SPRAT

THE JOURNAL OF THE G QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

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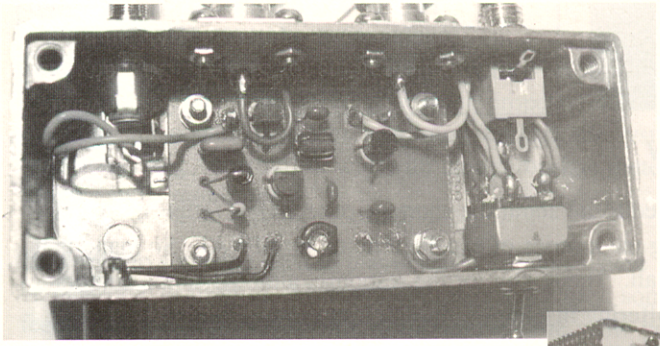
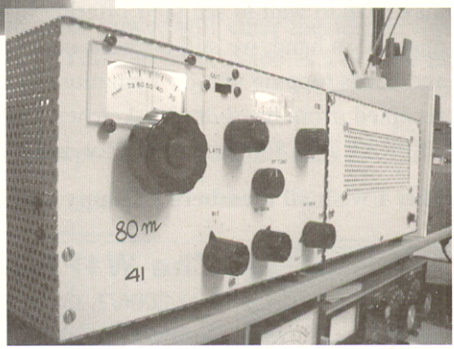


The SP1
A New GM3OXX
Transmitter



HB9FAE "All Tubes"
80m CW Transceiver

Remote Aerial Current Probe ~ Generic Audio Amp ~ The SP1 TX
QRSS Receiver for 10.140MHz ~ Palm IR Keyer ~ DC-DC Inverters
Toroidal KANKs ~ Peak LCR Analyser ~ All Tubes 80m CW
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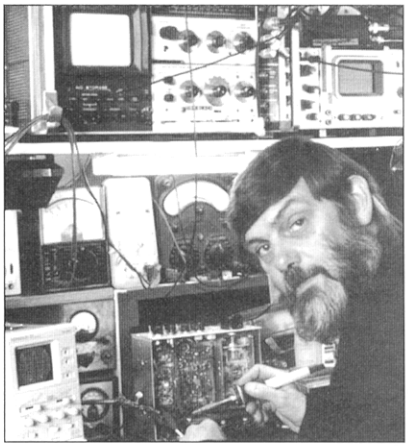

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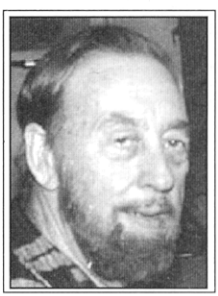
Rev. George Dobbs G3RJV

After my complaint in the last editorial about the shortage of technical articles, several members responded by sending me a series of excellent items for SPRAT. So many that this issue cannot contain them all. Thank you for the response, although some authors may have to wait to see their offering in SPRAT. But..... in spite of having some material in hand, we still do want new contributions to SPRAT. The file had run low and needs topping up. So I am more than pleased to receive items. Most formats are accepted; from hand-drawn sketches to fully worked PC-ready articles. If anyone wants a SPRAT style formatted page for an article, please send me an email.

May I wish all members a Happy and Blessed New Year for 2007.....



The W1FB Memorial Award 2006/7

For 2006/7, the theme is **Shack Accessories**

Submit any design on this theme – those little [and large] useful extras that help to run your QRP station.

Please submit your design to G3RJV as soon as possible, with circuit sketch, all values and brief notes.

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

72/3

G3RJV

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A Remote Aerial Current Probe

Ian Braithwaite, G4COL, 28 Oxford Ave. St. Albans. AL1 5NS

This article describes a very simple idea which I've never seen described elsewhere: put a current sensor at the aerial, and send the detected voltage down the feeder to the shack, where it is measured. Radio frequency power travels up the feeder to the aerial, and the dc voltage, proportional to the aerial current, comes down the same feeder. It works, and has been in operation here for the last few years.

As I learned years ago from the writings of the late great Les Moxon, G6XN, radiation is proportional to aerial current. This means that for a current-fed aerial, such as a half-wave or shorter dipole or doublet or typical ground plane, feed point current needs to be maximised for best radiation.

I can't remember the idea cropping up, but for some time I'd been pondering the question "how does one know the aerial is working properly?" This may seem like a rather stupid question, since stations can be heard and worked, the system can be tuned for minimum SWR (standing wave ratio), and with an appropriate meter, power disappearing into the feeder can be monitored.

However, to someone used to playing with circuits, where voltages and currents can often be measured or derived, this is not entirely satisfactory: something is missing. Suppose the feeder loss increases over time, for example. The same power will enter the feeder, the SWR will actually improve, but less will be radiated. This can be detected as a decline in aerial current.

The basic and widely used radio frequency (rf) current probe is shown in figure 1.

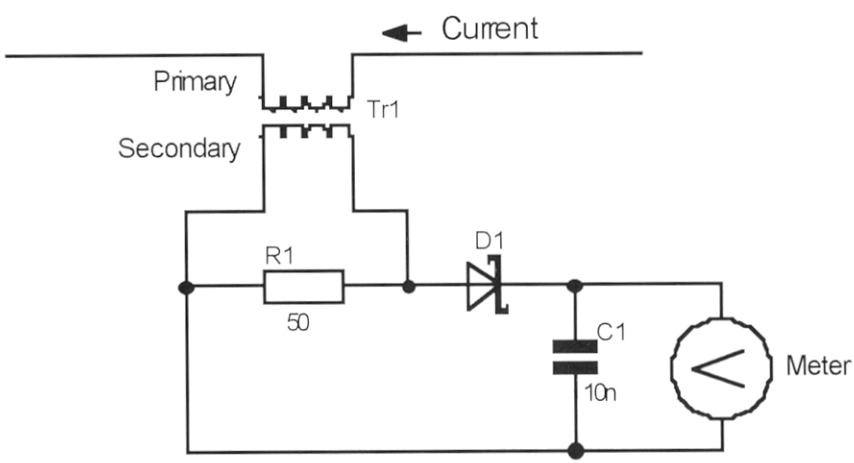


Figure 1: basic radio frequency current probe

The current to be monitored passes through the primary of the transformer where it generates a magnetic flux which couples into the secondary, causing a current to flow, developing a voltage across secondary resistor R1. This is detected by a diode peak detector (D1 in conjunction with C1). (With ideal components, C1 would hold the peak voltage forever. In practice the charge quite rapidly leaks away.).

Although the diagram appears to show equal turns on primary and secondary, in a typical rf probe, the primary is one or two turns and the secondary around ten turns on a toroidal core. The secondary resistance is kept relatively low to minimise the resistance introduced into the primary current path by the probe (see appendix).

The circuit diagram of the complete remote aerial current probe system is given in figure 2. The current probe itself, which should be recognisable from figure 1, is located at the aerial and the actual aerial current flows through the primary. Capacitor C2 is included as a dc block for cases where the aerial would provide a dc short, such as a loop or folded dipole; otherwise it is not needed. R3 provides a high impedance to radio frequency currents so that the probe is practically invisible at the operating frequency. The current probe dc output appears across the feeder.

At the shack end, we need to provide a capacitor C3 to prevent items such as tuner, SWR meter or the transmitter/transceiver itself, from shorting out the feeder at dc. Resistor R4 does the same job as R3.

With a resistance between the detector and the meter close to 100 kilohm, the voltmeter must have a very high input impedance or the measured voltage will be reduced. Fortunately, modern digital multimeters typically have an input resistance greater than 10 megohm, and it is not difficult to homebrew one's own meter circuit if desired.

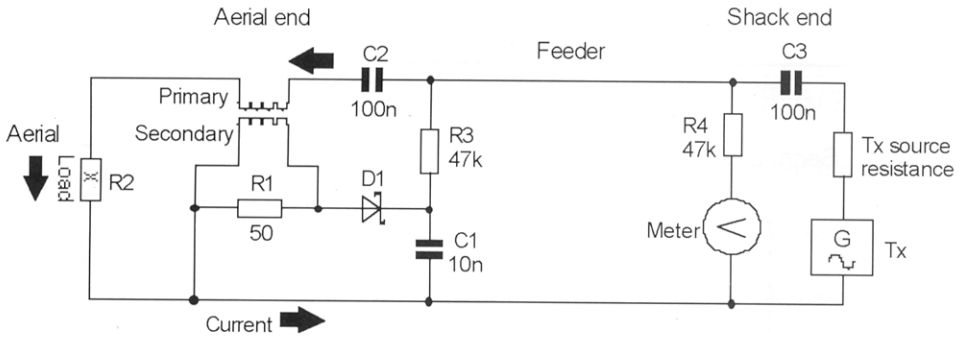


Figure 2: aerial current probe system

Note that for balanced feeders, another resistor the other side of the meter is a good idea if a meter with long leads is used, since these can act as an aerial and also unbalance the feeder.

Component selection and construction:
The toroidal core I have generally used is an FT50-43, which I obtained from Graham at G-QRP Club Sales. Since it "just worked", I haven't been through a big selection process. The secondary is ten turns of enamelled copper wire, evenly spaced, occupying about three-quarters of the circumference. Wire diameter is not critical, but about 0.5mm (26 swg) is a convenient size.

With the primary, which is the aerial wire itself, there can be a choice. For an unbalanced aerial such as a ground plane, the vertical element or cable feeding it can pass through the centre of the toroid, constituting a single primary turn. In the case of a dipole or doublet, either one leg or both is made to pass through the toroid, making one turn or two. Some may feel uncomfortable with the lack of symmetry of only using one wire of a balanced aerial, but under most circumstances I doubt this will be noticed. Figure 3 shows the balanced arrangement. It's important to feed the wires through in the right direction, or the net primary current will be theoretically zero and only the out-of-balance current will be detected (though this may interest some!). Having two primary turns halves the turns ratio and doubles the sensitivity, but increases the resistance added in series with the aerial. (For a half-wave dipole and 47 ohm secondary resistance, two ohms will be added, absorbing about 3% of the power, which is unlikely to be noticed.)

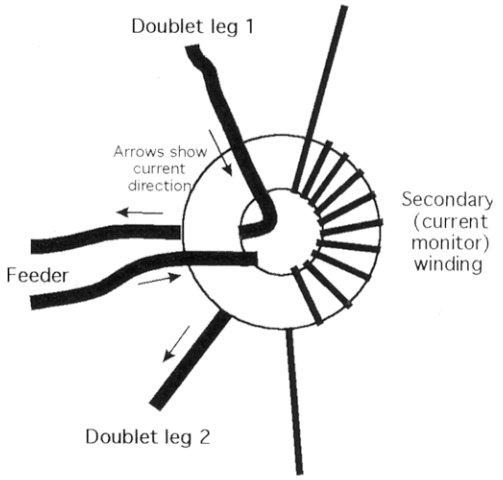


Figure 3: passing both wires of a dipole or doublet through the toroid
I've generally used OA91 germanium point-contact diodes since these have a low knee voltage and give good sensitivity. These and low capacitance Schottky diodes are much preferred to silicon junction diodes with their higher knee voltage. Choose Schottky types with care: many modern ones are brewed for power supplies and can have relatively high capacitance.

Not much else is critical: just avoid long wires and wire-wound resistors.

With a signal generator, I've found the current transformer and detector to be useful over a range spanning from topband to well beyond the 6 metre band, where my test equipment and interest run out. The output voltage varies less than plus and minus 10% over this range.

Figure 4 shows a current probe in a waterproof box at a dipole centre. (The large resistor between the dipole wires is a high value one soldered into circuit for mechanical stability only.) The balanced 2-turn primary approach illustrated in figure 3 has been used.

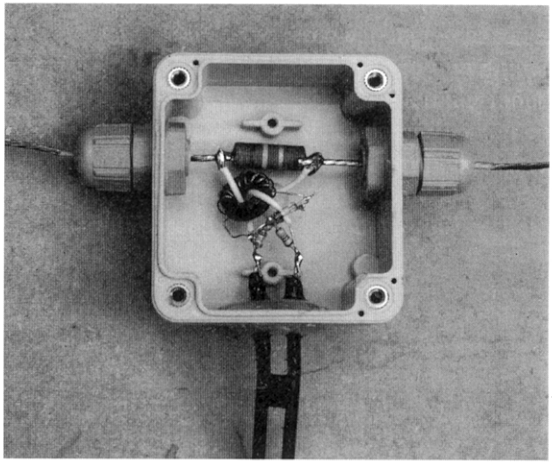


Figure 4: Dipole centre with current probe.

Figure 5 shows the coaxial voltage pickoff in use at the shack end (the pick-off resistors for balanced feeder are built into my home-brew tuner).

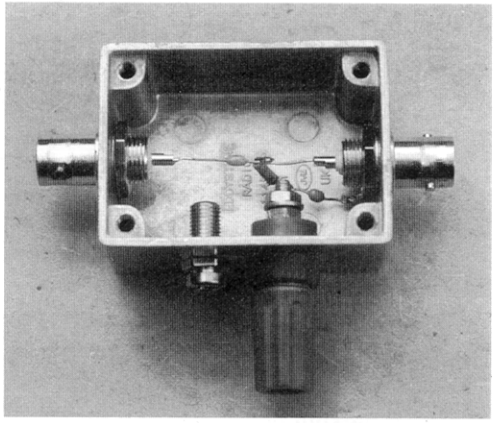


Figure 5: coaxial voltage pickoff

In use – some notes:

Operation simply amounts to reading the current probe's output voltage on a suitable high impedance meter in the shack. Adjustments of aerial length and/or tuner settings aim to obtain a peak at the selected operating frequency.

The main use of the device is likely to be for comparative measurements only, but if desired, readings can be related to powers using the equations in the appendix. The table

below is intended to provide a **rough** idea of the readings to be expected when supplying power to a resonant half-wave dipole or 73 ohm resistor.

Power W	Physical turns ratio	Detected voltage (V)
5	5	2.9
5	10	1.5
2.5	5	2.0
2.5	10	1.0
2	5	1.7
2	10	0.8
1	5	1.1
1	10	0.5

It's a good idea to record the first current measurements, particularly on a new aerial, as a basis for later comparison. Given the same transmit power and tuner settings, the current should stay much the same over time, indicating the tuner and other items in the signal path are as good as new. If not, it's time to examine the various elements of the aerial system.

Unlike the SWR meter's detector, which, with a very good match, operates at low levels where the diode detector loses sensitivity, the current probe's detector is used to tune for a peak, so sensitivity is good.

In all cases I've encountered so far, the current peak has occurred sufficiently close to the minimum SWR condition that the current probe can be used to tune the aerial system on its own, and the SWR meter is not needed (though one is often built into commercial gear).

Some may be concerned that a non-linear element like a diode near an aerial might generate distortion in the form of harmonics and inter-modulation products. There are two counters to this: first, a similar arrangement has been used for many years in some types of SWR meter. Second, I went looking for such distortion while I had use of a spectrum analyser, and could see no signal degradation at all at 10W.

I hope other more inventive souls will extend applications for the device: although I haven't tried it, it might come in handy for tuning a two-driven-element beam aerial for equal currents for best front-to-back ratio. Certainly, a current detector on an unused aerial gives a measurable output when a nearby one is driven.
As far as I know, you saw it first in Sprat!

Appendix – useful equations:
If there are N times as many turns on the secondary as on the primary, the secondary current Is = Ip / N where Ip is the primary (in this case, aerial) current.

The voltage developed across the secondary load resistor Rs, is Is * Rs = Ip * Rs / N.

Assuming these are rms quantities, the peak secondary voltage will be a factor root 2 (1.414) larger. A perfect peak detector would read this value. However, a real diode detector will produce a lower output voltage due to the diode's "knee" voltage. For a germanium point contact, or Schottky diode, this voltage will be about 0.25V.

If the aerial radiation resistance is Rrad, the power radiated is (Ip ^2) * Rrad.

Experimentally to date, I've found the best match between measured current probe output and known load powers has been obtained by taking the transformer turns ratio as N + 1 where N is the physical turns ratio. I guess this accounts for imperfect magnetic flux coupling between primary and secondary.

The transformer perturbs the circuit to a small and often negligible extent: with the secondary load resistor Rs, the transformer adds a primary resistance Rp in the path of the aerial current. Rp = Rs / (N^2)

Useful general reference on aerials:
http://www.ee.surrey.ac.uk/Personal/D.Jefferies/antennas.html
from which: "The contribution to the E field at large distances is proportional to the [amount of charge being accelerated] times [its acceleration]. This has dimensions Coulombs-metres/sec/sec, which has the same dimensions as the rate of change of the quantity (IL) for a current I in a little length L of conductor. "

~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

Correction to "Binaural effect headphone amplifier" - Sprat Autumn 2006

Ian Braithwaite G4COL

The lower ends of R5 and C5 go to ground: the symbol was clipped in the production of the magazine.

My original circuit diagram was drawn using two sections of a quad op-amp TL074 (while the built unit used the dual TL072). In the preparation of the article for Sprat, the + and - symbols on the op-amp inputs became swapped.

You could build the circuit as printed using a TL074 - the pin numbers (disregarding the + and - input labels) are correct.

Alternatively, the pin numbers for the TL072 relative to the Sprat article are:

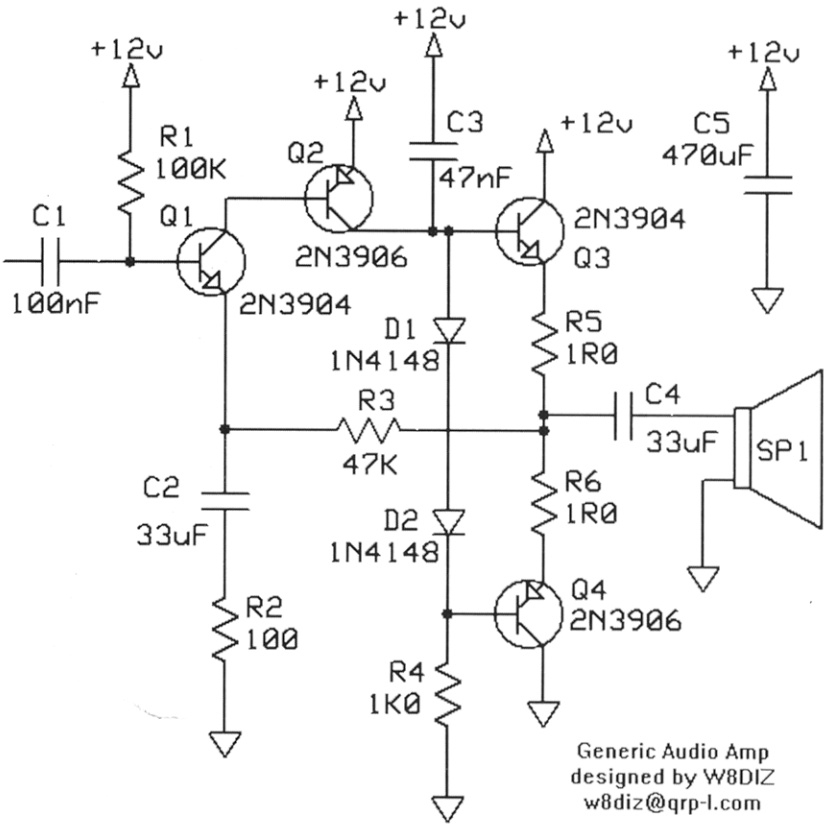
TL072	Sprat (TL074)	
1	1	U1a output
2	2	U1a - (inverting) input
3	3	U1a + (non-inverting) input
4	11	Power supply negative (grounded)
5	5	U1b + (non-inverting) input
6	6	U1b - (inverting) input
7	7	U1b output
8	4	Power supply positive (+12V)

Generic Audio Amplifier

Dieter Gentzow – W8DIZ (info@kitsandparts.com)

I know that the general trend for circuit design is SMT but I am still playing with discrete components.

For those that can't find their spectacles, here is a simple audio amp that performs somewhere between an LM380 and an LM386, IMHO. The parts in the design should be in most builders junk boxes. Circuit works well from 9 to 14 volts. If you want a little more gain, short out R2, the 100 ohm resistor. This circuit will also work down to 3 volts. Just tweak the values of R3 and R4. Speaker is a standard 8 Ohms.



If you build this toy and you make any improvements, please let me know. I may end up using this amp in a larger project later this year and any improvements are welcome.

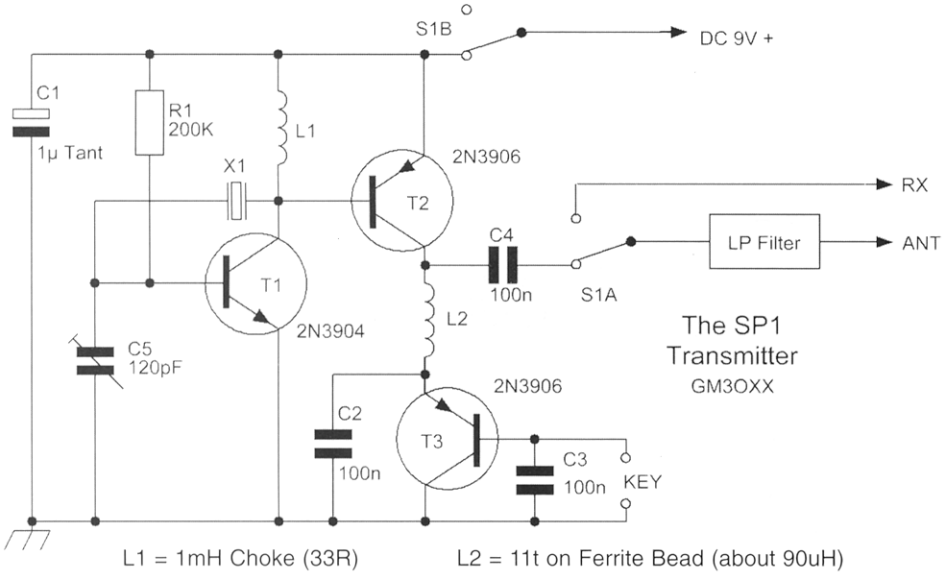
The SP-1 a simple xtal ttx,

(because the transistors cost six pence !)

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

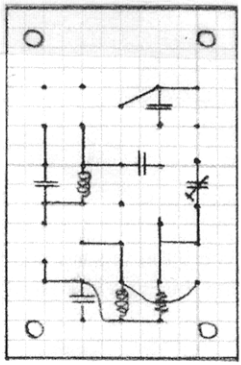
When standing in the supermarket looking at the PP9 batteries, I had the idea of building a simple xtal ttx that you could run of a dry battery power supply.....Aye sad!
The idea was to make it so simple and cheap that anyone could build it and all the parts could be found in the average junk box.

The choice of transistors was very easy as some of the most common transistors are the 2N3904 and 2N906 and having over a total of a thousand in my transistor stock, buying them from Rapid electronics who sell them at two pence each if you buy them in quantities of 500 now you know what to ask for Christmas or birthday!



The circuit is very simple and trying to find a new circuit using two transistors in a co/pa circuit is not easy (impossible) so the circuit is not new just the arrangement.

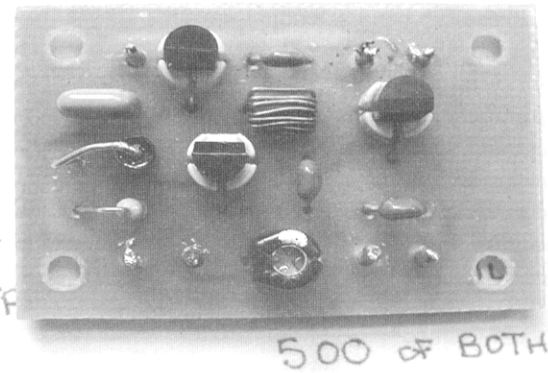
Some data sheets showed that the 2N3906 had a max IC of 200ma and the 2N3904 only had a max IC of 100ma, so the 2N3906 was used for the pa as it should stand a wee bit more abuse and had the bonus of keeping the keying transistor in the ground side. If you use a hand key you can leave out T3 and then it will only cost you 4 pence (Hi), only put T3 in the circuit to protect my keyer also you will get out a wee bit more power out as the junctions of T3 act as a series resistor.



PCB Layout

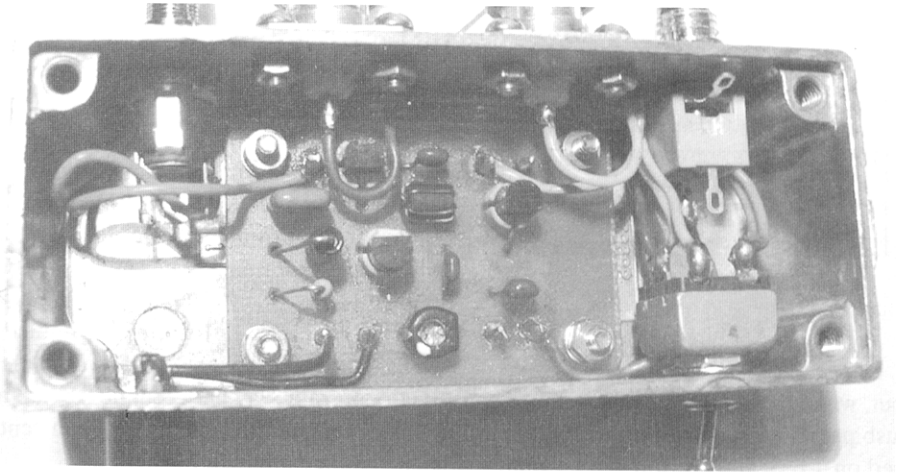
Construction is very simple and including the prototype I built four boards and all worked first time. Next bought some small tins to put the boards in but then with a wee bit of good luck found some Eddystone diecast boxes type 27969P just the perfect size for the board and plugs and sockets.

The reason for using a ferrite bed type choke for L2 is because its not easy to find small rf chokes that handle 200ma and just in case your tempted remember one of the old rules of thumb never put two rf chokes of the same value in a circuit other wise you might find out you don't need a xtal to make it oscillate.



Using a 9volt supply it gave ....on 3.5MHz 600mw, 7MHz 250mw, 10MHz 250mw, 14MHz 160mw, 18MHz 150mw, 21MHz 120mw, 24MHz 140mw, it will work all the way down to 3volt, I also did test it on 13.8volts but the wee 2N3906 got awfully hot and the power dropped of rapidly (inbuilt qsb) so stick with 9volts, if you need more power then build a bigger ttx, on 3.5MHz with 13.8volts it gave a 1watt out but fell of very rapidly - so please don't ..... mind the 2N3906 is still working.

I spent two nights using it on 3.5MHz and worked 9 stations and 3 on 10MHz great fun. So now the dark nights are coming get out the solder iron and start raking in the junk box.



A QRSS Receiver for 10.140 MHz

Dr Andrew Smith G4OEP (aj-smith@uk2.net)

The concept for this receiver is a little unusual, and developed out of discussions with Hans, G0UPL and Des, M0AYF on the QRSS reflector net (Ref 1) and on the QRSSTXRX Yahoo group. The author would like to acknowledge their contribution to the development of the ideas embodied in the design.

QRSS is a specialised mode using very slowly modulated signals, and computer assistance in extracting extremely weak signals (tens or hundreds of mW) from overwhelming noise. (Ref 2). Activity is mostly concentrated in the sub-band extending upwards 100Hz from 10,140,000Hz, with individual signals having bandwidths of 5Hz. This narrow band allows a very simple signal - frequency crystal filter to be used in the front end of the receiver, while the use of an H-mode commutative mixer assists in producing a robust receiver with excellent 3rd order intercept and wide dynamic range. Gain is provided at a.f. by op-amps having the extremely low noise of 0.9nV/√Hz. The filter characteristic is asymmetric, and when correctly adjusted provides lsb rejection of the order of 40 to 45dB. Although the receiver has much in common with direct-conversion designs, it is best considered to be a TRF system, since its selectivity is provided at the signal frequency rather than a.f.

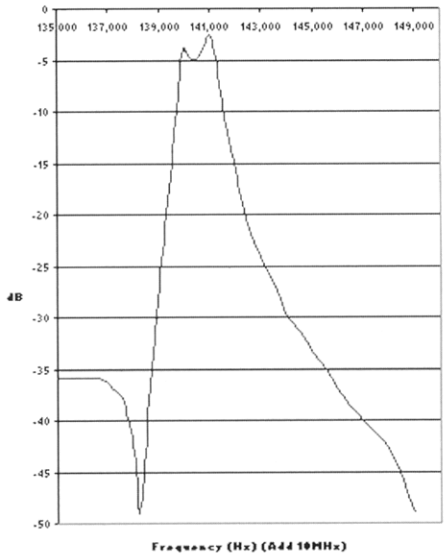


Fig 1. Filter Characteristic

The H-Mode mixer is claimed to be capable of a 3rd order intercept of the Order of 30dBm, which exceeds that of a diode ring. The present realisation is a novel modification of the classic form (Ref 3), developed for audio output rather than an i.f. output. It uses the Pericom P15C3125, operating from a 5v supply rather than the Fairchild FST3125, which can be operated from 7v. The latter device should be substituted if the best possible large-signal capability is needed. The 3125 bus switch is driven from two 10.140MHz clock sources in antiphase. To achieve accurate balance, these are derived from a 74AC74 bistable which in turn is driven from a source at double the required L.O. frequency. A push - push doubler and a 10.140MHz crystal are used. The doubler must be carefully trimmed to minimise the fundamental component in its output, while the crystal oscillator must be accurately set mid-way between the lsb null and the usb passband of the filter. Correct phasing of T2 is essential. Windings shown centre-tapped on T1, 3, and 4 are wound bifilar, while on T2 they are quadfilar.

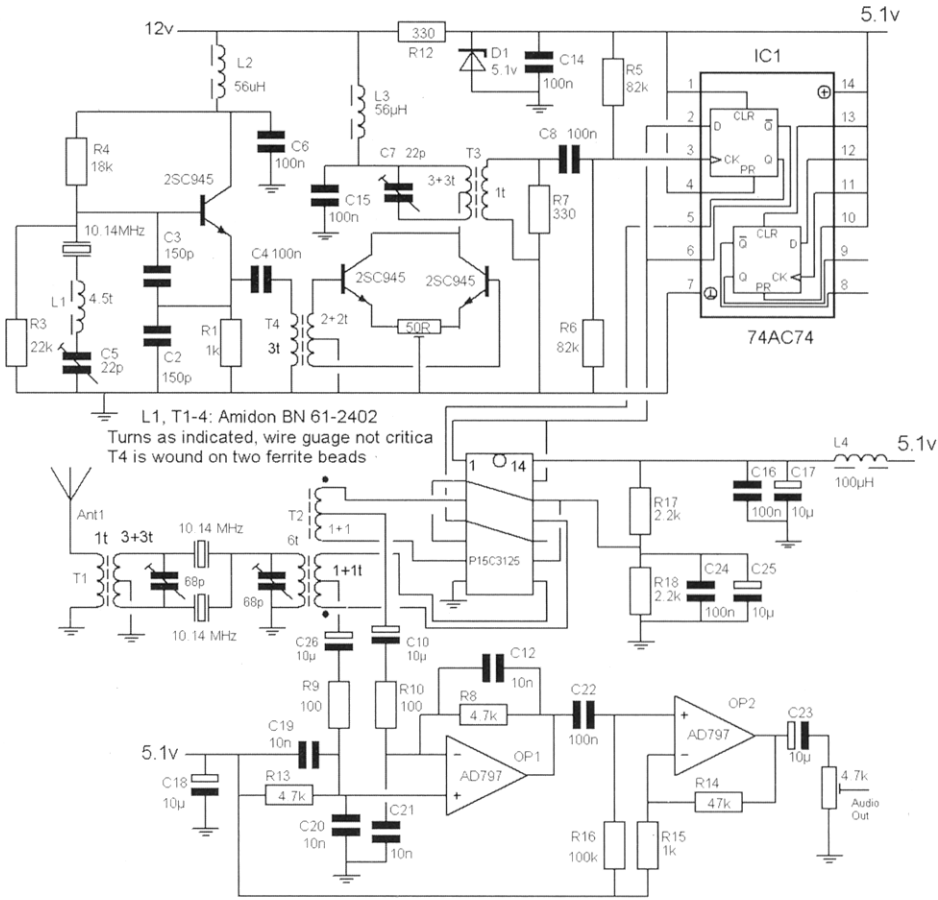


Fig 2. Circuit Diagram

During the development of this design a very large body of resource material was collected relating to commutative mixers (collected by G0UPL) and signal-frequency crystal filters (M0AYF). This material is available in the Files section of the QRSSTXRX group (Ref 4). Other relevant material can be found on the G4OEP website (Ref 5).

References.

1) http://mail.cnts.be/mailman/listinfo/knightsqrss_cnts.be
2) Extreme Weak-Signal QRSS Experiments, G0UPL, Sprat 127, pp4, ff.
3) http://www.warc.org.uk/cdg2000/the_cdg2000_transceiver.htm
4) http://tech.groups.yahoo.com/group/qrsstxrx/files/
5) http://g4oep.atspace.com/links/links.htm

Review: Palm Radio Wireless IR Keyer

Dick Arnold, AF8X, 22901 Schafer St. Clinton Twp., Mi. 48035. USA

I have the great privilege of being chosen to be a Beta tester for Palm Radio products. Their latest creation is a wireless keyer using infrared technology. This allows CW operation of your rig without an interconnecting cable between the rig and paddle. This frees up the paddle to be located up to five-meters away, wherever the operator finds it to be most comfortable.
The IR receiver and Keyer are packaged in separate boxes along with necessary connectors and cable and comprehensive user manuals for each unit.

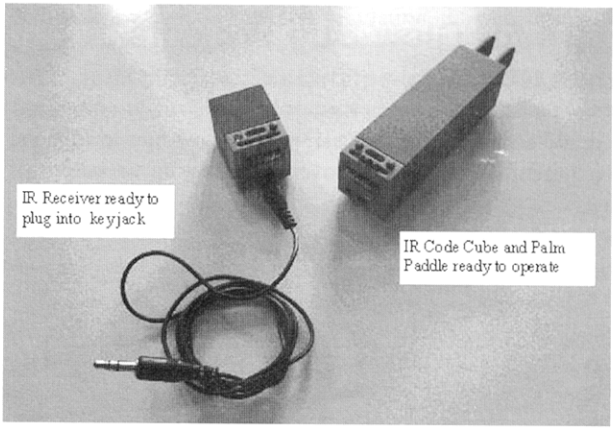
The IR Code Cube keyer was designed to be plugged into the Palm Mini Paddle^{A}. This makes a great compact package with no external connections, however a stand-alone model is available for those who prefer a different paddle. The IR Code Cube has two programmable memories so it is usable for contest exchanges as well as casual operating. The IR Code Cube is powered by an internal lithium (CR2032) battery and has no on/off switch. It is operated by the finger paddles.
The IR Receiver uses the same type battery but does have a button to power it up as well as varying the frequency or turning off the side tone and powering down the unit.

As I am familiar with both the Palm Mini Paddle and the Original Code Cube, I was able to connect the receiver to my K1 with only a cursory glance at the directions. Using a cable with stereo jacks at both ends, I connected the receiver to the key jack on the K1. The short length of cable allowed me to locate the IR receiver on top of the K1. The IR Code Cube was then plugged into my Palm Mini Paddle. I pressed the power button on the receiver once to power it up. Sitting about six feet away with the paddle/code cube in my hand. I pressed the paddle and the K1 came to life sending a string of dits. I pressed the other paddle and another string of dits! Some thing was wrong! Ah, I remembered the K1 has an internal keyer and needs to be disabled when using an external keyer. I programmed the K1 input to manual and tried again. This time the K1 operated just as if I had the paddle plugged in directly.

I moved around the room to see what the infrared limitations were. I was surprised to find that I could point the IR Code Cube in different directions and still maintain contact. I think that the infrared beam can be reflected by almost any hard surface to make the operator's position very accommodating.

I was anxious to try the IR CodeCube in sunlight as I operate portable quite often. I moved out side and set up the K1 and the IR modules in open sunlight. The engineers at Palm Radio purposely reduced the range of their IR CodeCube to prevent it from interference from stray IR radiation. It seems to work well outdoors, but I would try to keep the receiver from pointing directly at the sun.

Palm Radio also offers an IR Sensor that is intended to be built into your rig and powered from the same source.



My opinion of these devices are, like the rest of their products, well made, the design is unique, and works as advertised.

The American distributor for Palm Radio is MorseXpress. (http://www.morsex.com/) Check there for pricing.

The Palm Radio web site has much more information on the IR Technology as well as the rest of their products.

(http://www.palm-radio.de/english/english.html)

The direct link to the Palm IR system may be found at **http://www.palm-radio.de/e_irlt/eirlt.html**

Palm Radio
Infrared Link Technology

A/ The Palm Mini Paddle is a small, iambic, retractable paddle developed for portable operation. The retractable feature protects it from damage during transport. Unlike some other mini paddles, the Palm Paddle is fully adjustable and has a choice of hard or soft stops depending on your own preference.

Comment on "Beginners AM Radio" SPRAT 128 - David Long G3PTU
Using the MK484

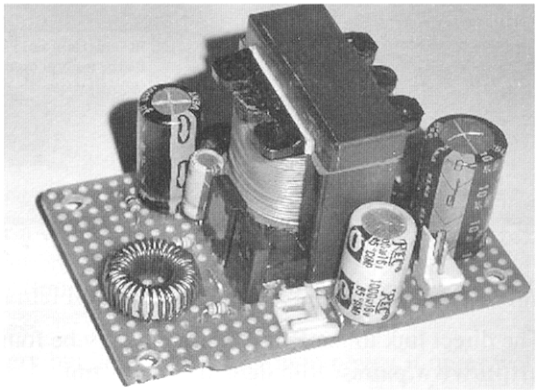
I have used these devises and instead of a series of diodes to provide the supply regulation, I used a normal red LED. Not only does it give 1.4Volts regulation but also you get a on lamp for free. [For other voltages there are always the Blue and White ones to consider]

FOR SALE: Denco Coils, about 40, £5.00 each, details SAE or call QTHR. 200ft 50 ohm Ethernet cable, ?" dia similar RG8, quality cable buyer collect £25.00. Sinclair Radionics constructor kit, with 6 tr. BC receiver, working £50. Weller TCP iron, 45 watt, with power unit, 2 bits, no.s 7 & 8, good soldering iron. £35. Peter Brent, G4LEG, 14 Stagelands, Crawley, West Sussex. RH11 7PE.

DC-DC Inverters for Glow-Bug Projects

Dr. Andrew Smith G4OEP (aj-smith@uk2.net)

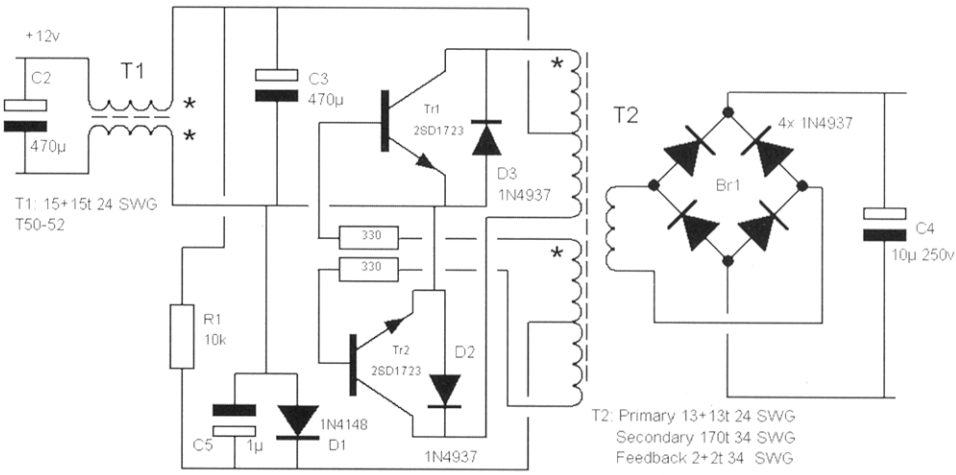
I first became interested in making dc-dc converters while designing a glow-bug headphone amplifier using EF80 valves. The requirement was for a converter delivering an output of 25mA at between 170 and 200V when powered from a 12v dc supply. Deriving the HT supply from a converter seemed a good idea since it allowed the system to run from a standard 'wall-wart' low voltage supply, and removed all possibility of 50Hz hum getting into the amplifier's output from the HT supply. It occurred to me that to develop a facility for making reliable, compact, and efficient converters of this type would be equally useful for a range of other glow-bug projects.



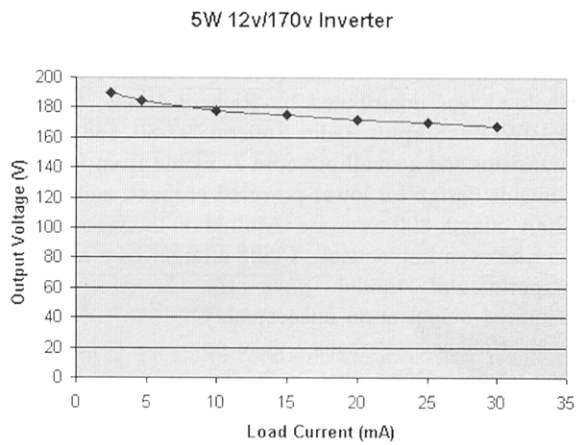
First Attempt. I had no previous experience of designing converters, but decided to concentrate on the push-pull type of self-exciting power oscillator shown in the circuit diagram below, as this seemed to be likely to be efficient, and does not rely on any trick techniques. A difficulty in applying rational design techniques to this project was that I had several likely-looking cores in the junk-box, but absolutely no technical specification for any of them. So I decided to experiment with a ferrite E-core salvaged from a dead PC monitor. This was obviously capable of handling much more power than the 5W or so required for the project, but using a large core has the advantage that a large turns/volt ratio can be used, and therefore few turns are needed for the high-voltage secondary winding. A picture of the completed converter is included. It is fairly compact, but obviously there is scope for miniaturisation by using a smaller core.

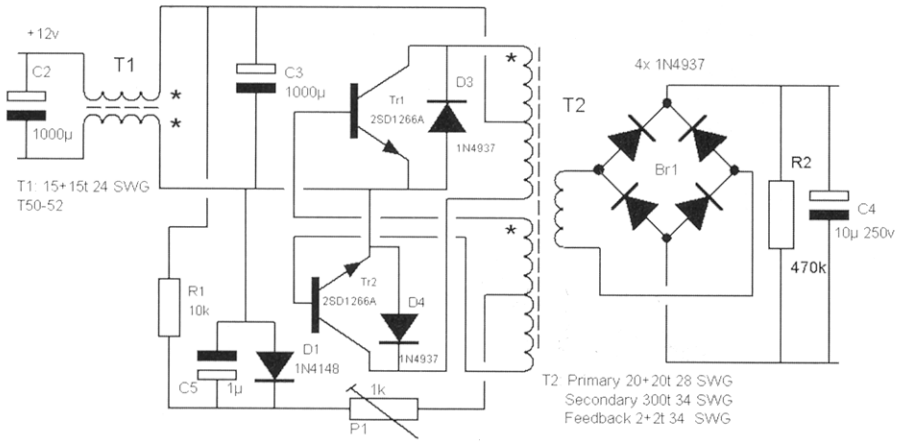
The textbooks do not include C5 or the two 330 Ohm resistors in the base circuits, but I found that including these increased the efficiency significantly. That the 330 Ohm resistors were required suggests that 2 turns on the feedback windings is excessive; 1 turn would probably suffice, but I ran out of patience, and was reluctant to dismantle the transformer again, so they remain. Diodes 2 and 3 have been added to allow the inverter to operate efficiently at low output currents, and to reduce the maximum output voltage on no-load. The system oscillates at about 25 kHz, which is well outside the range of audibility, and the residual ripple at the output is 50 kHz. T1 is wound with the two windings arranged on opposite halves of the circumference of the toroidal core, the beginnings of the windings entering the core from the same side, and progressing in opposite directions around the core. Including this component in the dc input connections assists in reducing emc problems. The 2SD1723 switching transistors were from the junk box: any small, low-power transistor with a transition frequency in the tens of MHz range or above would suffice. With an efficiency in the range of 85%, no heat sinks are required. The 1N4937 is a fast-recovery diode, but 1N4007 diodes perform almost as well as these, and could be substituted with little loss of performance.

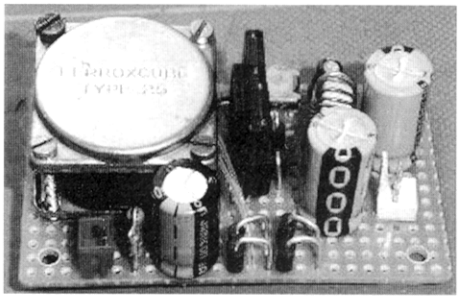
Textbooks suggest that for best regulation, the output winding should be in two halves, with the primary and feedback windings sandwiched between them. This is inconvenient during the development phase, but is probably worth rewinding the transformer in this fashion once the required number of turns for the various windings has been finalised.

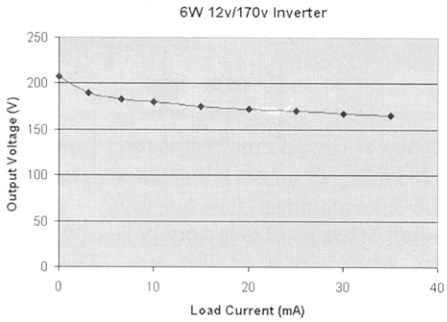


Second Attempt. I was very pleased with the result of this first attempt, and was encouraged to try again with a smaller core. The rich treasure cave of the junk box produced an old Mullard LA1 Ferroxcube core, so I started experimenting with this. The circuit which emerged is shown below. The efficiency of this converter is around 80%, depending on load conditions. A regulation curve is attached. The converter stops oscillating and shuts down gracefully if the output current reaches 38mA, so there is no chance of a burn-up if the circuit is overloaded, but I have not been brave enough to apply an impulsive short circuit on the output terminals when the system is working normally. P1 was set to zero for the full-load test, but can be increased to optimise efficiency at lower power levels. As before, the output winding is in two halves, sandwiching the primary and feedback windings. These circuits are essentially transformers, so the output voltage can be varied simply by changing the number of turns on the output winding, the power limit remaining the same.

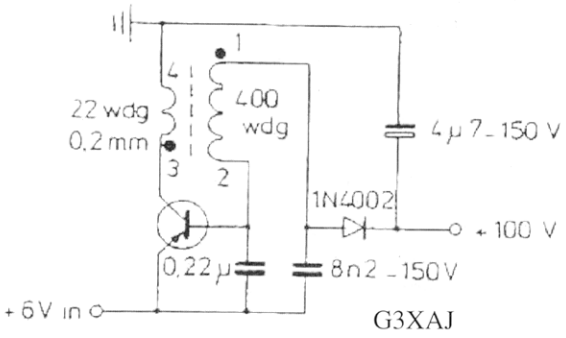








Discussions on the internet revealed a number of alternative techniques. A very promising one (below) was contributed by Richard Hinde, G3XAJ, and has a provenance ramifying via PA0WDW, Surplus Radio Bulletin '97-80, and the Philips Company. This uses a single PNP transistor and a small pot core available from RS - part No 228-220. This is probably a very suitable design for lower-powered projects, and could be developed for the 5W level. But for 200v output, 800 turns are required on the secondary winding, and this seems a little daunting, maybe even impractical. Using a larger core might be a way around this, but I found that an experimental model gave the required output at an unacceptably low efficiency. Perhaps I gave up too easily. Note that with this circuit a PNP transistor is essential for a positive output: an NPN transistor can be used if a negative output is required. Silicon types could be substituted for the AC128 Ge type specified.



Making a Toroidal KANK

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

Here are the details of making your own Toko KANK Coils using toroids. The main advantage is the higher Q and it's disadvantage is that it always require some adjustment either coil turn spacing or adjusting the number of turns a trimmer capacitor eases this problem.

So we'll use the 3 most famous ones, these are the KANK3333, KANK3334 and KANK3335 and use standard cores. The yellow core being much preferred to use in ossy's (oscillators), a tip for you ossy builders after winding is to boil them in hot water for a minute or so this anneals the copper on to the core, you can go green and lop a chucky egg in at the same time.

Kank 3333, is the one to use for 1.7 ~ 4 Mhz, Kank 3334 for 4~ 14 Mhz and Kank 3335 for 14 ~ 30 Mhz ranges approximately.

T50-2 Red Core	Pri turns	Sec turns
Kank 3333 (45uH)	96	7
Kank 3334 (5.5uH)	34	6
Kank 3335 (1.2uH)	16	4

T68-2 Red Core Core

Kank 3333 (45uH)	89	6
Kank 3334 (5.5uH)	31	5
Kank 3335 (1.2uH)	15	4

T50-6 Yellow Core	Pri turns	Sec turns
Kank 3333 (45uH)	106	8
Kank 3334 (5.5uH)	37	6
Kank 3335 (1.2uH)	17	4

T68-6 Yellow Core

Kank 3333 (45uH)	98	7
Kank 3334 (5.5uH)	34	6
Kank 3335 (1.2uH)	16	4

The primary winding should be evenly wound over the entire core wile the secondary is close wound over the earthy end of the primary, alternatively taps can be used instead, a small trimmer capacitor can then be used across the main winding or the windings can be 'trimmed' by adjusting the winding spacing.

The secondary windings have been calculated from the primary to secondary turns ratio given in the KANK coil data. For the secondary winding I would be tempted to use 5 turns for range 1, 4 turns for range 2, and finally 3 turns for the highest range 3 coil on all the cores

Renewing your G-QRP Subscription

Tony Fishpool G4WIF – Membership Secretary

Last January I literally opened thousands of envelopes. You will recall that I previously asked members not to staple cheques to other papers and many respected my plea. You can imagine how painful removing all those staples could eventually be. So for those that may have missed last years notice - **please no staples**! Please also quote your club number as well as your name and callsign in all correspondence - it really does help. All payments should be to "GQRP club" and not in the name of any club officer.

There is a standing order form in this issue of SPRAT. As well as ensuring the continuity of receiving SPRAT you also help reduce the thousands of letters which I will otherwise have open in the new year. My postman would probably thank you too!
Of course, the standing order **must** quote your **membership number** or we won't know who has paid. I will be writing to members who last year had unclear standing order mandates which necessitated a lot of detective work to discover who you are. If you don't see an update on the Sprat Label next year showing that we have received payment then that may be why your Sprat stops arriving.

It has been a good while since we had to raise subscription to £6 for UK members and yet some standing order payers have still not increased the mandate to their banks. So from this year, if that applies to you, the club regrets that we will return your payment and your membership will not be renewed.

Members paying by cheque or credit card can of course pay for more than one year if you wish. We **can not accept Switch or Maestro or any debit cards** due to high bank charges. Please write your callsign and membership number on the back of the cheque. You can also pay at any time of the year. You don't have to wait until the spring but please don't pay late.

Finally, I would like to express the club's grateful thanks to everyone who helped (and continues to help) sponsor club members in other countries who either have no access to hard currencies or cannot afford to pay their subscription to the G-QRP Club.

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Peak Atlas LCR Passive Component Analyser

A Brief Overview by
Gerald Stancey G3MCK, 22 Peterborough Ave. Oakham. LE15 6EB

This is a nifty piece of equipment that will tell you the value of a resistor, capacitance of an inductor over a wide range of values. You don't even need to know what the component is as long as it has two leads! Just put the on it and hey presto it gives the answer.

The stated accuracies and ranges are:

Inductance	Range	1uH to 10uH
	Resolution	min. 0.4. typical 0.8
	Accuracy	± 1%, ± 0.8uH
Capacitance	Range	0.4pF to 10mF
	Resolution	min. 0.1pF. typical 0.3pF
	Accuracy	± 1%, ± 0.3pF
Resistance	Range	1R to 2M
	Resolution	min 0.3R. typical 0.6R
	Accuracy	± 1%, ± 0.6R

Note you cannot accurately measure small inductors, for this you will need a device like the Miser's Microhenry meter

I think this is a superb piece of equipment and has already earned its keep in my shack.
See: http://www.peakelec.co.uk/acatalog/jz_lcr40.html
Peak Electronic Design Ltd. Atlas House, Harpur Hill Business Park, Buxton, Derbyshire
SK17 9JL. +44 (0)1298 70012

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FOR SALE: Trio Amateur Band Receiver JR 500 s in good condition with speaker £40 or near offer - also
WANTED: Class D Wavemeter, complete or incompete. Wanted for Case, Dial and tuning capacitor/coil pack. WHY. G4GDR, QTHR or 01793 762970

WANTED: 10m to 4m transverter, homebrew or commercial, Yaesu 7M-24A Spkr – Mic for Yaesu FT708R, Working or scrap old CB rigs. G1SFS. 01858 – 469535.

WANTED: G QRP Club Antenna Handbook – state condition. Christian Minamont F4EAI, 9 rue de la Folie, 37270 Montlouis sur L. France

WANTED: Maplin Magazine December 1988 and June 1989. Also: 300pF variable condenser (± 50pF) with incorporate slow motion drive. John D Noble, 35 The Queen Mother Court, Borstal Road, Rochester. ME1 3JF.

"All Tubes" 80m CW QRP

Greg Knobel, HB9FAE, 3 via Cugnoli, CH-6572 Quartino, SWITZERLAND

Tubes are still very attractive, or maybe even more in the recent years. I use to put every old junk in the garage, and one day I had to decide to use it or to throw it away.

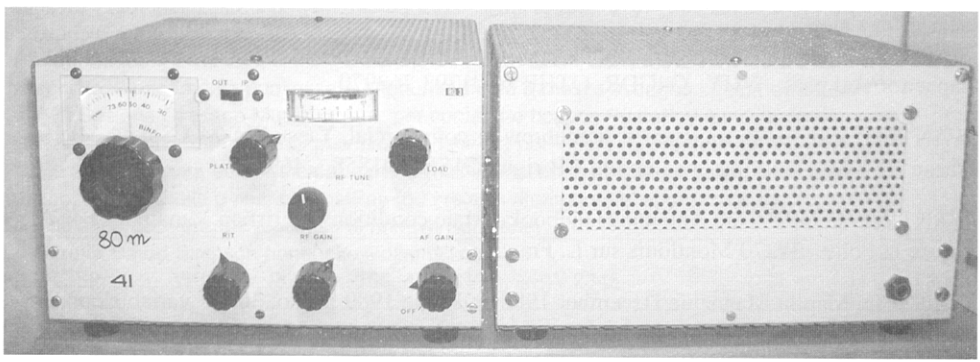
So, I began the construction of this TRX. It is based on the "Norwich TX" in Sprat nr.88, and on the "Multi-band valve 10w QSK TRX" in Sprat nr.74. It is not really "all tubes" since I did the Sidetone, QSK and audio filter solid state.

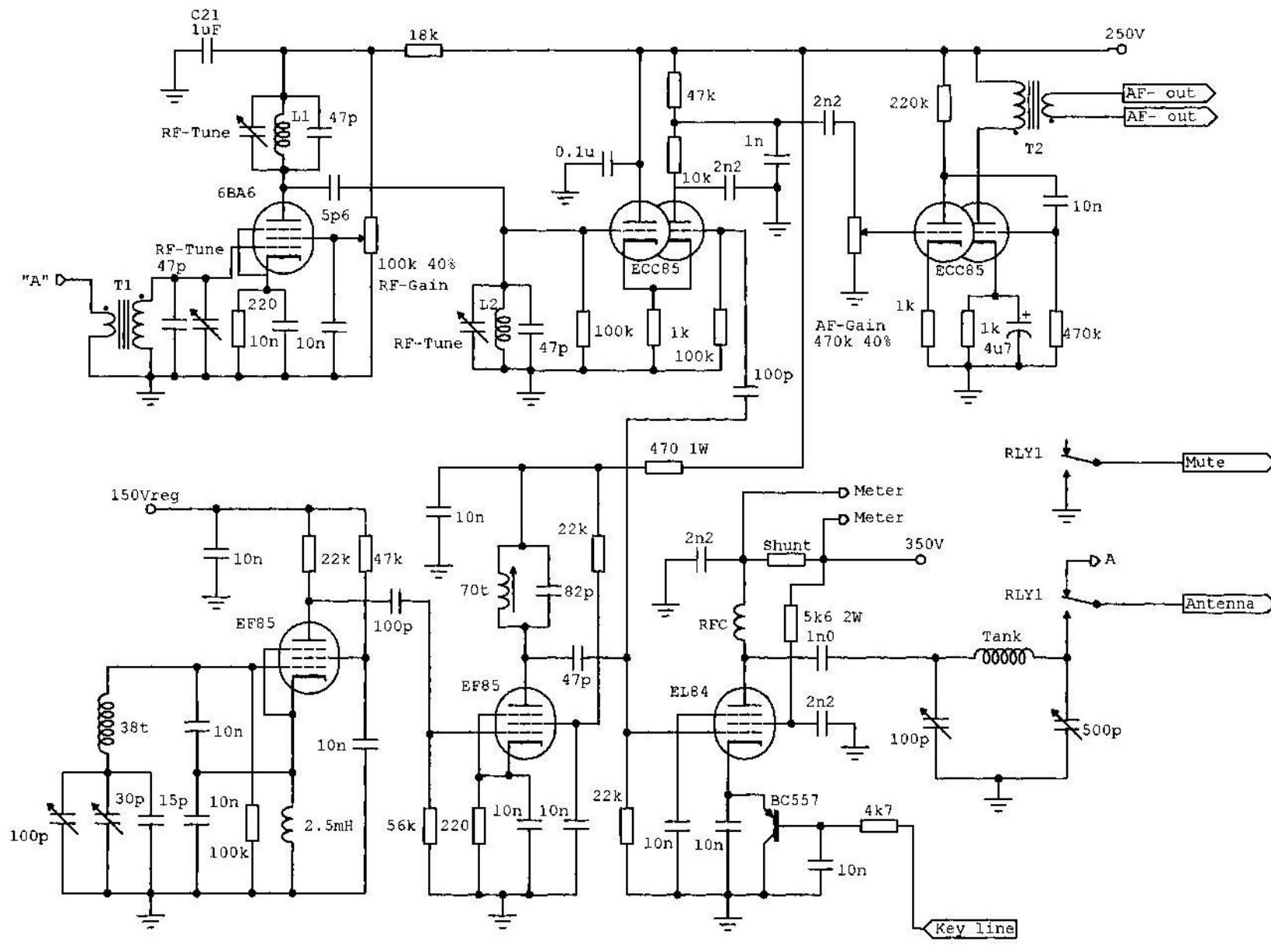
There is a lot of room for experiment, with different tubes, front-end filters and so on. A better mixer could be very useful. My first try was a multi-band with tuned multiplier, but I failed. The box is homemade: blades are cut by handsaw, and bended by hand following the Sprat instructions, sorry I do not remember which one. Colour spray, press-on letters and numbers, covered with clear lack spray do the make-up. One difficult point (for me!) has been the VFO: I do prefer transistors for that. But since it works at 1750 kHz, to be doubled at 3500 kHz, it is stable enough for usual traffic.

The P.S.U is boxed with the speaker. It gives 350V for P.A., 250V, 6.3V for the filaments and 12V D.C. for the solid state.

In the very nice article, Bruce G3WCE gives all the information for the TX, and Igor UZ3ZK describes the RX. One mistake: the "second RX output" is useless, because of the frequency of the VFO: I noticed that as soon as I tried out!

The output power is 5W, and here also you can try other tubes and plate voltage.
I am very happy with this simple rig: my best DX is W1KM using the half sloper antenna at my QTH. I have more digital pics of it, ask me for: hb9fae-qrp@bluewin.ch
And since "real radios glows at night!" the next one will be another tube-rig.




C21
1uF
18k
250V
RF-Tune
L1
47p
6BA6
5p6
RF-Tune
47p
"A"
T1
220
10n
10n
100k 40%
RF-Gain
0.1u
47k
10k
2n2
1n
ECC85
L2
RF-Tune
47p
100k
1k
100k
100p
2n2
220k
AF-Gain
470k 40%
T2
AF- out
AF- out
10n
ECC85
1k
1k
4u7
470k
470 1W
RLY1
Mute
150Vreg
10n
22k
47k
EF85
100p
10n
22k
70t
82p
47p
EF85
Meter
Meter
2n2
Shunt
350V
RFC
5k6 2W
1n0
Tank
EL84
2n2
A
RLY1
Antenna
38t
10n
30p
15p
10n
100p
100k
2.5mH
10n
56k
220
10n
10n
22k
10n
10n
BC557
4k7
10n
100p
500p
Key line

Building a Replica Paraset

Simon Dabbs, G4GFN, 9 Windover Close, Southampton. SO19 5JS

Until now, my involvement in vintage radio had been restricted to restoring and operating old equipment. But one winter's day I was on the Internet, browsing some of the links from the VMARS website. I ended up on an Italian website dedicated to the manufacture of replicas of the Paraset or Whaddon Mk. VII, and this is where my story begins.

Getting hooked

After a few minutes of exploring this and other websites, my interest grew rapidly. I'd heard a bit about the Paraset; how during WW2 they were dropped to SOE ("Special Operations Executive") agents behind enemy lines, particularly in occupied France and Norway. I'd read nerve-racking accounts of SOE wireless operators sending enciphered traffic back to London, constantly in fear of being detected and captured by the Gestapo, with the direst of consequences. I soon began to realize that it would not be difficult to build this transmitter/receiver. The transmitter is a crystal-controlled, self-oscillating 6V6 beam tetrode. It is cathode keyed and covers 3.3 to 7.5MHz in two bands. The receiver is a "0-v-1", i.e. no RF stage, a regenerative 6SK7 detector, followed by another 6SK7 as audio stage. It covers 3.3 to 7.5MHz, in a single band.

Mechanically, the only remotely complicated part was the slow-motion drive for the receiver tuning, and it seemed like a remarkably small number of components for a set capable of sending/receiving traffic over thousands of miles. It is said that there are precious few of these original sets in captivity, which is a pretty valid reason for having a go at building a replica. "This is for me", I thought. I was hooked!

Getting it right

The Internet provided me with virtually all the information on components, circuit diagrams and mechanical drawings of the panel and case. However, it soon became apparent to me that there were various versions of the circuit out there. Some of this is probably due to differences between various production versions of the set, but worryingly, there are circuits in circulation that are clearly are erroneous. This also goes for the physical component/wiring layout diagrams for the underside of the panel.

For the receiver, I followed the circuit diagram given in Wireless for the Warrior volume 4 (reference 1), without problems. The circuit for the self-oscillating 6V6 power tetrode caused some "fun and games" for me. The diagram that appears in the above seems to rely on its positive feedback (to achieve oscillation) solely by means of a "gimmick" capacitor between anode and grid. I could not get it to oscillate. I was then told by fellow VMARS member, Peter Mellett, G3PIJ that in the version of the circuit found in reference 4, is much closer to a conventional Colpitts oscillator, by addition of a couple of capacitors in the grid circuit. Peter also kindly advised me of some more appropriate values for these capacitors than those given, the improved values being 220pF (silver mica) instead of the 0.002uF, and 10pF (S/M) instead of 100pF. I eventually got it to work extremely well.

As for the wiring diagrams for the underside of the panel, I ignored the published drawings, and just followed the schematics and wired up as I felt was most convenient (see "How original do you want

it?"). In fact, in reference 3, many errors in the wiring diagram are identified by the author himself, and equally confusing corrections are given.

Getting the bits

Most of the components are pretty "bog standard" and with luck, should be available from your/your best mate's junk box. Particularly if using older resistors and capacitors, it's a good idea to test them first with a suitable meter. The coils have to be wound, but they are straight forward, and excellent drawings are given at reference 2. For the transmitter, I used a piece of 32mm white plastic waste-pipe as a former, and a piece of 25mm polythene rod for the receiver coil.

The audio output stage calls for a 36-Henry choke about the size of a 1-inch cube. No mean feat, you'd think, but I used the primary of a miniature mains transformer (about 5 to 10 VA), ignoring the secondaries. It worked well; I didn't bother to measure what the actual inductance was! You'll need a pair of high-impedance headphones (e.g. DLR)

Don't worry if you don't have any vintage 10X crystals of the right frequency for the transmitter. I acquired a few random ones from a rally, removed the innards, and soldered a modern crystal inside each, ordered to the required C.W. frequencies.

The only demanding piece of mechanical engineering is the slow-motion drive to the tuning capacitor. You will need to find a knob-cum-engraved metal disc of the right diameter. The drive consists of a bare capstan and knob. I used an ordinary rubber grommet to provide the drive between the two. Of course, the centres of the two shafts need to be exactly the right distance apart, to achieve the correct friction. I experimented first, using a scrap piece of aluminium sheet until I got it right, and then carefully transposed the measurement onto the final panel.

Don't forget that the variable capacitor used to tune the tank circuit needs to be insulated from earth. I used some pieces of Paxolin sheet to achieve this. Remember too, that the shaft will be live with 350V, so make sure you choose a well-recessed grub screw to secure the knob!

Getting fussy -How original do you want it?

Before you really get going, you need to ask yourself that question. If you want something as near to the "real McCoy" as is humanly possible, there are some challenges to overcome.

Whaddon Mk.VII's were built into metal boxes (which apparently, were originally manufactured as cash boxes). The hinged lid is fairly deep, to house the valves and to clear the controls when closed for transporting. So to manufacture one, you would need to have access to sheet-metal cutting and folding equipment, and matching expertise to use it. Like many constructors, I took the easy way out and fitted the panel into a suitable, hinged wooden case I was fortunate to find in my loft. Other constructors have successfully made their own wooden cases.

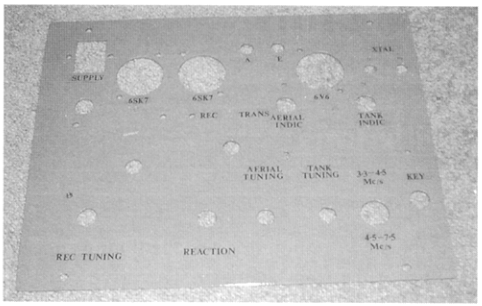
The original sets had a miniature morse key built-in under the panel, with only the knob protruding. You would need to manufacture one or be extremely lucky to acquire a suitable key. I was fortunate in that the lovely hardwood case (from an old laboratory conductivity meter) I used had a separate, oblong compartment, in which I mounted a 1940's 8-amp Army key. Another alternative is to simply mount a jack socket in place of the miniature key, and use a completely external key.

I have used mostly genuine 1940's components above the panel. Purists may want to use genuine 1940's components under the panel as well (and to use the exact component layout), but for the time

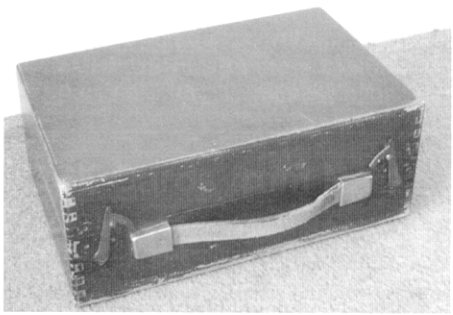
being, I have used any electrically suitable component. A compromise would be to place modern components inside hollowed-out vintage parts.

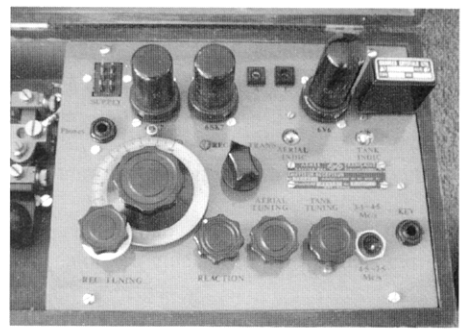
Getting going

Once you've made your plans, wound the coils, collected together the components and obtained/made your case, the next step is to make the panel. First, I cut some 2.5mm aluminium sheet to fit the case. I then printed the panel drawing from the Internet and used a photocopier to scale it to actual size. I then taped it over the aluminium sheet and used a punch through the paper to mark all the centres of the holes. These were then carefully drilled out using a pillar drill. Having de-burred and degreased it, I primed the upper surface with special-metals primer and gave it two coats of grey cellulose spray paint. I then used black Letraset to make all the labels, and then applied two coats of polyurethane varnish.



The next step was to mount all the bolt-on components, placing a solder tag under every nut, as it is surprising how many earth-points are needed. Then the panel can be wired-up underneath, making sure that no component fouls the case when the panel is eventually fitted onto it. I wired and tested the receiver first, before moving on to the transmitter. I used my bench power supply to power the set during the testing phase, before building a stand-alone PSU. The receiver, to my surprise, worked first time. The transmitter was a bit tricky to get to oscillate at first, as I had to experiment a bit with the capacitors in the grid circuit (see "Getting it right", above).





Getting it on the air

My PSU consists of a mains transformer with a 6.3V filament winding (the three valves take 1.05 amps in total) and a 300-0-300 HT winding. Bi-phase rectification by a pair of 1N4007 diodes provides about 320VDC at 40mA (the transmitter load), via an LC pi smoothing circuit with 32uF for each capacitor and a 10H choke. One area where I deliberately deviated from the official circuit was that I placed the dropper resistor for the receiver inside the PSU box instead of inside the set, as I didn't like the idea of having lots of heat generated there. This was easy for me as I had a six-way PSU plug and socket for the set (it would work with 4-way), and the HT section of the rx-tx switch I used was double-pole double-throw. If you do likewise, do not be tempted to have more than a few uF of smoothing downstream of the dropper resistor, or the receive HT will take too long to settle, after switching back to receive. At a later date, I plan to build a PSU that will run from 12VDC, to enable portable operation.

Another mod I did was as a result of having difficulty with getting the aerial indicator lamp to light on the transmitter. I decided it would be more meaningful to simply have a lamp in series with the aerial output itself, as a true indicator of aerial current. I used a 6V, 0.3A bulb, shunted by a 12-ohm resistor. I calculate that this will introduce a loss of less than 2dB into a 50-ohm load (and at home I will be using it with an ATU anyway).

The receiver is, frankly, incredible. The reaction control is very smooth and sensitivity and selectivity remarkably good on 80 metres. SSB is resolved well, too. I find that if an SSB signal is too strong to be resolved, increasing the reaction allows it to be copied. With the reaction reduced to just below the point of oscillation, I have copied many VMARS members on AM. My receiver struggles a bit on 40m (not my favourite band anyway), but is still usable, certainly in the daytime, before the big broadcast stations get too strong, nearby.
My transmitter delivers about 8W on 80m and about 6W on 40m

The first QSO took place on the afternoon of May 7th 2006, when I worked G0JXX, about 50 miles away in Worthing under quite poor conditions. Using a 10X crystal in my Paraset on 3510kHz, Mike gave me a 559 RST report with no chirp. The transmitter also appears to be free from key clicks. I have since acquired HC45u crystals for 3560, 3577, 3580 and 3582kHz, and have installed each in a 10X holder. These tend to be slightly chirpy compared with the proper 10X crystal. I suspect that the fairly high grid current is heating up the quartz on each dot and dash. That's why I'm careful not to keep the key down for more than about a second at a time when tuning up, lest the crystal should overheat and shatter.

The Paraset Club

Unbeknown to me, several other amateurs have been building Parasets, and a group of enthusiasts is emerging. Rev. Adrian Heath, G4GDR has set up an embryo Paraset Club. At the time of writing, there are 11 members (9 British stations and 2 Norwegian), 8 of whom have working Parasets. Adrian can be contacted at: 227 Windrush, Highworth. Swindon. SN6 7EB.

References

Wireless for the Warrior Vol. 4, L. Meulstree (Wimbourne Publishing 01202 873872)
www.qsl.net/ik0moz/parasecond.html (Drawings, photographs of replicas, PSU data)
www.qsl.net/ik0moz/paraset_eng.htm (Stories and photos of replicas made)
www.mines.uidaho.edu/~glowbugs/paraset.htm (Photo of an original suitcase Paraset, circuit diagrams)

ANTENNAS - ANECDOTES - AWARDS

Gus Taylor G8PG 37 Pickerill Road, Greasby, Merseyside, CH49 3ND

The ZS6BKW Multiband HF Antenna Revisited

Martyn Vincent, G3UKV,9 Sleapford Long Lane, Telford. TF66HQ

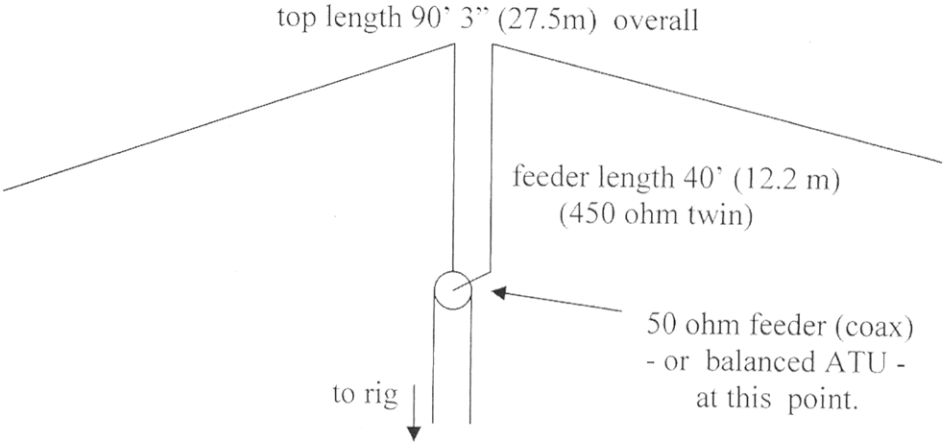
This is the antenna for you guys who want to get on HF effectively, and haven't too much space or cash to throw around. Actually, it's a design from ZS6BKW (aka GOGSF), similar to the G5RV, but it actually resonates on five bands, (well 6, actually) and doesn't rely on a tuner (ATU) to make it work. The design appeared in TT (RadCom) Jan and Feb 1993, but is also in Pat Hawker's "Antenna Topics" (publ. RSGB 2002) It's only 90 ft long (27.51 metres), with a 40 ft (12.2 m) downlead.

So, it's a cousin to the G5RV (which only resonates on 14 & 24 MHz), but better as it needs no ATU on 40, 20, 17, 12, 10 and 6 metres. When Telford DARS were doing the 50MHz Trophy contest down at Bridgnorth, I took the necessary bits along to tryout this antenna. For simplicity, I set it up as an inverted-vee configuration. The reason was simple - you only need one support to hold it up, not two. I also had the club's MFJ Antenna Analyser with me so that I could see what was happening. I recorded the data - see below.

Incidentally, all centre fed antennas can be supported by just one mast, with the ends left to droop down. The 'rule of thumb' is that the angle at the apex should never be less than 90 deg, otherwise cancellation between the two halves occurs. Furthermore, as it is the current peaks along an antenna that do most of the radiation, having the centre at the highest point is a positive advantage, rather than supported at each end with a big droop at the centre (current point nearest to ground). This is another reason for not being too fussy about the ends of a centre-fed antenna being lower, or bent around. It will have minimal effect on radiation efficiency. The only thing is never have the ends dropping right down to ground level - because the ground will seriously de-tune the antenna and it will not work - believe me, I've tried it. Just a yard or so off the deck makes all the difference. Simply have end insulators (or plastic strips etc), then wire or twine to the tying-off points. This effectively raises the ends of the antenna sufficiently clear of the ground. So, the 'BKW can be horizontal (two supports) or inverted-vee layout (single support), as shown. Incidentally, the same applies to a simple dipole.

The antenna wire can be solid copper, stranded, insulated or not. A lot of rubbish is printed about the merits or otherwise of different sorts of wire.
It's largely hogwash. Wire is wire at these frequencies. Wet string?. ..well that's a different matter ....
In the original design, 300 ohm twin was used, but I prefer the 450 ohm stuff. It's much stronger and losses, especially in wet weather, are lower when impedances are high down the line. Back in 1985, 450 twin wasn't readily available, there was only 75 and 300 twin, or the option of making your own open-wire feeders (which actually are the best of all- around 600 ohm, but these do tend to twist or get caught in trees etc! Yes - bitter experience and soldered joints here too!)

horizontal or *inverted-vee* *layout*



Finally, if you want to use it on other HF bands (3.5, 10,21 MHz), an ATU (just like at the bottom of your '5R V !) will do the business, but preferably at the bottom of the 450 ohm feeder with a balanced output, not after a length of 50 ohm coax, if you've had to use it to reach your rig. Of course for 1.8 MHz (160m), you could short out the feeder twin, and feed it like a Marconi antenna, with a suitable ATU. Not very clever, however.

Here are the MFJ figures I recorded on the test antenna:-

Best in-band freq:	SWR	"R" at feedpoint	Notes
3.38 MHz (80m)	7:1	20	tunes easily with A TU
7.00 MHz (40 m)	1:1	40	puurrfect
10.1 MHz (30 m)	high	high	needs atu
14.06 MHz (20 m)	1:1	40	wonderful
7.85MHz(17 m)	1:1	50	below 1.3:1 in 18MHz band
21.00 MHz (15m)	high	high	needs atu
24.69 MHz (12 m)	2:1	100	OK, even without an *ATU*
28.62 MHz (10 m)	1.3:1	60	No sweat!
50.27 MHz (6 m)	1.3:1	60	A surprise: 6m. too!

Just to show the "proof in the pudding", I used it on 7 and 14 MHz, and got excellent reports, as one would expect with a half-decent antenna! Didn't have time to use it on all bands, but I leave that to you - to tell everyone how good it is.

Note from G8PG – G0GSF (ex-ZS6BKW) only lives 2 miles from my home QTH.

AWARD NEWS

Worked G QRP Club 140 Members G3ZNR. Well done OM.

Very best New Year wishes to all AAA readers from Gus, G8PG.

A (small) Collins Filter Windfall

Graham Firth G3MFJ (Club Sales Officer)

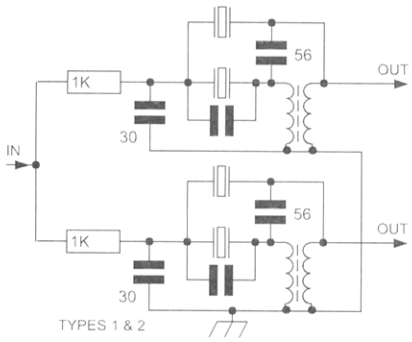
We have had a small windfall of crystal filters (actually, they were found in George's cellar!). There are not very many and instructions on how to obtain one or more are below.

There are three types – all around 5MHz, all are shown as 1.1kHz bandwidth and all of them are the same size - 24 by 19mm board area by 19mm high. They are mounted by 2 screws, probably some American size as they are not BA or metric.

Two are identical except for being marked with slightly different frequencies – 4.998074MHz and 5.003023MHz. The box label shows them as 4 pole, but see the diagram below. The filters themselves are marked with this frequency plus a second frequency of 4.996977MHz and 5.001926MHz – probably at a greater attenuation.

The third type has a frequency of 5.000830MHz and is 4 pole – again see the diagram.

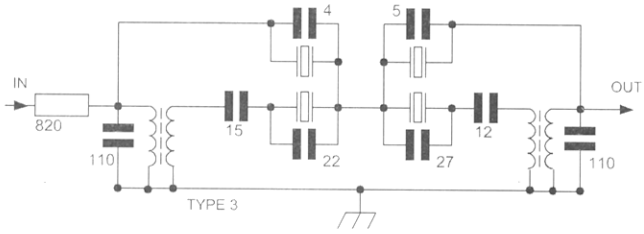
When I opened the boxes of these, a couple of them had a broken pin, so I took the opportunity to remove the outer cover and see how they were wired. Where I could read the capacitor values, they are shown on the diagram. Unmarked ones are small – I guess a few pF. All the windings on the toroids measured as 5.6µH on my Atlas – I don't see any reason to disbelieve this. I could not see any markings on the crystals. The internal wiring is as follows:



Type 1 – Collins 8161411-7-62
4.998074 – P2, 4.996977 – P1
Type 2 – Collins 8161411-7-63
5.003023 – P6, 5.001926 – P5

Type 3 – Collins 8161411 – P4
5.000830 – P4
1.1 kHz

As can be seen, types 1& 2 have one input and two outputs. Each half is a 2 pole filter. Type 3 is a 4 pole. I have not done any measurements except to prove that they are on 5MHz – and that they have a narrow bandwidth.



If you want any, they are available from club sales – address as on the back page. I have a limited quantity of each type, if you can reserve what you want with an email, then please do so. If you have to order by post, then please send a separate cheque for these, then I can return it of I have run out. I will keep a few aside for postal orders, it would be a bit unfair to sell them all to those who have email.

They are £5 each plus £1 postage for any quantity – please order what you want, not to fill your component stocks – I reserve the right to ration until I see what the demand is.

COMMUNICATIONS AND CONTESTS

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

Firstly, please may I draw your attention to my new address (as above), which should be used for all future correspondence. You may remember that there was no garden at the previous house in Bickley and I could only erect an indoor doublet squashed into the roof space. I was amazed how well the antenna performed on some bands, but it certainly demonstrated to me just how lucky I had been when living in Buckinghamshire, where I had a 2 ele Tri-Bander and inverted vee doublet at 40ft.

You'll not be surprised to hear that space for antennas was high on the priority list when choosing this new QTH, and I soon put up a 180ft inverted vee doublet supported in one of the trees. It is such a pleasure to be back on the bands with a reasonably efficient antenna, but my experience of living with an indoor antenna serves as a sharp reminder that many operators have to contend with less than ideal antenna facilities, and yet derive plenty of success and enjoyment from the hobby.

I have missed out over the last 2 or 3 years, but hope to be more active during **Winter Sports** this year, and see how well the new antenna performs. The event (possibly in full swing as you read this) is non-competitive, and gives every opportunity for all to join the fun and make plenty of QRP/QRP contacts, no matter how big or small their antenna installation. The only important consideration is that you enjoy the relaxed nature of the event by working as many QRP friends as you can, and (hopefully) then send me a copy of your log. I will try and include as many as possible of your 'highlights' in SPRAT.

CZEBRIS 2007

If you prefer a competitive edge to your QRPing, then this event is for you. The scoring system is shown below but, in common with all QRP events, you will find this a relaxed and enjoyable weekend of operating.

1600z Friday 23rd February to 2359z Sunday 25th February, around the usual QRP cw frequencies: 3560, 7030, 14060, 21060, 28060kHz, +VHF/UHF if conditions permit.

Your Location	**QSO With Station In**			
	UK	OK/OM	Eu	Non-Eu
UK	2	4	2	3
OK/OM	4	2	2	3
Eu	4	4	1	2
Non-Eu	4	4	2	1

No multipliers. Your final score is the total number of points scored. Separate logs for each band showing (for each QSO) date, time, callsign, exchange sent/received, and a summary sheet showing your name, callsign, claimed score for each band, and brief details of your station should be sent by the end of April to G3XJS (UK entries). Non-UK entries go to OK1AIJ (Karel Behounek, Na sancich 1181, 633705 Chrudim IV, Czech Republic).

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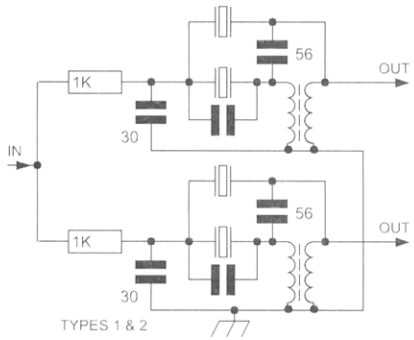

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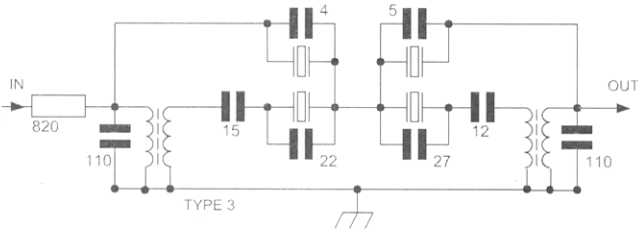

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We are both happy to receive logs by email: "g3xjs@gqrp.co.uk" and "karel.line@seznam.cz".

Guido, HB9BQB, has kindly sent me results of the **5th HTC-QRP Sprint 2006**, which I will be happy to forward to anybody who would like them.

One side effect of moving house was a six-week period without any Internet connection. Don't ask me why it took the combination of BT and my service provider so long to move the connection from one house to another, but it did! Much of the information I include in this column arrives by email, and perhaps that's one reason for it being a little shorter than usual, but the less time you spend reading this the more time you can spend on the air!

Items for inclusion in the next SPRAT should be sent (to the address above) by the beginning of February; in the meantime I wish you Season's Greetings and a Very Happy New Year.

72 de QRPeter

G-QRP-DL-Treffen 2007

Das traditionelle G-QRP-DL-Treffen fuer Mitglieder des G-QRP-Clubs findet auch 2007 wieder am **letzten Wochenende im April (27/28/29) in Waldsassen,** in der Nähe von Cheb/OK, statt – unsere QRP-Freunde aus OK sind herzlich willkommen. Weitere Infos gibt es von DJ3KK, POB 801, D-25697 Meldorf (bitte SASE) - oder auf der Homepage: **http://www.g-qrp-dl.de**
Zu Vortragsthemen und Beiträgen usw. bitte Bernd via DK3WX@DARC.DE kontaktieren – vy 72 es awds DJ3KK, DK3WX, DF6MS, DL2MGP, DL8MTG

The traditional G-QRP-DL-meeting for members of the G-QRP-Club will be held at the last weekend of April 2007 (27/28/29) in **Waldsassen near Cheb/OK** – our QRP-friends from OK are welcome. Further infos via DJ3KK, POB 801 , D-25697 Meldorf (pse SASE) and on our homepage: **http://www.g-qrp-dl.de**
Lecture and article etc., please contact Bernd via DK3WX@DARC.DE
vy 72 es hpe cuagn DJ3KK, DK3WX, DF6MS, DL2MGP, DL8MTG

FOR SALE: Ten-Tec Argonaut 509 with matching psu. In very good condition, slight mod of a socket on rear apron for digital read-out. Complete with Ten Tec Desk Mic, psu, and digital read -out box and handbook, £125. Good home wanted for a QRP Classic.
WANTED: Class D Wavemeter, complete or part stripped. Need Dial, Coilpack, and case. Rev A Heath, G4GDR, 227 Windrush, Highworth, Swindon, Wilts, SN6 7EB (Phone 01793 762970)

FOR SALE: Epithyte-2 80M SSB tcvr. Partly built kit, with all hardware, documentation, enclosure and receipts. Not much left to do: no longer necessary, as have built SSB module for K2. Cost £80 in 1999: will sell for £20 plus p&p. Phone Chris, M0PSK on 0151-924-1525 or email c.g.gibson@liv.ac.uk.

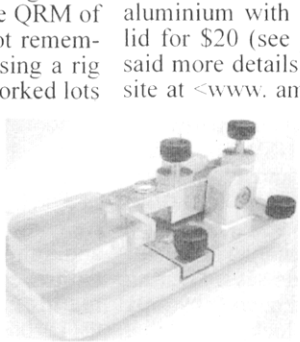
MEMBERS' NEWS

by Chris Page, N4CJ (G4BUE)

Highcroft Farmhouse, Gay Street,
Pulborough, West Sussex RH20 2HJ.
Tel: 01798 815711
E-mail: g4bue@adur-press.co.uk

G4RAW, a 40 metre QRO SSB DXer friend of **G3OUC**, recently visited Pat and heard his homebrew Skyliner QRP SSB rig that he built 20 years ago to use with kite antennas on 40 metres. Roger thought it was a rather sensitive and selective rig and offered to try it out on his inverted vee dipole in the CQWW SSB Contest. Afterwards he telephoned Pat and excitingly reported that he worked 31 DXCC (including 6Y, CT3 and CN) in just two hours operating. He thought the rig performed very well amongst the QRM of a major contest and added "I cannot remember when I last had so much fun using a rig and testing the limits". **G3XBM** worked lots of Europeans in the CQWW SSB Contest on 10m with his CB four feet loaded whip and using an ATU made some transatlantic QSOs on 15m. **G3LHJ** made 74 DXCC from 372 QSOs on 20m in the CQWW CW Contest. Derrick used 5W to his three element tri-band Yagi and says his 72,556 points is a little down on last year.

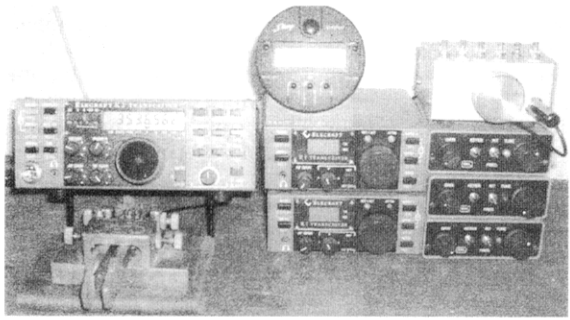
G3XBM has put details of a new QRP transceiver from Japan on his web-site <http://www.g3xbm.co.uk> (see photograph above). The HT-200 is a prototype QRP HF and 6m rig from Tokyo Hy-power, more famous for their HF and VHF linear amplifiers. Roger says it could be a useful QRP rig if the price is right. At first sight the rig looks simple and basic, offering few of the bells and whistles of the more up-market QRP rigs such as the FT-817 and the IC-703. Its lack of complexity may well appeal to many. **XE1UFO** reports a new software defined radio kit by Dan Tayloe, **N7VE**. It is called the FireFly and is a 30m transceiver kit with an SDR receiver and a conventional VXO tuned transmitter offered by Hendricks QRP Kits at $60. Steve says more information is at <http://www.qrpkits.com/firefly.html>. **N6KR** announced new Elecraft products at Pacificon in September. Wayne said they are mini-module kits and include a wattmeter with a computer interface, an analog audio filter with bandpass and lowpass functions, and a six-section 40-dB step attenuator. More details on the Elecraft web-site <http://www.elecraft.com>. **KI6DS** said Doug Hauff (American Morse) had two new products at Pacificon: a new straight key kit for $25!, that was a huge hit, and a new Anti-Altoids box machined out of aluminium with a neat way of attaching the lid for $20 (see photographs below). Doug said more details of both are on Doug's web-site at <www.americanmorse.com>.



GØSVO has been a member of the club since January and says what an absolute pleasure the club is. Pete gets more pleasure from CW and uses QRP with a FT-857 and G5RV antenna and has QSO'd I, OK, SP etc on 5W. He writes, "When my transmitter/receiver improves I will venture up to 20m to

work some real DX! The truth is that none of this would have happened if I (and a few others in the Spalding Club) had not joined the G-QRP Club. A big thanks to all in the club and long may it continue. I wish I could write about great DX etc, but that will (I hope) come in the future".

WB5GWB says Long Island, New York has a QRP club (LIQRP Club) and many of the members are 'Elecrafters'. Jeff says they are a small informal group with no bylaws or subscriptions and meet locally, in good weather outdoors at the Sunken Meadow State Park where they put up antennas in the trees and try out a variety of QRP rigs. During the winter they meet at Nicky's restaurant in Centerport where they have 'show-and-tell' and have even been known to get on the air from inside the restaurant with an indoor antenna. Jeff says it is free to join LIQRP Club and you don't have to live in the area, just send him an e-mail at <wb5gwb@optonline.net> and receive your own membership number. The club have a modest web site at <http://www.qsl.net/liqrp/>.



Above is a picture of **SM5CBC**'s all homebrew QRP-station consisting of an Elecraft K2, two Elecraft K1s, three DSW IIs, an external CMOS Super III keyer and a Jones paddle. Einar has monoband antennas for 80, 40 and 20m. The radio clock updates from a German longwave transmitter that links signals from an atomic clock. He says, "During a 56 year period the time will change by only one second. I bought the clock to see if it does and if not I will return it to the dealer!". Einar is currently building an ATS3A, an SMD kit from **KD1JV**. Two years ago he built the ATS2, a QRP 5W transceiver for 80, 40 and 20m. The reference crystal in the ATS3A has been changed to 50MHz from the 40MHz in the ATS2 enabling it to work on 30m as well.

WB3AAL worked **ZB2FK** on 30 metres on 6 September receiving a 559 from his K2 at five watts into a Butternut HF9V on the ground and the following day worked **9A/OM5MF** on 40 metres. **M3KXZ** worked **KG9N**, **W2IRT** and **TI8CBT** in quick succession on 17 metres SSB with 10W on 14 September and then switched to 5W CW to easily work **V31MR** who gave Pete a 339 for his best DX CW QSO. The **V31MR** was part of the Straight Key DXpedition. Pete later worked the **YX5IOTA** DXpedition on 17m CW. On 25 September **G3CWI** was doing a SOTA activation on 30m when he was called by **FP/G3TXF**. Richard says, "Not bad as I was just using 1.5W to a low wire!".

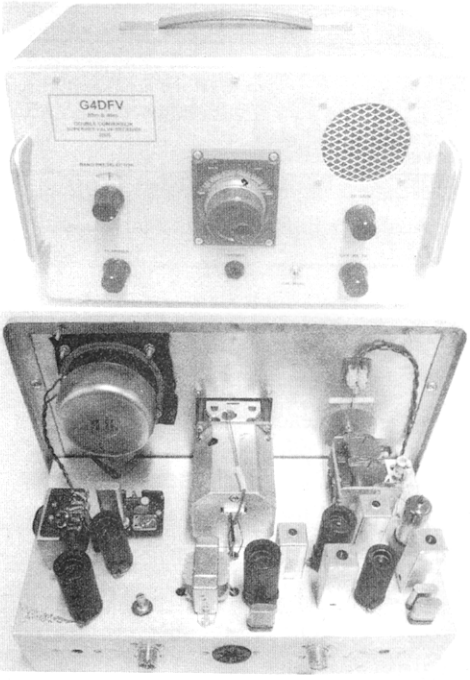
G3XBM worked 30 DXCC (including EA8) on 6m this sporadic-E season with mainly 5-10W SSB with a V2000 VHF/UHF vertical. Roger, who is in Cambridge, says there is a small group of AM operators on 144.55MHz with a regular 'Monday night at 8pm' activity slot. He still has a regular QSO with **MØBXT** on QRP AM. He also reports an AM group active on Tuesdays from the Midlands and says 70.26MHz is still popular with 4m AMers.

GØFUW recommends <www.expotools.com> as an excellent company to deal with. Steve needed a new bearing (ball race) for his 15 years old PCB drill and says the offer swift and courteous service. They also have a catalogue in addition to their web-site. **GØBPS** recommends Squires Model & Craft Tools, 100 London Road, Bognor Regis, West Sussex PO21 1DD; telephone 01243 842424 as another good source for tools and electronic parts. Their catalogue is almost 700 pages.

RV3GM reports the daily 'round table' on 3577kHz at 1900z. Oleg says all QRPers are welcome to join in. **OK8OME** says "QRP and simple wire antennas really do work". On 16 September Mike finally finished installing his homemade multiband doublet on the QTH roof and after checking the ATU tuning on all bands, heard a CW station calling CQ from Russia on 20 metres. Mike called him with 5W and to his surprise, answered straight away. Mike wrote on the G-QRP Reflector, "This was very exciting for me as it is my first ever QRP QSO and I just wanted to share my pleasure with you all and thank you for the

encouraging messages on this Reflector". If you are on the Internet but not the G-QRP Reflector, then you may be missing out! See <http://www.gqrp.com/>.

Received too late for SPRAT 128 are details of the 19th Homebrew & Old Time Equipment QSO Party on 19 November from **DJ7ST**. The event is for operators of homebrew equipment more than 30 years old on 40 and 80m and has a QRP class. Hal says it is organised by the QRP Contest Community (QRPCC), an international network of 130 QRP enthusiasts from 12 countries that has been organising and promoting QRP contests since 1992, including the well known Original QRP Contests. This event will probably be repeated in November 2007.



G4DFV built a double conversion SSB/CW superhet receiver for 80 and 40m using valve technology and housed in a steel cabinet that was once home to a Heathkit signal generator (see photographs above). The passive tunable bandpass front end feeds a 7360 beam-deflection mixer into a 1700kHz IF followed by a 6KE8 mixer down to 455kHz. For frequency stability Duncan used a VFO unit culled from a defunct Kenwood TS-120.

GØEBQ has built a second Club clone for /P work; it gives just under a watt from a 9.6V Nimh battery (see photograph above). Nigel has had QSOs all over Europe with it and will be taking it to EA5 in the second week of January when he will look for members around 14060kHz. **G3KJX** planned to be QRV 17 October/11 November from the Algarve as **CT1/G3KJX** with his K2 and FT-817 and a 4m receiver. Brian was hoping for more QRP activity than his last visit in April.

On 6 November **MØHMR** was on holiday at St Ives, Cornwall and was QRV with his 0.5W or 5W IC-T3H 2m hand-held talking to **G4BHD** just up the coast when **F4MXX/P** called into the St Ives repeater from 300kms south of Paris. This alerted Chris to a likely increase in conditions and the following morning he was surprised to hear **G3TSO** on WH near Swindon. He was able to fully quiet WH while standing in his window using 5W when he attached a 5/8 colinear to the hand-held and found a site on high ground overlooking Penzance. Using repeaters Chris QSO'd **F4EBE** who was leaning out of his window in Paris with a hand-held, **DF3JET** near Arnhem, **ON4CO** and **ON6ZJ** via a repeater at Guent, **PE3BB** via the Nijmegan repeater and **FØDTC**. Chris says several of the stations were quite amazed at the activity and were asking me for QSLs as a souvenir of the day. It was strange to be a DX station! He assumes the propagation was tropo ducting.

That clears the files again and just enough space left to wish you all a Happy Christmas and all the best for your QRPing in 2007. Please keep your information, news, comments and pictures coming and let me know how your winter goes, by 20 February 2007, please.

QSL Cards from Nasko - LZ1 YE

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 or 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**
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 (make cheques payable to : Melanie Rowe)