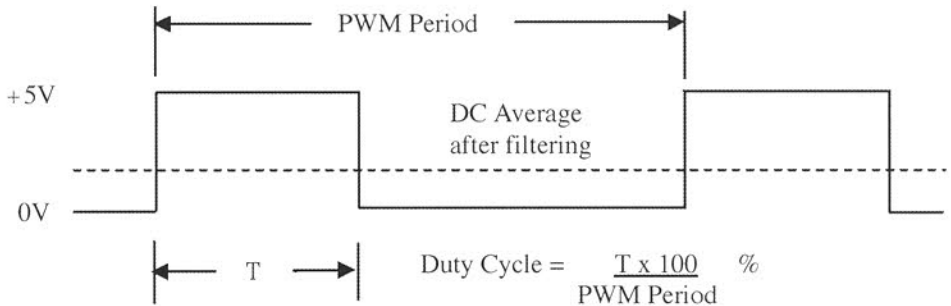
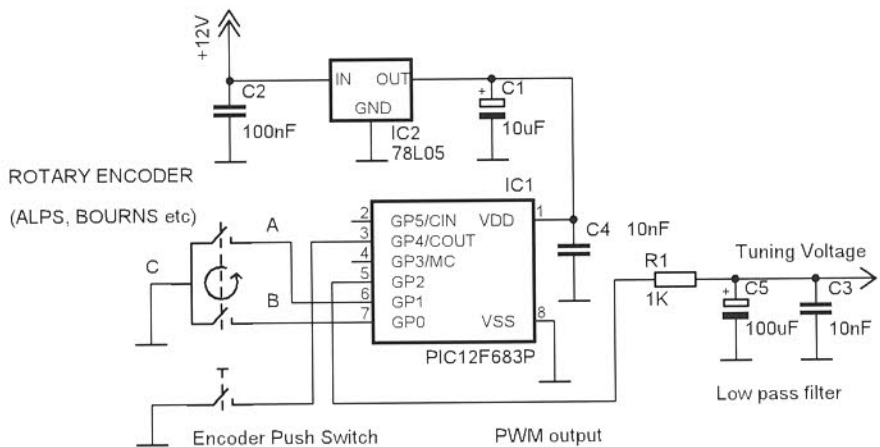


fig 1 PWM Waveform

cycle decreases. The PWM output is averaged by a simple RC low pass filter with a corner frequency well below the PWM frequency, to produce a DC voltage. This DC voltage can be used directly to drive a high impedance tuning varicap or buffered with an operational amplifier to drive lower impedance circuitry. The only constraint is that for the averaging to be effective, the load on the RC filter must be high impedance. The RC filter corner frequency is a trade off between tuning response (the rate of change of the DC output) and suppression of the PWM fundamental.

## Circuit and Software Detail

The schematic is shown in **fig.2**. To keep the parts count low, the PIC12F683 processor runs on its internal clock at around 8MHz, saving an external crystal and a couple of capacitors. In common with many of the Microchip “PICs”, the 12F683 incorporates a PWM module. This feature is intended for motor control or servo applications but in this design we use the PWM module to digitally generate a DC voltage. The PWM module is configured to operate at around 7.8kHz, the highest possible frequency for an 8MHz clock and the maximum 10 bit duty cycle resolution. This frequency is over 11 octaves higher than the RC filter corner frequency, ensuring good attenuation of the 7.8kHz component. The 10 bit PWM duty cycle word defines the 0% to 100% duty cycle in 1024 linear steps. After averaging by the RC low pass filter, the PWM waveform is converted to a DC voltage ranging from 0V to 5V in 4.9mV increments.



**fig.2** Digi-Pot Schematic

The rotary encoder and its integral push switch are connected to the PIC’s “General Purpose Input/Output” (GPIO) port which has internal pull up resistors enabled on these inputs. As the encoder is turned, the contacts ground the respective input pins in a quadrature sequence. A timer driven interrupt routine scans the encoder contacts every few mS looking for a change in state. When a change is seen, the new contact states are analysed to determine which way the encoder turned and a software defined 10 bit counter is incremented or decremented accordingly. Following each change, the contents of the 10 bit counter are loaded into the PWM control register to define the new duty cycle and hence set the new DC output voltage from the RC filter. At the limits of the tuning range the counter is held at its “end stop” values of zero and 3FFh, (1023).

Operating the encoder push switch causes the processor to toggle between two tuning step sizes; a unit step per encoder increment and 10 steps per increment. This provides fine and coarse tuning rates. Holding the push switch on when the Digi-Pot is powered up changes

the tuning direction (the sense of the output voltage for the encoder rotation). This is stored in the processor's EEPROM and re-applied on subsequent power ups.

## Results and Future Development

The Digi-Pot has been tested on a simple 7MHz VFO with very good results. A tuning range of 80kHz was achieved and although tuning linearity suffered because of the range, resolution remained adequate for SSB. Sidebands at the PWM fundamental were detectable on a receiver although they were at least 60dB down. Whilst it's unlikely that they would pose a problem, further attenuation would be possible by clocking the PIC from a 20MHz crystal and using a higher PWM frequency. Some minor changes to the GPIO pin allocations and a pull up resistor for the encoder switch would be necessary. Reducing the RC filter corner frequency would also provide further attenuation at the expense of a delayed tuning response. The use of a PIC with a higher resolution PWM module, such as the 14 bit version in the PIC18F1330, would provide scope for greater tuning ranges and finer resolution. Finally, the additional RAM in the PIC18F1330 could be used as a delay line for implementing a complementary Fast Huff Puff stabilisation scheme, capable of operating with inputs at up to 50MHz. The stabilisation could be disengaged by the tuning action for smooth fine tuning. The software source code for the 12F683 is available for download at [www.cumbriadesigns.co.uk/resources](http://www.cumbriadesigns.co.uk/resources) .

## Membership News

### Tony G4WIF

Australian members please note. David Simpson VK2DBS has informed the club that he will no longer be able to continue as our representative. Please contact G4WIF with any enquiries or to pay your subscriptions. Obviously for now this means that you will not be able to pay by cheque in Australian Dollars. You could contact your bank and see if they have an economic way of sending £8 sterling to me but usually international money orders can be pricey. Please consider using Paypal. (see [www.gqrp.com/paypal.htm](http://www.gqrp.com/paypal.htm)).

The club wishes to extend our grateful thanks to Dave VK2DBS for a long and totally reliable service to the GQRP club.

**From G3RJV:** I would like to add my personal thanks to Dave for all his work, with sorrow that he is no longer able to continue as our VK representative. Our overseas representatives do a valuable job for the club. If any Australian member would like to serve as our VK representative, please contact Tony at [g4wif@gqrp.co.uk](mailto:g4wif@gqrp.co.uk).

## 2008/9 Handbook

### George – G3RJV

It would appear that the printers lost the initial; "I" from part of the handbook containing some of our Italian members. Please amend your handbook and add an "I" for members between IK0IXI and IV3YNB.

## IRT with QSK

John Shaw, G3ZKZ, 2 Castle Cl. Felixstowe. Suffolk. IP11 9NN

One of the things I enjoy doing is making simple QRP transceivers and recently the thought crossed my mind – just how difficult would it be to fit QSK to a simple rig. So I decided to have a go.

I looked through back issues of SPRAT and other magazines to find a circuit to “lift” but without success. They were thin on the ground and those I found were either too complex, or I didn’t understand them – or both. So I decided to modify a favourite IRT circuit of mine to QSK

The IRT circuit is one I developed some time ago and it has given good service. You can set it to any note you like +/- 1kHz of the receiver frequency and for netting, it is not essential to remember where you have left the IRT knob parked. The only mods necessary to adapt it to QSK were to fit some back to back diodes to stop the RX and TX lines talking to each other and to fit an 8 volt regulator to eliminate any discrepancy in voltage between RX and TX lines.

TR1 and TR2 attend to the QSK switching.

R3 holds on TR2, which in turn, via R2, holds on TR1, which passes the RX volts to the Net/Offset switch that operates the IRT when in the RX mode. When the CW key is pressed, this switches on TR3, which passes plus volts to the IRT, and also to R4, which then switches off TR2 and, with the help of R1, switches off TR1.

Setting up the IRT is quite simple, just check the DC voltage at the junction of D4/D5 and with SW1 in the offset position, turn the 10K linear Pot to mid voltage. Then set the switch to the net position and adjust the 10K preset to the same voltage. This will get you in the parish but as things are rarely linear you could improve the centralisation with a frequency counter if you find it to be necessary. But this setting is not at all critical.

Components:

1 x 10K linear pot

1 x 10K preset pot

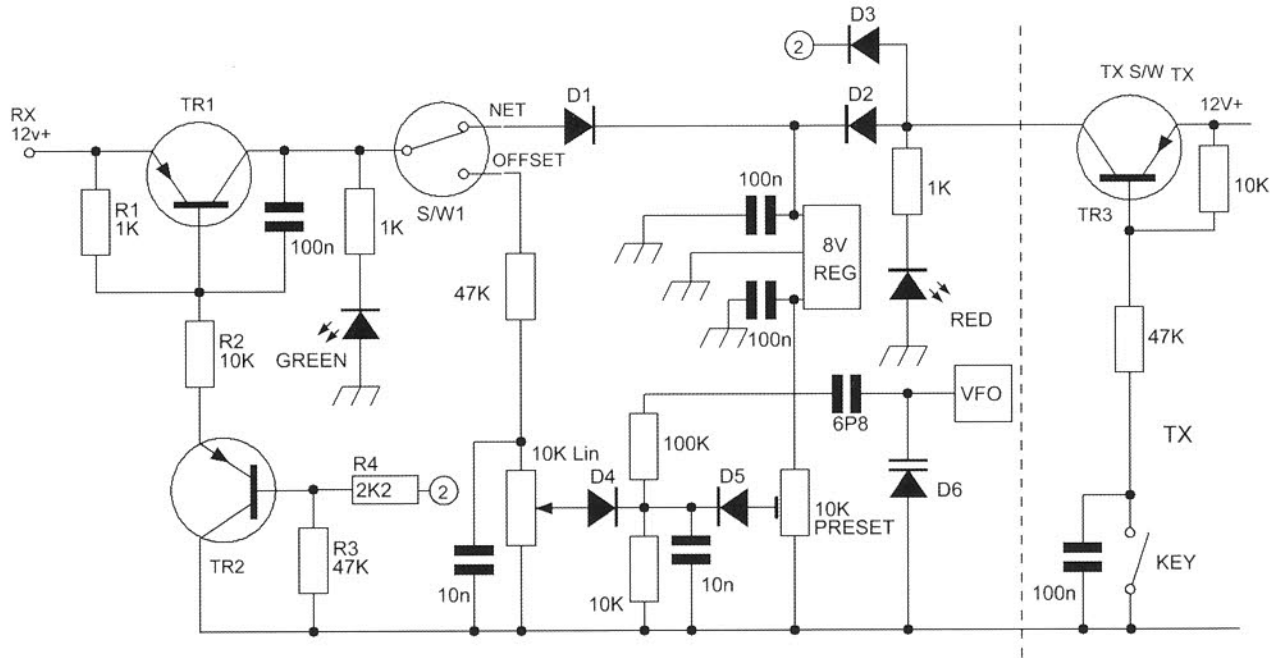
2 x any small signal silicon PNP transistors

1 x [surplus] varicap diode [D6]

1 x SPDT Switch

5 x silicon diode –waiting their turn in your junk box

plus capacitors and resistor to suit.



## Selectoject –Take 2

Jeff Furman. AD6MX. 1449 Yukon Drive, Sunnyvale, CA 94087. U.S.A.

Here is a modern rendition of an old audio filter, the “Selectoject.” I think it was originally invented by O. Villard of SRI/Stanford ( O. G. Villard, Jr., and D. K. Weaver, “The selectoject,” QST, vol. 33, pp. 11-17; November, 1949.) and published in ARRL Handbooks in the 50’s and 60’s. This circuit has been rediscovered on occasion, (Very high-Q insensitive active RC networks Tarmy, R.; Ghausi, M., IEEE Transactions on Circuit Theory, Volume 17, Issue 3, Aug 1970 Page(s):358 - 366,) for example. It’s much easier to get high Q than with a Sallen-Key or infinite gain multiple feedback filter.

One way this filter is used is to peak an interfering signal, then switch modes to null it out. Another use is selecting the desired signal in the peak mode. It seems that National had a Selectoject built into the NC125, as seen in the bama archive schematic. My only claim is the simplified switching between peak and null from the Handbook versions and the use of opamps instead of transistors or tubes.

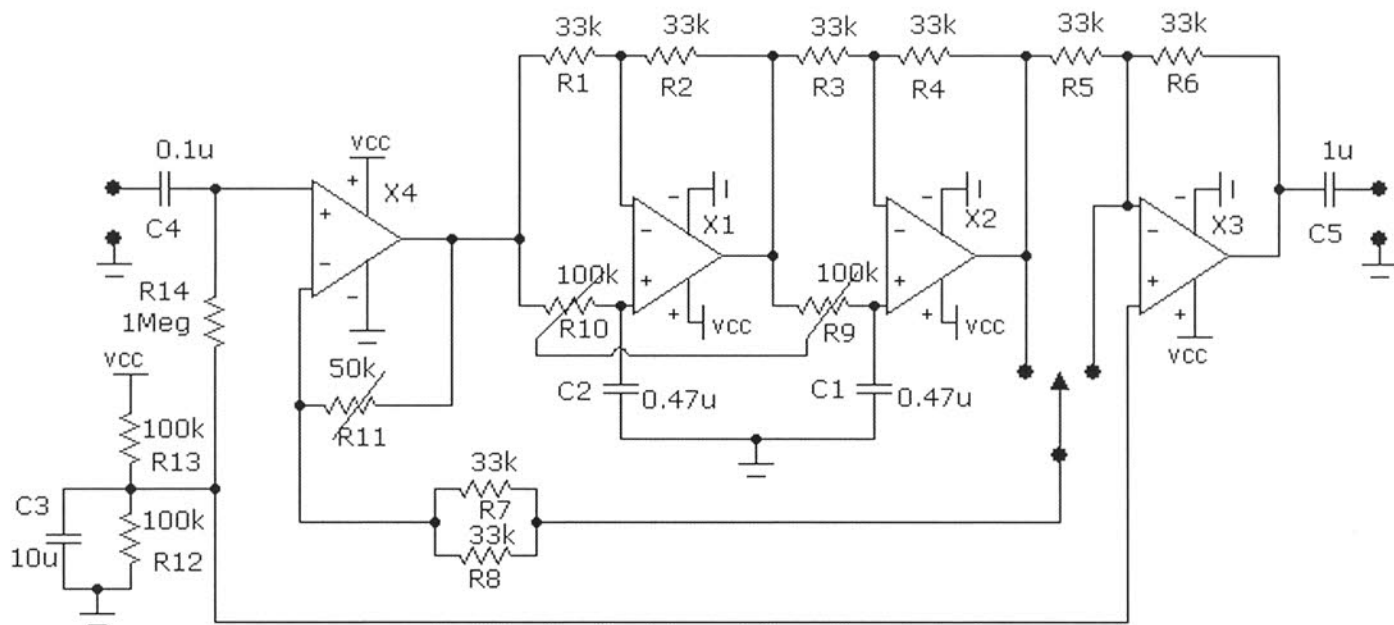
Notes:

(R1, R2), (R3, R4), (R5, R6, R7, R8) require matched values. They may all be equal; an eight resistor 16-pin dip pack has adequate matching. Typical useful values here are in the 22k to 100k range. The parallel combination of R7 and R8 is critically proportioned to R5 and R6. The wiring at the junction of R5, R6, inverting input of X3 and one pole of the switch needs to be minimized. Since it is an opamp summing junction, extra distributed capacitance affects the amplifier’s stability. A small cap across R6 (0.1pf to 10pf, say) will help compensate this issue if necessary; switching the summing junction represents a legitimate design compromise. The ganged rheostats R9 and R10 have less severe tracking/matching requirements than R1 through R8. Likewise values of C1 and C2 need not be precisely matched.

Typical values might be 100k and 0.47 uf. Adding end resistance to R9 and R10 of the range 1% to 10% will improve the tuning functioning at the high frequency end; audio taper pots might have better control than linear pots. The slow taper end should be connected to the wiper for this to work properly; depending on the direction of the taper, the frequency calibration marks should either be on the panel or else be on the knob skirt; one or the other will yield the desired frequency increasing clockwise labelling. R11 is roughly twice the value of R5, R6, R7, R8, (R11=50k for R5, etc.=22k, 27k or 33k; R11=100k, for R5, etc.=47k or 56k; etc.)

Lots of quad opamps might work here: LM324 or your choice; put in a socket and try different types; The space for these notes is way too small to embody a treatise on amplifier selection. Supply voltage might need adjusting based on the particular type. Low impedance headphones definitely need a buffer of some sort, perhaps an emitter follower, LM386, LM380, etc





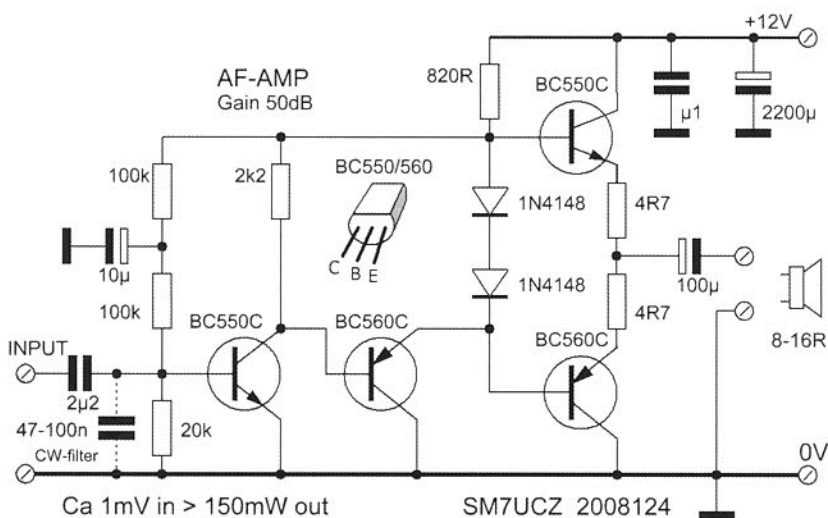
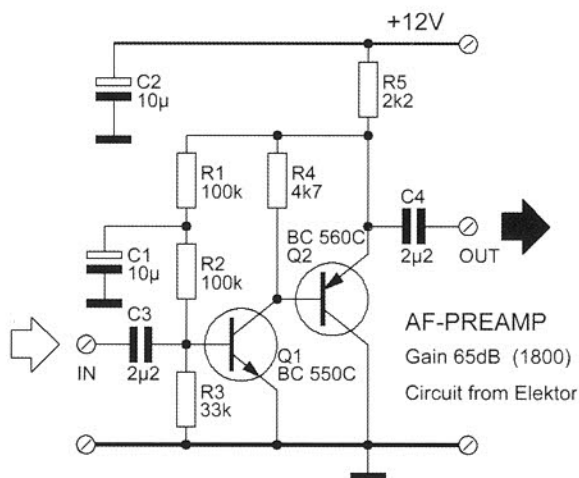
Updated Selectoject Jeff Furman AD6MX 1-22-2009

# Audio Amplifiers for Diode Ring Mixers

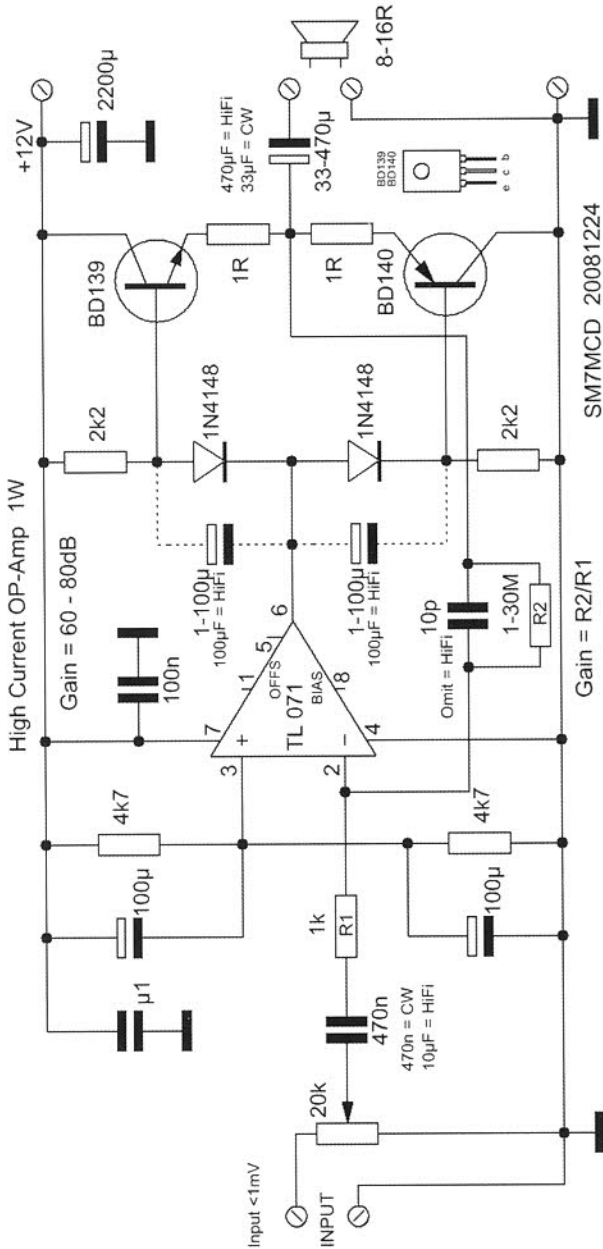
Johnny Apell SM7UCZ, Ekedalsvagen 11, S-373 00 Jamjo. Sweden

I wanted a small audio amplifier for a diode ring mixer, and such amplifiers need many dBs of gain. So I remembered a circuit in Elektor that promised 65dB gain. Why not attach a power stage behind it?? I made a test amplifier and found it worked well.

I showed my friend Leif SM7MCD the board and he made some tests, changed some components and measured about 50-55dB gain. That was so far so good....



# 1.5W AF-AMP



A couple of days later Leif come back with another circuit that he had run in a computer simulation program.

I made a board for a test and it was a really good circuit and very stable.

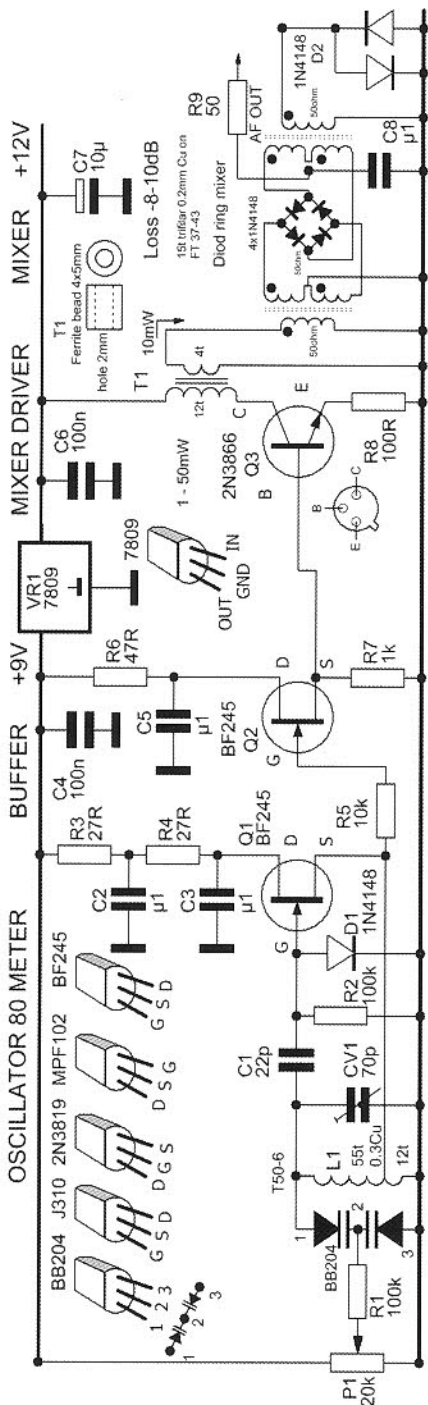
## Lots of power out 1,5W !

And the gain... it is possible to set the gain to over 50.000 (50Mohm/1k) times without oscillating!!

With the capacitor in feedback line it is possible to select the passband for a CW note.

It takes a little time to start up the amp depending on the big capacitor at the "+" input to the IC.

The TL071 was at hand and I have not tested with another IC, but it will work with any.



SM7UCZ 20081221

## Diode Mixer and VFO

This is the circuit I tested. We want to show young people how easy it is to make a receiver.

The components are what we had in bags or sacks!. We wanted to use easy components. That is why we used a potentiometer for frequency control.

I have lot of BB204 varicaps. The VFO covers 3.5 - 3.8MHz. It would be no problem to alter the turns and tune to 40 meters.

I don't have any antenna filtering ...direct to mixer. We don't have big problems with BC stations. Our only BC (1179kHz) transmits only 06.00-08.00 17.00 - 19.00 every day. I can hear it in the background, but it is not a problem.

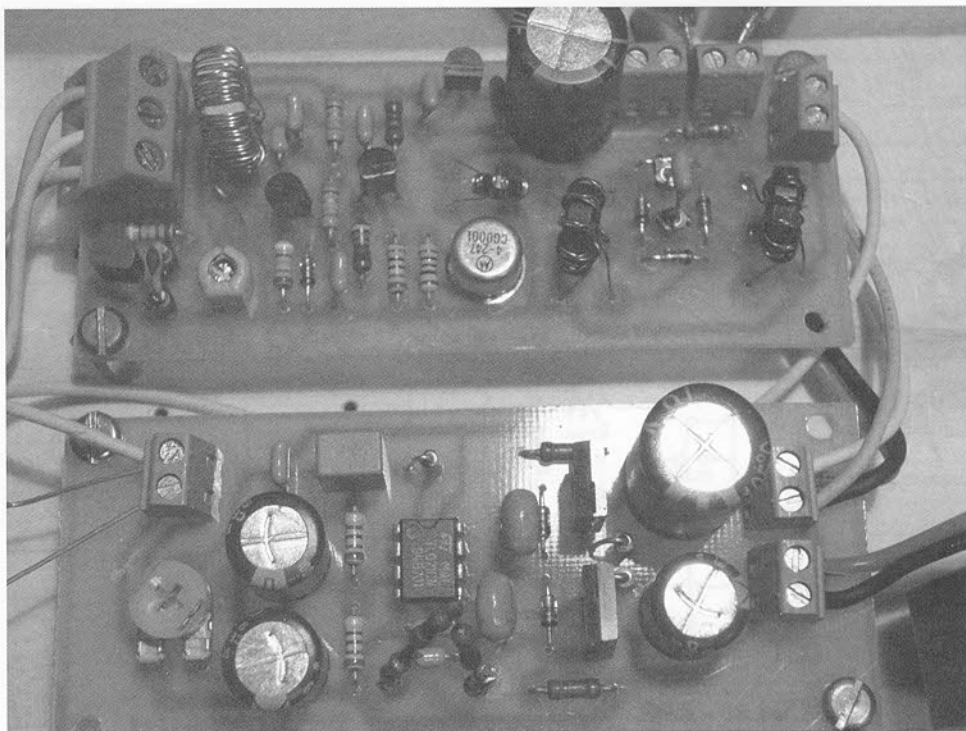
**Mixer transformers = 15t trifilar  
0.2mm Cu on FT37- 43**

**T1 = 12t / 4t on ferrite bead  
4x5mm, 2mm hole**

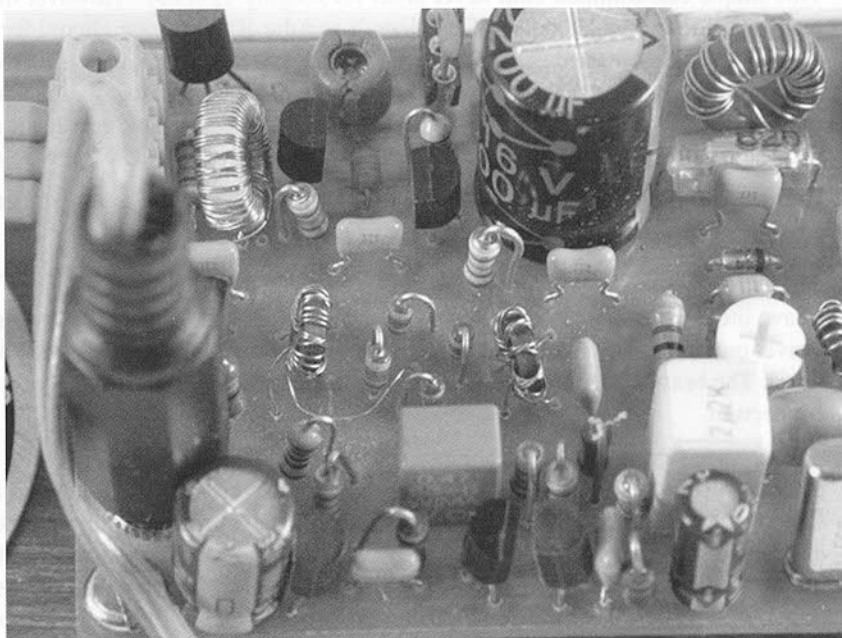
Notes:

1] The antenna signal enters at the top of the pair of diodes (D2) at the right-hand side of the diagram (not marked)

2] I had good results with the 150mW amplifier using 2N3904 and 2N3906 (G3RJV)



The 150mW and 1.5W amplifiers

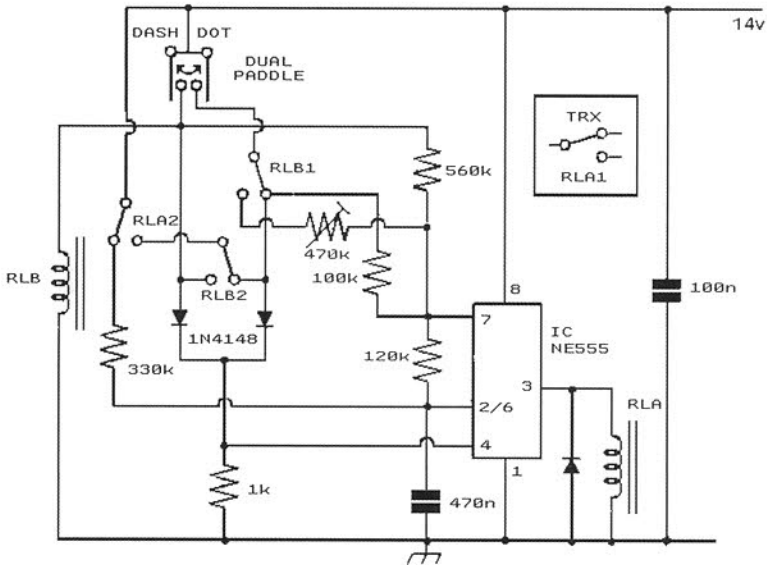


The Diode  
Ring Mixer

# The Paddler Novice Keyer

Peter Howard G4UMB 63 West Bradford Rd. Waddington Clitheroe BB7 3JD

## THE PADDLER NOVICE KEYER



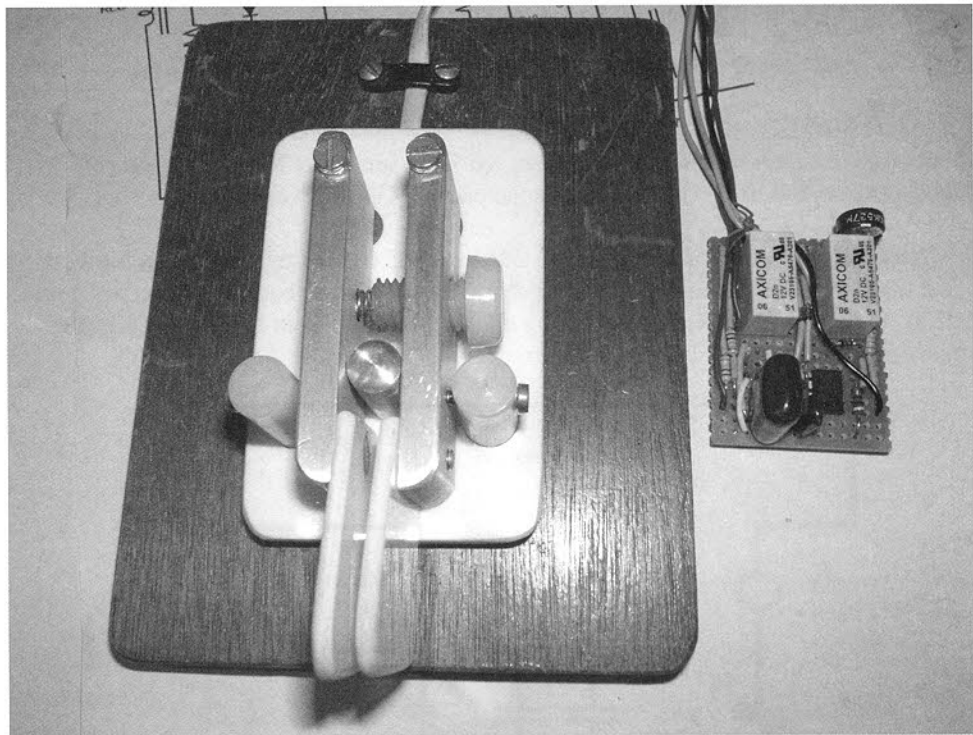
This simple one common chip keyer is set for roughly 12WPM. However the 560k resistor value can be altered for Dash length and the 100k resistor altered for Dot. If a single paddle key is used the 470k preset resistor can be omitted because this variable resistor is adjusted so that when a dual paddle key is squeezed together the dot speed is equal to the dot speed of the dot paddle. By omitting the variable resistor if a dual paddle key is squeezed Dashes will result instead. I have used 12v 2p2w relays.

Unfortunately this design through its simplicity lacks the ability to remember a Dot movement if this movement is made during the sounding of a Dash.

The relay switches ensure that a Dot cannot be made until a Dash has finished.

I have included a simple home made key to accompany the circuit. The two metal bars swivel on 4mm screws at one end. These are connected underneath to the Dot and Dash wires. The brass 10mm post between the bars is connected to the common positive connection.

The bars are forced apart from the brass post by a spring got from a latching ball pen that protrudes from a loose blind hole in a nylon 10mm screw which is screwed into the RH. Dot metal bar. The two outer nylon posts each have a 3mm screw through them to adjust the contact gap and paddle travel. The material I used for the base and paddles is plastic. To finish off and to hide the connections underneath I mounted the keyer on a plinth of 10mm stained plywood which also gives it stability. All electrical parts are easily obtainable but to make the keyer it would be an asset to have access to machinery.



## Another Windows Calculator Tony Plant, G3NXC

In SPRAT Nr 138 GI4FLG mentions the use of Google as a calculator. For those using Windows XP there is another option - the Power Calculator available free from the Microsoft site:  
<http://www.microsoft.com/windowsxp/downloads/powertoys/xppowertoys.msp>

When installed, this calculator allows the entry of a formula as described for the Google site but offers the additional advantage that a range of inputs can be specified and the results displayed as a graph.

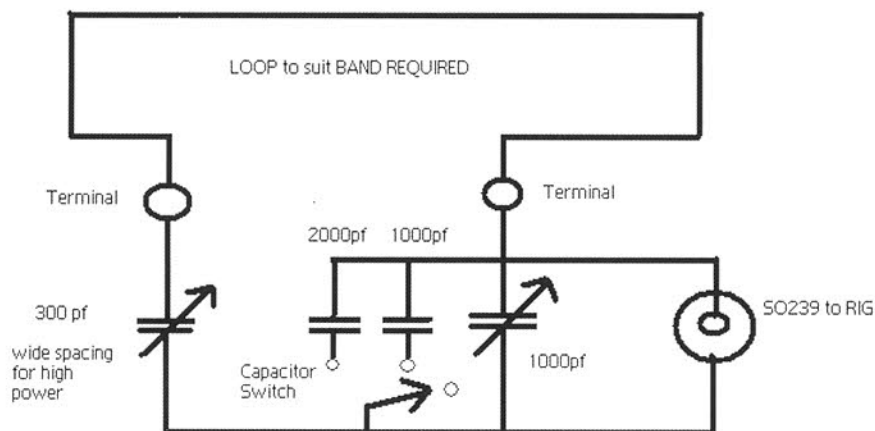
Another useful bit of software available from this site is a program to resize a .jpg file. After installing the program just right click on the file to be resized, select 'resize' from the resultant menu and then choose a resize option. No need to open the file and since the program creates a new file, the original data is not changed.

## Mini Portable Loop Aerials

Jim Stirling GM3UWX, 25 Maxwell Road, Bishopton. PA7 5HE

I made these aerials about two years ago for use on holiday and they work so well that I think other members might like to try them too. They are really Magnetic Loops but tuned and matched using capacitors as in the original US Army design.

My Aerial supports were made by gluing 20mm uPVC conduit tubing (25mm for the top band Loop) into square frames using inspection elbows for the corners. (Materials from B&Q) There is, of course, no reason why the loops need to be in frames, but it makes them easier to handle.



This is really a PI matching unit with the loop as the inductor. Size and number of turns to suit band.

I decided that 26 inches was the largest size that I could easily fit in my car and experimented from there. The dimension given is the size of the wire loop and the conduit is cut accordingly. I built and tested each loop before gluing the conduit corners in place and reduced the frame size in each case until I could tune the highest frequency with a capacitance of around 60 pf. This gives reasonably high Q but is not as sharply tuned as a Magnetic Loop. I glued each loop only after I had got the size right.

For the single turn loops, I used PVC covered heavy duty flexible cable, the kind used for the DC power supply for 100 watt HF Rigs and for the multi turn loops, smaller PVC covered flexible wire like the cores of a 13 amp mains cable.

The Tuner is just a PI circuit with extra capacitance switched across the 1000pf matching variable capacitor to allow for the high Q of the loop. The loop is the inductance and the radiator. The 300 pf tuning capacitor has a 3/1 slow motion drive for easier tuning.

The two Variable caps in my QRP tuner have quite small spacing and were taken from an old valve receiver.



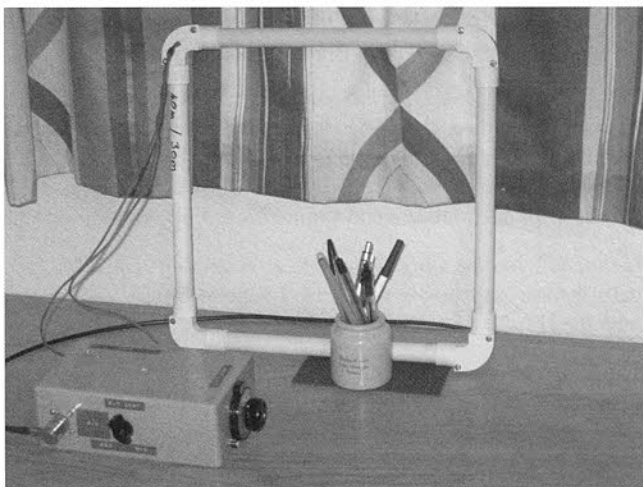
My QRO Tuner has quite a large wide spaced transmitting variable capacitor from an old 150 watt AM/CW valve transmitter and a series of switched fixed caps for loading, so that I can fit the whole thing into a 6" x 4" plastic box. It runs 100 watts.

These are the loops I use:-

1.8 MHz 26 inch Five turns.  
3.5 MHz 24 inch Three turn.  
7/10 MHz 26 inch Single turn  
7/10/14 MHz 21 inch Single turn.  
7/10 MHz 12 inch Single turn.

The 12 inch loop is the one which I use for teaching Practical at the Paisley Amateur Radio Club, with the Club Shack at the other end. It sure beats carrying a 66 foot aerial around.

**Note** If you connect a suitable inductance to the terminals instead of the loop, the tuner will work as an ordinary PI Aerial Tuner with the aerial wire connected to the 300pf terminal and the Earth to the outer of the SO239 connector.



MEMBERS ADS - MEMBERS ADS - MEMBERS ADS - MEMBERS ADS - MEMBERS ADS

FOR SALE: ELECRAFT K2, basic 15w model, SSB with mic. GWO, phone for details, £375. Also QRO model, up to 100w RF [!], auto ATU and many options fitted. John, G3GTJ, 01963 240319 (Somerset).

WANTED: Yaesu FT7B. Also I would like to talk to anyone with experience of a JUMA TRX transceiver kit from Finland. John, G3GTJ, 01963 240319.

FOR SALE: Alinco DJ596 with speaker. Mic and 3 el. 2m. beam, 7 metre fibreglass mast £80. Kenwood TH26E £20. Also two interfaces RTTY and SSTV RTTY program on 3.3" floppy. £5. Tom, M3EHA, Tel: 01606 597342 or thomas.williams32@btinternet.

# Simple Vacuum 80m Superhet

Gert de Gooijer, PA3CRC, St. Adrianusstraat 81, 5614 EN Eindhoven  
pa3crc@peopleskills.nl

## Introduction

A simple but good performing receiver can be built for (almost) free in just a few days, providing valves are used, your junk box is piling out with remains of old surplus sets and you are willing to do some experimenting in order to use the stuff you've got on hand. Sounds like conditions met where hams live...

Valves, because they are tolerant, easy to use and give a lot of gain and dynamic range without the need for tricky techniques, getting rid of oscillations and/or applying oscillator power. None of that all: they just work! And, you end up with a magnificent glow-in-the-dark-80m-DX-receiver, giving great pleasure. (Think this receiver will work also very well on 160 and 40, for higher bands you might need more sensitivity, who tries?)

In my case it started with this junk box, all those parts waiting to get employed. They'd passed so many times through my hands, making great plans I never really started. So finally started with this receiver, which turned out to be simple to build and it really compares favourable on CW with whatever other receiver (that I know). Antenna is a full size 80m-dipole, both ends 40ft up with open feeders and symmetrical ATU, so I know what dynamic range, sri *range* is!

Let me tell you the story. If you are a "collecting" ham, you are very likely to have comparable parts in your junk box in what case I hope to inspire you to use those valves. Be careful though with the HT: 200V tickles a bit more than 12...

## The main parts

It started with the 6AS6, which is a *dual-control-grid* pentodes. That really made me wonder. Difficult to get data on it too. Came out of a Star fighter. Exiting isn't it? Besides the normal *g1* control grid this valve also got a *g3* control grid. So compare this valve with a medium power dual gate leftmost. Sounds great as a mixer! If you happen to have a ECFxx kind of VHF mix/osc tube (there are thousands of them around), go ahead, guess that one will work too. Just look in the data book/internet for data. Noise is low with these pentode mixers so no RF amp needed, which contributes to strong signal handling.

The 6AK5 (=EF95) was chosen for the VFO just because I have them, their filament power (heating) is not that high and they have a high transconductance  $S$  (mA/V). This give the possibility for very loose coupling with the VFO Coil. The VFO coil is coming out of a BC211 frequency meter.

The IF cans come from a WS31 (=BC1000) the first FM-walky-talky in the world. You can easily take these cans apart and rewind them. Used some 100 turns of 0.1mm wire and that gave resonance with the caps you see in the schematic. Used these as high- (mix-anode) to low- (xtal-filter) impedance converter. At the output side of the filter you see the same trick the other way around. Other IF-cans will work well too after rewinding them to the IF you need.

The xtal filter is a professional 1400kHz-pole filter, some 1000Hz wide. Very nice for easy listening. For most rag-chew and even DX QSOs this 1000Hz is a good compromise, specially with the bandpass tuning. (BFO and VFO shift, hi...). I think Guess the club's 9MHz CW filter will work great too but did not try. You can also make your own filter out of 4434kHz xtals.

There is no IF amplifier, but there is a potmeter for setting the IF attenuation. This way the RX can handle a wide range of input levels. the ECH81 comes from an old 16mm film projector, as does the output transformer. If you do not have such a transformer, just use a 230 to 12V mains transformer... the ECH81 your will find likely sitting in your junk box, it was very widely used in broadcast receivers. Do not know where the ECL80 comes from, one day it was just sitting there. They were used in B/W TV-sets. A ECL86 would also work and has higher ratings but also a far higher power drain. The AF-output from the ECL80 is more then enough to drive your whole family mad, the neighbour included.

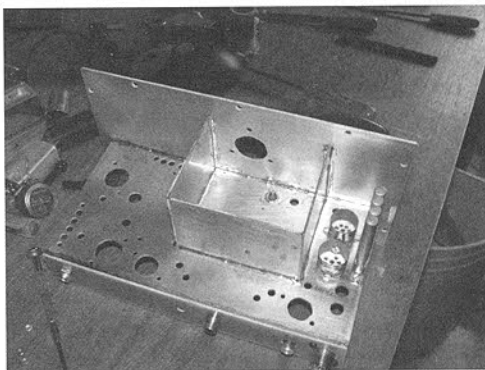
The high voltage transformer comes from a modern (!) uP based (!) ISDN-PBX but has amazingly no low voltage winding. The high voltage electrolytics come from SMPS boards, and I still got a number of old tubular ceramic C's and polyester ones with 200V-plus ratings.

Trimmers are the old Philips co-centric multi turn air-ones. You found those in the old BC-receivers. They are real quality stuff! They look like mini-vacuum-C's without the glass and the vacuum. But very likely you will have your own choice of non-SMD prehistoric air-dielectric trimmers somewhere. They are often very stable compared to modern trimmers with film or ceramic dielectric.

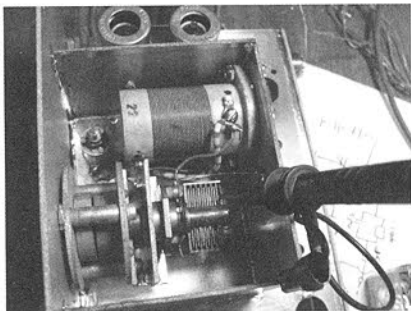
Since the CW part of the 80m band is only 100kHz , a simple ball drive vernier is adequate. Mine had a 0...100 marking which by dumb-luck matches within a few kHz over the whole band. Use a good quality air dielectric variable cap for tuning the VFO.

#### Construction

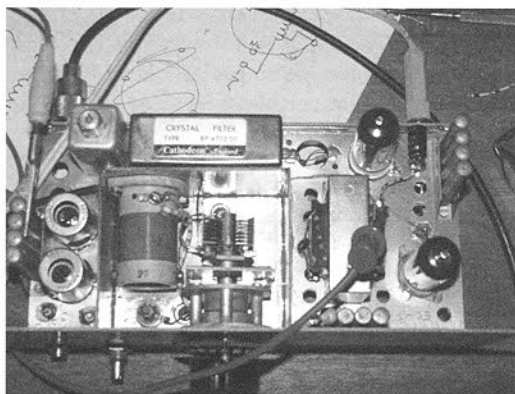
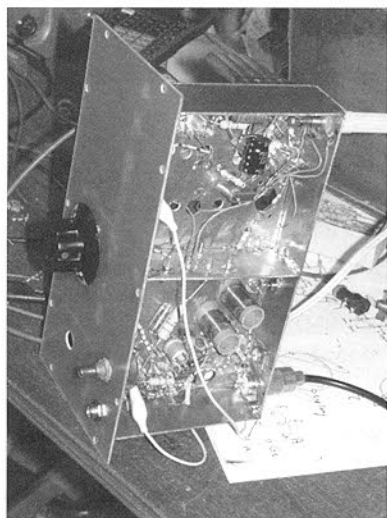
No difficult chassis construction, the chassis has been made of double sided copper clad glass-fibre epoxy board. Scrub them well and you can make a very sturdy chassis soldering them together. (see picture 1) Make sure to drill and file the whole before soldering the parts together. With a good round and square 12" file you can make the larger holes very easily. Very much unlike steel plate! And the double-sided copper foil shield very well without giving to much loss. Make sure to connect all sided together. For good grounding you can put straps through the larger holes as a kind of feed-through. Do not know if that's really necessary, but it surely doesn't hurt.



Well, and then you get the joy of putting the stages together. Use your own schematic, because you've got most certainly other parts. I started with the VFO, making sure it oscillates (yes right away) and tweak the range. (see picture 2) Make the input band filter (on PVC 5/8" tubes), grid-dip them glue them in the chassis, put the VFO on the 3<sup>rd</sup> grid of the mixer, the antenna signal on the 1<sup>st</sup> control grid and you will be able to receive 80m on an other receiver using it as a IF, and so on... The parts are



big ones, you use screws, ... It is easy, step-by-step. And within a few evenings (or one weekend) you will have a very nice 80m receiver, without headache. (in picture 3 & 4 the receiver is almost ready) Placement of the parts did not turn out to be critical, but use good sense.



If you want to use the receiver with a transmitter, do not forget to include a muting system. Here I apply a negative voltage around 15V (-9V is OK too). The receiver is completely dead as long as you switch off the antenna and ground the input of the receiver. (The antenna relays is in my transmitter) You can also put a switch on the front to manually mute the RX.

*For the schematic see picture 0.* While building I used ample of decoupling Cs and Rs, and they are not all in the schematic. Here and there a value may be different after tweaking the circuit, but that's all very easy. Again, be careful with the HT. During experiments, use a banana plug on the HT, so that you can keep the filament running while cutting the HT.

## Results

This receiver (see picture 5) is a pleasure to use on CW. The tuning rate with the simple ball drive is OK. It has no AGC, so do not let the strong stations surprise you. But the advantage of no-AGC come apparent when listening to "normal" and rag-chew QSOs. It is by far less tiring because the background noise stay in the background and the signals are on top of it. Many modern (Japanese) sets do not have a good manual IF gain so there you are depending on the AGC. Even during the recent CQWW-CW-contest the receiver performed very well on the big antenna if it comes to strong and weak signals. In those kind of short contest-contact I missed the AGC, because you do not have the time to adjust the IF gain to every new station. (I did not participate in this contest, it is too big for me)

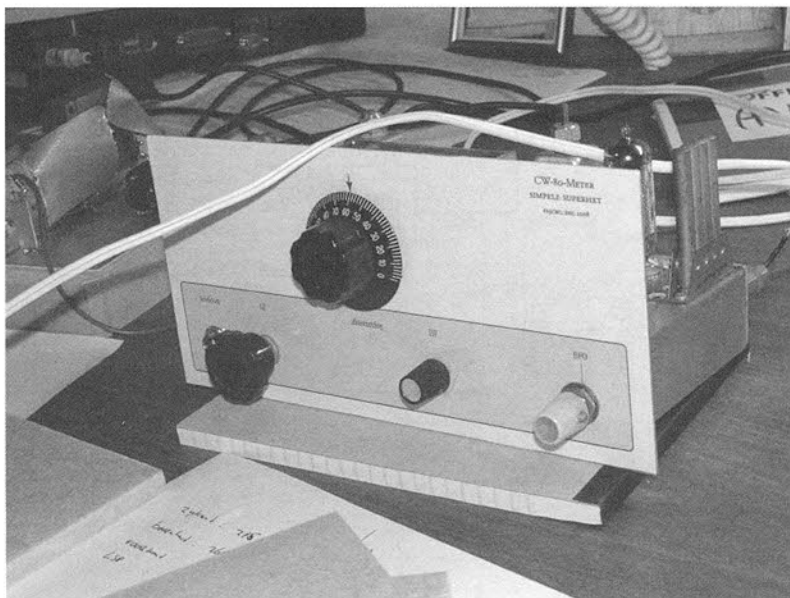
I made a mistake, the AF gain pot is on the left and the IF on the right-hand side. Afterwards I prefer to have the IF gain in my left hand while tuning with my right hand. But well, in first instance I thought the output would be that low that I would hardly need a gain-pot at all. It turns out that there's ample of AF output for driving a speaker up loud.

While muting the receiver for a long time the mixer tube might cool down a little causing a very small frequency shift, but I did not notice that. Initial frequency shift is about 3 kHz, in the first half hour. That could be better, but well, afterwards I put it on 3575 and I can monitor that frequency all day. So first switch it on, then make you a nice cup of tea and start listening

afterwards. (3575 is a frequency used for rag chewing by many Dutch stations, but you also hear other countries there. I think you find xtal for that on the club sales pages)

In a few weeks heard all of Europe on 80, some Asian sigs and one W-stn. Made nice contacts too with a MoPa TX and such a 3575.6kHz xtal. Next step is putting it all together in a cabinet, together with a compartment for the speaker & power supply (*picture 6*).

I wish you much joy using those old beautiful parts and putting them back to work, and the result is really worth while!



Enginuity Centre, Coalbrookedale  
Telford TF8 7DU

part of the Ironbridge Gorge Museum  
A World Heritage Site

# Telford Hamfest

## Sunday 4th October

Entry £2.50 Doors open 10:30

Bring and Buy

Entry includes discounted admission to Enginuity  
There is on-site catering  
Two first class pubs on the doorstep  
Plenty of local accommodation

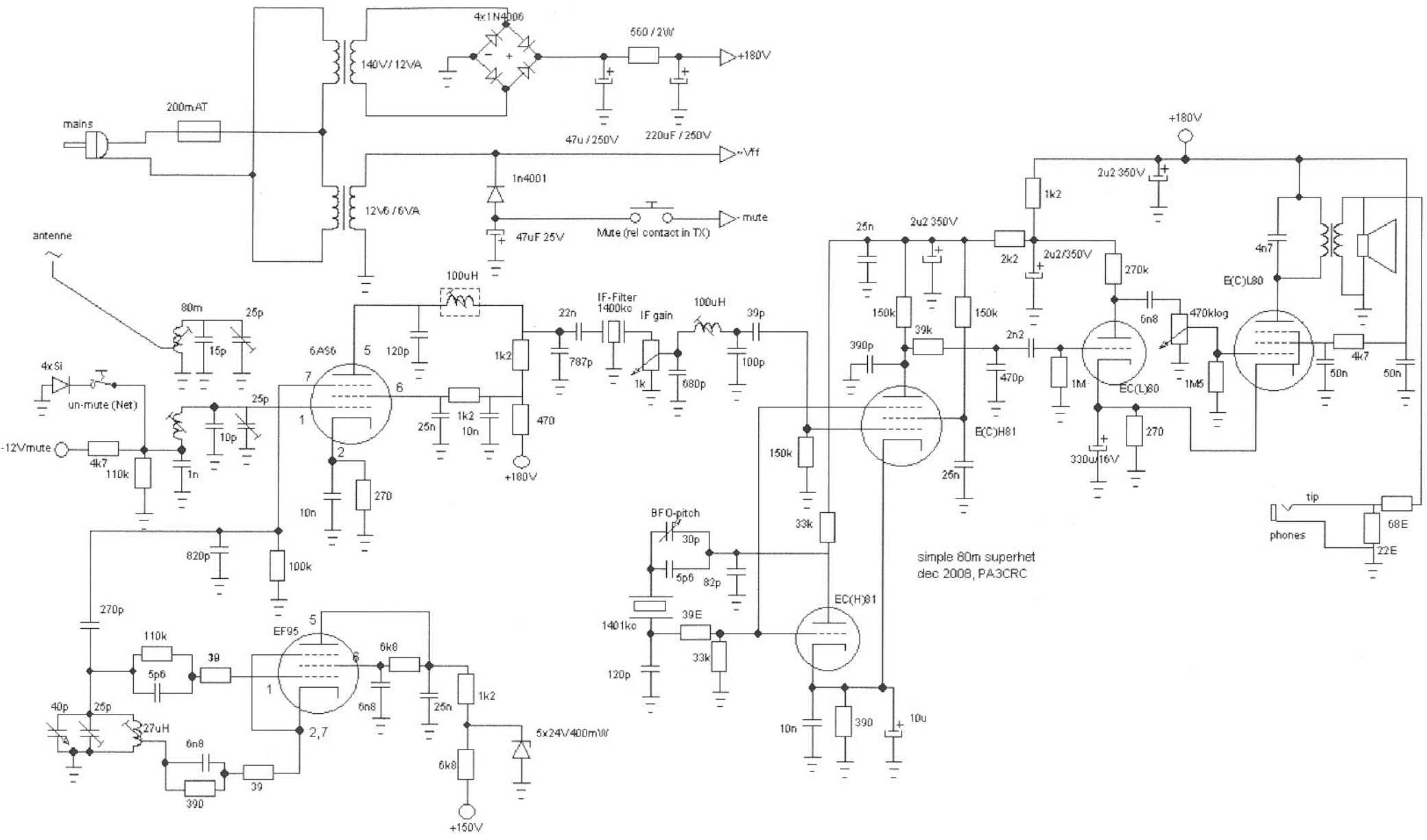
Info Visitors: Martyn 01952 255416 Exhibitors: Bob 07802 678875

Talk-in from GB4THF on 522. GB3TF on 433.200 and on 4m

Event Organised by the  
Telford and District A.R.S.

[info@telfordhamfest.co.uk](mailto:info@telfordhamfest.co.uk)

[www.telfordhamfest.co.uk](http://www.telfordhamfest.co.uk)



simple 80m superhet  
dec 2008, PA3CRC

# Valves at low B+ voltages (2)

Duncan Telfer G8ATH (dtelf.g8ath@virgin.net)

With apologies, my article in SPRAT #138, Spring 2009, requires some corrections:

Page 6: The caption to **Fig. 1a** should include the addition: **VS** = valve socket array.

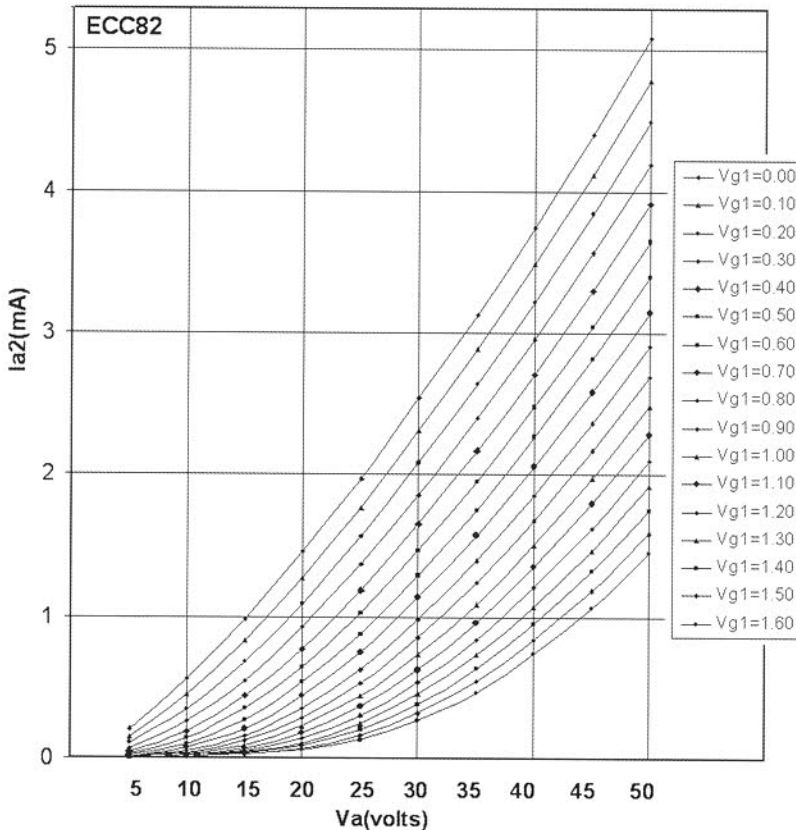
Page 7:

The caption to **PHOTO 1** should include ... **MP** meter panel {*not M*} ...

Page 8:

The caption to **FIG. 2a** should be moved up 5 lines to below the diagram and include: ... corresponds to  $V_{g1} = -1.60V$ . {*not -0.6V*}

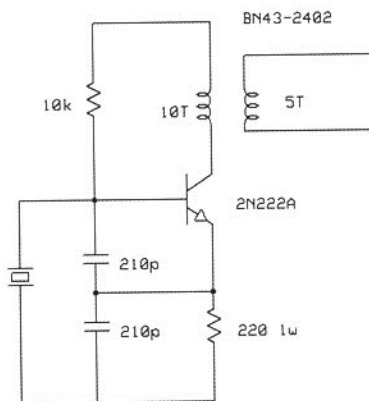
Mention of **FIG. 4** refers to this missing diagram, which should have been included:



**FIG. 4.** ECC82:  $I_a$  vs  $V_a$  measurements over the  $V_a$  range 5 to 50V (single anode).

## A Useful Crystal Oscillator

Paul Debono, 9H1FQ, 65 Triq Il-Hafur, ATTARD BZN 03, MALTA



I wanted a high level hf local crystal oscillator for the first convertor, an H mode switching mixer technique, requiring some 10dB or more LO to drive the 74AC86. Much experimenting went on with CMOS, but was unable to keep it quiet, in the absence of a crystal: it was oscillating at odd, unwanted frequencies, even without a crystal in circuit.

So I looked at various circuits, picking a bit here and there, and came up with this circuit. My AD8307 based RF meter is indicating some 19dBs coming out, using

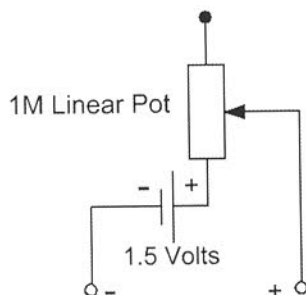
three separate xtals, 13.3 Mhz, 8Mhz, and 15Mhz to convert the signal to 6Mhz phasing IF. However, this power came out on the breadboard. When I constructed the circuit, manhattan style, the performance deteriorated ranging between 10dB to 18 dB out, depending on the frequency. Still, it is useful output for my project.

## A Simple Meter Tester

Jerry Gerard G0AED, 18 Hunstanton Rd. Dersingham, PE31 6HQ

I love simple test equipment and this meter tester could not get much simpler. All that is needed is a scrap of printed circuit board, a one Meg-ohm linear pot, a bit of flexible wire and a 1.5 volt battery. I use a battery holder glued onto the board and a hole drilled to hold the pot.

I calibrated a scale for it using a low current range on my DVM plus a large knob to get a reasonable scale. It will let you know if a meter is working and tell you the FSD as well.



Range is from 25 Micro-amps to 1 Milli-amps.

Handy to take to radio rallies as well as the workbench.

Credit for this circuit to Chris, G4ILR.



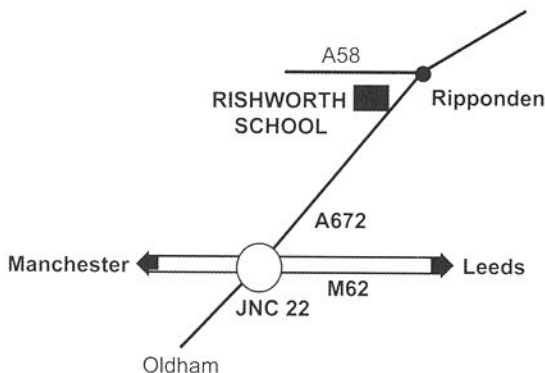


# THE G QRP CLUB MINI-CONVENTION

(in conjunction with the Halifax Radio Society)

**SATURDAY 24th OCTOBER 2009**

**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!**

**Further details and extra maps at [www.gqrp.com](http://www.gqrp.com)**

#### **LOCAL ACCOMMODATION:**

Look on the club webpage or ring G3MFJ [0113 267 1070] or G3RJV [01706 377688]



**Large Hall Space for traders**

**Dedicated Lecture Theatre**

**On-site Car Parking**

**To book a table (or tables), contact Dick, G0BPS, on 01303 894 390, or by email to [tables@g0bps.com](mailto:tables@g0bps.com)**

# The G-QRP Club Mini-Convention 2009

Graham Firth G3MFJ

Just a few lines to wet your appetite for the forthcoming event on the 24th October next. After last year's venture into a new location, we were very pleased with the event, so this year's is going to be in the same place – and will be much better.

We will have the usual excellent range of speakers who will be using the well-equipped lecture theatre at the school.

There will also be a raffle – we have a volunteer who has offered to organise it for us – this is one of the things that we didn't have last year

The table booking arrangements will be in the very capable hands of Dick Pascoe G0BPS. Dick has helped organise the tables at most of the past events in Rochdale, and he has offered to resume his duties this year. If you want to book a table (or tables), contact Dick on 01303 894 390, or by email to [tables@g0bps.com](mailto:tables@g0bps.com). He will send you a booking form, or tell you where you can download it from.

We will have a buildathon. The school at Rishworth has some well equipped laboratories, so it would be a shame not to make use of them. Buildathon events have become very popular in the USA, and there was a very successful one in Bath last year. At the "Four Days in May" QRP event in Dayton last May, QRP ARCI had a buildathon based on George's Sudden receiver - built Manhattan/ugly style on blank PCB. This was incredibly successful – new builders aged from 9 to 90 built a working receiver. A lot of them had never held a soldering iron before. We will have this same receiver kit at Rishworth with a few improvements. So if you fancy having a go at this style of construction you will be welcome to join us.

One of the speakers at the Rishworth event will be talking about simple, and not-so-simple PICAXE projects. As a follow up to this talk, we will have a buildathon/program-athon where we will show you how to write simple programs and upload them to the PICAXE. Don't be frightened – they are very very easy to handle. We will also have kits available for you to take home and do it yourselves.

We hope also to have a simple surface mount project, so that those who have not set foot into this method of construction can have a go.

Finally, amongst other things, we would like to have a homebrew competition. Anyone out there who would like to have a go at organising one? We will help all we can.

Anyone got any more good ideas – if you have. Let us know, but be prepared to be asked to help organise it!

Remember – October 24th - put it in your diary – now!.

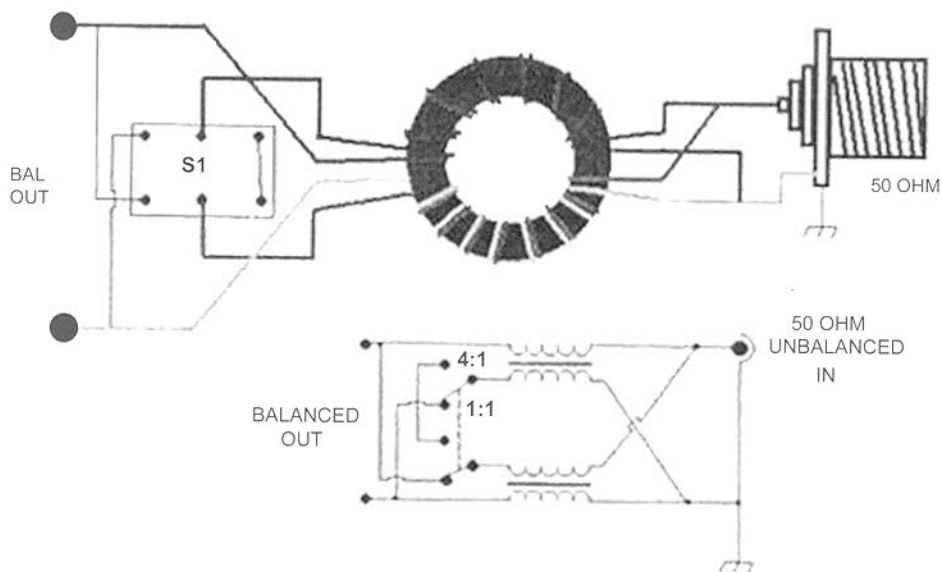
## Antennas Anecdotes Awards

Colin Turner G3VTT

30 Marsh Crescent, High Halstow, Rochester, Kent ME3 8TJ  
G3vtt@aol.com

Well here's another jam packed jelly tight issue of AAA with five pages. Thanks to a number of members there are a few interesting items in this quarters epistle and if you have sent me an article please wait. I would like to thank straight away my good friend John G0LAD who has kindly sent me some excellent artwork from his computer to enhance the column.

### A switchable balun from the Michigan Five Watter magazine



**FT114-43 Core, 2 Pairs #20 insulated wire, 11 Turns each pair:  
Each pair on opposite sides as shown in diagram.**

If you have ever run out of tuning range when using a 4:1 or 1:1 balun try this idea from the Michigan QRP Club. Rick KC8AON has been experimenting with an off centre fed dipole for all bands and found he needed a 1:1 balun for most of them but on 15m he needed a 4:1 balun for a good match. Not wanting to waste time changing separate baluns he built this device with a two position double pole change over switch. Although he used an FT114-43 toroid there may be other types that would work just as well, perhaps the T150 or 200 ranges from Amidon. This balun works well with the FD3 OCFD on 40 – 10m shown in the last AAA.

## The Portable Vertical from Les G0NMD

*Les writes* 'Since assembling a K1-4 and taking it to Gozo (Malta) on holiday I have been fascinated by the possibility of a portable aerial to go with this lovely little portable rig. I looked at the various options available in the dealers shops but they were too expensive. A tank aerial was also "silly money", and scarce.

I searched the internet for ideas. The PAC-12 spawned some thoughts. The W3FF Buddipole (dipole and monopole) had a lot going for it. I aimed at something based on a PAC12, and bought 10 feet of 0.25" aluminium rod through a local engineering company. I cut this into separate lengths and the engineers threaded it for me. They made stainless steel caps to fit plastic plumbing pipe, threaded to take the rod and with a radial screw to fasten the cap into the pipe, and made "couplers" to join the sections of rod together. The engineering bill was high, and the concept was a disaster! The rod was far too flexible for such heavy caps, especially when I wound the loading coils with fairly heavy wire. It radiated, & I made a QSO but it just wasn't a proper job.

So more internet research, and it was Phil Salas, AD5X who – for me – really got sensible about HB portable aerals.

Phil shares good ideas, has clear pictures and diagrams and good text. His design attempts reasonable efficiency, is easy to build and makes no magic claims. It is a centre-loaded ground-plane vertical – like most others - but is longer than most. Unless it is used by the sea its going to be a compromise aerial, but you can make the compromise small if you engineer it properly. To be portable (suitable for airline baggage) it needs to break down into short lengths and be light-weight, but be a fairly simple thing to make. The most difficult part for me was making a "universal" base able to be put up almost anywhere. I am still working on it. Phil provides the basic thinking; use his ideas to make your own aerial how you want with what you have to hand.

If I was starting again I'd do it differently but I have the alloy rod, and it cost me money, so I'm using that. It wobbles in the wind, but hasn't snapped yet. It is light, takes down to a short overall length, and it works. I rough tune using the clip to short out parts of the loading coil, and fine-tune by extending/collapsing the telescopic top.

Here is the current recipe.

1 x 4 foot telescopic aerial (Maplin) - a bit fragile, make up a tube with a threaded end and solder the aerial into it if you can.

Several lengths of 1/4 inch, (I've got 10 feet of it!) threaded 1/4 x 20tpi (1/4 UNF)  
Home-brew AD5X-style loading-coil mounted on fibre-glass rod (piece of old solid-glass fishing rod)

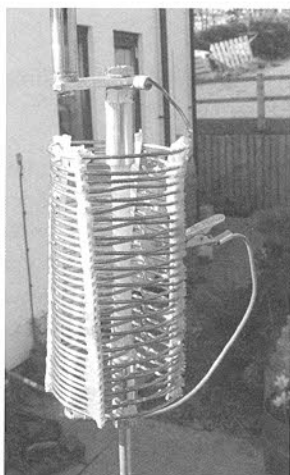
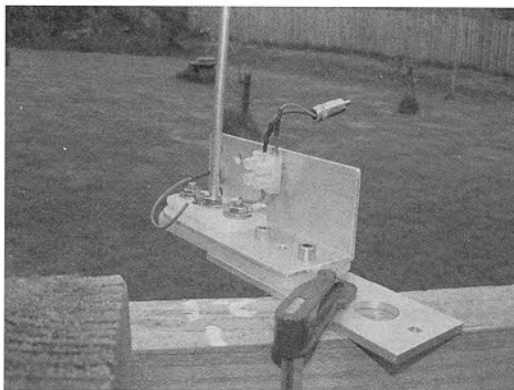
Base-mounting - aluminium angle and plate sandwiching chunks of chopping board as insulation.

Stainless steel hardware from local Fixings supplier, (1/4 UNF) Allen screws, nuts & washers.

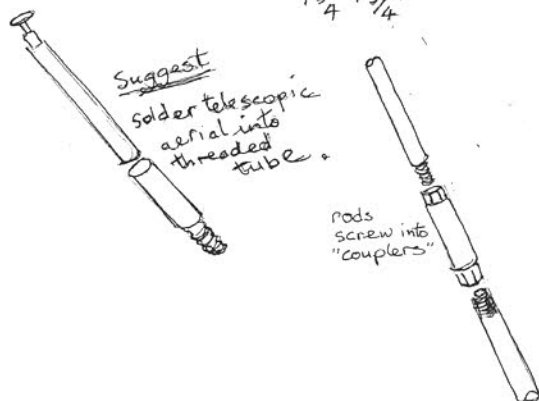
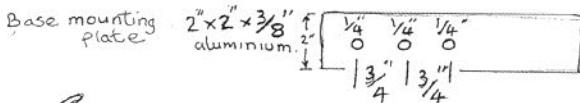
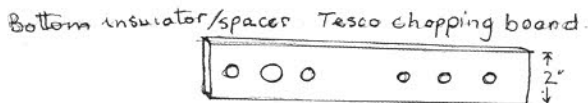
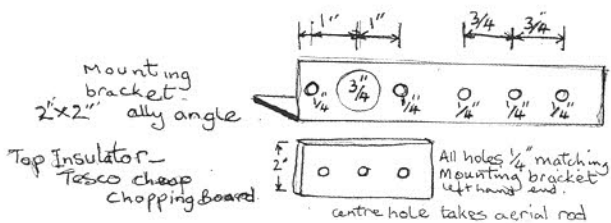
1/4 wave radial wires – you get better SWR if they drop away at 45 degree angle.

**Tips:** My next one will be more like AD5X's. The coil will use his "nylon edge-trim", which is flexible grommet for protecting wires and pipes going through bulk-heads in boats etc. (It took a long time to find that out!). RS sell it in the UK as do Cablecraft (look for "Grommet Strip"). I made my own coil former; it took ages and is very ugly but it works. It is easier to get metric stainless steel hardware, and a better variety is available than UNF.

A longer top section is better, but you do need to reach it for tuning or make the bottom section tunable...

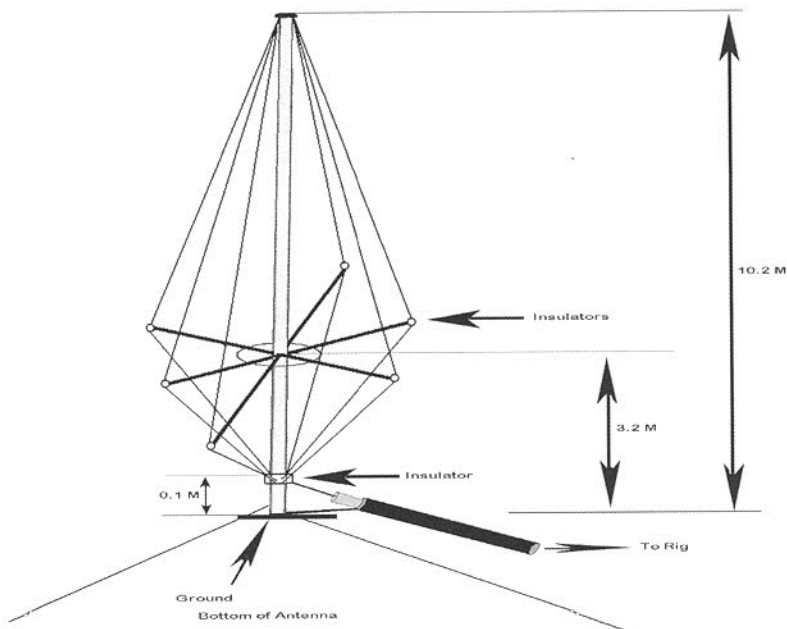


Useful Web references: [www.ad5x.com](http://www.ad5x.com) especially <http://ad5x.com/images/Articles/CoilRevB.pdf>  
 PAC-12 [www.njgrp.org/pac-12/](http://www.njgrp.org/pac-12/) [www.cablecraft.co.uk](http://www.cablecraft.co.uk)



A parting thought:  
 A full-length wire plus wire radials are still a better aerial but there isn't always a convenient support for the wire on a beach...  
 Now where's my map of Gozo?'

The base plate of Les's antenna. Note the G clamp fixing it to the fence and the Phono connector to the rig.



### US7I JW Vertical Antenna

I've received another letter from Victor UJ7I JW this time with an number of interesting antennas including a wideband vertical for HF which is well know in the Russian federation with a height of only 10 metres. This design should not require an ATU.

It is a broadband design I've seen used by many of the worlds navies and relies on vertical wires to form the radiating structure. The distance between the wires gives it an effective larger area and so contributes to its wide bandwidth. The spreaders are 1.72m long and the outer wires connect together at the top and bottom where they connect with the coax cable inner conductor. The coax braid attaches to the radials each of which is 10.2 m long. If possible you should attach 8 radial wires. Or the steel hull of your boat. You may need to go to B&Q to find some suitable plastic to act as spreaders. Anybody like to try this one?

Victor has supplied this diagram which John GOLAD has redrawn on his computer for AAA as one of his entries into the 'AAA Best Antenna Design' for this year. Thanks

Victor and I shall include your other entries at a later date. Oh yes - the nickname for this antenna in the Ukraine is the 'Carrot' - for obvious reasons.

### Award News

Congratulations to the following members: **G5CL** with 10 2 way CW QRP, **G0BAK** with 20 GQRP station worked (all CW) and **LA1TPA** with 50 countries worked QRP. Well done to you all and thanks you for supporting the GQRP Club awards.

### An Anecdote in AAA

Gerald G3MCK has written to me again with some comments to encourage those of you who are interested in improving your CW. If you've made a start then Gerald suggests:

- Accuracy is not important – just get stuck in!
- Don't worry about not getting 100% copy – just relax and enjoy it
- Most QSO's are banal and predictable so write a crib list of things to send
- Put on the list in the first over - your 'RST, QTH and name'
- In your second over - your 'rig, power and antenna'
- Third over your - 'thanks and 73'
- Remember don't start at 12 wpm and then try to increase your speed. Just learn the code at 18 wpm then jump in and try it at 18 wpm working European stations
- Don't worry if you only copy their calls!
- Try to get at least one CW QSO a day
- Keep at it and ENJOY it.

Seems like good advice to me. For once the cat is wrong! Just try what Gerald says and have fun this summer!

I am always interested in antenna designs and I have a number of them waiting for publication, particularly some 160m designs for next autumn, please do not stop sending them in.

If you are interested in a 'Valve Portable QRP Day' then please keep an eye on the GQRP Reflector over the summer but I suggest **Saturday July 25th** so you have a few weeks to think about your power supply, valve transmitter and antennas. Hope this idea is approved by our Communications manager! Have a good summer and hopefully see you all from the beach.



### INTERNATIONAL QRP WORKING FREQUENCIES

**CW: 1843, 3560, 7030, 10116, 14060, 18096, 21060, 24906, 28060**

**SSB: 3690, 7090, 14285, 21285, 18130, 24950, 28360 kHz**

*keep these frequencies special for qrp - call "cq qrp" often!*

# COMMUNICATIONS AND CONTESTS

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

## CHELMSLEY TROPHY 2008

I've received entries from Peter G3JFS, Dave G3YMC, Carl GW0VSW and Paolo IK1ZYW, to whom my grateful thanks. All found QRP activity (and therefore their 2-way QRP score) on the bands to be lower than in previous years - probably as a result of the poor conditions. Dave commented that, despite 2008 being an even worse year for propagation than 2007, he had actually managed a slightly better score during 2008. As usual, he submitted a first class entry (2808 QSO's, 130 DXCC) having run his K2 at 5W CW into a 65ft wire, 30ft loaded vertical for 160m, and a sloping dipole for 30m. As he points out himself, having more than one horizontal antenna at any given time effectively disqualifies him, but Dave's excellent results - including a 40m CW QSO with VP6DX (Ducie Island) - should not go unnoticed.

Carl has very limited facilities for antennas, and used a homebrew 'Crown' wire loop (104ft) in the loft, fed via an LDG Z11, and an indoor 80m mobile whip. His transceiver is a QRP+. The Dx featuring in his log include 3X, 4X, 5B, 7X, 9K, 9L, 9M6, A61, D4, FM, HZ, K, UA9, VE and V51. Not a bad list with such a limited antenna and poor band conditions! He had 426 QSO's and worked 66 DXCC with CW and 7 with SSB.

Paolo spent the year operating as 9A/IK1ZYW with his FT817 and 12m radiator held vertical by a 9m fibreglass pole, and a single counterpoise. He worked 13DXCC QRP/QRP, and a total of 21 DXCC throughout the year. During a hot July Saturday afternoon, he tried operating by the seashore, but did not notice any indication that signals were enhanced, either Rx or Tx.

Peter worked a total of 107 DXCC (101 CW and 67 SSB) in his total of 385 band/mode slots. His highlight was a simplex QSO with VP6DX on 80m SSB using 10W PEP and a bent end fed wire. He used a variety of equipment - IC706, TS450, FT1000MP and a collection of homebrew QRP Tx's. Peter's overall score was a little lower than Dave's, but Dave's honest admission re his second horizontal antenna effectively hands the 2008 Chelmsley Trophy to Peter. We offer him our congratulations on another very fine entry.

## CZEBRIS 2009

Along with his log entry, Alex G4FDC included some interesting and worthwhile suggestions that I think are worth pursuing. I received only one other entry this year, from Brian GM4XQJ, and Alex's suggestions may help address the problem of (recent) low UK support for this event, and encourage participation generally. The G4FDC log shows a total of 44 points (80m:16, 40m:24, 20m:4) using 5W CW from a TS 120V and 26m end-fed sloper. Brian accumulated a total of 66 points (80m:14, 40m:15, 20m:37) using 5W CW from a K2, 290ft loop for 80/40m and TH3 tri-bander for 20m. Brian's TH3 has obviously helped his 20m score considerably, but he has nevertheless earned his CZEBRIS 2009 win. Well done Brian!

I have tried to obtain the results from OK/OM in order to include them here, but unfortunately Karel OK1AIJ has been having PC problems and therefore not able to send them in time. One of Alex's suggestions is that CZEBRIS be adjudicated either in the UK, or in OK/OM - but not (as is currently the case) split between the two. This would ensure results from the UK and



OK/OM are published together, which should be more informative and encouraging for all participants. Karel is quite happy to take on the task of adjudicating **all** log entries, providing he is in the position of having reliable email facilities, and so he and I will discuss further this possibility.

One other suggestion from Alex is that we organise time slots for each band, which would hopefully concentrate activity levels and result in more potential QSO's. I certainly think the idea is a good one, and will talk to Karel accordingly. Please drop me a line if you have any thoughts, or write to Karel (SPRAT 137 page 33 for contact details).

### **New Event: VACUUM DAY 2009**

An idea for a new fun event from Colin **G3VTT**, who writes:

"A few folk have asked about a 'Vacuum Day' when we could try old-style QRP valve/tube equipment. Could I suggest **Saturday July 25th** from dawn to dusk? I intend to be QRV, along with the Invicta QRP Gang, from the beach using a couple of parasets and whatever else we dream up and build before the day. You could be active from beach, summit or workbench – it matters not! Just ensure your TX, RX or Tcvr has filaments in its active devices. Camping while watching those filaments glow should be fun!

There are no specific rules – just be active and send your logs and experiences to me (g3vtt@aol.com) and I will collate something for SPRAT. Please include technical details of your set-up as it will be interesting to see how we all derive power. No prizes are planned, but I *might* send you a polished 6V6!"

This sounds like a good one to me, so give it a go if you can. Several members have already expressed (via the G-QRP Internet Reflector) their interest and support for Colin's idea and so hopefully a fun day will be had by all. The suggestion is to look around the normal 80/40m QRP CW frequencies (inc. 3579) and call "CQ QRP Valve" or "CQ QRP Tube". No serial numbers, but an exchange of Club membership numbers would aid the Club Members Award program. If the event is well received, perhaps we could consider including 30m and 20m for our overseas members.

### **YEOVIL FUN RUN 2009**

My thanks to George **G3ICO** for the following results:

<b>80m:</b>			<b>40m:</b>		
G4PRL	5W	358	G3BPM	4W	080
G3BPM	4W	348	G5CL	5W	053
G3ICO	3W	258	F6GGO	5W	010
DL2BQD	5W	200	G3ICO	3W	010
F6GGO	5W	125			
DK3WX	5W	115			
G5CL	3W	010			

### **WINTER SPORTS**

Somewhere between Dom **MIKTA** and myself, his entry disappeared into a void and so was not included in SPRAT 138. To put matters right, I can now thank him for sending me details of his WS activities, which included a 20m QSO with TF/LX1NO. Dom used a Norcal-20 and

Softrock SDR on 80/40m with a small 2SC1945 PA (FDIM 2008) into an end-fed wire. He was also testing a 500KHz Rx so could not use the planned W3EDP.

## **O QRP CONTEST**

It is not normally my practice to include details of non G-QRP organised events as space does not allow. However, members may already be aware of the sad news that Hal **DJ7ST** has sadly passed away. He was best known, of course, for his work helping to organise the O QRP Contest. Lutz **DL1RNN** has been part of the team for some years and will, with the support of others, continue to run the event. Logs for the event should in future be sent to: Lutz Gutheil, Bergstrasse 17, 38446 Wolfsburg, Germany. The next O QRP Contest will be held on 4th/5th July 2009.

## **20m FELD HELL FREQUENCY**

On 9th April this year, I wrote to the officers of the Feld Hell Club suggesting that they should re-consider their decision to recommend 14063KHz for Feld Hell. I pointed out that, not only was it uncomfortably close to the internationally recognised 20m QRP CW frequency but, in addition, their choice does not comply with the internationally agreed 20m band plan. Despite the email having gone to all officers of the Club, I have (to date) received no reply.

Summer is nearly with us, and with it the opportunity for many to operate /P. Time to hit the bands with QRP! Have plenty of QRP FUN and please remember that the deadline for the next SPRAT is the beginning of August.

72 de QRPeter

## **Light bulb warning!!**

**David Smith G4COE, 54 Warrington Rd. Leigh, Lancashire, WN7 3EB**

There have been one or two articles recently about dismantling those low energy light bulbs and using the bits inside, no problem here with that but beware....!

Inside these things there's a little ol' component we call a capacitor, being tiny it may be marked around 8uF at 350V or more.... gee, nothing wrong with that either – but the devil can bite, and it hurts!

Guess how I found out? I removed one of these for the next door neighbour, it had laid on the bench for a day and half, being nosy I wanted to see what's inside so I opened it, I got out the habit of putting my hands across high voltage components a long ago, funny how one forgets, and I did... it was shocking I felt it right in my elbow, it really did hurt.

Get a resistor a Kohm or so rated at half a watt or more or an old screwdriver and bridge the component leaving in place a few seconds, just because it's small it doesn't say it's harmless.

These lamps don't use a bleeder resistor, a high value resistor across the capacitor so it discharged slowly after 'switch off' which is a normal practice. If the lamp circuit should stop oscillating there will be no drain at all on the capacitor, thus it will hold a charge for many hours or days.

**Do ensure the capacitor is discharged before touching any part of the circuitry inside to be on the safe side.**

# MEMBERS' NEWS

## by Chris Page, G4BUE

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



Congratulations to **GOUPL**, **KB9YIG**, **K5FLU** and **KK7B** who were inducted into the QRP-ARCI QRP Hall of Fame at Dayton in May. **W8IFF** has put photographs from the Four Days in May (FDIM) QRP activities at Dayton on the Internet at <http://www.flickr.com/photos/nigelgunn/>.



The photograph below is the **G4STT** Trophy awarded to **G3XJS** and mentioned in this column in SPRAT 137. **G3XWH** was one of the small group who donated the award to the RSGB and provides some background to it. Richard, writes, "Don, **G4STT** (ex-**G8STT**) was a very well known and respected amateur and gentleman in the Harrogate area and also much further afield as he was net controller for many years of the Saturday morning 'Nidderdale Net' on 80m. In 1982 myself and two other Harrogate amateurs Simon, **G4KCR**, and Robin, **G3YHC**, began fell walking on a monthly basis, mostly in the Yorkshire Dales and Lake District. In 1989 we decided to extend our range to Scotland and organised a few days in the Rannoch Moor area to include an ascent and activation of Ben Nevis using the callsign **GB5BN**. Simon arranged the loan of the then new Mizuho 2W 40m QRP rig and end-fed zepp from Waters & Stanton and Don agreed to be net control for the operation from Harrogate. Simon subsequently purchased the equipment and we went on to activate Scafell Pike and Snowdon summits using **GB5SP** and **GB5SN** respectively over the next two years. This led to our taking the Mizuho on the regular monthly walks with Don acting as base station from Harrogate, managing to conduct QSOs on a remarkably large number of occasions considering the variability of conditions over the following years. When Don sadly became a Silent Key in 2000, along with other locals David, **G3UNA**, and Marcus, **G8HDN**, we thought it appropriate that Don's support for our QRP operations should be acknowledged in some way and hence Marcus agreed to obtain a Norcal 20 and David would convert it into a suitable trophy by spraying it in a special gold finish and mounting it on a plinth. The RSGB AGM of 2001 was held at my work establishment, Harrogate Ladies' College and so we thought it most appropriate to present the trophy to the RSGB to be first awarded on this occasion. By a remarkable coincidence, Don's daughter Carole Cameron is now the Head of our Prep school Highfield and was delighted to see the RSGB report in *RadCom* of the last presentation of the trophy to Dave, **G3XJS**, in October 2008". See <http://www.davesergeant.com/qrp/qrp.htm> for more information about the **G4STT** Trophy.

Congratulations to **G3LHJ** who QSO'd **K5D** on 30m 26 February with his K2 at 5W about an hour before they went QRT. **G3OXO** has received the QSL from **XW1B** for their two-way QRP QSO on 1 February (see photograph) which, with a QSL from **4O6Z**, and a 20m QSO with **WP4DQK** on 15 May, will increase George's two-way QRP DXCC to 116. Later QSOs with 4 **PA3GNZ** is QRV on 6m SSB with his FT-817 at 5W and a 30m Zepp antenna. When 30m is open, **CO2ZZ** finds he can work many stations with 2-5W and 40m dipole fed with open-wire feeder. Arnie suggests making a very stable 5MHz VFO and doubling it to the 10.1 to 10.2MHz main area of QRP operation on 30 metres. **G3JFS** has worked 60 DXCC this year on CW, SSB and RTTY. Peter's list includes C5 and 5N on 10m CW, 6W on 17m CW, PZ and YV on 20m RTTY and HV on 20m SSB. He has received QSLs for his two **K5D** 80m QSOs.

VIETIANE LAOS		
<b>XW1B</b> / G4RP		
(A1K - AA4XZ, H50ZY, XUFADZ, /SMZ, /BVZ, /K17)		
CQ Zone - 28 - Grid Locator - QK17 - IYU Zone - 49		
G4RPQXX 2001 - 2002 - 2003 - 2004 - 2005 - 2006 - 2007 - 2008		
10.1 MHz - 10.2 MHz - 10.3 MHz - 10.4 MHz - 10.5 MHz - 10.6 MHz - 10.7 MHz - 10.8 MHz - 10.9 MHz - 11.0 MHz		
QSL MGR E21EIC <a href="http://www.e21eic.com">http://www.e21eic.com</a>		Bruce E. Ault P.O. Box 841 Vientiane, Laos

A suggestion from **GM3MXN**, "At times we have quite a bit of QRM from fellow QRPers using 3560kHz; could I suggest an alternative overspill frequency close by, this would also clear the European strong 'fish fone' that seems to have taken up the frequency?" What do members think? Tom adds, "I am disappointed that so few members are heard on 5289kHz and 5291kHz, two good QRP frequencies ideal for a crystal controlled transmitters, and QRM free". Following two recent QSOs with Tom on 5289kHz, I can vouch for what he says about 60m. **WAØITP** reports the only QRP spotting site, <[www.qrpspots.com](http://www.qrpspots.com)> has passed 16,000 hits. Terry thanks those using the site and says, "It is ideal for home or portable use, self-spotting is encouraged, as are sprints, nets, and other announcements. This is your QRP bulletin board on the web".

**G4KKI** is impressed with the performance of the PAC-12 antenna when operating /P. Last time out on Black Hill in the Pennines, Bill used it on 40m for about 15 QSOs, including several two-way QRP (see photograph on right of him operating the MFJ-9020). He says the PAC 12 is great for backpacking as it just 'packs' away into a 12 inch load (see photograph below right). Bill says, "I couldn't get hold of a six foot telescopic whip so I used a four foot one from Maplin and added two extra one foot sections above the coil to make up for the shorter whip section. I also had a play with the so called 'magnetic longwire balun', although 30 feet of wire is not what you call long". With the 30 feet strung out of his shack window sloping down to about five feet above ground and seven feet of it coming back towards the house (no space here), one evening at 2200z at the beginning of May, Bill was surprised to hear 20m open to the USA, and worked **W1HIS**, **N4AF**, **AA3B**, **KA1R**, **KA1EFO** and **K1XM** in about half an hour with 5W CW from the FT-840. He is just finishing 'The Super Tee' ATU from SPRAT 72 but he says it's a bit big to fit in his rucksack for /P. Bill will be QRV /P in the first week of August with his MFJ-9420 and a kite antenna from Marconi's big aerial site at Poldu, Cornwall.



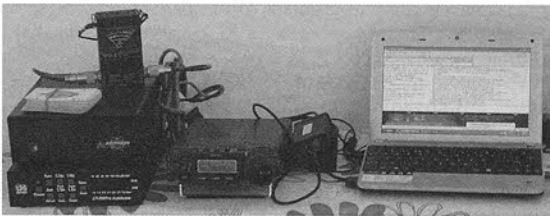
**N9YSQ** used his FT-817 at 5W in the ARRL DX Phone Contest to QSO XE, 6Y, P4 and PJ2 on 15 and 20m with his 20m 'classic' GP and ATU. Tom built the S30 antenna from the *ARRL Antenna Handbook* design using half inch copper pipe and eight quarter-wave radials. The antenna also tunes on 10m but he didn't hear any stations QRV in the contest. **MI5MTC** is using 5W with a recently acquired Ten-Tec Century 22 and welcomes any information about the transceiver. **MIKTA** has been busy building. Dom has completed the MKARS 80m (**G6ALU**) adding battery pack/CW keyer and ATU, **ATS-3B** and **QBSA (KDJJV)**, WinKey USB (**K1EL**), Si570USB (**GØBBL**), Softrack V9.0 with Si570 control, and is building HFVFO and IQPro/LNA/LPF (**AAØZZ**), TA7358 transceiver (**VU2HMY**), QRP2004 (**GØBBL**, **G8BTR** and **MØPUB**), and some valve projects.

Welcome to new amateur Stephen, **2EØPOW**, who has built some Howes, a Brendon 80m kit and test equipment from either the RSGB's *Radio and Electronics Cookbook* or **GØFUW**'s guidance in his amateur radio class. **G1HSM** recommends ESR Electronic Components Ltd <<http://www.esr.co.uk/>> for small quantities of components. Leon says they do not have a minimum charge like Farnell and Rapid do. **GØUBE** reports an amateur radio TV channel on the Internet at <[WWW.amateurlogic.com](http://WWW.amateurlogic.com)>. John says there are many programs of interest, including a tour of MFJ factory and building with surface mount.

**GØBON** worked 16 DXCC in the BERU Contest with his Norcal 20 and 102 feet doublet, including 6W on 40m, and later QSOs on 20m with HZ, PY, J2 and C3 on 40m. Ivan has modified his doublet into a 'commudipole', as featured in the May 2008 *RadCom*. He says this is basically terminating the 450 ohm ladder line into a 4:1 balun mounted just outside the house and then taking a short coax feed into the shack. It is certainly an improvement in feeding RF into the shack over the previous arrangement he had. **G4ICP** has been participating in the recent 80m CW 'Club Champion-

ships' contests to attempt an unofficial QRP 'Worked all Counties' to get an idea of the coverage of his indoor antenna, which is an end-fed doublet in the loft. Richard has worked 26 counties and finds the coverage is fairly omnidirectional. On 26 May **G4GXO** found a good opening on 6m with 3W SSB and base loaded 39 inches whip. Ron says, "With no permanent antennas yet at my new QTH, I set up my FT-817 on the patio table in my back garden and couldn't believe my luck to find 6m open into Europe from Cumbria. I had great success working several stations in a belt than ran from Northern Spain across France, Switzerland and Austria into Northern Italy. I received reports of up to S5/7 which illustrate just how effective 6m can be for QRP in an opening".

This photographs on the right shows **GÖBPS's** FT-857 station set up on an ironing board in a Cyprus villa for a week at the end of April/beginning of May. Dick made about 100 QSOs on PSK31 but says conditions were not good. **G3IXZ** missed their annual EA8 holiday due to redecorating but spent more time on QRP software defined radios (SDR), his main interest. Rob has built several **KB9YIG**



Softrock kits, including the 40/30/20m which he used in the DL QRP and BERU contests. In about two hours, he worked eight DLs and six VE3s with 200mW and says, "Anyone who has not tried SDR has missed a treat and the use of Rocky software for CW operating is bliss. A small 5W PA is on the way and I'm planing a nine band version". **MIKTA** was also QRV in the BERU Contest and worked 5B, 6Y, 9H, J8, P3 and VEs with his NorCal and dipole on 20m, 5X, 6Y and P3 on 40m with his FT-817 and quarter-wave vertical, and 9H on 80m with SDR and a **W3EDP** antenna. Dom QSO'd **5N/LZ1QK** on 20m just after the contest.

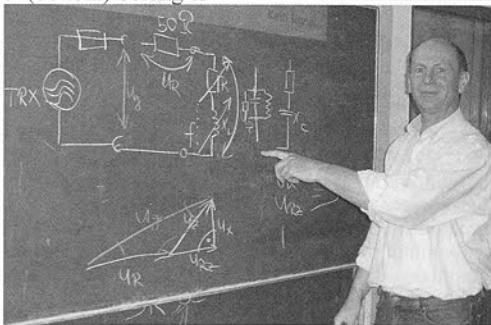
**DL2BQD** reports on the annual meeting of the DL branch G-QRP in Waldsassen at the end of April. Dieter writes, "Andreas, **DL4JAL**, (far right) spoke about his tiny DDS VFO for all bands (right), Bernd, **DK3WX**, (below right)



lectured on measuring methods at antennas and Fred, **DJ3KK**, introduced how to programme a PIC and use it together with a TX. You will find extra information on the web-sites of **DL8UZ**, **DF5SF** and **DL2JWL** on SDR and an antenna analyser and feeder lines were other topics. The 'CW 579', 'CW 72' and 'VY 55' car plates (bottom) belong to three of the participants of the meeting".

**G4FDC** reports the Slovak QRP Rally was to take place on 16 May in Vrutyky, organised by the 'Slovak Band of QRPers' and the **OM3KfV** radio club every two years.

Genesis Radio of Australia have announced a new SDR QRP kit, the G40 all mode 5W 40m transceiver (over 380 components) for US\$ 149. See <<http://www.genesisradio.com.au/G40/>> for more information. **GIHSM** draws our attention to an e-mail from **WA3WSJ** on the QRP-L Reflector about the Feld Hell Club who in April moved their 20m frequency from 14074 to 14063kHz, see <<http://sites.google.com/site/feldhellclub/Home/feld-hell-faq>>. Ed suggests sending the club e-mails asking them not to do this. A good idea, the club's Board members and e-mail addresses are listed at <<http://sites.google.com/site/feldhellclub/Home/contacts>>.



**MM5SPL** is building a 'steam driven' (valves) QRP CW transmitter using three 10XAJ 40m crystals, (*Practical Wireless* December 1963), but couldn't find any 10XAJ crystal sockets and used an ordinary electrical 'choc-block' connector strip. Peter says, "The spacing between the pins is perfect and although the sockets are not sprung-loaded, it doesn't matter too much. Providing the grub screws are not over tightened (the pins are hollow and likely to buckle) the problem is solved and it works like a charm". **G4DFV** uses ordinary 'wander' sockets which Duncan says also work like a charm. **WD5L** has just built a 9V PSU from a broken 'wallwart' and an LM317T. Rick says, "Fuse the primary side of the power supply with proper gauge wire so it doesn't overheat. Make sure all hot connections are insulated, use wire nuts so they don't ground out or unable to touch the chassis and, importantly, make sure you put a 1uF tantalum capacitor between the second pin, the output, to ground with the positive side pointing toward pin two or you will see fireworks. This will improve transient response".

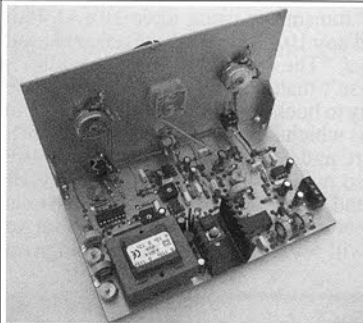
The photograph on the right shows **G4FBC's** shack with several homebrew items, including a PW Theme, Dart 80m DSB transceiver and Otter 6m receiver. The big box next to the FT-101ZD is a 400W PEP linear made with four TV line output valves. Ron thanks members for their recent generous help; **MIKTA** who sent him some free RF chokes for his Paraset replica after mentioning on the Club Reflector that he was not having any luck in obtaining suitable types; **G4OEP** for advice and suggestions for the repair of his army manpack PRC320 and much technical information for several 'mods' for the set, and **GM3OXX** who sent him a free complete built and tested JBS transmitter board and spare PA transistors after he e-mailed George for advice about not getting much RF out of the one he had built. "Who says the 'ham spirit' is long gone, not in G-QRP club that's for sure!", writes Ron. "By the way, it turned out that my version of JBS had a dubious 'Chinese copy' for the PA transistors! Beware of cheap 'bargain' components at rallies!"



Between 2030 and 2045z on 15, 16 and 17 August, on behalf of the QRP Transistor Society, **G3IEE** in Kingston (1875kHz) and **G3JNB** in Surbiton (1856kHz) will transmit on CW (maximum 10 WPM) "to ascertain the maximum possible radiation distance using the present power and equipment". Amateurs running transistor transmitters on 160m are invited to participate and SWLs are asked to monitor transmissions. All stations to transmit for the entire quarter-hour 'QRP test TTX de G——' and every third round announce QTH. Please let Victor know in advance you intend to take part (by post or to <victor@g3jnb.freemove> and send him SWL reports after. **G3UGF** will be QRV 13/18 July from the Holy Island of Lindisfarne, Northumbria. Richard is hoping to try out his new compact 'Vacpack' portable antenna system.

**GOBAC** is building the LCK transceiver with help from G4EUK and tried a different method of construction to his usual 'dead bug' method he generally favours. Bill used a single sided copper board as his ground plane (GP), fed the components through this and then simply wired them up underneath. He says the only problem was two of the large polystyrene capacitors had to be mounted on this side of the board and not the GP side. **G0FUW** reports **G3PCJ** has added four new kits to his Walford range <<http://www.users.globalnet.co.uk/~walford/>>: the Churnside, an AM transceiver for any band up to 6m; the Willet, a simple DC receiver for 20, 40 and 80m and matching transmitter the Washford, and the Trull, a simple beginner's medium wave TRF. **G0BBL** says SDR Kits are now stocking three popular Mitsubishi RF FETs used in QRP linear power amplifiers up to 50MHz: RD00HHS1 maximum 0.3W RF; RD06HHF1 maximum 6W RF, and RD16HHF1 maximum 16W. See <[http://www.sdr-kits.net/USB/RF\\_FETS.html](http://www.sdr-kits.net/USB/RF_FETS.html)>.

My thanks to all the members who have contributed to this column and sent me their photographs. The column depends on you and can only exist if you send me contributions, including photographs of you, your antennas and what you have been building. Don't be shy, let me know how your summer goes, by 20 August, please?



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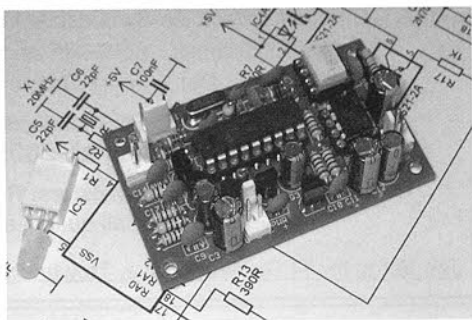
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LZ1YE has sent me details of some attractive QSL cards including the Club Log.

Members can make their orders by sending samples, explaining what they want to print, and sending the materials: photos, files...etc via e-mail: [qsl@qslprint.com](mailto:qsl@qslprint.com) or [qsl@kz.orbitel.bg](mailto:qsl@kz.orbitel.bg) or if no internet access via the postal address: Atanas Kolev, P.O.Box 49, 6100 Kazanlak, Bulgaria. Examples of cards and prices can be seen at [www.qslprint.com](http://www.qslprint.com)

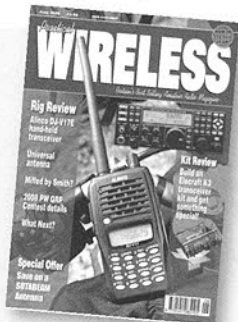
For people need QSL cards urgently LZ1YE dispatches three days after the payment is made. UK Members can pay via a UK address: Please send your cheque / cash via recorded delivery to: LZ1YE QSP Print service, c/o Melanie Rowe, St. Leonards House, 35 St. Leonards Road, Exeter, EX2 – 4LR, Devon. e-mail: [m0mja@aol.com](mailto:m0mja@aol.com) (make cheques payable to : Melanie Rowe)

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G3RJV has a Wooden Lodge situated in the Dyfi Valley in central Wales close to the Irish Sea and in the Snowdonia National Park. It has been completely refurbished with a large living area, conservatory, double bedroom, twin bedroom and a double bed sofa in the living area. Naturally there is a small amateur radio station with a QRP HF transceiver and a 2m multimode. An easy to use station in a quiet location.

Look on the webpage above or for leaflet write to G3RJV or email [g3rv@gqrp.co.uk](mailto:g3rv@gqrp.co.uk)

# GQRP Club Sales

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

Antenna Handbook – 2 <sup>nd</sup> edition – members £6.00, non-members £10.00 plus post	} £1.20 (UK); £2.30 EU
Radio Projects volume 3 – Drew Diamond – members £5, non-members £10 plus post	} DX - £3.90 per book
6 pole 9MHz SSB crystal filter 2.2kHz @ 6 dB, 500ohm in/out £12 plus post	} £1.00 (UK); £1.20 EU
Polyvaricon capacitors – 2 gang (A = 8 to 140pF, O = 6 to 60pF) c/w shaft ext & mtg screws – £1.20 each	} £1.70p (DX)
Pair LSB/USB carrier crystals HC18U wires - [9MHz ± 1.5kHz] £6 pair	}
MAR-4 RF amplifier - £1.50	} All components
HC49U (wire) crystals for all CW calling freqs – 1.836, 3,560, 7,028, 7,030, 7,040, 10,106, 10,116, 14,060, 18,096, 21,060, 24,906, & 28,060 - £2.00 each	} plus postage
HC49U (wire) crystals for DSB on 40m – 7.159MHz - £2.00 each	} (ANY quantity)
HC49U (wire) crystals – 1.8432MHz, 10,111MHz – 50p each	} 60p (UK),
HC49U (wire) crystals – 3.5795MHz, 3.5759MHz, 3.5820MHz, 3.6864MHz, 4.1943MHz, 10.0MHz, 13.50MHz, 32MHz – 30p each	} £1.20p EU,
	} £1.70p (DX)
Miniature crystals (watch crystal size – very low power) – 7,030, 10,106, 18,096, 21,060, 24,906 & 28,060 – limited quantities - £2.00 each	}
Ceramic resonators – 455kHz, 2.0MHz, 3.58MHz, 3.68MHz & 14.30MHz – 50p each	} if
Schottky signal diode – 1N5711 low fwd volts for up to vhf/uhf 20p each	} ordered
Varicap diodes – MVAM109 – 40pF @ 9v, 500pF @ 1v. 75p each	} with
– MV209 – 5pF @ 12V, 40pF @ 1v 35p each	} max of 5
	} toroids
	} or binders
	} use that
SA602AN - £1.75	} postage.
MC1350 - £2.00	}
LM386N-1 - 4 to 15v, 300mW, 8pin DIL - £0.40	}
CA741 op-amps 8pin DIL – 5 for £1	} plus
TA-7942 Radio IC – direct equivalent of MK484 (& ZN414) – 75p	} 10%
2SC536 transistors (npn) FT - 100MHz, hFE-320, VCBO+40V - 5 for 50p	}
MPSA92 transistors (pnp) FT - 50MHz, hFE-40, VCBO-300V - 5 for 50p	} of this
IRF510 FETs - £1.25	} postage
	}

## Toroid cores – Priced per pack of 5 – max of 2 packs of each per member

T37-2 – 75p; T37-6 – 75p; 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 – £1.00; FT50-61 – £1.20;

BN43-2402 - £1.00; BN43-202 - £2.00; BN43-302 - £2.00; BN61-202 - £2.00

Ferrite beads – FB-73-101 (3.5mm dia x 3.2mm long, 1.2mm dia hole) – 40p for 5

All toroids are plus postage – up to 5 packs = 60p (UK), £1.20p (EU), £1.70 (DX); Each additional 5 packs please add 50% of the same postage etc.

(please note – if you order 2 packs – you will probably get all 10 in one pack)

Binders for Sprat - the original 'nylon string' binding type back in stock again! Black with club logo on spine £3.75 each plus postage (one: UK – £1.00, EU – £1.80, DX - £2.40. More – add £1, £1, £1.20 each)

Back issues of SPRAT are still available at 50p each. I have most issues from 78 plus a few earlier ones. UK Postage is 1<sup>st</sup> magazine – 50p, each additional magazine add 40p.

Sprat-on-CD V3 – 1 to 132 (see Sprat 132) – members price - £5 plus post UK - £1.00, Eu - £1.20, DX - £1.70

I have sold out of the large toroids, and the 9MHz CW filter - no more are expected.

Please note - I only have stock of the above items – I do not sell anything else. Anything in previous advertisements not shown above is out of stock – if it becomes available again – it will be in the next magazine.

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

Visa/Mastercard. - Due to insurmountable problems, we have now ceased to accept credit card payments – sorry to anyone this affects – if it really stops you buying from the club, or paying your subscription - please contact me and we will sort something out.

If ordering multiple items, enclose the highest postage charge plus 10% of the rest please.

## MINIMUM ORDER for cheque or PayPal payments is £5

For orders less than £5 – please use postage stamps (any denomination £1 or less please) - any quantity of stamps is OK, or cash. I can accept cash in GB Pound, or US\$, or €uros – but please send securely!

You can order via e-mail to g3mfj@gqrp.co.uk Pay by PayPal please.

PayPal is very successful – if you can use it, please use it – it is easy! Send the order to

Paypal using g3mfj@gqrp.co.uk - show clearly what you want with the payment – pay in GB Pounds please - and include your membership number!