



# SPRAT

THE JOURNAL OF THE G QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

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Summer 2007



**IK0IXI Solar Powered DDS Controlled 20m Transceiver  
(14 MHz CW transceiver with a QRPProject UniDDS module)**

**Rochdale Convention 2007 ~ The "CC3" ~ Maidenhead Pixie  
Improved Traveller-2 RX ~ Nicky's RX Appraised  
Whatif Ceramic VXO ~ PSU Load ~ 600m. Transmitter  
PCB Lacquer ~ Two Acorn Valve Transmitters – 6m Transverter  
Gluestick Variable BFO ~ Bead Wire Antenna ~ Transmatch Mods  
Simple Receiver for 40/80 ~ Antennas-Anecdotes-Awards  
Communications & Contests ~ Club News ~ Member's News**

# JOURNAL OF THE G QRP CLUB



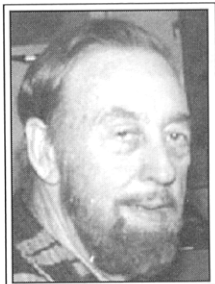
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## Rev. George Dobbs G3RJV

In this issue of SPRAT, and old radio friend of mine, **Colin Turner, G3VTT**, takes over the G8PG "Antennas Anecdotes and Awards" column. Colin will also be taking over the club awards scheme. Our thanks to Colin for stepping into this role. Please be patient with him, especially over awards, as he needs some time to set up new methods of working.

On the same subject, please be patient with all club officers! No one gets paid for anything they do for the club and all have busy "real lives" and give us time freely and cheerfully.



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## The W1FB Memorial Award

The winning design for 2006/7 (Shack Accessories) is the "CC3", a simple but useful idea by G0KJK which appears in this issue

## The W1FB Memorial Award 2007/8

Design, build and operate a QRP Transmitter that is powered from a "natural source". Please send details to G3RJV by Spring 2008

72/3

G3RJV



# THE G QRP CLUB MINI-CONVENTION

**SATURDAY 6th OCTOBER 2007**

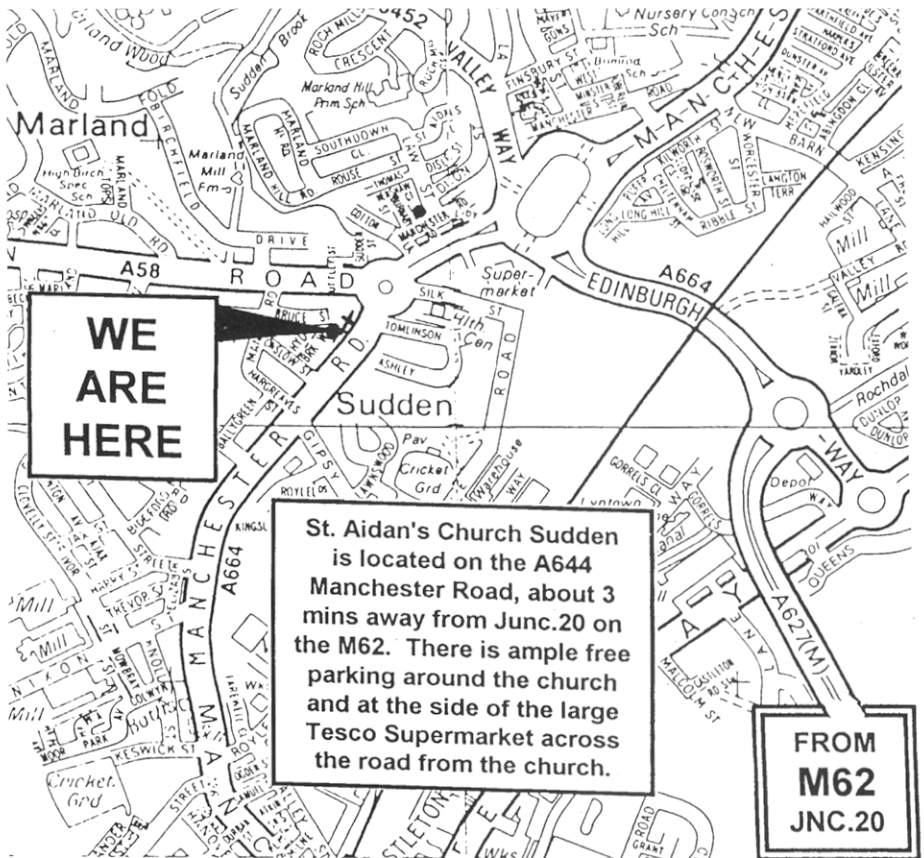
**ST. AIDAN'S HALL SUDDEN ROCHDALE**

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Across the Motorway - Inkeeper's Lodge, Oldham. [www.innkeeperslodge.com](http://www.innkeeperslodge.com).



## The CC3 Crystal Calibrator & Band Edge Marker

Rev. Keith Ranger, G0KJK, 144 Newton St. Macclesfield, SK11 6RW

In the G0KJK shack there is frequent need of a crystal frequency reference source to achieve two purposes - the calibration of home-built short-wave receivers and ensuring that amateur band edges are clearly identified to keep all transmissions within permitted frequency allocations. After considerable thought a simple and cheap circuit was developed using three easily obtainable crystals, giving the project the name "The CC3 Crystal Calibrator and Band-Edge Finder.

The circuit of the CC3 will show that the crystals chosen are for 2, 6 and 7MHz. The component values given ensure generation of fundamental frequencies and vigorous harmonics from 2 to 30MHz. The telescopic aerial is mounted through the back of the project's aluminium enclosure using grommets and for most uses will remain fully retracted. It can, however, be extended a little if higher frequency harmonics are less easy to identify. In the prototype CC3 this has almost never been found necessary. The fifteenth harmonic of the 2MHz crystal on 30MHz, for example, is very clearly heard on the station main receiver without extending the aerial at all.

Components and their values in the CC3 can be varied considerably and satisfactory performance still expected. I chose the 2N2222A transistor as the basis of the circuit's Colpitts oscillator because I had plenty of them but any good HF equivalent that may be available in your spares box should do the job. As built, and using a red LED indicator of power on status the circuit drew less than 15 milliamps from its PP3 battery, and a rechargeable equivalent would give excellent and economical service. If you leave out the LED the power consumption is much less but I personally like to see visual evidence of power on to remind me at the end to switch off! The front panel of the project therefore requires holes for an on/off miniature toggle switch, a rotary switch of 2 pole 3 way capability to bring the three crystals in and out of circuit and a LED.

Layout of the circuit is up to you. I used an 18 way tag strip I had in my spares box for ease of soldering but this is purely a personal preference. How you mount the battery inside the enclosure is also open to choice. My experiments with the prototype suggest that layout is in no way critical and a wide range of permutations will still be rewarded with successful operation.

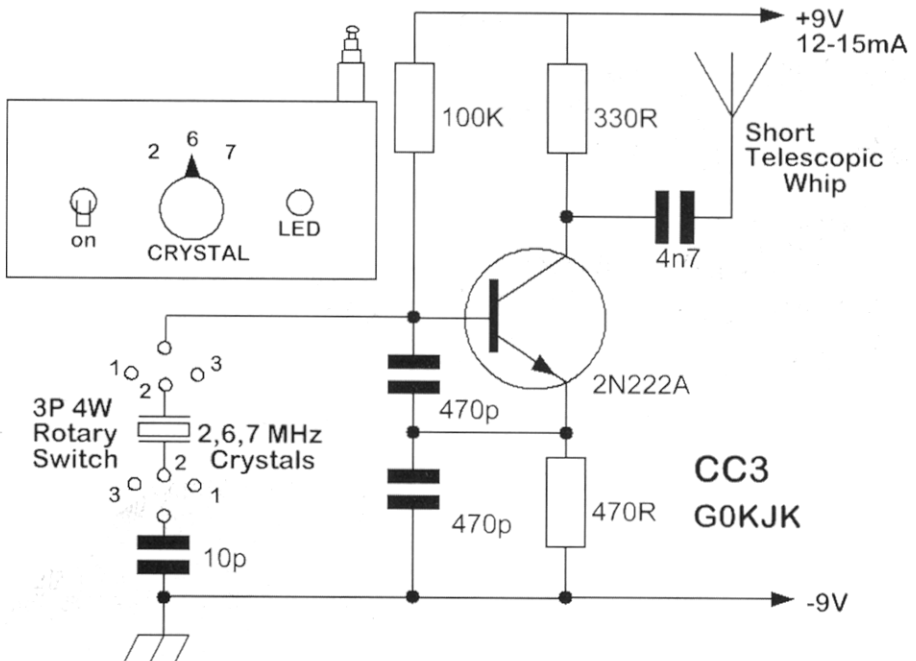
So, why the frequencies chosen for the CC3 of 2,6 and 7MHz? Firstly, they are readily and cheaply available from mail order firms that advertise in SPRAT. Secondly, they provide a series of harmonics and coordinates that enable amateur bands and their LF frequency edges to be easily identified, either using just one crystal or comparing the output of two. Let me illustrate:-

The 10pf capacitor in series with the crystals ensures that they all oscillate very slightly HF of their marked frequency. This means, for example, that the 7MHz crystal oscillates at around 7001Khz, safely inside the permitted band edge. With this in circuit, the 40,20,15 and 10 metre amateur bands are easily found, the fourth harmonic being on, say, 28004Khz. If you take care to operate HF of the CC3's readings for these four bands there is no risk of falling foul of the Licence conditions!

Suppose, however, and once again by way of example, that you wanted to differentiate between the third and fourth harmonic to find the 10 and 15 metre bands in receiver calibration. A quick switch to the 2MHz crystal will provide a rapid separation. Nothing will be heard on 21MHz but the 14th harmonic will be audible on 28MHz together with the 7MHz crystal's 4th harmonic.

Do you see the principle? A few very simple mathematical calculations will throw up the wide possibilities of frequency identification use by a Shack Accessory like the CC3. To give another example, suppose you wanted to find the 160, 80 and 12 metre amateur bands on a "cut and try" coil-wound home-brew receiver. The 2MHz crystal will take you close to the HF ends of both 80 and 160, by its fundamental and first harmonic; the 12 metre band on close to 25MHz can be found by identifying the 4th harmonic of the 6MHz crystal on 24MHz and then searching HF for the next reading of the 2MHz crystal on its 13th harmonic of 26MHz, then interpolating some mid-way between them. Any amateur activity on the 12 metre band should then be quickly found. I hope all this doesn't sound "as clear as mud" - maths was my very worst subject at school!

To help with possible component sources:- I procured my aluminium enclosure from Maplins, my 18 way tag-strip from Bowood Electronics, my crystals from Sycom (2 and 6MHz) and (7MHz crystal ) JAB Electronics. The service provided by these component supply firms is greatly appreciated by SPRAT readers. The short telescopic aerial (in fact, two of them!) I acquired for £1 from a Pound Shop. My CC3 cost me not much over a tenner, so for all the help I've already had from it it has been money very well spent!



## Maidenhead – Pixie Re-Visited

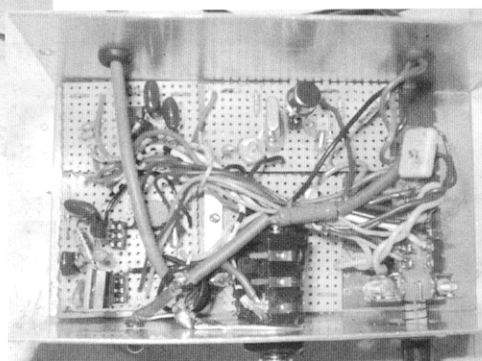
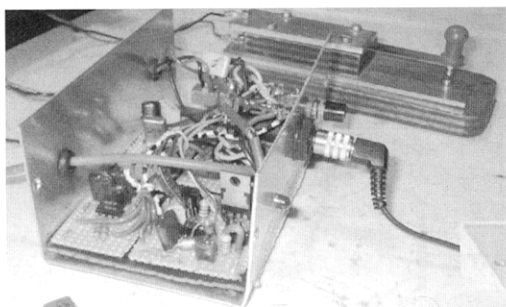
Peter Howard, G4UMB, 63 West Bradford Rd. Waddington. Clitheroe. BB7 3JD

This article is a modification to a project from Sprat No 93 which I was involved in making at the time by members of the Maidenhead ARC. The Pixie Trx. in this case was designed for 80m using the GQRP Club crystals 3540 / 3550 / 3560 and has been reproduced in various forms over the years and this is yet another effort on my part to create another variation to the basic circuit. If you have the 93rd Sprat it would be helpful to open it now before reading further. My intention was to modify the circuit to obtain a higher output ( which is achieved with the addition of three extra bits) and still be able to use the existing 6 pole 2way switch. The output now is about 2W.

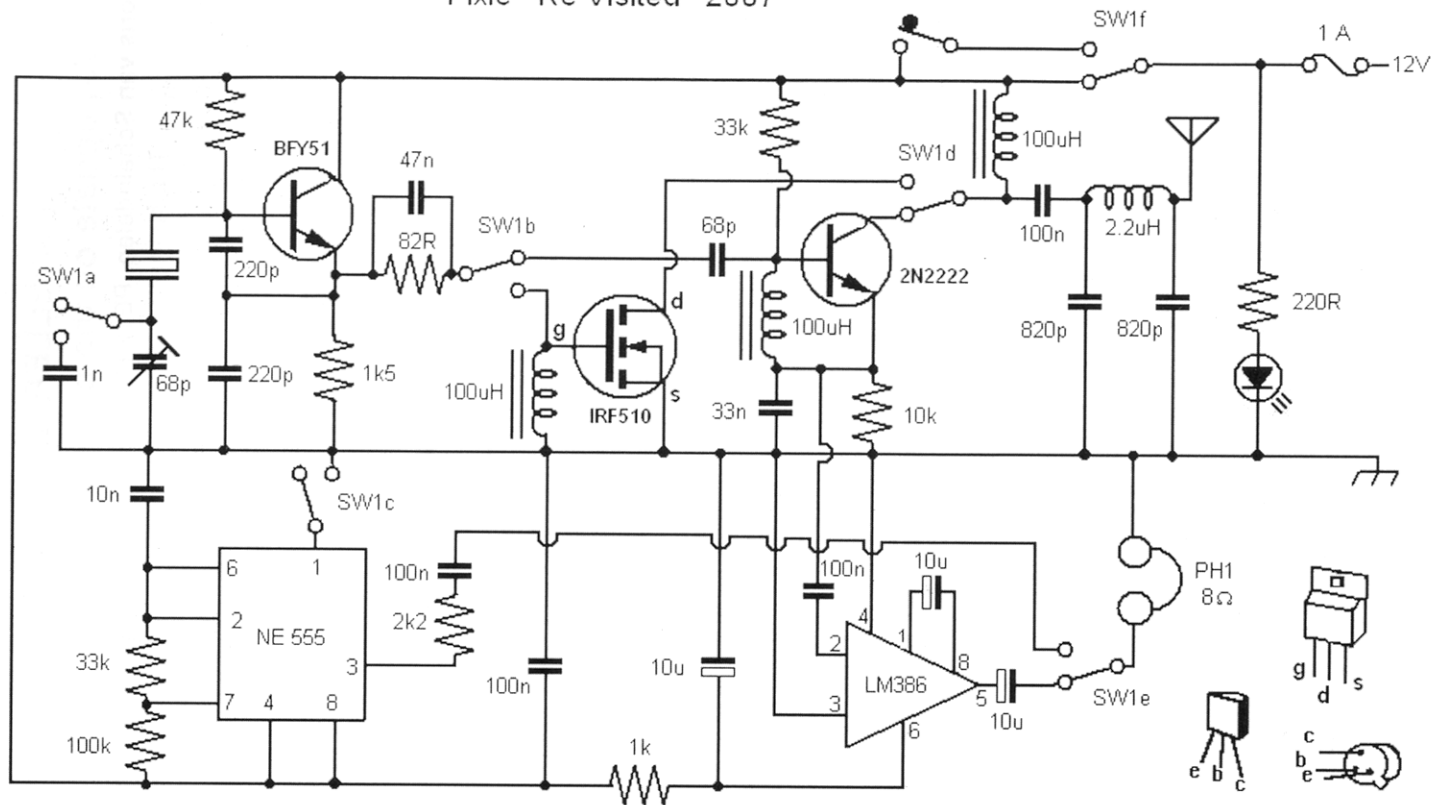
Incidentally I found by experiment that by changing the mixer /output transistor in the original circuit to an expensive MRF476 about 2W could also be got and the receive sensitivity was still OK. For those who are not able to refer to the 93rd Sprat I should explain that the trimmer capacitor is not meant for tuning, it's purpose is to offset the frequency between transmit and receive. The NE555 stage can be excluded if no side tone is required. The circuit was built on pieces of stripboard as separate stages and all wired to the switch.

I like having transistors in sockets; but I have found lately that these are hard to obtain. Try this solution. Get some DIL IC sockets, like the ones that are just a frame with spring like contacts and cut them up into sections of three adjacent sockets. Alternatively cut them into a row of four connections then by wiring them up in line as E- B- C- E they will accommodate most transistors which are made with either a base connection in the centre or at one end.

All of the transistors in this Pixie are fitted this way. Having sockets enables you to experiment with a selection of transistors and note how much variation in performance is obtained as well as the convenience of not having to de-solder them if they blow!



Maidenhead  
Pixie Re Visited 2007



## **SW – KTH TRAVELLER 2 - Improved receiver**

### **An update on the design in SPRAT 130**

Joris van Scheidelen PE1KTH, de were 5 , 3332kc Zwijndrecht,  
The Netherlands [www.kthkit@xs4all.nl](mailto:www.kthkit@xs4all.nl)

The SW-KTH TRAVELLER was published in SPRAT number 130.

The target was simplicity and a low component count for a pocket size receiver.

The Traveller 2 is upgraded with front-end selectivity and a coarse/fine band tuning. In the first version the wideband antenna amplifier, amplified all the incoming signals especially strong broadcast stations in the forty-meter band.

Some front-end selectivity is needed after the antenna protecting the detector.

TR1 is the same type of transformer as TR2 (10 MHz) has been used.

Also BB112 is used and connected on the slider of P3.

With the coarse Band tuning P3 the frequency band (part) of interest is selected.

With P1 the stations are tuned in.

The ratio of P1 and P3 can be chosen for the best tuning performance in this case 1:10.

Adjust the transformer TR1 for maximal signal strength with the REGEN near regeneration on a not too strong AM station. Because of the low Q factor of TR1 (proxy 90) TR1 is tracking TR2 very well.

So two extra components give front-end selectivity instead of the 100K ohm resistor.

Optional C1 and C5 can be placed if low value varicaps are used for narrow band reception.

Performance:

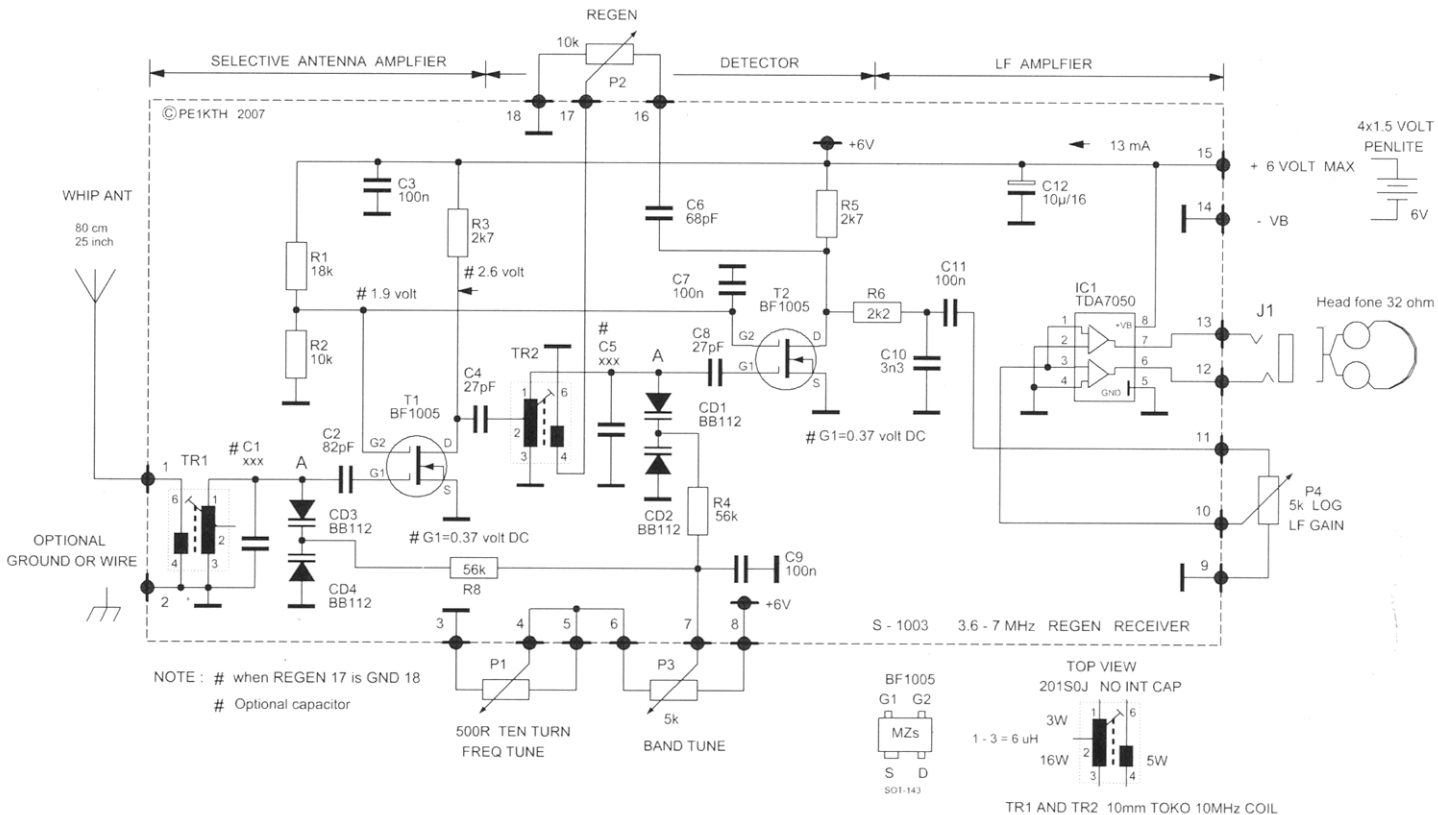
Receiving broadcast and CW stations is excellent.

For SSB the sensitivity is less due to the high oscillation level in the detector (de-sensing the detector).

Both FREQ TUNE and REGEN must be used carefully for clear reception of SSB



# SW-K1H TRAVELLER 2

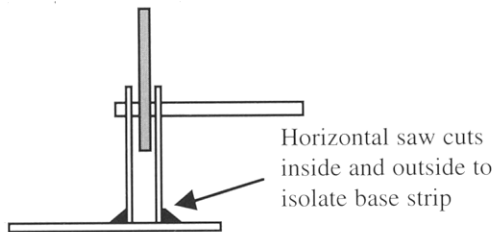
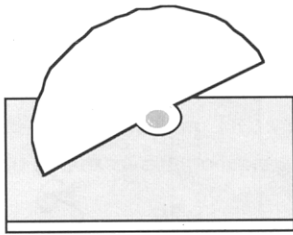


# Variable Dielectric Capacitors

Harry Brash GM3RVL, 5 Hillview Dr. Edinburgh. EH12 8QW

Over the years the author has constructed several variable capacitors based on dielectric vanes of various shapes moving between parallel metal plates. Usually the application has been a single band ATU and on one occasion it was a small transmitting loop with a couple of parallel aluminium plates and a square sheet of Perspex which could be swung in and out by a string to tune the loop.

The project described here was aimed at constructing a variable capacitor suitable for a VFO. The capacitor plates were formed from pieces of double sided glass fibre PCB with a single rotating vane of suitable high dielectric material, such as plastic, moving between the PCB plates to vary the capacitance. Initial attempts were very crude. The outer copper surfaces were isolated close to the base by saw cuts leaving just enough copper for soldering to the baseboard PCB. The inner surfaces were similarly isolated by saw cuts unless one plate was to be grounded. The rotating dielectric vane was cut from an available piece of plastic sheet (2mm Darvic) and drilled to give a tight fit onto a Paxolin 1/4" rod as the drive shaft. The two fixed plates were clamped together and drilled with clearance holes for the driveshaft. The capacitor was then assembled and lightly clamped with paper spacers between the two fixed plates and the dielectric vane. The whole assembly was then soldered along the isolated base strips to the PCB baseboard. The two paper spacers were removed and the variable capacitor was operational.



The basic formula for a parallel plate capacitor is  $C = \epsilon_0 \epsilon_r A / d$

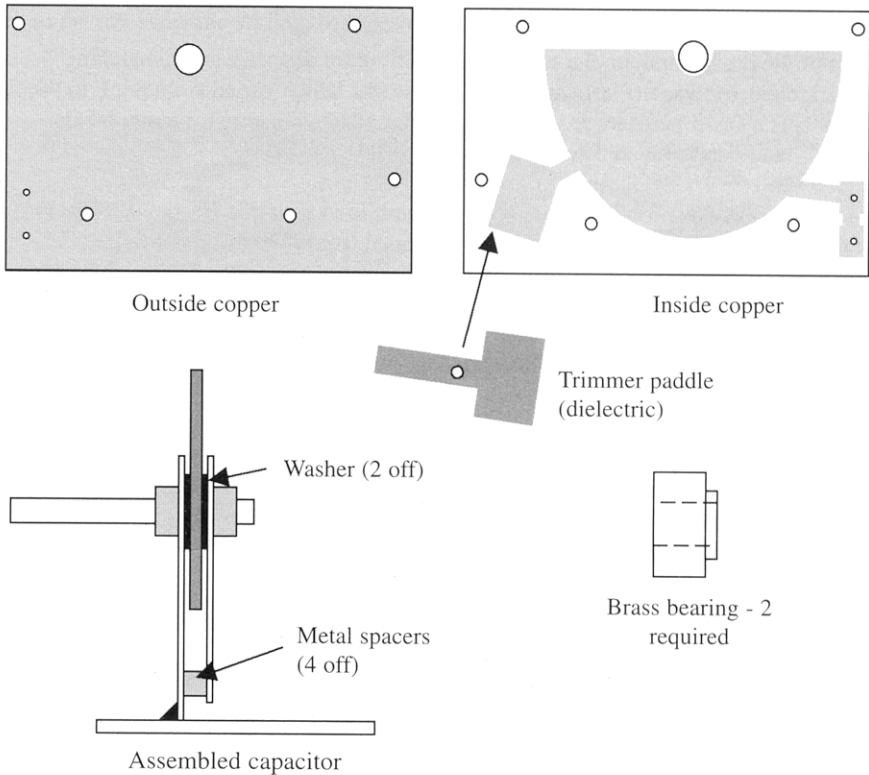
Where  $C$  is the capacitance,  $\epsilon_0$  is the free space permittivity,  $\epsilon_r$  is the relative permittivity,  $A$  is the area of the plates and  $d$  is their separation. The capacitance of this variable capacitor is made up of two separate areas, one having air between the plates and the other having the higher permittivity material. As the moving vane is rotated, the capacitance changes in a way which is determined by the shapes of the moving and fixed plates.

This type of variable capacitor clearly gives a proportional variation of capacitance which is lower than conventional variable capacitors. In fact the best ratio that can be achieved theoretically is  $\epsilon_r : 1$ . In practice, due to stray capacitance, the practical shape of the moving vane and the fact that the moving vane does not completely fill the gap, this ratio will be reduced. However, there are lots of applications where this is not important.

There are some inherent advantages with this type of capacitor. Since it is the proportion of the gap which is filled by the moving dielectric which matters, lateral movement of the moving vane along the shaft axis is relatively unimportant whereas, for the conventional variable capacitor it is critical due to the inverse relationship with the plate separation. This should make the mechanical construction less demanding. Another important advantage is that there are no moving electrical contacts to generate noise or to introduce losses in an ATU.

The first capacitor gave encouraging results despite its rather basic mechanical design. The next version of the capacitor incorporated a few refinements. The fixed plates were etched, using household gloss paint as a resist, to remove unwanted copper, brass bearings were fitted and the moving vane was properly clamped to the shaft to improve alignment. A trimmer capacitor was also included.

One of the fixed plates is shown below with the shaded areas being copper. The other fixed plate is a mirror image except that about 3mm is taken off the lower edge of the plate. It is mounted onto the first plate by metal spacers and screws.



The brass bearings were soldered to the outside of the fixed plates before assembly.

The moving vane was made from 1.5mm Plasticard and the drive shaft was 1/4" Paxolin rod. The two spacing washers were made from the thin, relatively tough, plastic sheet used to make antistatic bags for ICs etc..

The trimmer paddle was made from the same dielectric material as the moving vane and was mounted using a suitable screw and locknuts.

The shaft was machined and drilled to clamp the moving vane as shown below (enlarged scale). The moving vane was drilled to fit the smaller diameter and the whole assembly was clamped together and superglued. Alternatively, both parts of the shaft can be tapped and joined by screwed rod.



To avoid hand capacity effects, the copper was not removed from the back of the two capacitor plates and the outer copper surfaces were grounded to the baseboard. This meant that there was a large fixed capacitance in parallel with the variable one.

Using 1.6mm PCB and semicircular etched plates of 70mm diameter and a matching 1.5mm thick dielectric vane (Plasticard) gave a capacitor which varied from 84pF to 94pF. Although this is a small percentage variation it is more than adequate for many VFOs. The trimmer paddle gave an adjustment of about 3pF.

As a practical test of the variable capacitor it was built in to a simple Hartley VFO with no extra tuning capacitors and an existing coil. This tuned from 4230kHz to 4480kHz.

Rebuilding the capacitor with a moving vane made from glass fibre PCB with all the copper etched off gave a capacitance variation of about 86pF to 106pF and a tuning range in the same VFO circuit of 4060kHz to 4470kHz. The increase was due to the larger relative permittivity of the glass fibre PCB (~ 4) compared with Plasticard (~ 2).

It is surprising that this type of capacitor is not used more widely. Mechanically, they are quite simple to construct and, provided that the dielectric material used has passed the "microwave oven" test, the variable capacitor should be relatively loss free, despite the high voltages which can occur in ATUs – even at QRP. You have the added benefit of being able to design the capacitor to fit the task rather than the more usual requirement of designing the circuit to suit the available variable capacitor.

## Nicky's TRF Appraised

Aren van Waarde, Boslaan 62, 9801 HH Zuidhorn, The Netherlands

In the past few years we have built several regenerative receivers, including a solid-state radio from the US, a design with Russian battery valves, and a circuit without any coils from *Elektor* (see our website at <http://home.hetnet.nl/~a.van.waarde>). The "Howlicrafter" which we like best is "Nicky's TRF", described by Colin Davis in *SPRAT* 70, 3-7, spring 1992. Nicky should be Nick by now, just like our own son Henkie has grown up to become Henk.

The accompanying picture shows our incarnation of the Davis radio. We used the PCB layout from *SPRAT* and added a 4 kHz low-pass audio filter, hardwired on the inside of the receiver front.

The radio is in a metal enclosure. Front and back were cut from the case of a damaged power amplifier (NAD 2200). The bottom is prepared from the back panel of a Sansui amp. The top is from PCB material whereas both sides are made of plywood, covered on the inside with aluminium foil. In order to avoid microphony of the tuning capacitor and to add a finishing touch to the idiosyncratic styling, the speaker is mounted outside of the receiver cabinet in an empty biscuit tin (later filled with wadding).



The TRF worked immediately when power was applied. The first notes which it produced were "To God be the Glory" (interval signal of WYFR, Okichobee, FL). When the XYL heard this, she concluded: "Must come from George's magazine"! Main tuning is by a 500pF air variable with 3:1 reduction gear (Hopt), fine tuning by a 5pF air trimmer (Jackson) and regen adjustment by a ten-turn pot (cheaply available from Oppermann in Germany).

(Sony AN-1) located in our attic. Stability is excellent. On 40 metres, we could listen to QSOs of more than 45 minutes in SSB with hardly any retuning.

Visitors are thus made to believe that NAD is an abbreviation of "Nick's Advanced Detector".

## Whatif Ceramic VXO

Richard Wells G0RXH, 40 Greenway, Crediton, Devon. EX17 3LP

Its strange how things come about, most people say that nothing in the world of electronics is new and this is probably very true. Occasionally a new circuit does come along that breaks this mould but is still usually based on sound electronic principles.

My new VXO idea I would like to say falls into this category but in all honesty my electronics design usually consists of the 'what if' school of thought and this is exactly what happened here.

As we all know a good VXO should allow a large pulling range but this usually means a standard crystal oscillator circuit plus inductor and variable capacitor or varicap with its associated circuit. Of course a ceramic resonator can give a very nice frequency span but still requires all the tuning components, and as is well known it is these and the oscillator capacitors that cause drift.

With this in mind I decided if I built a VXO with a 4Mhz ceramic resonator, what could I remove from the circuit and still have it oscillating? This left me with a FET, a 1 Meg resistor an old RFC choke and ceramic resonator. Not very clever I here you say, and indeed it was just a solid unmoving 4 MHz oscillator, hardly a VXO!

At this point I thought "what if I add a 1K variable resistor in the source leg, will this allow a frequency shift?" Common sense would say no and that it would just change the amplitude of the output as used in many FET amp circuits but surprisingly this was not what happened.

The scope showed a very un-sinusoidal output but its amplitude stayed fairly constant.

The frequency counter showed 4.065Mhz with the pot at zero rising to 4.095Mhz at full range, it worked! The stability was good, very good, not solid but it was only the 1Hz digit of my counter that was moving very slowly downwards.

Excellent considering this circuit was on a scrap of PCB with no screening and just running of a 9v battery.

I decided to remove the RFC and replace it with a tuned circuit in the drain of the FET which consisted of 60ish turns of 38swg on an old 5mm slugged former, brought to resonance with a 150pf capacitor on my homebrew dip meter.

When I fired up the circuit this time the scope showed a lovely sine wave and then the second interesting thing happened. I adjusted the slug in the core to check that the output was on resonance and the frequency went down. The tuned circuit on the drain allowed the bottom edge frequency to be set, my ceramic VXO now went from 3.980Mhz up to 4.065Mhz, again this is not something that would be expected, the output showing a minimum of 8v p to p across the whole tuning range.

The circuit is shown here for your experimentation with notes on some of the components.

It should also be noted that a buffer stage will almost always be needed if the VXO is to be useful and that a voltage regulator is also required but not shown for simplicity.

It should be possible use the Whatif Ceramic VXO on any frequency if you have the resonator and a tuned circuit for it, but remember this is a work in progress and lots of things can still be tried.

Adding 2 resonators for greater shift (not tried this yet) is one , I did add a 3.5795Mhz crystal and although it worked in the circuit the frequency shift was very poor , only a couple of hundred Hz, this though could be used as a nice RIT add on to an existing oscillator.

I don't claim to fully understand why it works as it does, but obviously the FET characteristics are being changed as the pot is turned but why the frequency changes whilst the amplitude remain almost constant I will leave open for discussion.

As you will see the ceramic VXO idea is simple and hopefully will inspire others to say 'what if' when thinking of the next project to build.

Notes on Components

C1 = 0.1uF (Decoupling)

C2 = 100pf (Output)

C3 = 0.1uF (Decoupling, but reducing this value will improve the tuning range. Beware that too small a value will cause RF to appear on the pot VR1 leading to microphony)

C4 = 150pf resonates L1 (Find value using trial and error, I did!)

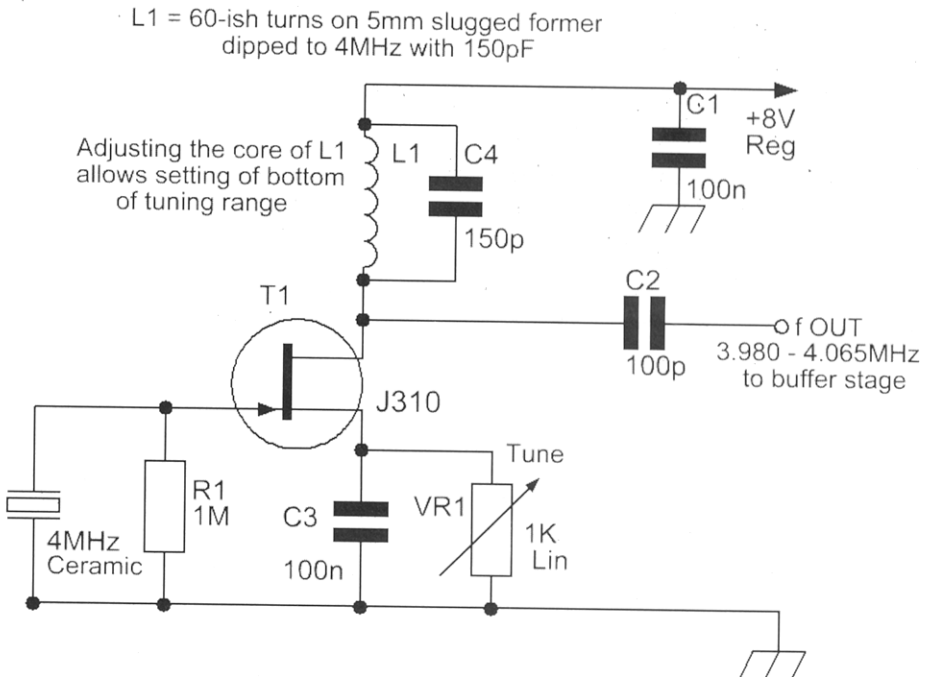
L1 = see Diagram

Q1 = FET J310

R1 = 1Mohm, it will work without this resistor but does not always start.

VR1 = 1k Lin pot, the tuning control leads can be any length

Ceramic Resonator 4MHz (Or your choice see text)



# Dummy load for PSU testing ~ “another bright idea”.

David Smith G4COE, 54 Warrington Road Leigh, Lancashire

You'll certainly see bright lights with this article. I wanted a dummy load to check a power supply, a nice n' simple way is to use bulbs, about the cheapest I could find are the 12V 35 Watt halogen wire ended about 25p each, order code GY6/35 HQ, but you can of course use what you can get your hands on... different wattage will require re-calculation.

Easy really, Watts/Voltage = Current in amperes, and the number of bulbs x the current will give you the total consumption, have you seen the price of high-powered resistors... and they're fixed, our 'bright emitters' are at least adjustable... and cheaper.

“Ok, ok I didn't design the bulbs”, otherwise I would have made em' 13.6V, you'll just have to turn the 'wick' down a notch and turn it back up after testing or you'll see bright light's big style so let's be kind to em', 13.6 V at 18 Amps and 12V at 18 Amps is like giving an elephant a peanut.

*The only warning is not to touch the glass bulb “especially after eating fish n' chips”, they are wrapped in a removable sleeve.*

These 10mm devices fitted in a electrical connector strip commonly known as 'chocolate blocks' admirably, for my purpose I used two strips which held 8 bulbs each...in case I wanted 24V, gee two of these in parallel would give me 560 watts (16 x 35W) some 46 Amps.

All that needs to be done is to screw the terminal strip on a block of wood near the edge and wire them up 'Christmas tree style' but in parallel. I used stranded mains cable for this... do avoid the thin stuff, then I inserted the lamps so that they overhung the edge of the wooden to aid cooling they do get hot and they are bright...take real care here, if shielding is used allow for lots ventilation.

Using 12V 35Watt lamps

1	35w	2.9a
2	70w	5.8a
3	105w	8.7a
4	140w	11.6a
5	175w	15.5a
6	210w	17.5a
7	245w	20.4a
8	280w	23.0a
9	315w	26.2a

**NOTE: Do not attempt to use this on transmitters or you'll blow the PA.**



## **A 600 metre Solid State Transmitter**

**Ian Keyser G3ROO, Rosemount, Church Whitfield, Dover, Kent, CT16 3HZ**

*Ofcom (Office of Communications) has decided to permit a limited number of Amateur Radio Full licensees to operate under a Special Research Permit between 501 and 504 kHz for a 12 month period commencing from 1st March 2007*

When the NoV (notice of variation) was made available I immediately applied for one. I had one for 73 KHz and did several experiments on that band but the aerial problems defeated me! My best DX was 559 at 12 miles... not exactly DX!

600 KHz could prove a different project with the possibility with eventually the of possible DX when other countries obtained access to the band. My experience when at sea had proved the possibility when on several occasions I worked back to PCH from the Indian Ocean .... The Transmitter consisted of three 807s with 600v.... superb ground system though, a steel ship and hundreds of miles of salt water!

Our ERP is limited to 100mW.... But due to the inefficiency of the aerial systems typically 10 to 20 watts of RF is required to obtain this level. There are several programs available which will predict the power required.

I first thought of using valves but the complexity of construction and power supplies changed my ideas and solid state was decided upon. Then I had to decide if to design linear or digital. Digital won for several reasons. The primary one was that construction would be easy and (almost) predictable.

A VFO about 2.008 MHz was decided upon to enable a quadrature system to be used at a later day to construct a phasing receiver. A 4013 is used to divide this signal by four and provide two antiphase signals at 502 KHz.

These outputs have insufficient current drive to drive the gates of power FETs so a driver Ic is required. The TC4426 is an ideal choice and can sink or source up to 1.5 amps.

I had a large box of enhancement mode FET's similar to IRF530's... I could afford to blow a few up.... And I did!! The first output transformer I constructed used two unknown ferrite tubes.... The FET's drew 10 amps but I got 2 watts out and the ferrite got very hot, very quickly!

I then bought a load of 3c90 ferrite rings and built a transformer with those... 9 rings on either side threaded on two lengths of 6mm brass tubing which was used at the collector load winding. A secondary of four turns was used threaded through the tubes.

On connecting to a 30w dummy load I switched on and the power meter went hard over.... Changed over to a 200w power meter and found that I had 120 watts and 12 amps being

drawn.... Very good efficiency! After a few minutes the FET's failed but the heatsink was cool, proving that the FET's were switching on and off very quickly indeed and that the on resistance was very low.... Of course it is only during the 'on' half cycle that power is dissipated and if the on resistance is low, the power dissipated is low.

The FET's were replaced and 0.5 ohm 3W resistors wired into each source. Turning on and now we had 4 amps being draws and an output of 12 watts. Increasing these resistors to about 2 ohms should reduce power to QRP levels.

Investigation with the scope revealed the reason for failure, there was a horrible spike on the collectors reaching +100volts.... Due, almost certainly, to the inductance of the transformer being too high. I did consider rebuilding the transformer but decided that an easier method was to add two zener diodes on each drain to ground. I first used 25 volt zeners and they soon got warm due to the fact that they were also clipping the main waveform, not only the spike. I added another zener in series with the existing zeners and then all was then tame.

Then for the final test.... Running the Transmitter without a load. This proved not to be a problem, a very important point as while tuning aerials almost any load can be presented!

## **PCB LACQUER**

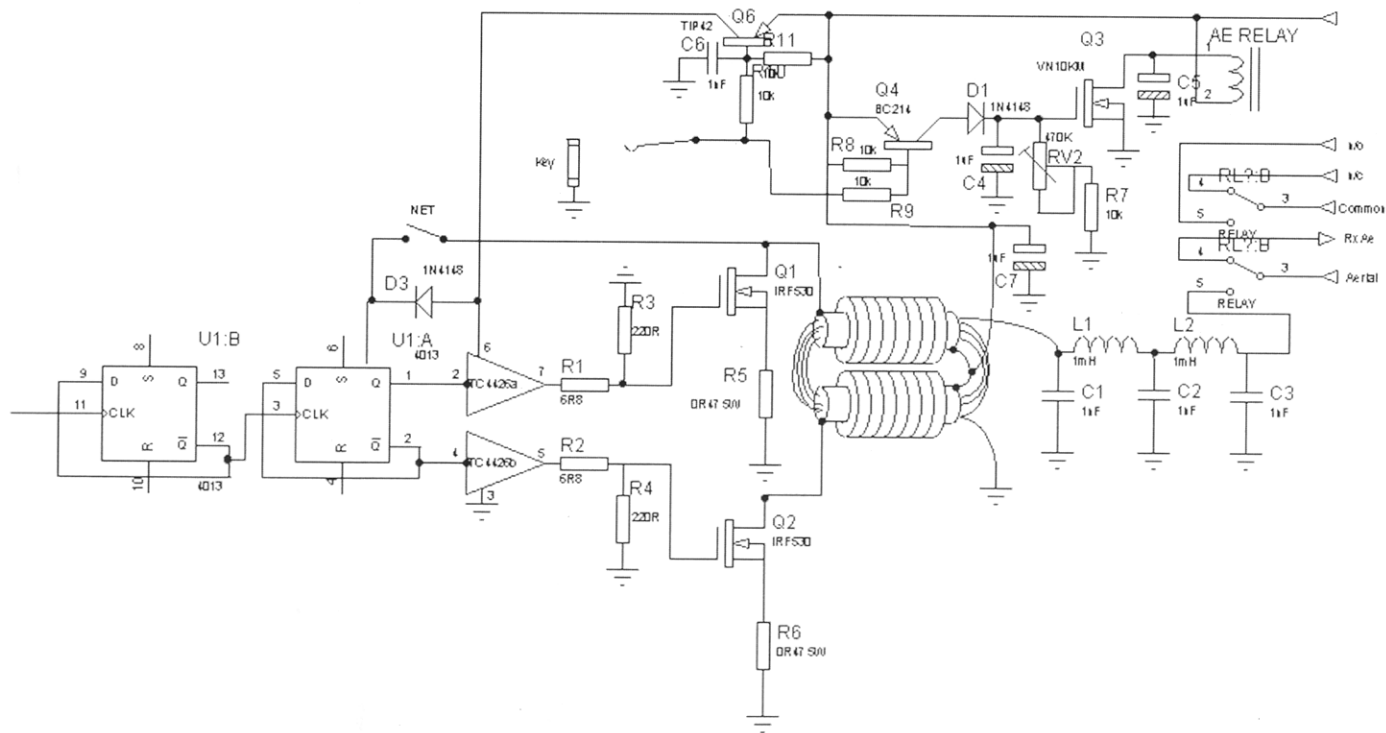
**Anthony Langton, GM4HTU, 71 Gray Street, Aberdeen, AB10 6JD**

I have recently started using printed circuits in order to work with surface mount parts. After a few trials, and more than a few errors, I began to get good results. The freshly cleaned boards looked really smart, so I did not want them turning green with time. Maplin had the answer, a spray-on varnish that could be soldered through if necessary. I hurried off to the local branch only to discover that they had none. What's to do? What any SPRAT reader would do; make my own.

I had some isopropyl alcohol for cleaning flux, etc from boards so I decided to dissolve some resin in the alcohol to make a lacquer. This is the way painters used to make their paints. Where to get resin? Why, the music shop. I remembered that violinists use it on their bows. I scraped off flakes and dissolved them in the alcohol until it was the colour of a good single malt.

It went on easily: it is a very mobile liquid and covers smoothly, with very little needed. It dried to a satin finish and does indeed act as a flux. I carried a test piece around town, taped to my bicycle, to give it good exposure to fumes and weather. There was no sign of any tarnishing.

Satisfied with the outcome, I stored it in an old apothecary's bottle, which I labelled. No-one else goes into my workshop and there are no children in the house, neither am I yet so doddled that I might confuse varnish with Glenfiddich. It's just good practice.



## Two articles on Acorn Transmitters!

Both appeared at about the same time – KF4YJQ's implementation of the Dave Ingram, K4TWJ, original and SM7UCZ takes the idea further.

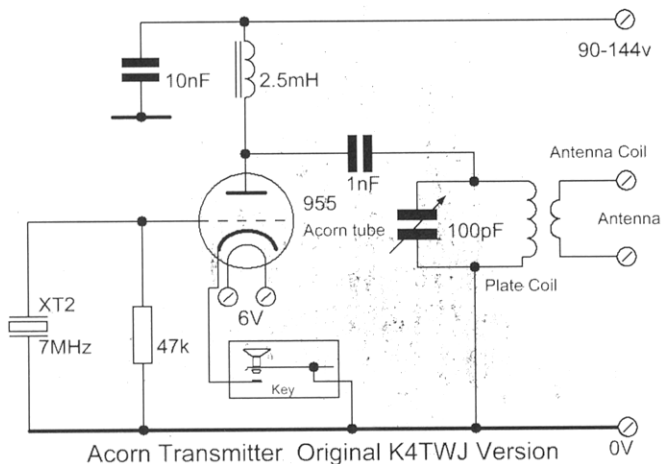
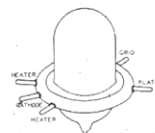
### Acorn Valve Transmitter on 40m

Walt Bullerwell KF4YJQ, 409 Needlewood Dr. Clarksville, TN 37040, USA

Inspired by George Burt's accomplishments in "QRP Basics", I have adopted him as my ham radio mentor. This is one of my 200 m.w. rigs that were constructed using one of the little 955 Acorn tubes (valves?). This little tube was developed by RCA in the mid 30's and is rated at 180V-DC on the plate. In deference to the ages of these little wonders, voltage has been limited to 135 V.DC - Plate voltage is supplied by 15-9V batteries (PP3 is the English designation) wired in series. The power supply, utilizing these 9V batteries, provides pure DC voltage and results in a clean, chirp free signal. A 6 V lantern battery is used for filament voltage. I have worked 13 states with one of these little rigs (I have several) for a distance of approx 700 miles. Surprisingly, the signal reports were quite good for such low power. I use a WWII RAF straight key and a 40 meter dipole at 30 feet. The tubes are plentiful and can be purchased for about \$4.00 each. The tube sockets are a bit scarce but they are out there. (Picked up two at a recent hamfest for free) No attempt should be made to solder leads directly to the pins on the tube as it would shatter the glass. The variable capacitor should be on the order of 100 pf. The coil form is a 4" piece of 1 1/4" dia plastic pipe. For 40 meters, the plate coil is 21 turns of 22 ga. insulated wire with an antenna coil of 6 turns of the same wire (wound in the same direction). Like most "valve" rigs, the larger crystals (FT 243) will produce the more stable signal. The circuit for this little rig was designed by my friend, Dave Ingram. I would be happy to respond to any inquiries from members interested in constructing one of these little rigs.



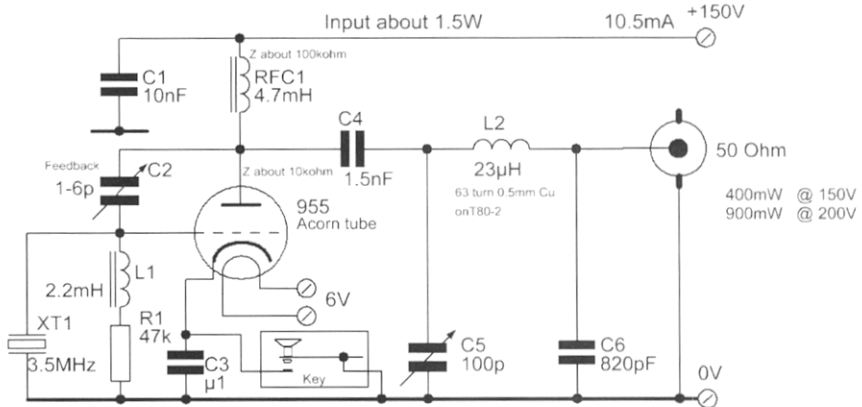
The Acorn Valve



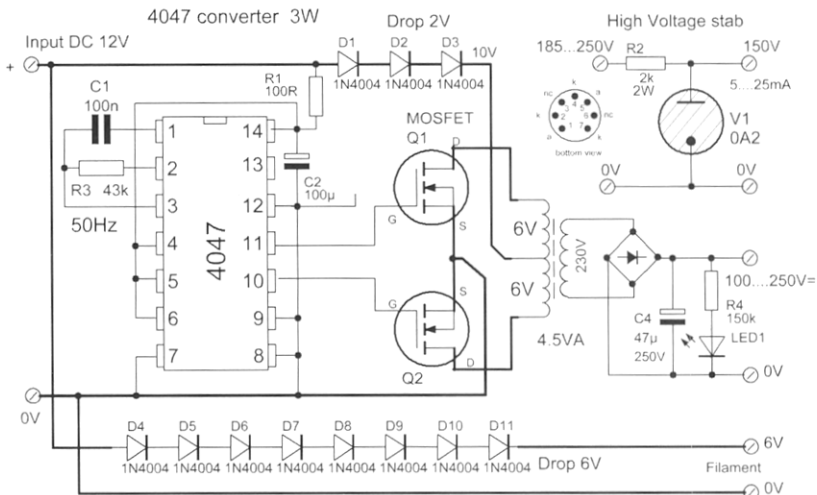
# An Acorn Valve Transmitter

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

The circuit shows my latest version of an Acorn transmitter, and a power supply for it. The output from Mark II into 50 ohms is between 400 - 500mW. Originally it was about 100mW. After I calculated the coil for a PI-version the efficiency went up from 10% to about 30%. It overcame a miss-match between tube and coil and only cost one extra condenser. On 80 meters I had problem getting the oscillator to start. The tube have too little C between anode and grid. The tube is made for UHF. So I put a little trimmer between anode and grid.



Originally I wanted to run it from 6V, but the PCB transformers are very lossy, so although a 230/6V transformer is calculated to about 230/11V, when you take power out the voltage will drop 5V!!! So it is useless to have them to transform backwards from 6 to 230V. It will only go up to about 125V idling. I can't find any 230/3V PCB transformer. Therefore I had to go up to 12V supply. The voltage is stable at 150V with a 0A2 tube.





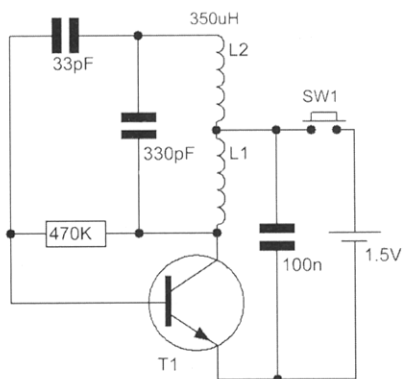
# Glue Stick Variable BFO

Richard Wilkinson, G0VXG, 139 Church Rd. Jackfield, Telford. TF8 7ND

This Christmas a well known drug store were selling AM/FM PLL SW radios for £2.99. These cover 30m, 40m, and part of the 20m amateur bands. They have reasonable audio quality and good gain but because they are AM they cannot resolve SSB or CW. There have been other circuits but these are fixed frequency and I found them ok for CW but not so good for SSB. The glue stick has a piece of threaded plastic in its centre and if this could be used to lower and higher a piece of ferrite near a coil then a variable BFO could be created. The switch for the oscillator is controlled by the screw top.

## Circuit

This is based on a Harley oscillator and uses a centre tapped 350uH coil and a 330pF capacitor. A ferrite toroid or similar is used to tune between 455 and 460kHz. The circuit runs on a 1v5 button cell and consumes about 80uA.



## Components

Glue stick 10.5 \* 2.5 cm  
Internal tube 4 \* 2 cm  
Vero board 6 \* 14 holes  
Button cell eg AG13  
Miniature switch  
Ferrite toroid  
0.1mm enamelled wire  
NPN transistor eg 2N2222  
330p, 33p capacitor  
470k resistor

## Construction

Take your discarded glue stick mine was about 10.5 cm by 2.5 cm and remove the top and glue holder. Dip the "adjustable" end into some boiling water for about 30 seconds. Once the plastic is soft you can remove it by twisting and pulling. Soak all of the 4 parts in some hot water to remove the glue.

Cut the threaded plastic to 3cm. This will allow the smaller 4 cm tube to sit on top of the threaded plastic and be level with the top of the glue tube. Re fit the adjustable end back into the tube. Obtain a 1 by 1.8cm ferrite toroid (or equivalent) this should sit neatly into the glue holder. Drop the glue holder and ferrite into the tube and make sure that it goes up and down.

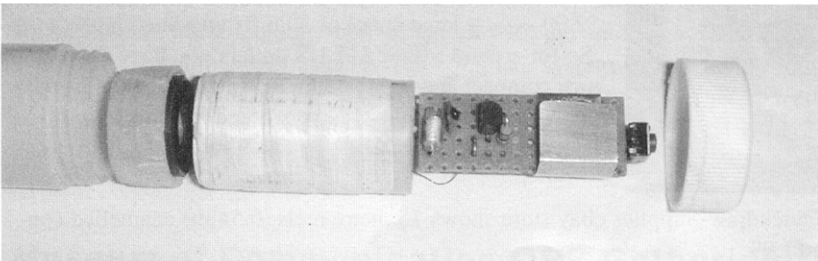
Using the small tube start winding the coil from one end, when 1.3cm has been wound make a centre tap about 5cm long, continue winding until the coil is 2.6cm long, leave

about 5cm of wire at each end of the coil, the total turns will be about 110. NB this tube will have to fit inside the larger tube when wound with the coil. With the 3 wires coming up the outside of the tube wind a single layer of PTFE tape over the wires and the coil. Cut a 2cm disc of plastic and bond to the where the coil starts, this stops the threaded plastic from entering the smaller tube. The Vero board needs to have a button cell battery holder added. This can be made from 2 pieces of brass or tin, the zero volt connection just lies on the Vero board and is folded around so that it can be soldered to 2 tracks underneath. The other piece needs to be bent so that it forms an "N" shape and again this is soldered to 2 tracks on the other side of the board.

The switch is soldered to the top of board such that one pin is connected to positive and the other just connected to a free track (this will be connected to the centre tap of the coil) Check that the circuit fits snugly into the small tube, then solder the 3 wires from the coil as shown.

Test the BFO and push the small tube into the larger tube, the switch should be just proud of the top of the tube. Screw the cap gently onto the tube and the BFO should switch on. If it does not work you might need to add a disc of card in the lid such that it exerts a little more pressure onto the switch.

The BFO works within a 6 inch diameter of the radio for strong signals place close to the radio for weaker ones move further away.



## AMTOOLS UK

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D9 9M fibre glass telescopic pole, now only £24.50. D6 6M POLE, £12.50. ADE-1 double balanced smd mixer. (Like SBL-1), 2 FOR £5.50. Fibre glass spreader set for cobweb, quad, etc. £22. HZj7 QRP ribbon antenna kit, £14. Springy (Slinky) £2.45. 20pc micro drill bit set £3.50. Eye loupe magnifier (10x mag.) £2.50. Mini-Circuits HPF-505X-1 mixer, £2.00..... Lots more! ..... Low mailing charges worldwide.

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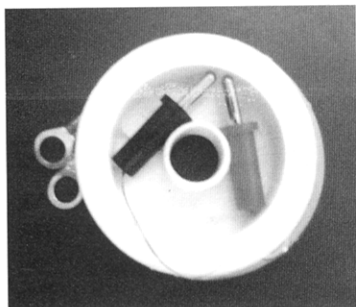
## WA3WSJ Bead-Wire Antenna

Ed Breneiser WA3WSJ (breneiser@dejazzd.com)

I backpack the AT here in the US and I've always wanted a small, lightweight HF antenna that won't break the bank. I finally have designed one that works great for QRP portable use. I call it the "WA3WSJ Bead-Wire Antenna." It made from bead wire, yes - jewellery bead wire that is used to make bead jewellery! Wall Mart sells it over here packaged in a 40 foot spool. I even use the spool to store the antenna. A spool sells for just under \$2.00 US.

I take one 40' spool and tie on around 50 feet of 30lb test fishing line to one end. This is used as my radiator wire. I tie a small loop on the end of the fishing line. This loop just slips thru a 1oz. sinker and this is used to throw up into a tree etc.

I also purchase two more spools and cut three 16 foot ground radials using the bead wire. I now have one 40' radiator wire and three 16' ground radial wire that I throw out around to operate. I use a BNC to two binding-post adapter that plugs into the antenna bnc on my Elecraft KX1. The whole antenna fits on one small spool and weights-in at 2oz!



Parts for the WA3WSJ Bead-Wire Antenna:

\$6.00———3ea. 40' bead wire spools @ \$2.00 ea.

\$3.00———1 set solder less banana jacks Radio Shack # 274-721

\$2.00——— large spool of 30lb fishing line

So for around \$10 or \$11 US dollars you have a very nice compact and lightweight qrp antenna that will tune on 20m,30m and 40m. I have worked Europe with this antenna using my KX1 @ 3w on 30m.

**UK Note:** The Quickdraw-Supplies ebay store shows 15 metre reels (0.5mm) enamelled copper bead wire at £1.99.

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

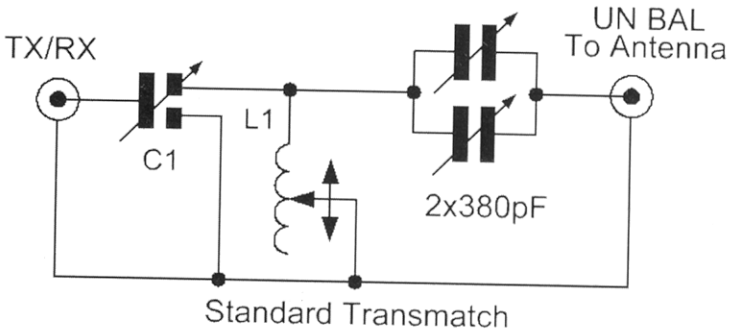
FOR SALE: Son of Zerobeat. New CW zero beat indicator kit from Jackson Harbor Press with manual. £7.50 plus p&p. (Cost \$33 in 2004.) Phone Chris, M0PSK on 0151-924-1525 or email chrism0psk@gmail.com.

WANTED: Can anyone supply me with an IC that Maplins used to sell? An EN2016 to keep an old project running. It's a four NPN transistor array package. Email: phoward@tesco.net. Peter Howard, 63 West Bradford Rd. Clitheroe. Lancs.

WANTED: 500 KHz 10XJ / FT243/241 Xtals - types that can be opened on 500 KHz. Also a good low frequency Receiver that will cover 500 KHz. Adrian G4GDR, 227 Windrush, Highworth, Swindon, SN6 7EB

## Transmatch Modification

Jim Brett, G0TFP, 11 Manor Rd. Astley, Tyldesley, Manchester. M29 7PH



The Transmatch A TU circuit is well known and covers a wide matching range. It can easily be built for QRP work using old domestic air spaced tuning capacitors and simple coil winding. The problem arises in arranging two capacitors to work in differential mode (C1).

My mechanical system finally failed and in desperation I tried a standard two gang capacitor with the common shaft going to the Tx/Rx. This does not give the loading/coupling ratios in the same way as the differential arrangement but it works OK. It has enabled me to obtain a perfect match with the antenna system I described in Sprat issue 112 (Autumn 2002) page30. The complete system covers 15m through to 160m. For reference the coil is wound on a 2" dia. former 35 turns evenly spaced over 3" with taps selected by a rotary switch. The taps are at 1,2,4,6,8, 11, 14, 18, 22, 26, 30, and the end of the winding at 35 turns.

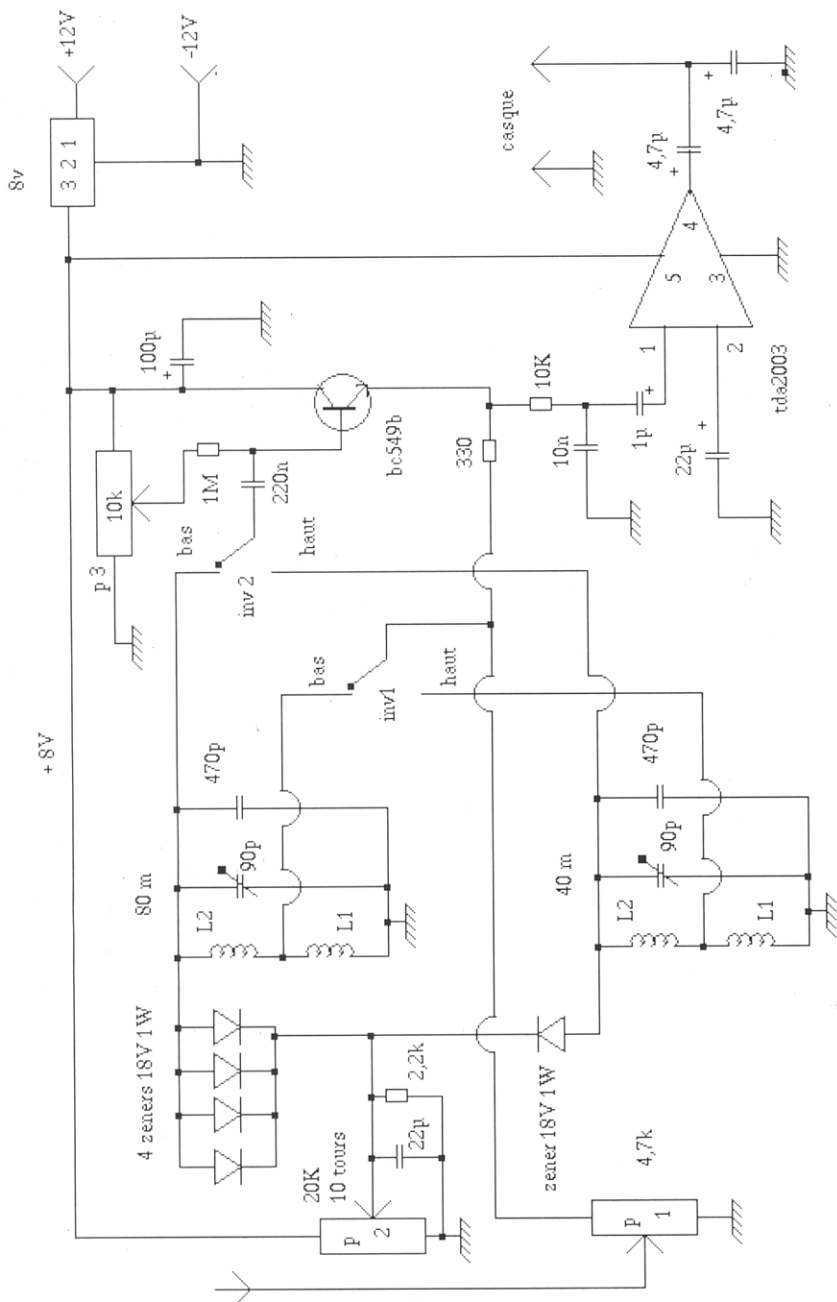
## Museum of Communication QRP Gathering

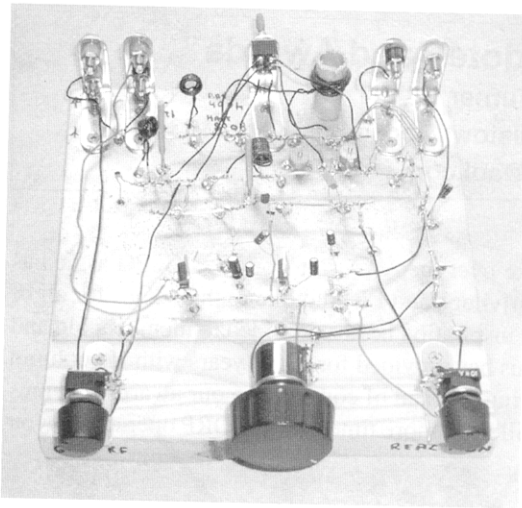
It is proposed that a get together of QRP enthusiasts be held at the **Museum of Communication, 131 High Street, Buntisland, Fife, KY3 9M, on Sunday, 21<sup>st</sup> October, 2007**, doors opening at 1.30 p.m. for a 2.00 p.m. start. There will be a group admission charge to the museum of £2 but this includes a cup of tea or coffee and a biscuit. The theme of the display this year is "From big bands to broadband" and there is a permanent radio shack. To assist in catering arrangements please notify the museum of numbers attending by Saturday, 13<sup>th</sup> October, 2007,

by Email to [gm4grc@blueyonder.co.uk](mailto:gm4grc@blueyonder.co.uk) or by post to the museum or telephone John. GM4AQO, at 01592-874719. If visitors are interested in partaking of high tea at a local hotel, cost approx. £8, please also inform us so that reservations can be made as it is a popular venue on a Sunday. As the museum changes its display every year and if there is sufficient interest this could become an annual event.

# A Simple Receiver for 40 and 80 meters

Olivier Ernst, F5LVG, 2 rue de la Philanthropie, F-59700 Marcq en Baroeul, France



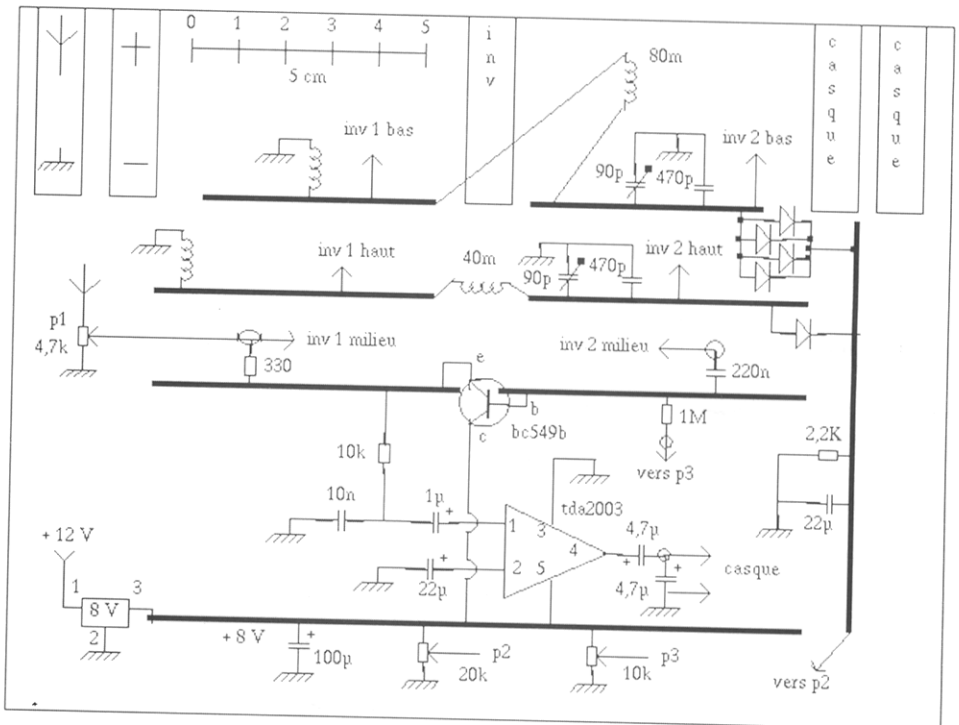


This is a solid state version of the old OV1 regenerative receiver. The results are similar to those of the vacuum tube version. Note the 3 following points:

- No variable capacitor but varicap diodes (actually zeners used as varicap) to tune the receiver.
- Detection output on the emitter of the BC549C transistor.
- No inductive link between L1 and L2.

	L1	L2
7 MHz	5	10
3.5 MHz	6	11

8 mm diameter except 3.5MHz L2 15 mm



# Antennas Anecdotes and Awards

by Colin Turner G3VTT

30, Marsh Crescent, High Halstow, Rochester, Kent ME3 8TJ

G3vtt@aol.com

A salute to Angus!

I have been asked by George G3RJV to take over the AAA slot from Gus G8PG as he has now retired from this post. This is a great privilege and I would like to thank Gus for all of his hard work over the last 25 years and the inspiration he has provided to members old and new. I intend to continue with the recipe Gus has provided for many years with his column and provide you with antenna ideas, operating tips and of course keep our awards schemes up to date. Thank you Gus, we hope you will have more time now for QRP operating – you are still a leading light in QRP.

## An LF Loop for 80m and above.

As a first antenna project I want to take a look at a simple loop antenna that I have field trialled along with Geoff G3YVF. As some of the G members know we regularly camp out along the banks of the River Thames and try out either new antennas or our latest homebrew creations. Coombe Beach, Egypt Bay and St Mary's Bay have been the birth place of the 'Marsh' transmitter and receiver, G3VTT's 1V3 TRF and the 'Heron' transmitter.

This particular antenna is 77 feet (24.06m) in circumference and can be easily supported by a fibre glass fishing pole particularly if you can obtain one of the larger ones of 9 metres length. A 77 foot version will tune 80m and smaller versions can be made to cover one or two bands. I have tried a 12 foot (3.65m) version in the shack to tune the 17m, 20 and 30m bands.

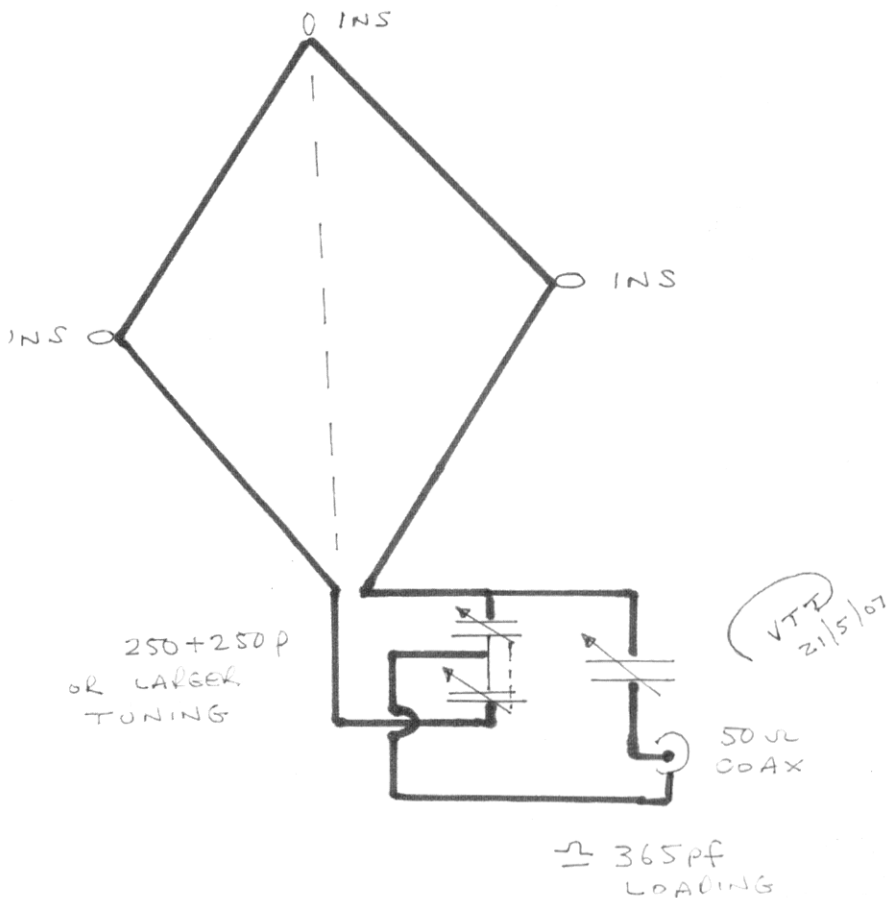
Essentially the system is a parallel ATU with a wire loop as the inductor. As you can see the antenna forms the tuning coil and the tuning range can be increased by using a larger value capacitor for the main tuning. At QRP power levels a broadcast radio type of capacitor will work without flashover although originally I did use a wide spaced twin 160pF capacitor to tune which allowed me to run just a little more power. With a larger than 77 foot loop and 500pf capacitors it would be quite easy to tune the 160m band.

The capacitors must be adjusted for minimum SWR and the beauty of the design is that you are able to hear an increase in receiver noise which has a definite peak which certainly lifts ones morale and confidence in contacts to come! Remember to use the thickest wire you can obtain to keep the losses down.

A version made for the HF bands using 12 feet of thick wire will fit in the shack and those with limited space could try this design in the loft or outside on a balcony.

Some of you may recognise this antenna as being similar to a system sold by MFJ. You would be correct. Apart from a homemade version being a lot cheaper than the commercial the original idea goes back to the 1960's or possibly earlier and stems from some experiments by Rod Newkirk W9BRD.

1 SUPPORT  
1 MAST (NOT METAL)



## A Simple Tuned Loop for HF

(I hope you can see the details from this rather poor picture - I am still learning how to use my IT package!)

Of course the antenna will not be as efficient as a full size dipole, it is after all less than a half wave long, but it will enable you to be on the air from small or awkward locations. The given length of 77 feet will work on 80m alone, lengths of 22 feet and 12 feet can be used to give operation on 80/40m and 30/20m respectively. Some cut and try will be needed depending on the values of capacitor to hand.

I worked Peter G3XJS and Ian G3ROO/M on as he drove up from Dover to the Medway area a few weeks ago on 80m with perfect Q5 signals both ways. We did notice a dead zone at 5 miles from the transmitter but consider it a perfectly practical antenna for general

operation. I also had a report that the loop and my KI were heard at the same time in West Wales by GW3UEP.

Loop antennas are an area of antenna designs that has yet to be fully investigated by radio experimenters and it would be interesting to see how this antenna performs when horizontal, perhaps just a few feet off the ground. A low loop will exhibit high angle radiation and a 77 foot version would fit into the smallest garden plot. Is there anybody out there who would like to try this antenna in the horizontal plane and let me know how you get on?

An idea of mine for the future is to try a large version of this loop, probably around 200 feet in circumference, which will resonate on the new 500 KHz band. I suspect I will need to source some fairly large tuning capacitors for it.

### The New 501-504Khz Band

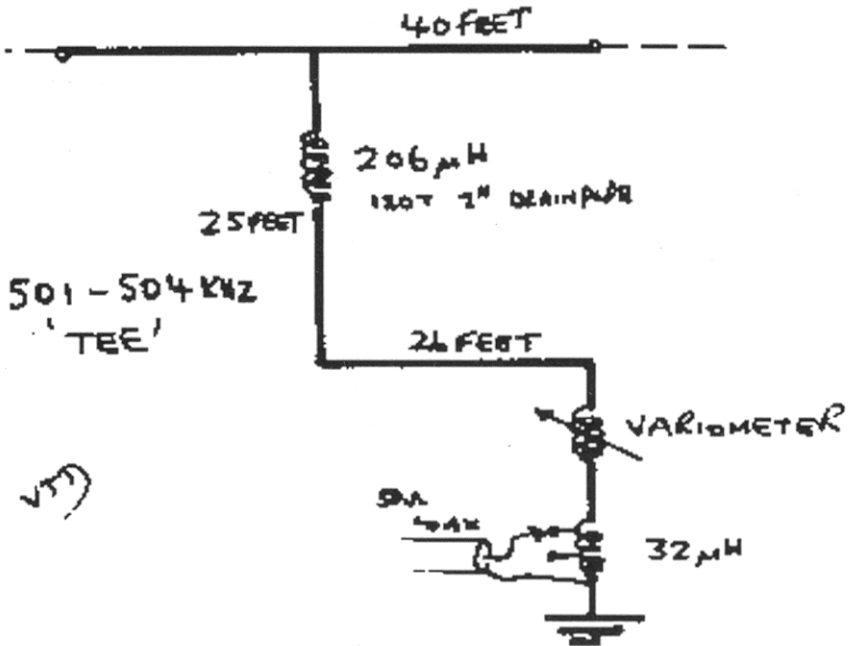
How many of you have applied for NoV's for the new band? If you want to work in a QRP heaven this is the band for you. No contests and hand sent CW are the order of the day and for once you have to make your own equipment. There are a growing number of operators building equipment for this band and running moderate or QRP powers as the new band is permitted with only 100mW ERP. With the sort of antennas we use, short capacitive tees and long wires with low efficiency, this will require a power of 4 to 6 watts to give the permitted 100mW ERP. With these QRP powers there are contacts being made around the UK and across the Irish Sea. Talking to the local QRP operators using this band we feel it is a band where QRP could really make its presence felt and contribute to the development and experimental work that is being carried out.

I currently use 4.54 watts output from a 3 stage transmitter using an EF184 crystal oscillator, 6CL6 buffer amplifier (with a 5mH anode choke) and a 2E26 PA. The receiver is a 'Fire Fet' ECF82 (6U8) as a Pierce oscillator and mixer feeding into my K2 tuning 3.501 to 3.504. Many other stations are using more modern technology such as MOSFETS and CMOS divider IC's dividing from a VFO in the medium wave region and above if crystal controlled.

My route via tried and tested vintage technology has been quick but left me covered in quartz dust as I ground the bar crystals from 500 KHz upwards. I am currently on 502 and 501.5 KHz using a Marconi Tee with a 40 foot top at 30 feet and a top loading coil of 206 uH in the centre with a 25 foot vertical section joined by a 26 foot length to the series tuning variometer. The results so far are only G and GI as only the UK has the band but I have been heard by two stations in Holland. Getting on the band with a 5 watts crystal oscillator and power amplifier should be fairly straight forward.

The G3YVF 'Marsh' transmitter described in a previous Sprat is a good starting point. A simple two section LPF on the output with 6300pf end capacitors and 12600pf at the centre point with 16uH coils should work well. Incidentally those values supplied from GI3PDN and tried by G4GDR, G3YVF, G3XAQ, G3UNT and myself work very well in cleaning up the harmonic output of our transmitters. The band feels like 160m in the 1960's along with rapid QSB and QRN. There are no QRO stations – yet.

A 40 foot flat top, loading coil and vertical wires for 502 KHz.



I am very keen to promote '5 ton' and if there is anybody locally in Kent or Essex who has an NoV or has submitted for one I am prepared to loan them a transceiver made by G3YVF. I had my first contacts on this rig which is a crystal controlled transmitter and regenerative two stage receiver. Do not mock such a simple arrangement – I worked G3KEV in Scarborough for my first contact using it.

### Awards

The Awards program by G-QRP club is currently being reviewed by George G3RJV and I and I hope to be able give you further information in the next issue of Sprat. With the poor band conditions entries into the scheme have been low but as things improve I am looking forwards to receiving your claims.

### Next Time

I plan to tell you more about some simple wire antennas next time, thanks to G and UA members who have written to me, and give you some operating tips. In the meantime try and keep the QRP frequencies active and those soldering irons hot. If you have any antenna, operating or constructing tips you wish to share plus your awards enquires please contact me as indicated above.

72 Colin G3VTT



## Have you met “SwitcherCADIII” yet?

David GM4ZNX

If you have a computer, you know that you can buy simulation programmes and you know that the prices of the full-blooded versions are targeted at global corporations. If you don't have their budgets you get a choice of free or cheap simulators that are really more toys than tools. However, someone has upset that appletart.

One semiconductor firm has had a superb version of a full-featured simulator written around the usual “SPICE” core and they're giving it away free as a sales aid for their op-amps and switch-mode PSU chips. You probably haven't heard of Linear Technology inc. but they've been around since the 1980s. The reason the amateur world mostly doesn't know of them is that they've specialised in super-duper op amps and power control devices, not the common or garden 741 equivalents. Their stuff is good, but other specialist firms do similar things.

To get the software (PC only - and I'm an Apple user at home) Find the website [www.linear.com](http://www.linear.com) and use their search box to find “switchercad” then select SwitcherCAD/LTSpice download and registration. Just follow the instructions. Note that you can download without registering. What you've now got is a Spice simulator with a schematic drawing front-end that is even better than the P-Spice freebie that was on the go some years ago. This version has no limits on the maximum number of components, and can do monte-carlo simulations to explore component variation sensitivities.

The libraries come with loads of components, and a number of familiar transistors. All the op-amps and fancy parts are LT type ones, of course, but we can't begrudge them that after their extreme generosity in giving this thing away. Some people have grabbed models of other makes of parts and used them successfully, but I usually just use the nearest LT part.

Using this programme, I've modelled switch mode PSUs for work, and a polyphase phasing method SSB receiver and all went well. I Monte-Carlo'ed the polyphase filter to check what tolerance parts I needed for a chosen level of alternate sideband suppression.

What else need I say beyond it does what it says on the can, it is one of the best Spice versions around, and, oh yes, it's free. Nuff said?

### Telescopic Fibreglass Poles

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# COMMUNICATIONS AND CONTESTS

Peter Barville G3XJS, 26 Hever Gardens, Bickley,  
Bromley, Kent. BR1 2HU. E-mail g3xjs@gqrp.co.uk

Please may I remind you all about IARU Region 1 **INTERNATIONAL QRP DAY** on 17th June, which is our opportunity to use QRP on the bands, and Fly the Flag! If you're not sure about the event details have a look in the Members Handbook, page 24.

## CZEBRIS 2007

I'm delighted to report that I received three times as many entries this year as I did last, but that still only makes a total of 3! My thanks to **G4FDC**, **G4MRH** and **GM4XQJ** all of whom supported the event and submitted logs. Poor conditions, and the presence of UBA Contest activity did not help, but contacts can always be made on the bands, if we do but try! Congratulations to everybody who took part, and in particular to Ron, **G4MRH**, who won the event by having amassed a total of 66 points using his IC706MkII with 5 watts to a trap dipole at 25ft. Interestingly, that is the identical score to last year's winner, G4FDC.

## CHELMSLEY TROPHY 2006

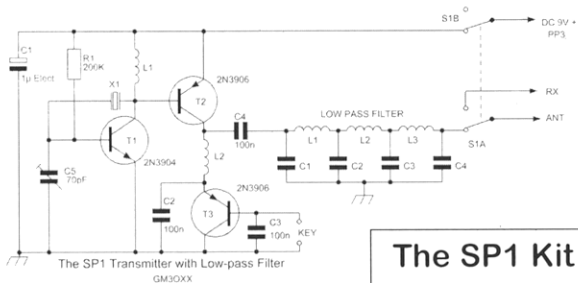
Twice the number of entries compared to last year, but that equates to a grand total of 2! Nigel, **M0DBO**, was keen to offer his support, although he says that he had a comparatively quiet radio year. His equipment was a TS530SP (5 watts CW, 10 watts SSB) and an Elecraft K1-4 (40m, 30m, 20m and 17m). The antennas used were a home made vertical, a low 'long wire', an inverted vee doublet and the helically wound antenna described by **G8PG** in the QRP Antenna Handbook. Peter, **G3JFS**, was also keen to offer his support, having noticed the poor level of support last year - my thanks to you both. Peter's equipment is very varied: IC706, TS450SAT, FT990, FT1000MP, Uniden 28/30, homebrew 4W single valve CW Tx and a homebrew 1W transistor CW Tx. Power used was 1-4 watts on CW, and 4-10 watts pep SSB. His HF antenna is a 66ft doublet, approximately 30ft high at the centre, with a back-up 50ft wire sloping up to 30ft in a tree, fed via a Smartuner. The wire/Smartuner combination proved to be very convenient for quick band changes, and most QSO's were made with this antenna. **G3JFS** completes a rare double, and is the winner of the Chelmsley Trophy for 2006, to go with his success (announced in the last issue) in Winter Sports. Well done Peter!

## 2006 HF INTERNATIONAL LOW POWER 'SPRINT' CONTEST

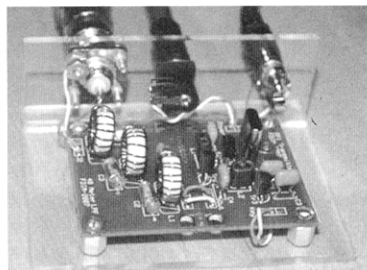
Alex, G4FDC, has kindly sent me the results of this event, which I will be happy to supply to anybody who cares to drop me a line. Congratulations to Alex for taking 3rd place in category C (5W, 2/3 bands).

Let's hope for some good summer weather and plenty of /P opportunities, whether in the UK or elsewhere. Make sure you make plenty of QRP noise on the bands, and tell Chris all about the QRP FUN you've had, and he can then put the details in his column.

72 de QRPeter



The SP1 Kit



The "Buildathon" construction event at the Four Days in May event prior to the Dayton Hamvention featured the building of the GM30XX "SP1" Transmitter from SPRAT 129. Extra kits were produced to make the price viable. These spare kits are now available to club members.

The kit includes a screened, through-plated, printed circuit board and all the parts including the low-pass filter and a crystal on 7.030MHz.

**The kits are available from G3MFJ (see back page of SPRAT) for £12 plus 80p UK postage - £1 EEC - £1.50 DX (Please note methods of payment on back page)**

**In the USA from Kanga US, 3521 Spring Lake Dr. Findlay OH. 45840-9073**

**Tel: 419-423-4604 <kanga@woh.rr.com> for \$25 (shipping charge of \$5 for orders shipped to the US).**

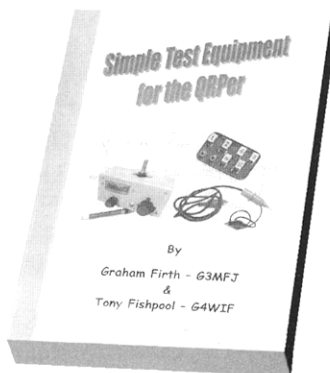
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### G3RJV DOWN-SIZING

Prior to retirement (Summer 2008) and moving to a much smaller house, G3RJV is down-sizing. ("Shedding a lot of Junk"... Jo-Anna) As time permits, items for sale will appear on <http://www.g3rjv.org.uk/>

There will also be plenty of stuff available at the Rochdale Convention in October.

# MEMBERS' NEWS

by Chris Page, G4BUE

Highcroft Farmhouse, Gay Street, Pulborough,  
West Sussex RH20 2HJ.

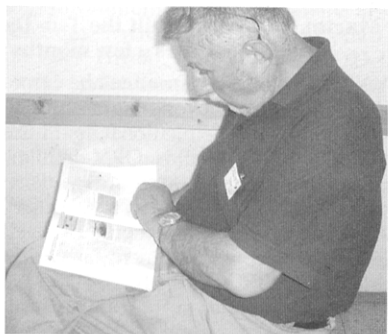
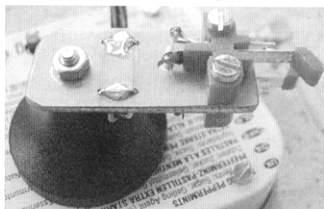
E-mail: <g4bue@adur-press.co.uk>

The big news this time is the announcement of the new K3 from Elecraft (right). It is available in a 10 and 100W version, modular (five/six hours construction and no soldering) or fully built, and with an option of roofing filters. More details are on the Elecraft web-site where the K3 is described as "Starting at under \$2000 for the 100 watt assembled model, the rig is comparable in both features and performance to transceivers listing at up to six time its price". Perhaps members who take delivery of the first batch (late summer) will let us know what they think of it and how it performs, please?

**G3VTT** was QRV 22 February/6 March from EA8 while on holiday. Colin used his K1 to work Europe on 20m and found the K1 receiver excellent in EA8, although in the UK he finds he needs the in-built attenuator at night on 40m. He had ordered the noise blanker board and a

further two-band module for 80 and 17m. Colin writes, "I had a super day at the local beach in mid-March working a string of other QRP stations using just an 80 foot wire 20 feet above ground with a 33 foot counterpoise on 40m. The in-built KAT1 ATU seems to tune most things. I have also made a 1:1 current balun using surplus computer mains lead ferrite to help tune dipoles with 300 ohm ribbon. Geoff, **G3YVF**, and I are gearing up for more activities on the beaches locally with our K1 and SGC2020 combinations". **G4ELZ** was QRV in the middle of May as **TF/G4ELZ/P** on EU-168 (with **G4EDG**). **GOFUW** will be staying in France for a weeks in July and plans to be QRV in the RSGB QRP Backpackers contests.

**DL2BQD** says the annual Walsdassen QRP Meeting 27/29 April included a report on Andorra by **C33IU**, filters by **DL2AVH**, antennas and measurements by **DK6SX**, and **DK3WX** presented his mini network analyser, the Electronic Swiss Army Knife for the radio amateur with only 50 parts, and his new mini auto-tuner for the Fuchs antenna (see <www.dk3wx-qrp.homepage.t-online.de>). Dieter congratulates the organisers on a job well done again.



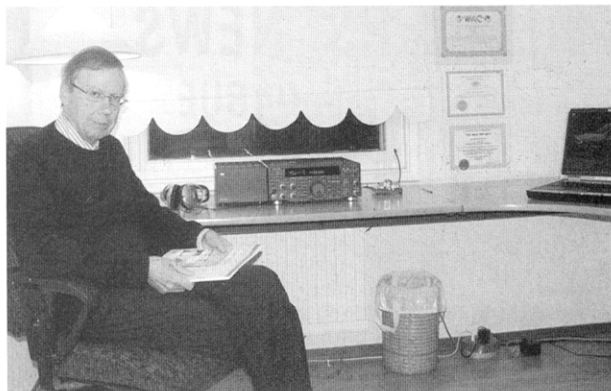
**Keys on show at Walsdassen (DJ3KK).**

**Dieter, OE6WTD, reading!**

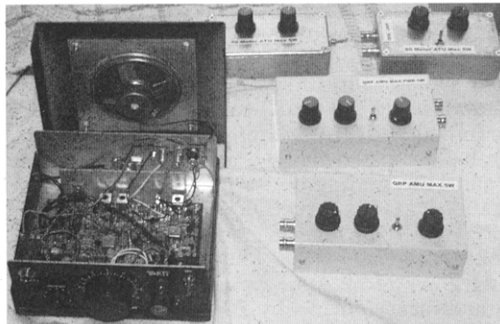
Too late for the last SPRAT, the EA-QRP Club announced their annual QRP contest in April. It is held the same weekend every year so put a note in your 2008 diaries for 19/20 April 2008. There are classes for 5 and 1W on 10, 15, 20, 40 and 80 metres and something I like: you are asked *not* to include /QRP in your callsign. More details from **EA4OA** and **EA4DAT** <ea4dat@yahoo.es>. **9A3FO**, Chairman of the Croatian Telegraphy Club invites all "Telegraphy lovers across the world" to apply for free membership by e-mail to <ctc@hamradio.hr>. Den says membership is free because it is the Club's principle to support CW which is far more important than any financial consideration. Their web-site is at <www.hamradio.hr/ctc>.



**SMOPMJ** has only been QRV on 30m the last few years and got QRP ARCI 1000 Miles per Watt award (#2079) but has now been told that 20m is a better band for QRP as there is more activity there. He has now changed his 30m dipole to a 20m dipole as he can only put up one antenna. The picture on the right shows Goeran and his TS-870S, Bencher paddle and Swedish Rex Key.



For those interested in a "Super VXO project", **IOSKK** has added details of his new 10MHz VXO page to his web-site at <<http://www.eco-lavoro.com/i0skk/superVXO/10MHzVXO.htm>>. **I7SWX** says for those interested in building an FSA3157 H-Mode mixer, **PA3AKE** has added a page to his web-site with the schematic and PCB layout (Eagle format) for the **G3SBI** 3T H-Mode Mixer using the FSA3157. Gian says Martein has also added his 2T H-Mode Mixer schematic to the 2T page, <<http://www.xs4all.nl/~martein/pa3ake/hmode/>>.



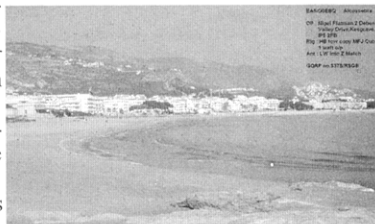
**Martin, 2EOAYQ, built the Ten-Tec 1380 kit and some AMUs a few months ago.**

**YN4SU** and after 15 minutes he came back for me, also with 5W. I am using a FT-817 and a half **ZS6BKW** antenna (one leg) from the top floor window to a tree in the garden". **N8ET** and his wife will be on their sailboat again this summer (20 June/10 September) doing a trip around Lake Superior and Bill will be QRV. While they are away Kanga US will be closed and any G-QRP Club issues (supplies, renewal, etc) will have to be handled by the UK or wait there return.

**G3XBM** is using his K1 40, 30, 20 and 15m into a 15m long long-wire tuned via the internal ATU and says it works incredibly well, with 33 countries and three continents worked by 5 May. Roger has been experimenting with amateur band crystal set reception and has had a two-way cross-band QSO with **MOBXT** on AM over 1.8 miles, receiving his signals quite well on a four component crystal set. He also heard **G2ABR** in Harwich on SSB (envelope detection only, confirmed by listening on SSB with his FT-817 and matching the envelope at 50 miles distant. At times he was S4-5 which Roger found remarkable. He says, "On the higher HF bands like 10m, it should be possible to hear European amateurs on a crystal set in an intense sporadic-E opening. My crystal set can hear down to -55dBm. I'm looking forward to the sporadic-E season on 6m and hope to better the 30 countries worked with QRP on last summer".

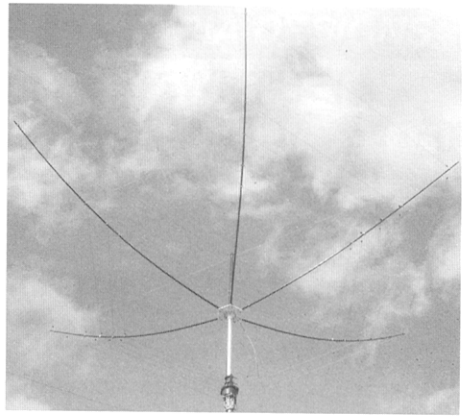
**GOEBQ** says 20m conditions are improving with his best QSO being ST2A. Other notable QSOs for Nigel were **TA4CW/MM**, **CN2ZR**, **EA9EU** and **3V8SS**. He is awaiting

**MIKTA** was QRV 15/16 April as **HBO/MIKTA** on 20m SSB battery powered 4W with a dipole from a 6500 feet hill above Malburn. First QSO was with **GIINK** running 4W while QRV from SOTA Kinderscout SP001 and as the skip lengthened he worked some USA stations. Dom writes, "I did try CW at the bottom of every hour but without any success. Maybe my CW was too slow or the CW callsign was too long? If anyone has any hints I would be glad to hear them". Writing on 19 April, **PA3GNZ** says, "Last weekend I met **9M2CNC** a few kHz above 14060kHz, in the evening. I worked him with 5W CW without problems and after our QSO the pile-up started. A day later around midnight I heard a pile-up on 30m for



**The EA5/GOEBQ QSL.**

a Sierra kit and will then be QRV on 10, 12, 15 and 17m too but is first building the Eamon Skelton PSU *Radcom* for it. Nigel will be QRV 18/28 May, 3/7 July and 28 August/9 September as **EA5/GOEBQ** from Alcossebre, see QSL below. Congratulations to **GM4XQJ** on working **BS7H** on 20m with 5W and his TH3 at 50 feet, plus members **EA8/GM4CXP**, **EA5/GOBHI** and **CT/G3KJX** on 20m. **F5NZY** has replaced his G5RV with two double windom antennas on the roof of his Paris QTH. Steph has also put up a vertical Hex-beam (right) and says only one word describes it - "Wow!" as it has changed his amateur radio life in working DX.



Congratulations to Steve, **GOKYA**, who, writing on 27 April, says, "I have never been much of a DXer but after attending the RSGB HF convention in 2005 I got interested in DX. Nothing serious, but when I switched to electronic logging I found I only had 44 entities and so I started to build it up until I got to 99 where I have been stuck for two weeks. Tonight there is **SV9CVY** on 14260kHz SSB at 59+20 working a big pile-up. I call, he works someone else - 1kW from the USA, 1Kw from SteppIR, 1Kw from VO - you get the idea? Then he works a QRP station and I think why not? I make sure the wick on the IC-7400 is down all the way to 5W, switch in the loft-mounted MFJ mag loop and call '**GOKYA QRP**'. Blow me! He comes straight back with a 59 report for country number 100, congratulating me on the signal quality and strength".

**GM4CXP** was QRV in the first two weeks of May as **EA8/GM4CXP** with 4W into a 16 feet vertical fed via 'Miracle Ducker'. Derrick says conditions were generally poor but 10m was open via Es on a couple of evenings but he couldn't make any QSOs. Klaus, **DF2GN**, and Tom, **DL4NSE**, were QRV from HB0 on 17 May on 30, 40 and 80m - thanks **DL2BQD**. **G8NXD** tried QRSS on 13 May on 10140kHz and put his homebrew 500mW TX on air for the first time with a simple PIC programmed to wobble the frequency with his **M3MSM** callsign in 5Hz FSKCW. Mike says, "It was put on air at 0700z and within about 20 minutes Mike, **ZL4OL**, had copied my signal and sent back a report via e-mail. My first QRSS report, from my best DX ever - was I gobs thanked! I still can't seem to get out of Europe on 100W of SSB".

On 28 April **GOUPL** was QRV with 2W on 80m from a hotel room in Joplin, Missouri as **WO/GOUPL/P** with a Unichip (<http://www.hanssummers.com/radio/unichip>) and long-wire antenna. Hans was visiting Ozarkcon (<<http://www.ozarkcon.com>>) with Jan, **GOBBL**, Alan, **MOPUB**, and Steve, **GOXAR**, organised by the Four State QRP Group. On 1 May **IKOIXI** worked **DK1OT** on 40m with 250mW using his Pixie 2 and an off-centre dipole. Fabio was calling CQ on 7030kHz when Alfred from Stuttgart answered with a 539 report for him. He has also worked **PA2DW** on 40m with the Pixie and has also completed his QRP DXCC.

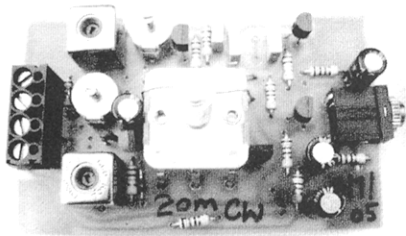
**GM3MXN** writes, "You will have seen in *Radcom* that there are now two suggested CW frequencies on 5MHz (5289 and 5291kHz), and I encourage members to use the band. Apart from an RTTY station at times on the lower frequency when long skip, the QRGs are ideal for inter-G working, and the construction of a two channel transceiver. The only difference between working on 5MHz and other bands is that you may have to give a military station a SINPO report, and when submitting logs". I should be joining you on 5MHz soon Tom as I am building the K60XV option for my K2.

**2E0BFJ** reports the results of the 2007 Yeovil ARC *Fun Run* on 19/221 March. Gary says it would seem that 40m could not get any worse as conditions were truly awful. The points gained for the best two evenings were as follows:

Call	40m	80m	Both	Pwr	Call	40m	80m	Both	Pwr	Call	40m	80m	Both	Pwr
F5VJD	30	233	263	5	G3YMC	10	220	230	5	DL2BQD	63	73	136	5
G4PRL	23	220	243	5	G4SLE	10	206	216	5	PA0RBO	-	130	130	5
G3JFS	56	189	245	4	2E0BFJ	-	140	140	5	F6GGO	10	100	110	5

Congratulations to the winners. **G3ICO** ran the only *bonus* station and made 380 points over the three evenings using 5W and his K2. Next year it is planned to have a fourth evening.

Please let me know how your QRP Summer goes, together with photographs and details of any DXpedition type QRP operating trips you plan for the autumn, by 20 August - thanks.



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**HC49U** (wire) crystals for all **CW** calling frequencies - 1.836, 3,560, 7,030, } £1.30p (DX)  
10.106, 14,060, 18,096, 21,060, 24,906, & 28,060 - £2.00 each }

**HC49U** (wire) crystals for DSB on 40m - 7.159MHz - £2.00 each } if  
**Miniature crystals** (watch crystal size - very low power) - 3.560, 7.030, 10.106, } ordered  
18.096, 21.060, 24.906 & 28.060 - limited quantities - £2.00 each } with

**Ceramic resonators** - 3.58, 3.68MHz & 14.30MHz - 50p each } heavier  
**Schottky signal diode - 1N5711** low fwd volts for up to vhf/uhf 20p each } items  
**Varicap diodes** - MVAM109 - 40pF @ 9v, 500pF @ 1v. 75p each } max of 2 } use that  
- MV209 - 5pF @ 12V, 40pF @ 1v 35p each } per member } postage.

**CA741 op-amps 8pin DIL - 5 for £1** } plus  
**2SC536 transistors (npn) FT - 100MHz, hFE-320, VCBO+40V - 5 for 50p** } 10%  
**MPSA92 transistors (pnp) FT - 50MHz, hFE-40, VCBO-300V - 5 for 50p** } of this  
**MK484 radio on a chip - £1.00** inc circuit diagram. } 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; BN43-302 - £2.00

**New** - BN43-202 - £1.80; BN61-202 - £2.00  
FT114-43 - 80p each (for postage - 2 counts as a pack of 5)  
FT240-43 - £3.00 each (for postage counts as a pack of 5)  
**Ferrite beads** - FB-73-101 (3.5mm dia x 3.2mm long, 1.2mm dia hole) - 40p for 5  
Plus postage - up to 5 packs = 50p (UK), £1.00p (EEC), £1.30 (DX); 5 - 10 packs = £1.00, £2.00p,  
£2.60 etc. (please note - if you order 2 packs - you will probably get all 10 in one pack)

**Sprat on CD (1 to 109) - £10 inc postage (UK); +50p (EEC); + £1 (DX).**

**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 - 80p, EEC - £1.50, DX - £2.00. More - add 75p, 80p, £1 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 1st magazine - 50p, each additional magazine add 30p.

**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.  
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**I no longer accept Visa payments where the member has an alternative method of paying, such as cheque, cash, stamps, PayPal or payment through one of our reps. For why - see Sprat 130.**

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

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