SPRAT

THE JOURNAL OF THE G QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

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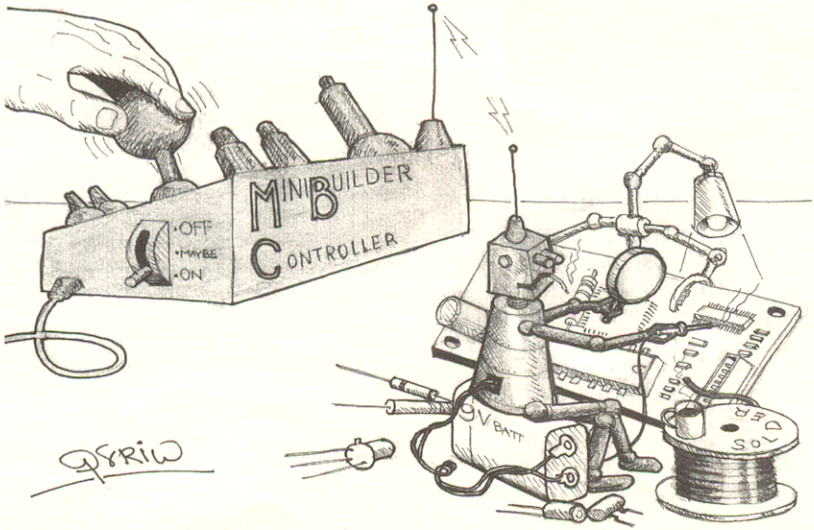
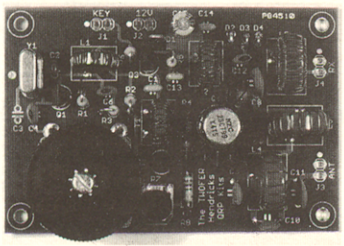


Surface Mount Devices are no problem now, but he keeps stopping for tea breaks

The TWOFER Transmitter



Kits Available

Lemon TX ~ Twofer Transmitter ~ KTH Traveller RX ~ Speaker Tip
RIT Potentiometer ~ Making RF Chokes ~ Making Ladder Line
Evolution of SSB Transceiver ~ G3EJS Tuner Mods
Active Antenna Using Op-amps ~ Softrock SDR Transceiver
SDR Transceiver Kit ~ Antennas-Anecdotes-Awards
Communications & Contests ~ VHF News ~ Member's News

JOURNAL OF THE G QRP CLUB

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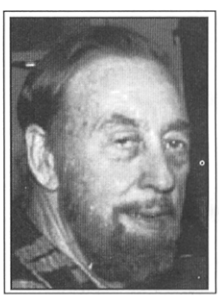
Rev. George Dobbs G3RJV

Gus Taylor, G8PG

In May of this year Gus Taylor, G8PG, will have been a licenced radio amateur for 70 years. Congratulations Gus! As you will see later in this issue, Gus has decided to retire from writing his long lasting column "Antennas-Anecdotes-Awards" and resign as the club Awards Manager. The replacement for the awards manager is underway and we have yet to find another writer for the column.

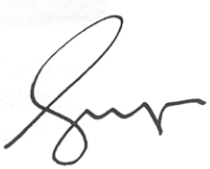
May I, on behalf of all club members, thank Gus for his long and hard working service for the club. Gus was a founder member (004) and has added richness to the work of the G QRP Club. Not only as Awards Manager and SPRAT columnist but in the kindly and understanding way he has helped individual members with their antenna problems. Gus will remain as a Life Member of the club and, of course, someone to seek out and work on the air.



The W1FB Memorial Award

Although I have not yet published all entries for the 2006/7 award, the new challenge is announced on the opposite page

72/3



G3RJV

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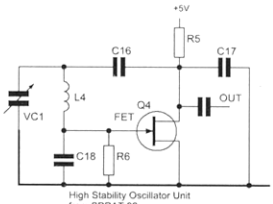
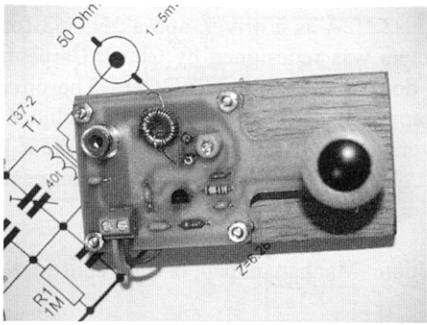
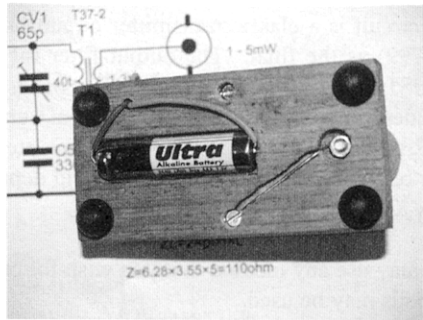
The Lemon Transmitter [AN IDEA AND A CHALLENGE]

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

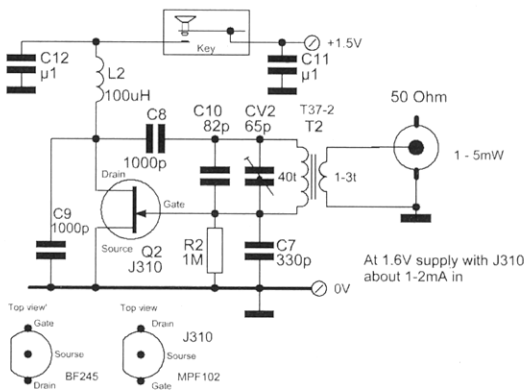
My friend Karl-Olof, SM3CLA, wanted a transmitter that he could power from a lemon to show young people. He wanted a VFO controlled. I tested different types but had problems to get it working down to 1V. This oscillator idea I found in Sprat 92, changed it a little and it works a little bit under 1V. I run my TX with a AAA battery and made a QSO a couple km to my friend in the village with this 1-3mW transmitter. The next step is to make a power amp to get at least 100mw out, with 1.5V of course! It's hard to get clean signal from my tests. Perhaps







The Lemon Transmitter



From G3RJV.....

So – a challenge for SPRAT readers.

Can you help Johnny produce a Lemon TX and even a transmitter that is powered from another "natural source"?

An interesting idea, so it can become the W1FB Competition for 2007.

The W1FB Memorial Award 2006/7

Design and build a QRP transmitter powered from any natural or unusual source of power. Please submit your design to G3RJV with circuit sketch, all values and brief notes. The winner will receive a special plaque.

The TwoFer: A Simple Transmitter for 6 Bands

Doug Hendricks - KI6DS

The TwoFer was first designed and presented in QRP Quarterly in 1986 by John Collins, KN1H, and Mike Michaels, W3TS. The original design had a companion receiver that used the crystal oscillator of the transmitter, thus, you got "Two-Fer" the price of one. This incarnation allows you to use whatever receiver you have to hand – perhaps the Poundshop Radio mentioned in Sprat 125?

Recently, Richard Fisher updated the circuit and I continued his work and added my own refinements to make the circuit buildable with commonly available components. The most difficult component to find was the variable capacitor for the VXO. This was solved by using a commonly available polyvaricon. Richard used a 30pF air variable, and I substituted the 10-60pF side of the polyvaricon and a 33pF capacitor in series. The G-QRP Club has made these available for a reasonable price. (see club sales page).

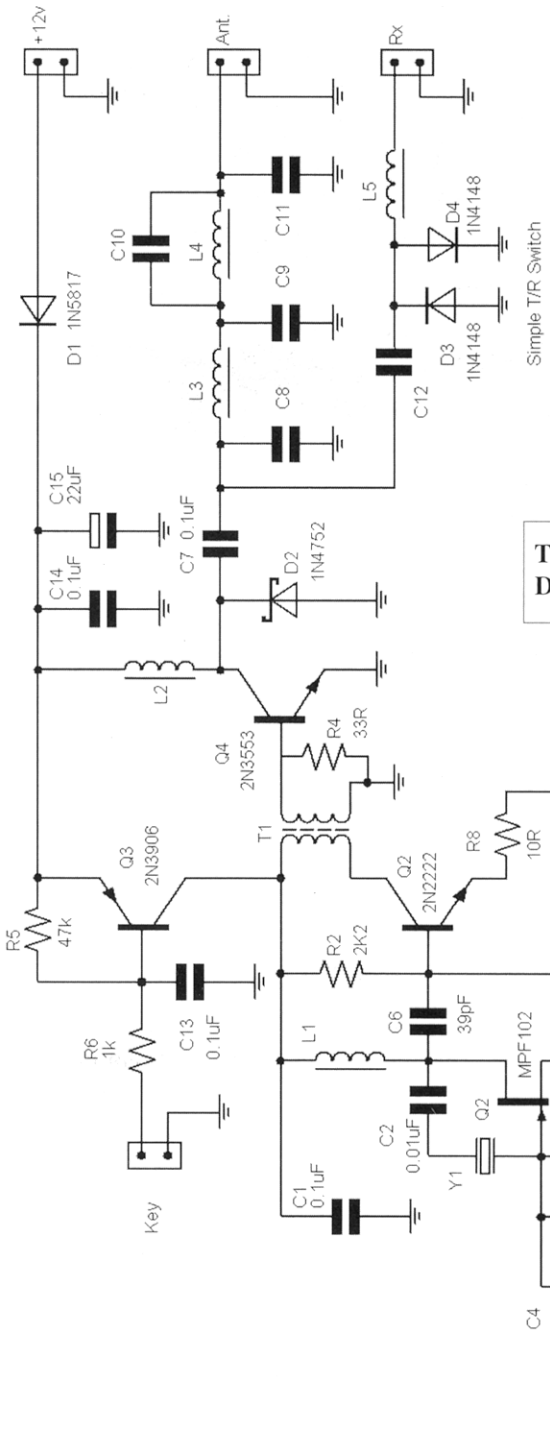
The circuit is a classic transmitter circuit using a 2N2222A as a driver, and a 2N3553 (or a 2SC799) as the final. The output filter for 40 meters was redesigned by Chuck Carpenter, W5USJ and the values for the other bands were done by Bob Okas, W3CD. The circuit includes variable drive with a maximum output of approximately 2.5 Watts. Also included is a T-R switch, and a connection for a separate receiver. The VXO as shown provides about 1.5 KHz of swing on 40 meters and is band dependent. Typically as you go higher in frequency, the VXO coverage will increase.

You may use any method that you wish for construction. Manhattan, pad, or ugly construction methods may be used.

The schematic shown is a generic version. You will need to check with the band table below for values that are needed for each band. The transmitter can be put on the following bands, 80, 30, 20, 15 and 10 meters with the values shown.

Capacitor Cx may be needed to pad the tuning capacitor to get the radio on the frequency of your choice. It will only be a few pico farads and may well be left out entirely. L1 is 36T on a FT37-43 toroid. L2 is 21 T on a FT37-61 toroid. T1 is a transformer wound on a FT37-61 toroid. 25 T Primary and 5 T Secondary.

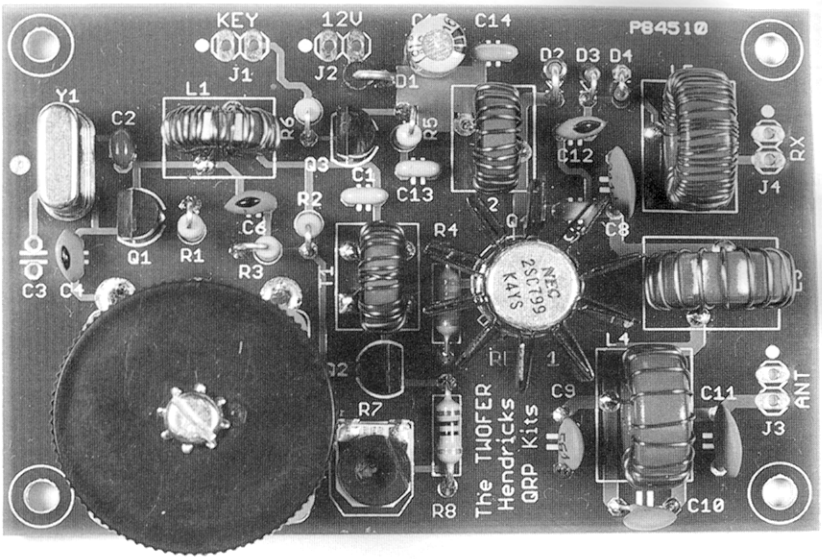
Band	C8	C9	C10	C11	C12	L3 T50-2	L4 T50-2	L5 T50-2
80M	1200pF	2000pF	180pF	1200pF	91pF	22T #26	22 T #26	67T #30
40M	240pF	560pF	120pF	240pF	47pF	15T #26	15T #26	45T #30
30M	470pF	680pF	56pF	470pF	30pF	13T #26	13t #26	40T #30
20M	270pF	560pF	56pF	270pF	22pF	10T #26	19T#26	34T #30
15M	220pF	360pF	27pF	220pF	15pF	9T #26	9T #26	28T #30
10M	180pF	270pF	15pF	180pF	10pF	8T #26	8T #26	24T #30



Editors note:
A Kit of parts is available from www.qrpkits.com/

Price $26 post paid (DX)
A good price with the current exchange rate !

The "Twofer"
Doug Hendricks KI6DS



The TWOFER Transmitter

Simple Loudspeaker Tip

Gert de Gooijer, PA3CRC, St. Adrianusstraat 8,
5614 En Eindhoven, The Netherlands

If you want to put a small loudspeaker in the front panel of a home brew set, put it in a small acoustic (sealed) box. Just look for a plastic pot (left over after the jam, chutney, ... has been eaten) that fits tight over the (round) speaker. Put some damping material inside, before glueing the container on the backside of the speaker; make sure that you've wired the speaker and fed the wires through a small hole in the plastic.

The speaker/pot forms a small acoustic box that you can mount at the inside of the front panel. If you put a grill over the hole in the front panel it looks very nice. For this mounting you can use glue too, modern glue can make a very good joint. Using this acoustic box has several advantages:

- you confine acoustic waves to the outside of the set, so less microphonics
- you get a better sound quality
- it is very inexpensive, you use something you would otherwise throw away (very nice feature)
- you can check audio quality before you make the hole in the front panel.

SW – KTH TRAVELLER - Reflex SW receiver

Joris van Scheindelen PE1KTH, de were 5 , 3332kc Zwijndrecht,
The Netherlands www.kthkit@xs4all.nl

The aim of this design is to build a simple small pocket size short wave receiver with modern components, see Fig 1.
Specification:

- Low voltage (5 volt) FET BF1005 with integrated stabilized bias network.
- Small 3 or 4 cell 1.5 volt mini penlight battery.
- Varicap tuning on 6 volt.
- Build with SMD 1206.
- Low component count.
- Low current consumption.

The high impedance signal from the 25-inch whip antenna is amplified by T1.
C1 and C7 insulating the DC internal bias of the BF1005.
TR1 is a 10.7 MHz IF transformer 10 mm TOKO size.

The REGEN signal comes via C5, P1 to pin 4 in the detector. If no oscillation occurs change junction 4 and 6 of TR1

The LF signal is amplified by IC1 with enough gain for the headphones.
A breadboard with ground plane setup was made see fig 2. In spite of long wires no signs of oscillation or spurri occur.

The regeneration control P1 is smooth and easy over the 3 – 7 MHz range
Measuring the DC voltage G1 and D of the BF1005 turn the slider of P1 to 15.

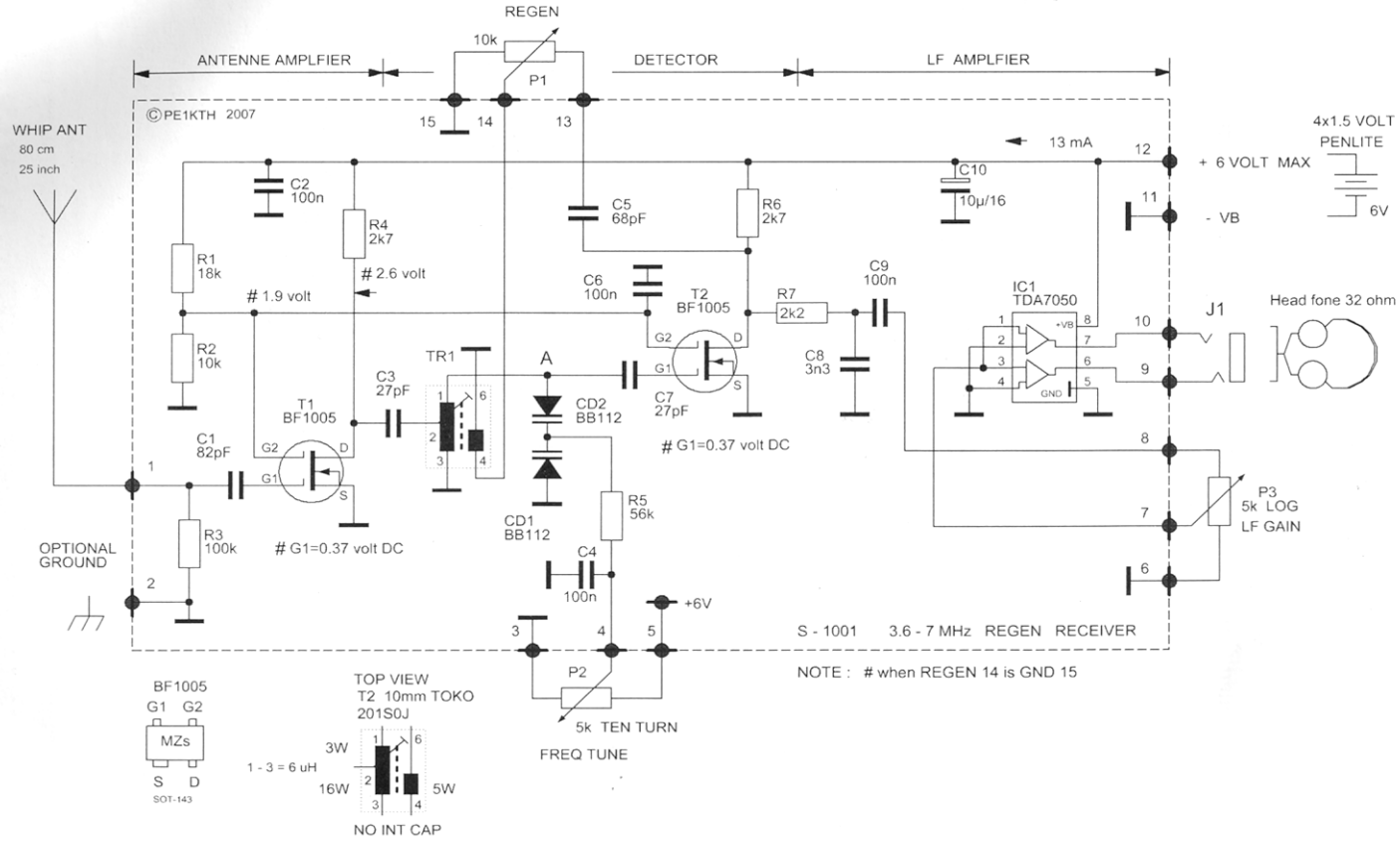
Receiving results;
The BC stations are loud and clear (thanks to MW power) for CW and SSB fine-tuning and band spreading is necessary
Air capacitors give better results (less dielectric loss).
The sensitivity is approximately 10uV.

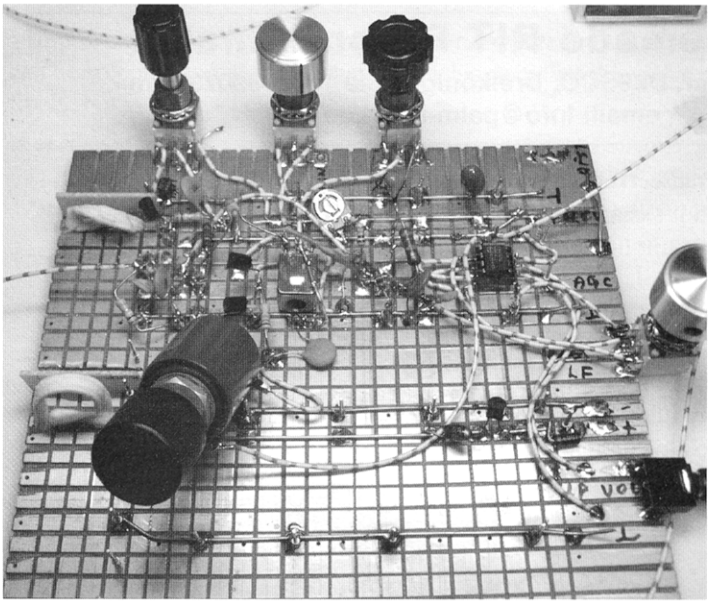
Building and components;

- The construction must be done with a good VFO in mind thus mechanical stable and well screened.
- Tuning and REGEN axes must be earthed or made from PVC (No hand effect).
- Keep the capacitive aerial free from objects and away from noise.
- Fet BF1005 is from Siemens see datasheet information.

This receiver is a fine travel companion or can be improved for serious CW SSB work.

SW - KTH TRAVELLER





SW – KTH TRAVELLER Receiver on breadboard

A Very Useful Service to Radio Amateurs

From Darek Milka, SP6NVK

The website <**www.hamatlas.eu**> is the result of four years work by SP6NVK.

It contains the complete information on **all 337 DXCC Entities**, including over 3000 pictures and more than 1100 maps. A very useful piece of work – Thank you Darek!

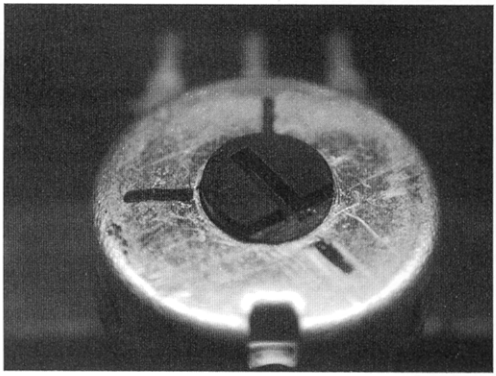
QRP in Liechtenstein - Tom Klaschka, DL4NSE

My friend Klaus, DF2GN & I plan to go for a QRP-HF-DXped to HB0/ Liechtenstein in late spring/ early summer. Calls will be HB0/homecall. We intend to stay for at least 12hrs to give as many QRPers as possible a chance to grab the rare one. Also for that reason we'll have two radios on the air in parallel doing different bands, Klaus will for sure run his 'BCR', the Blue Cool Radio made from a kit by QRPproject, I'll do my IC-703. Antennas will be wires (ZS6BKW & others) carried by lightweight 12.5m-poles (DX-Wire). Watch the frequencies around the QRP-activity-centres, we don't set up a certain schedule, just work the bands as condx permit. Details on date & time still depend on various qrl- & private obligations and hence will be given in time via the mailing list & with a related topic on ***www.qrpforum.de***. Last not least, Klaus & me are also users of eQSL (Klaus' AG-status is still pending), so QSLs will both go via buro & web. 72,3! Tom, DL4NSE (#7843)

A Homemade RIT Potentiometer

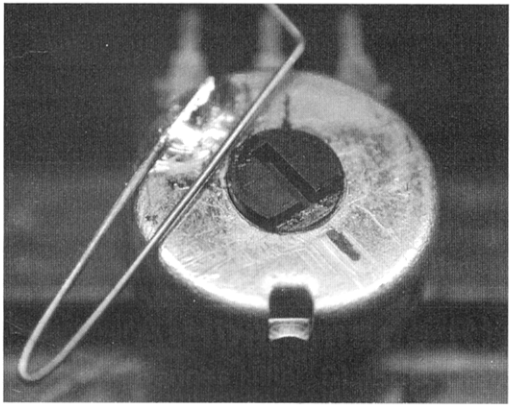
Hannes Hiller, DL9SCO, Dreiköniggasse 10, D-89073 Ulm
email: info@palm-radio.de

Many homebrew QRP transceivers have a built in RIT function. Generally a normal potentiometer is used, and it's centre position is defined by a knob with a mark or an arrow disk. Commercially built devices however use potentiometers with central resting and leaving the central position of the RIT potentiometer is usually displayed by an LED. Wouldn't it be beautiful to equip that homebrew-TRX with such a useful and comfortable feature?
Since commercially available pots with central resting are hard to find I want to describe in the following how a " regular " potentiometer (in my case with a 4 mm plastic shaft) can easily be converted to a potentiometer with resting central position as well as a switching contact for the LED.



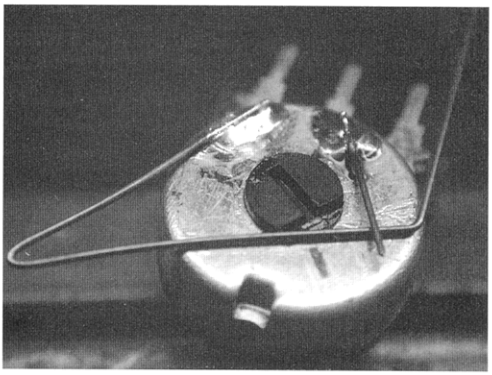
First the left and right end positions of the pot are marked on the rear side with felt-tip pen. This facilitates the finding of the accurate central position, which is also marked in the same manner. Use a sharp knife (cutter blade) to cut off approx. 1,5 mm from the potentiometer shaft and remove the segment of a circle that has developed from the cut **(fig.1)**.

In the next step, bend a short piece of (diameter 0.5 mm) spring steel wire (model construction accessories) to the shape of a narrow "V". One end is bent over approximately 45° and tinned with the soldering iron. Important: the spring steel must be roughed up with sand paper or a small file before tinning, otherwise the solder will refuse to coat the metal.



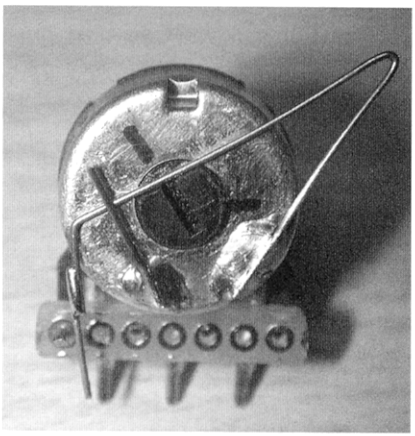
The other end, which is later soldered to the potentiometer housing needs to be tinned, too. Next step is to very carefully tin the potentiometer housing.
Attention: Make certain no flux gets near the center of the shaft since it could stick together with the housing. After that, the v-shaped spring can be placed onto the flat part of the pot shaft and soldered in position accordingly (**fig. 2**.)

To prevent the spring from jumping over the potentiometer shaft, a short piece of wire can be soldered to the pot housing in such a way that the v-shaped spring can still run freely, but is always held down **(fig. 3)**.



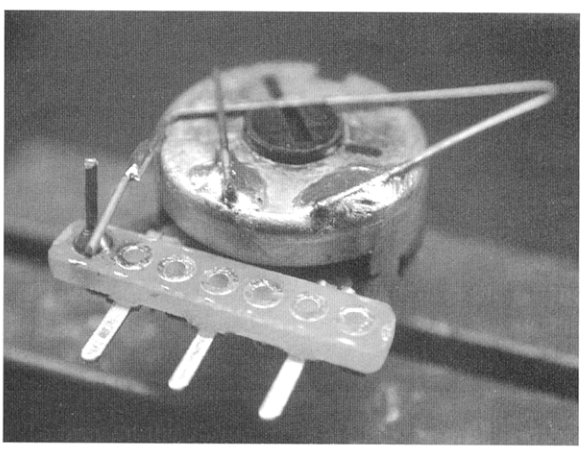
The middle stop of the potentiometer should function now, but if the central position is not yet accurate, the spring may readjusted by careful bending it's long arm.

Now to the switching contact: For contact material, I used a gold-plated wire that I cut off from an old transistor. Those make good contacts and have nice spring characteristics at the same time. The counterpart of the contact is a gold-plated pin of a circuit board plug - everyone must look what is inside his junkbox here! Also relay contacts are eligible.



Solder the contact from the copper side of a piece of perf board which is glued to the pot with superglue **(fig. 4)**.

An LED mounted in the front panel can now be switched to ground with this contact. Super bright-type LEDs should be used here, those already bring a good signaling effect with very low current consumption.



Finally it needs to be pointed out that smooth running of the pot is important, because naturally the smoother the pot turns, the more you get a definite feel for the center position of the pot! Have some fun with this easy bricolage which adds value to every homebrew transceiver!

Making RF Chokes

John Beech G8SEQ 124 Belgrave Road Coventry, CV2 5BH

Ian G3ROO at the Rochdale convention reminded me of the importance of good RF chokes, when he described the problems he had sorting out a K2 that someone else had started to build. This used miniature moulded inductors for the choke. I have also had problems with these in the past, so decided to wind my own.

The technique is this: Take a high value (>47K) resistor of ? watt rating and some 32 gauge enamelled wire . For a 100uH choke you will need about 1 m.. Scrape the enamel off the first 30 mm of wire and wind this tightly around the lead of the resistor as close to the body as possible and solder. Grip this wire lead in the chuck of a hand driven mini drill (a standard wheel brace will do, if it has a good chuck or mount a pin vice in the chuck). Wind all the wire onto the body of the resistor except the last 50 mm. Scrape the enamel off again and wind this part onto the other resistor lead & solder. Some lacquer can be used to hold the turns in place, but this isn't always necessary.

I don't bother counting the turns, I just measure the length of wire to be wound on. You can vary this to produce bigger or smaller chokes, but the ones described work well for frequencies from 3.Mhz to 30 MHz in small signal circuits, where the DC current through the choke is up to 100 mA.

If you want a heavier duty choke choose say 26 or 28 SWG wire and a physically larger resistor. If you want a lower Q choke, then damp it by winding it onto a low value resistor in the hundreds to thousands of ohms range.

Another way to produce a lossy choke is to wind 8 turns of 26 SWG wire through an FX1113 ferrite bead. This will also give about 100 uH choke.

At VHF/UHF the number of turns can be reduced and often a ferrite bead just slipped over a component lead will suffice. Glue in place with a soft glue like Bostik to stop it rattling.

High Q VHF/UHF chokes are easily made by winding a few turns sufficiently thick wire around a drill bit or pencil, so that the resulting coil is self supporting. At UHF this often becomes just half a turn (hairpin link) of 14 SWG wire. Some times I just wind a couple of turns around a 2 mm diam. Drill bit, using the lead of a bias resistor.

Lastly, I always check the DC resistance of chokes I've wound. Many will have almost zero ohms resistance, but ones wound with fine wire may have a resistance of a few ohms. It is useful to know this value, as sometimes if a choke is overloaded it can have shorted turns on it. This can show up on a DC test , but not always.

Rochdale Mini-Convention 2007

I have had several emails and letters about the convention this year ..... so just to confirm....

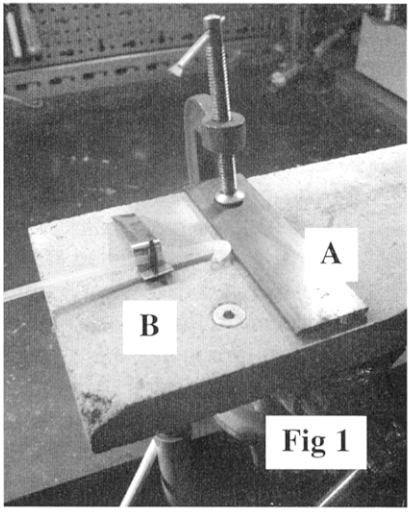
- The convention is on **Saturday 6th October**.
- Yes – I am retiring and moving in mid 2008 so this will be the final convention at the present site.
- Plans are being made to move the convention to a site not too far away.

Regarding my move and down-sizing see: **<www.g3rjv.org.uk>**

Homebrew ladder line – some ideas

Luca Norio, IV3TEK, via Umberto I° 116, 33085 Maniago (PN) Italy

Thinking to build an home made ladder line to feed a delta loop for 80 m, I have found in the article of AA1MY (SPRAT, Summer 2001 page 7) a very good solution for the construction of spreaders.



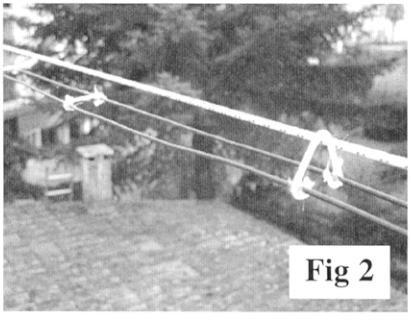
While I was planning the job I have had some additional ideas hereafter described to make easy the spreaders construction and to reduce the mechanical load on the line wires.

Material used for the spreaders.

The alternative source to the grass/weed trimmer wire mentioned in the AA1MY article has been a nylon wire used for external clothes-horse. It has a diameter of 3 mm. It is quite strong but still easy to be bent around a solder tip and rated to be weatherproof. I have bought it in an hardware store in a roll of 10 m for 7 Euros.

The bending tool (fig. 1)

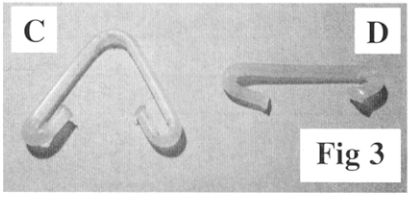
To make all the spreaders with the same shape and help the bending operation I have used a refractory tile with a hole of the same diameter of the solder tip. A small piece of metal or plastic *A* crimped on the tile works as length reference. A "Z shaped" tool *B* obtained from a small stainless steel sheet helps the bending of the wire around the iron tip.



Mechanical load of the line

For the line I have used PVC insulated strand type wires.

Considering that I needed a length of about 20 m between the antenna feeding point and the tuner, I have thought that it could be better to load the weight of the line on a third insulating wire as a plastic rope.



This helps to keep the line straight avoiding to pull too much the copper wires (fig. 2). For this purpose, a "V shape" spreader *C* has been placed every four straight spreaders *D* (fig. 3).

The spreaders have been fixed with hot melting glue every 0.3 m in the way explained in AA1MY article.

A suggestion after my experience. Spreaders hooks have to be kept (cut) as short as possible and filled with the glue. This avoids that the rope gets entangled during the installation

EVOLUTION OF A SIMPLE SSB TRANSCEIVER

Pete Juliano, W6JFR, 40 Cedarview Drive, Port Townsend, WA 98368 USA

I believe two of the best words in the English language are; "cheap" and "easy". In my quest for a cheap and easy build of a 17M QRP SSB Transceiver, I noted that by employing standard, low cost computer crystals certain combinations resulted in signals in the 17m ham bands.

One of the currently available standard computer crystal frequencies is 4.9152 MHz, (which also happens to be the IF frequency of the K2 transceiver). I noted that if an 11.520 MHz crystal (another standard frequency) was used in a Super VXO (Variable Crystal Oscillator) and then frequency doubled, it produces an output of 23.04 MHz. By using this as a LO (local oscillator) with a 4.9152 MHz IF, the difference frequency falls within the 17m band producing a USB signal with a 4.9152 MHz carrier crystal. I used this combination of LO and IF frequencies to prototype a simple 17m QRP SSB transceiver design which, in its final form will be a very compact transceiver for portable and vacation use. The transceiver uses two bilateral amplifiers that were described by Ron Taylor, G4GXO in SPRAT #128. Other G4GXO designed circuits were used in the project. The Super VXO provides about 30kHz of tuning range from 18.120 to 18.150 MHz. The results on the air have exceeded my expectations; with around 5 watts output I have worked 7 states, mostly in the mid-west, a distance of 1800 miles from my QTH near Seattle on the west coast. As a bonus this same IF when used with a 2.2 MHz VFO works on 40 Meters. The transceiver can be seen at the following website 'www.jessystems.com'.

Operation on other bands is possible by careful selection of LO and IF crystals but care should be exercised in the selection of frequencies to avoid unwanted mixing products. Below is a table that demonstrates some of the possible combinations that will provide operation on most of the HF bands;

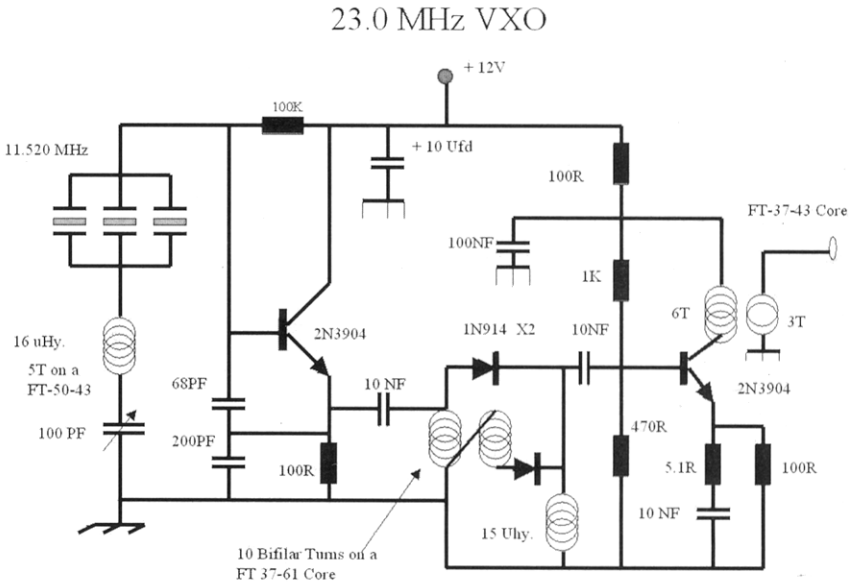
IF Filter Frequency	VXO Frequency	Resulting Frequencies
4.9152 MHz	11.520 MHz X 2	18.120 to 18.150 MHz
4.9152 MHz	2.2 MHz VFO	7.165 to 7.185 MHz
7.3728 MHz	11. 0 MHz, 11.046 MHz, 11.059 MHz, 11.228 MHz	3.66 MHz +/- 3.86 MHz +/-
7.3728 MHz	10.7 MHz X 2	28.8 MHz
9.0 MHz	5.185 MHz	14.185 MHz
9.0 MHz	12.288 MHz	21.288 MHz +/-
3.2768 MHz	11.0 MHz, 11.046 MHz	14.276MHz, 14.322 MHz
6.0 MHz	8.192 MHz	14.192 MHz +/-

Following the success of my 17m tests I have purchased all of the crystals listed in the table with a view to testing the transceiver on each of the bands.

The SSB filter is a standard four-pole Cohn ladder filter for which an impedance of 150 ohms was assumed. While more precise impedance values could have been calculated, either by using software or long hand, at 4.9152MHz the 150 ohms assumption works fine.

When building a filter the first step is to find four crystals that are within 50Hz of each other. Frequency matching is easily done using a simple oscillator and a frequency counter. Any crystal that doesn't meet the 50Hz limit can be used in the carrier oscillator. When used in a VXO type oscillator, there is adequate tuning range to place the carrier crystal frequency at the correct point on the filter slope. I purchased 10 crystals each for the VXO frequencies and 20 crystals for the filter frequencies. Out of a batch of 20 crystals I managed to realize three filters, two 4 pole and one 8 pole.

In its final configuration, the Super VXO employs three crystals all at the same frequency. By adding the third crystal the upper frequency limit was extended. Experimentation also revealed that a point is reached were too much inductance will cause the circuit to cease oscillation. Experimentation is the key operative word! The schematic is shown below.



Many thanks to G4GXO who reviewed this article and for designing some great circuits that can be employed to create cost effective ("cheap") and "easy" to build SSB QRP radios.

Mods to G3EJS's Tuner

Derek Alexander G4GVM, 52 Brockington Rd, Bodenham. Hereford. HR1 3LP.

I constructed this unit as described by Steve Warwick-Olive, G3EJS, in SPRAT 123. I have used it at home with my G5RV, portable with a long wire and counterpoise, and with 80m and 40m verticals. It is a beautifully compact design, which works well and is a handy addition for the FT817.

However, for my use, I felt the logic of operation could be improved.

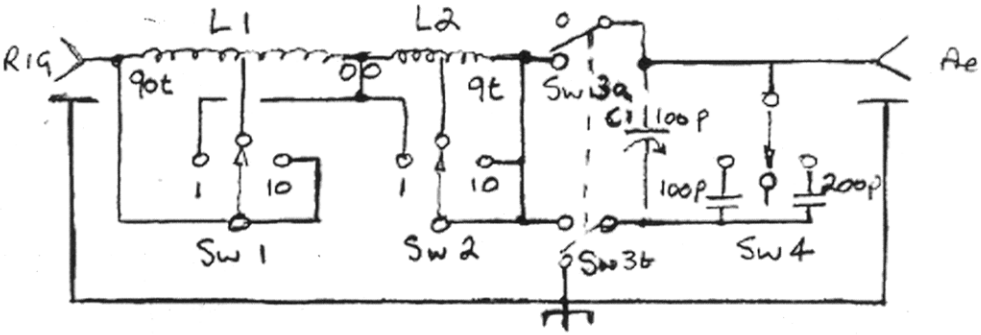
I made three basic changes:-

First, it seemed better to have the selected inductance as a continuous coil rather than two separate ones, albeit on the same former – hence the inductance of each coil is now increased outwards from the JUNCTION of L1/L2.

Second, L1 has been increased to 90 turns, with every tenth turn tapped and selected by Sw1; L2 is reduced to 9 turns, each one tapped and selected by Sw2. These switches, therefore, represent 'tens' and 'units' and can be set as a continuous coil of any number of turns 0-99. Also, recording a setting for future use is made easier.

Third, logic dictates that inductance should INCREASE with the CLOCKWISE rotation of the switches.

An Earth socket has been added for ease of connecting an earth or counterpoise.



L1 is 90t with taps every tenth. L2 is 9t with taps every turn. L1/L2 is a continuous coil of 99 turns of 24 swg on a 3/4" dia former 2 7/8" long.

Operating Procedure

Sw1 selects tens, and Sw2 units, for any number of turns 0 to 99. The combination of C1 and Sw4 tunes with virtually any capacitance from approx 10-300p - in either 'L' or

'series' configuration. Both Capacitance (depending on the position of the knob) and Inductance are INCREASED by CLOCKWISE rotation of the controls.

For a 'single wire' aerial with earth or counterpoise, plug the aerial into the PL259 and the earth or counterpoise connection into the 'E' socket.

Suggested power limit is 60 watts. S1/S2 should not be operated while transmitting.

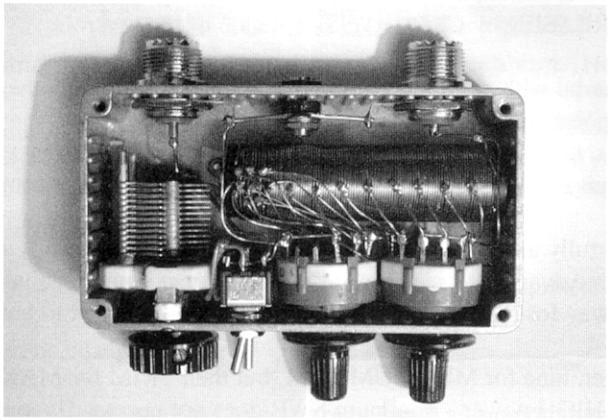
First, set tens (Sw1) fully anti-clockwise, units (Sw2) to midway, network to 'L' and capacitance to 150p. Advance 'tens' a click at a time for maximum receiver noise; move 'units' either way for possible increase, with further adjustment to both if needed, peaking with C1/Sw4.
Then, on LOW power, tune for MINIMUM SWR, but then TRIM for MAXIMUM RF output before using HIGH power - minimum SWR does not necessarily mean maximum power out !
It may be necessary to repeat the process using 'series' network if a low SWR cannot be found.
Note should be made of settings which are likely to be needed regularly with a particular aerial. e.g. Aerial 'A' 3.650 45 200 L NB. The sharpness of tuning (and therefore receiver noise) will vary depending on the natural resonance of the aerial being used and the frequency in use.

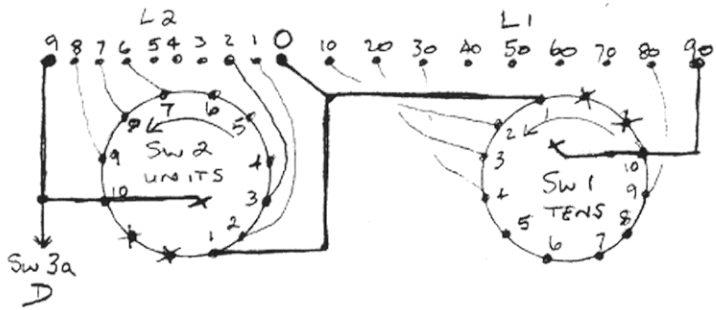
As an experiment, using a long wire (about 90 ft) and a good earth, I connected an aerial analyser to the AMU in place of the rig. Setting various frequencies, I found that I was able to achieve a very accurate and low SWR in each case – mostly 1:1. I recorded the same checks with the G5RV, but this is a tailor-made, 'multi-resonant' dipole and the settings are very different. Both are tabulated here.

G5RV				Long Wire		
Coil	C1/S4	SWR	**Freq**	Coil	C1/S4	SWR
98	100 S	1:1.1	**3.550**	36	200 L	1:1
22	200 L	1:1	**3.650**	35	200 L	1:1
22	100 L	1:1.3	**3.750**	34	200 L	1:1
14	200 S	1:1.1	**7.050**	15	200 L	1:1
11	200 S	1:1.3	**10.075**	21	100 S	1:1
3	200 S	1:1	**14.175**	7	100 L	1:1
1	200 S	1:1	**18.085**	0	100 L	1:1.5
5	200 S	1:1.3	**21.225**	12	100 L	1:1.1
1	200 L	1:2.3	**24.940**	4	100 L	1:1.4
1	200 S	1:1.2	**28.850**	5	100 L	1:1.1

As can be seen, the fiddly 1-turn taps prove their worth !

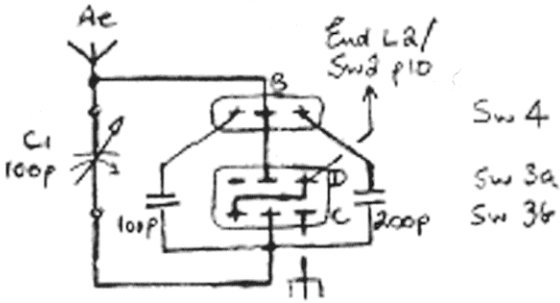
The lid, here removed, has four rubber feet



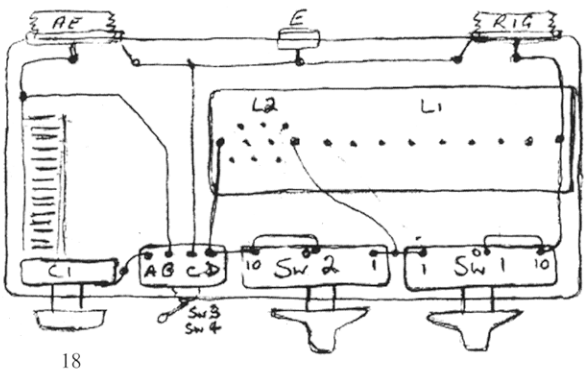


Inductor switch pin connections – Arrows show clockwise rotation.

Capacitors and 'Series'/'L' network switch connections



General layout showing main connections. Underside view.



Active Aerial using an Operational Amplifier

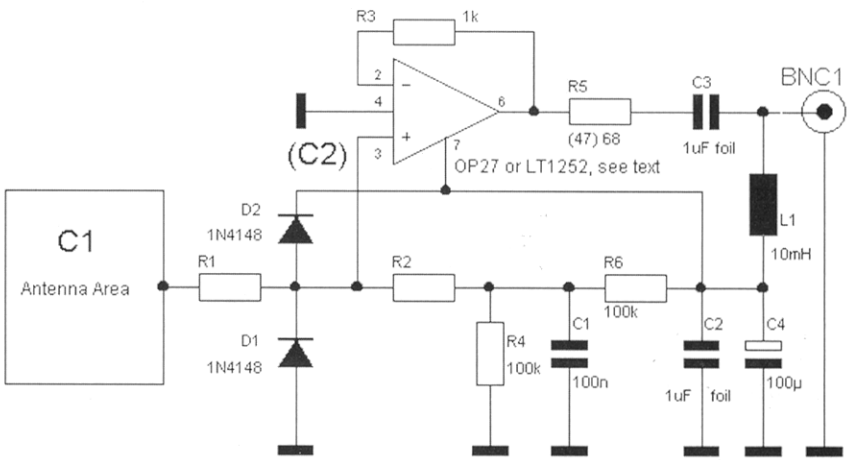
Ha-Jo Brandt, DJ1ZB, Eichenweg 7, D-84160 Frontenhausen, Germany

During the last year I have been engaged in finding out my best way how to receive Grimeton Radio, SAQ, the historic VLF CW radio station located on the southwest coast of Sweden, still employing a so-called alternator engine to generate a frequency of 17,2 kHz [1]. Whilst a loop aerial gave good results, an active aerial on a wooden pole, about 10 meters from the house and 4 meters high, proved to be even less prone to certain forms of interference from the mains.

My first active antenna has been the Mini Whip [2] proposed by Roelof Bakker, PA0RDT. But soon I became inspired by an article in [3] by Marco Bruno, IK1ODO, to try an operational amplifier in the active part of such an antenna. Active aerials have to pass many r.f. signals simultaneously, and intermodulation would result if the aerial were driven up to its limits. The greatest advantage of employing an operational amplifier I saw in the typical feedback of those amplifiers from output to input which is rather difficult to achieve in active aerials using few discrete active components. This feedback would allow to pre-distort the input signal to deliver an output almost identical to the original wave form.

Table 1

Operational Amplifier	OP27	LT1252
C1	2,6 pF	16 pF
C2	9 pF	4 pF
R1	150 kΩ	0...47Ω
R2	1 MΩ	12 kΩ



Active Aerial using Operational Amplifier

According to table 1 the circuit in fig 1 can be used in two different ways. When using the OP27, R1 and C2, the input capacitance of the OP27, will form an RC low-pass filter with a cutoff frequency of about 500 kHz. Supply current is just 4 mA. As the cutoff frequency of the OP27 is 8 MHz the cutoff frequency may be increased by reducing R1. The antenna area C1 can be as small as 900 square millimeters. Following the example given by PA0RDT the circuitry and the aerial can be built or etched on the same pcb.

The LT1252 is an operational amplifier with a cutoff frequency of 100 MHz. Wayne Burdick, N6KR, has used it already in 1997 for his SST QRP transceiver. This IC can be employed to realize an active aerial operating from 10 kHz up to 30 MHz. R1 will be zero in this case, or have a low value just to serve as a protection resistor for the clamp diodes D1 and D2 in case of a dangerous high voltage inrush. The value of the feedback resistor R3 in fig 1, in spite of being equal for both operational amplifiers in this example, depends on different considerations, according to sources [4; 5; 6]. As the output resistance of an operational amplifier becomes very low due to the feedback applied, resistor R5 provides a match to the cable impedance and also decouples the feedback path from the capacity of the cable, important for the stability of the amplifier [5]. Current drain of the LT1252 will be 10 mA.

Some readers may wonder about the low value of R2 in this second solution. The problem with this large bandwidth aerial is that the atmospheric noise at 10 kHz is up to 50 dB higher than at 30 MHz. If the active antenna area is reduced to avoid overload of the aerial at low frequencies, sensitivity at HF will be lowered correspondingly. The reduction of R2, however, is a means to reduce sensitivity at lower frequencies but to keep the antenna area large for better sensitivity at HF. Keep in mind that the capacitive divider C1/C2 will also lower its reactance towards higher frequencies. With this solution the antenna area may be made as large as 6000 square millimeters without overloading the aerial.

The performance of the antenna area concerning intermodulation can be controlled without the need of a spectrum analyzer. When intermodulation is caused by strong HF broadcast transmitters in late afternoon, carriers may appear at VLF almost every 10 kHz. If medium wave broadcast transmitters are the cause of intermodulation in the evening, other carriers may show up at VLF almost every 9 kHz. Furthermore, anybody may calculate the mixing products of strong local radio signals (f1 +/- f2; 2f1 - f2; 2f2 - f1) and try to detect them in a general coverage receiver. The aim should be to reduce these carriers or mixing products by reducing the antenna area (and/or R2) until they are barely discernible and will not harm normal reception on these frequencies. After doing this, sensitivity at VLF should be controlled and R2 altered if necessary. For optimum sensitivity at VLF it should be possible in a noise-free environment and installation to receive the signals of the russian "Omega" navigation system (short CW dashes) at 11,90, 12,65, and 14,88 kHz. Receiving these signals is almost a prerequisite for good reception of SAQ. It should be noted that the output of an active aerial will increase by about 6 dB when its height above ground is doubled. This may also influence the optimum permissible antenna area.

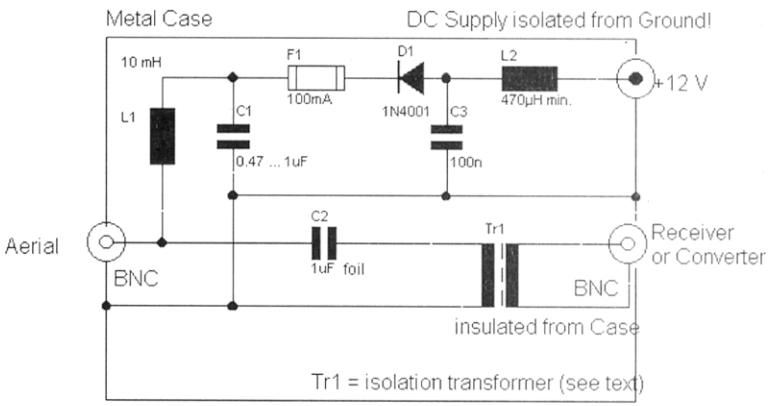
How we can relate the antenna area of the pcb to a capacity in pF? According to PA0RDT an area of 1200 square millimeters corresponds to a rod or whip aerial of 30 cm length and 2 mm thickness and will have a capacity of 3,2 pF.

The capacitiy of a whip aerial CA may be calculated using the formula

$$CA \sim \frac{55pF*h}{\ln(1{,}15*h/D)}$$

In this formula h is the length and D the thickness of the whip, all dimensions in meter. This formula has also been used to calculate C1 in table 1. C2 has been taken from the datasheets plus 1 pF for protection diodes D1 and D2.

Construction of the active aerial follows the example of PA0RDT. The PCB containing aerial and circuit is housed within a plastic drain pipe, with a BNC connector (and a BNC grounding lug for the screen contact) mounted in the lower end cup. My experimental models are using a pipe diameter of 50 mm because locally available. The picture may illustrate this. The small tube in the upper left, with a length of 105 mm, is sufficient for the OP27 aerial. The PCB measures 85 mm x 45 mm, about 20 mm length are needed for the antenna area. The LT1252 aerial will need the short tube and an additional longer tube of 215 mm length. For ease of changing antenna areas this PCB has been divided into two parts, 70 mm x 45 mm for the circuit and 135 mm x 45 mm for the aerial; both to be screwed together with an overlap of 10 mm. The PCB with the circuit is soldered to the BNC connector at the lower end, either directly or via short semi-stiff wires. Therefore two solder pads have been provided at the lower end, one in the centre and one on one side, corresponding to the contacts of the BNC connector and its grounding lug. I have preferred to round the upper end of the active aerial, to avoid any peaks or discontinuities in the surrounding electric field.



Power Feed in Metal Case for Active Aerial

Fig 2 shows the circuit to feed the active aerial via the coaxial cable. L2 prevents HF picked up by the 12 V line to be coupled to the receiver. Because of this danger a metal case should be used for the power feed unit. D1 is a protection against wrong polarity. For low-noise reception below 80 kHz the isolation transformer Tr1 may be necessary for low noise reception, when the cable braid is grounded not only outside the house, as demanded by PA0RDT, but also via a safety ground of the receiver in the shack. In this case an isolated BNC connector has to be used at the receiver output of the case. For VLF reception both

windings of Tr1 should have an inductivity of about 1,5 mH. If the input impedance of the receiver or converter should deviate from the cable impedance Tr1 should be altered as necessary.

When comparing active with passive aerials at HF one will find that some stations deliver a signal differing by just an S-unit or two whilst other stations perform extremely different. This is due to the angle and the polarisation of the incident wave. Therefore many manufacturers combine active whip aerials with dipoles. In this respect the simple active whip aerial seems to be reliable below 1,6 MHz only, where vertical polarisation is employed in most cases.

[1] http://www.alexander.n.se

[2] Infos about the Mini Whip: roelof@ndb.demon.nl

[3] http://www.vlf.it/op027a.htm

[4] www.analog.com Datasheet OP27

[5] LTC Design Note DN46 "Current Feedback Amplifiers Do's and Don'ts" by William Gross www.linear.com

[6] www.linear.com Datasheets of LT1252 and similar operational amplifiers

The Softrock RxTx SDR QRP Transceiver

Jan Verduyn G0BBL

Several thousand Softrock 40 Software Defined Radio kits have been built since late 2005, thanks to the efforts of Tony Parks, KB9YIG and Bill Tracey, KD5TFD. The receiver hardware kit is simple, consisting of just a sampling detector and a crystal oscillator, followed by a low noise AF amplifier. However overall performance is excellent through the use of Digital Signal Processing (DSP) in the Personal Computer. Indeed many QRPers are experimenting with Software Radio as it allows us to do "lots more with less".

Once the Softrock receiver kit was produced, one question often asked was when a SDR Transmitter would follow. With help from G8BTR and M0PUB, we started work on an SDR transmitter in the latter part of 2006 and the result is the RXTXv6.1 SDR transceiver. The circuit diagram and building instructions for the RXTX transceiver can be downloaded from the Softrock 40 internet site (ref 1).
Specification of the RXTX 40 m Transceiver is: Coverage 40 meter band in CW or SSB mode from 7000 kHz up to 7075 kHz using a soundcard with a 48kbps sampling rate. Coverage is extended to 7095 kHz with a 96kbps soundcard. Two crystals are provided and a jumper or switch is needed when moving from the CW to the SSB portion of the 40 Meter band. The kit also allows coverage of the 80 meter band from 3500 to about 3545 kHz, however an external TX LPF with a cutoff frequency of 4 MHz needs to be inserted to make sure no harmonics are transmitted on 40 meter band.
The RXTX kit is available for a number of bands direct from KB9YIG via the internet (ref 2) and the 40/80 meter version from G-QRP club sales (see below).

PA Circuit: The basic 1 Watt PA circuit is shown in Fig 1 as this may of interest for other QRP TX designs. Originally the PA stage consisted of a single 2N3866 in class AB, however we found three problems: Firstly RF output power was low, varying from 300mW to over 700mW depending on the manufacture of the 2N3866 used. It is clear that various makes of 2N3866 are not equal!! Another problem was that both carrier and 2nd harmonic suppression were measured at about -38 to -40dB, short of the -43dB required by the FCC. Tony Nailer G4CFY described similar issues in his design for a DSB QRP transmitter in a recent issue of Practical Wireless.

A suitable solution is to use a pair of BS170 FETs in push-pull, which easily delivered over 1 Watt RF Output power. Push-Pull operation and higher RF output results in harmonic and carrier suppression improving to -48 to -50dB, well within the regulatory requirements. The BS170 transistor is in a plastic TO92 package with a maximum dissipation of 500mW therefore some heatsinking is needed. Tony's kit uses a ? inch brass screw, washer and nut, which is more than adequate even for continuous operation at full output power, for instance when operating PSK. So far failures of PA transistors have been rare, even though several hundred RXTX kits have now been shipped. 2nd and 3rd order IMD performance is quite respectable at -38 and -28dB below PEP. Tom DG8SAQ has analysed the TX circuit and published the results on the Web. (ref 3).

Construction: Building the RXTX Transceiver kit should take about 5-8 hours and should be within the ability of amateurs with some previous kit building experience. Please note some 25 0.1uF Capacitors and all 7 ICs are surface mount devices, requiring a fine tipped soldering iron, antistatic precautions, good eyesight and a steady hand.

Computer and Software requirements: Whilst the Softrock 40 Receiver may be used on a modest 500 to 700 MHz Pentium Computer running the popular Rocky Software, the RXTX transceiver will need as a minimum a 1 GHz to 2GHz PC on Transmit. Another requirement that the PC Soundcard has Line-in, Line-out as well as a Microphone input socket. Currently two Software packages support the RXTX Transmit capabilities. One is a special version of PowerSDR adapted by Bill Tracy KD5TFD whilst KGKSDR has been developed by Duncan Munroe M0KGK (ref 4). Fig 2 shows the required connections between the RXTX board and the Personal Computer. A certain amount of computer knowledge will be required when initially setting up the program and the services of an experienced PC user who has an interest in SDR will be essential. However once the RXTX transceiver has been setup, those with somewhat limited PC expertise should be able to operate the RXTX SDR transceiver.

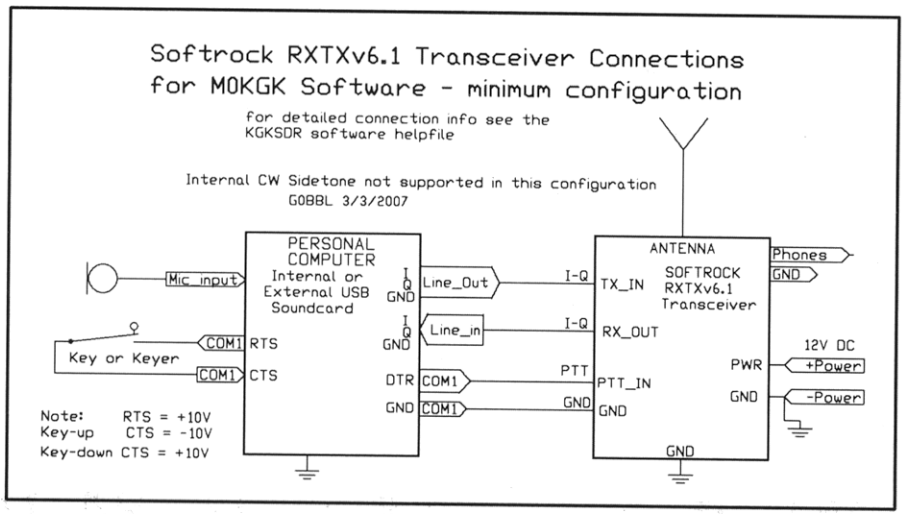


Fig 2 Basic Interconnections

Commissioning: Before the RXTX is used on the air it is essential that the purity of the TX signal is checked and the TX image rejection adjustment is carried out. A suitable method is to transmit a carrier from the RXTX to a dummy load and use a second receiver with S-meter to monitor to the transmitted signal. For example when transmitting a carrier on 7066 kHz (+10 kHz above the suppressed carrier on 7056 kHz) the TX image signal will also be transmitted on (7056kHz – 10kHz) = 7046 kHz. Tune the monitoring receiver to the wanted signal on 7066 kHz and position a short wire connected to the Antenna input of the monitoring receiver near the dummy load until a S9 plus 10dB signal is displayed on the S-meter. Next tune to the unwanted TX image signal on 7046 kHz and adjust the TX image rejection control in the software for minimum S-meter reading. Typically the S-meter reading will be between S3 and S5 after adjustment. TX image rejection calibration should be done and checked at a range of frequencies (+/- 20, 15, 10 and 5 kHz) above or below the Carrier Frequency. If the TX image signal is same strength as the wanted TX signal and cannot be reduced then check whether both TX I and Q signals from the PC are present in the RXTX. TX Carrier suppression is checked by tuning the monitoring receiver to 7056 kHz and verifying that the S-meter reading is S5 or less.

On the air results: A number of RXTX transceivers are now on the air and routine CW contacts over distances up to several thousand miles are made with a good antenna. Good quality SSB contacts are also reported, however with 1 W RF any QRM on the band quickly affects QRP SSB signals. Several operators are using the RXTX transceiver very successfully on PSK data mode. The narrow bandwidth of this mode compensates for the QRP power and cuts through the QRM. I would like to thank John G8BTR, Alan M0PUB and Tom DG8SAQ for their help in the development of the RXTX prototype and Bill KD5TFD and Duncan M0KGK for making software available to support TX operation. Special thanks to Tony KB9YIG for his efforts producing great SDR kits for the amateur radio community at very modest cost.

References:

1) http://groups.yahoo.com/group/softrock40/ You will need to register with yahoo to get access to the Files area. Select the RXTXv6.1 folder to access the kit documentation.

2) The RXTXV6.1 transceiver kits for various bands may be ordered direct from Tony Parks KB9YIG email address raparks@ctcisp.com. Current price of kit is $32 US/Canada and $33 for DX. Price includes the postage cost. Payment is made through Paypal. The 40/80m version is available through G-QRP Club Sales – see below

3) http://www.mydarc.de/dg8saq/PAJan/index.shtml Analysis of 1W PA by Tom Baier DG8SAQ

4) http://www.m0kgk.co.uk/sdr/download.php - Duncan's KGKSDR software can be downloaded from here. The link to the active KGKSDR user group is: http://groups.yahoo.com/group/kgksdr/

From G3MFJ – Club Sales:

As mentioned above, you can get one of these kits from me. The price is £18.00 including postage and packing. The kit includes the PA as mentioned above in Jan's article.

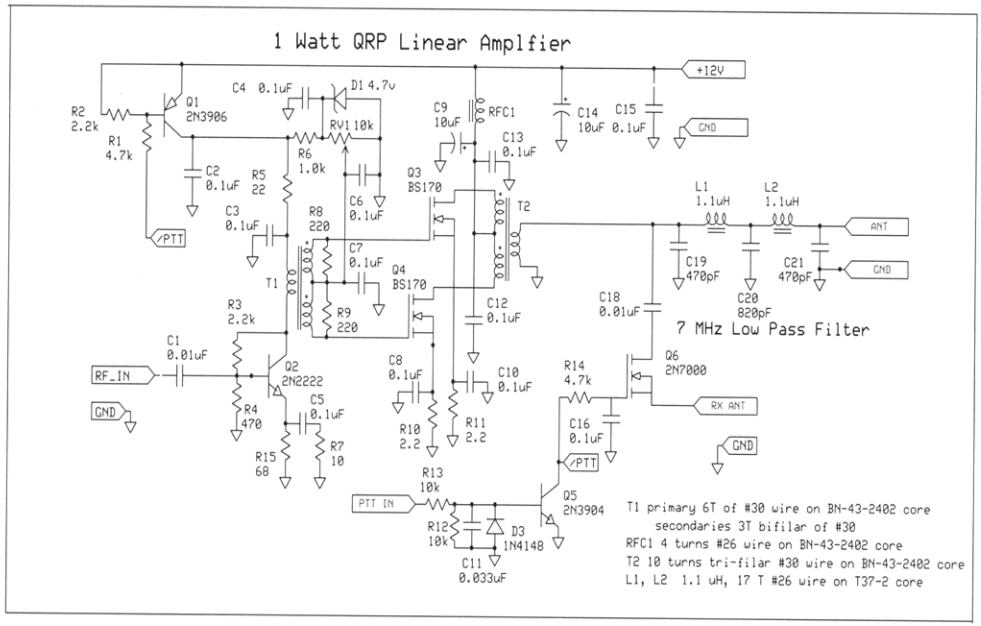
You will need a suitable computer running a recent version of Windows, and you will need access to the internet to download all the construction and set-up information as the kit supplied does not include these. The supplied kit does NOT include any of the cables and plug/sockets needed to connect it to the computer.

Finally, although the majority of the components are through-hole, the decoupling capacitors and all the ICs are surface mount, so you will need all the appropriate tools for soldering these small components – and a steady hand!

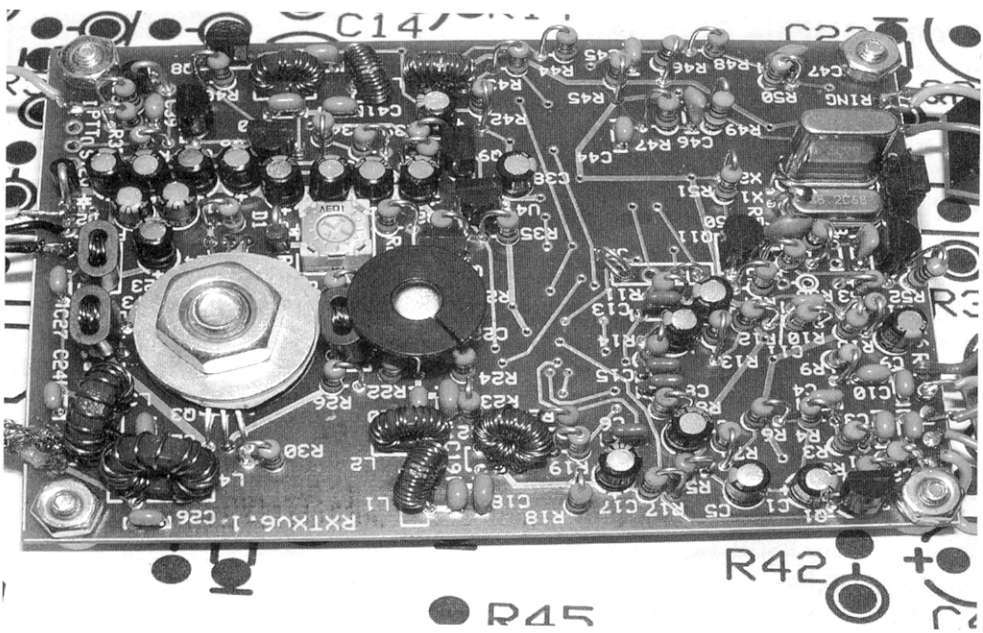
11th RED ROSE QRP FESTIVAL.

Sunday 3rd June, 2007. 11am to 4pm.

Location - Formby Hall, Alder Street (off High Street), Atherton, Manchester. M46 9EY Purpose - A friendly, annual event, to promote low power amateur radio operating and home construction. Features - Easy access from all directions, Trade and individual stalls, Club stands, including RSGB, GQRP, Low cost "Bring & Buy, Sales of new and surplus equipment & components, Hassle free. Large spacious halls at ground level, Huge free car park, disabled facilities. Delicious refreshments at QRP prices! Comfortable, well stocked lounge bar. Talk in on S22. Admission STILL £1.50p - Some tables available at £7 but please book early. Les Jackson, G4HZJ g4hzj@ntlworld.com 01942 87063



1 Watt QRP Linear Circuit



Softrock RxTx Kit Board

ANTENNAS - ANECDOTES - AWARDS

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

IT HAS BEEN A LONG, LONG TIME!

It was 31st May 1937 when I received my licence as G8PG. Nineteen months later I passed the examinations to become a Merchant Navy Radio Officer, and on 21st January 1939, set off on my first voyage. On 3rd September 1939 I received the signal that WW2 had begun. The next 6 years saw service in many places, and some narrow escapes. I was back ashore by the end of 1945 and G8PG was on the air again by mid-1946. There followed a period of coast station, aircraft ground station and part-time military radio work, then a change to being a Technical Author and later Technical publications manager. Also part-time teaching of students for the ham licence.

By 1971 I was getting just at little bit bored with ham radio when, on a whim, I bought a second hand PM3A QRP rig. One weekend using that rig brought all my enthusiasm back and made me a confirmed QRP man! A couple of years or so later George, G3RJV, announced he was forming G-QRP C, and I became Member 004. George soon had me working at things like the Award Scheme, Winter Sports etc. Later came the work with QRP people in many countries to produce an international framework for QRP working covering calling frequencies, power for various types of emission and so on. After that came a period of slowly establishing relations with QRPers in the then Soviet Block countries and seeing their QRP movements grow in strength and freedom. This brought one into contact with some wonderful people (too many to name here) and was enormously rewarding. Add to that all those met through antenna work, Award applications and other contacts and it has been a wonderful experience. Now with me having reached the age of 87 and my call the age of 70 it is time for someone younger to take over and for me to say

72 73 **ES CU QRP SN I HOPE**

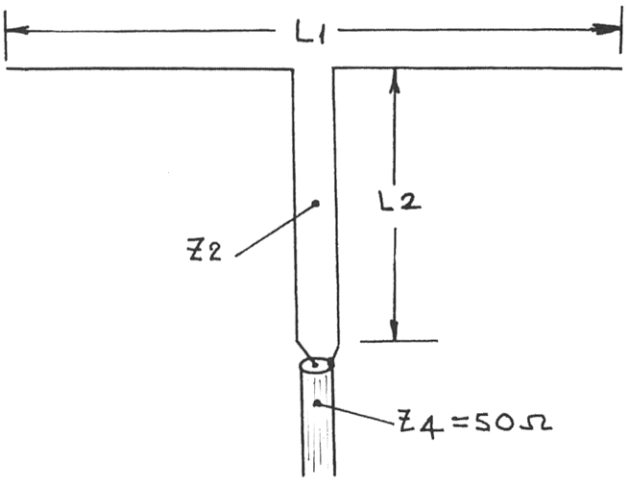
(But remember without the vision of G3RJV it would never have happened)

The ZS6BKW Antenna – from the horse's mouth

Brian Austin G0GSF (ex ZS6BKW) 110 Frankby Road West Kirby CH48 9UX

Imagine my surprise when told by a friend who'd caught his Sprat early that my old call sign featured prominently within issue No. 129. Sure enough, when I opened my copy, there it was: ZS6BKW that I'd not used in twenty years. Then I realised that it was my antenna and not me that was under the spotlight and so I suppressed my welling pride and read on with interest! How, I wondered had the antenna fared when Martyn G3UKV put it to the test? (See reference 1). Gratifyingly, it stood up very well and seemed to meet some useful needs. It might therefore also be useful if I provided a little background information about the antenna and also commented on how sensitive or critical the particular lengths and impedances of the ZS6BKW happen to be.

As pointed out by G3UKV, the basic ZS6BKW antenna is related to the famous G5RV first published in the RSGB Bulletin in 1958 by Louis Varney (ref.2). The G5RV is based on a clever idea in which a length of transmission line is used as a type of automatic ATU to produce an acceptable impedance match to a low impedance line on a number of HF bands. The beauty of the configuration is that it lends itself to careful analysis and therefore to optimisation. And that's where I started when I first looked at it seriously more than twenty years ago.



In my analysis of the G5RV configuration using both the Smith chart and my own computer program written in the early 1980s (and more recently using EZNEC) I always called the antenna proper L1 while the "series section matching transformer", that length of transmission line hanging down from its centre, is called L2 and its characteristic impedance is Z2. These details are illustrated in Fig 1.

Since 50 ohms is the impedance of coaxial cables most commonly used these days, rather than the 72-ohm twin-lead that Varney had in mind, I chose to make Z4 equal to 50 ohms. To qualify as a multiband antenna the combination of L2 and Z2 must be able to transform the impedance presented by L1 at its centre to some value relative to Z4 that'll satisfy some defined SWR criterion on all the bands of interest. I chose the upper SWR limit to be 2:1. This probably means that the antenna could be used without any other form of ATU since it's around about the point where the protection circuits kick in. My design target was clearly to have this happy state of affairs occur on as many HF bands as possible. G3UKV's measured results in Sprat Nr129 showed how well the antenna actually performed in practice. His finding that it also worked on 6m is an added bonus that I'd not considered but, as will be seen, it is certainly true that it does.

Anyone using the classical G5RV without an ATU will know that it only matches well on two of the HF bands: 14 and 24MHz. On all the others the SWR is never better than 3 or 4:1 and on most of them the best match actually occurs beyond the band limits. To be able to design the antenna (i.e. choose L1, L2 and Z2) so that the optimum match occurs within as many bands as possible requires a knowledge of the impedance at the centre of L1 on all HF bands. Such data were available in tabulated form in 1980 when I commenced my analysis, though probably not in 1958 when Louis Varney did his. Nowadays they can

easily be determined by NEC and all its variants. Since L2 is just a transmission line it will act as an impedance transformer and the very best way of visualising that impedance transformation process is to use the Smith chart. For those who might be interested to see how this was done I refer you to my paper published in 1987, (ref. 3).

That paper also described how the Smith chart was used to design the antenna system and the beauty of the method is that one can see almost at a glance which combinations of L1, L2 and Z2 will work and then, if needs be, change them to suit particular objectives. Any method that allows such visualisation of what is a complex process has lots going for it and that was most certainly the case here. Since computers are supposed to do just what you tell them to (!), one can then write a program that'll test every sensible combination of those variables at will, and that is what my program did. And it was the Smith chart that made all this happen reasonably quickly by providing the "sensible combinations" to start with. What emerged were the dimensions of the antenna system that has since become known, at least in some circles, as the ZS6BKW.

It will've been noted from G3UKV's article that both L1 and L2 in the ZS6BKW differed from those in the G5RV. Whereas L1 was about three half wavelengths long and L2 a half wavelength on 20m in Louis Varney's antenna, in mine they bear no simple relationship either to each other or to a particular amateur band. It turns out from the analysis that the optimum lengths of L1 and L2 are about 1.35 and 0.62 on 20m. In addition, there is a range of values of Z2 that will produce the best match on five HF bands and over the widest possible bandwidths within those bands. The obvious question you will ask is how critical are these particular lengths. Fig 2 shows the limits of L1 and L2 that'll produce a better than 2:1 SWR on five HF bands. It must be remembered that those lengths of L2 in Fig 2 take no account of the velocity factor of the transmission line used in practice. So its actual physical length will be shorter than those shown here by an amount equal to that velocity factor, or about 0.9 for typical slotted lines.

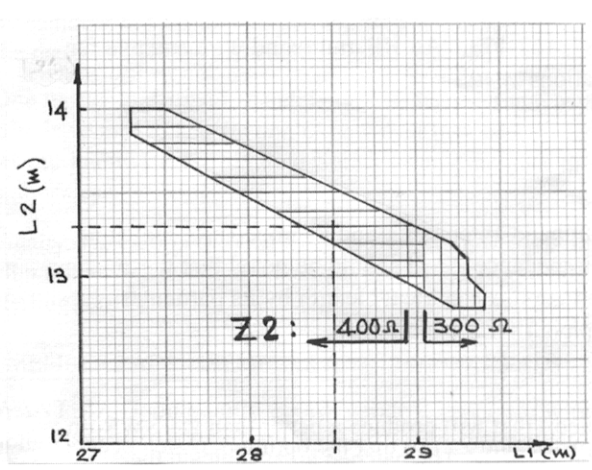


Fig 2 also shows the sensitivity of the multiband match to the value of Z2. It was clear from the analysis that 400 ohms was about optimum, though Z2 = 300 ohms is marginally better for the longest lengths of L1. If values of L1 and L2 close to the extremities within Fig 2 are chosen, the effect is to narrow the bandwidth over which matching will occur in some of the HF bands.

A very effective combination is shown in Fig 2 where L1 = 28.5m; L2 = 13.3m x V.F; and Z2 = 400 ohms. When erected horizontally at 10m above typical urban ground this antenna produced a better than 2:1

SWR on five HF amateur bands, viz. 40, 20, 17, 12 and 10m. The frequencies yielding the best match, and the 2:1 SWR bandwidths on each, are shown in the following table.

Band	40	20	17	12	10
Centre Freq. (MHz)	7.10	14.20	18.10	24.92	28.97
SWR min.	1.1:1	1.1:1	1.3:1	1.4:1	1.4:1
Bandwidth (kHz)	360	270	380	260	400

What about 6m? Martyn G3UKV's discovery that the ZS6BKW also matched well on the 6m band intrigued me so I tested it with EZNEC and sure enough it does. This particular version above produced its best match at 51MHz with SWR= 1.5:1. It also had a whopping gain of 12dBi with four major lobes at about 20 degrees to the wire in azimuth and tilted up at 25 degrees from the ground when the antenna was 10m high. Such features may well be useful to some.

So, if you want a simple antenna that will work on five HF bands without an ATU and on all of them with one, then maybe this is it.

References.

1) Martyn Vincent, Sprat, 129, Winter 2006, 32 -33, "The ZS6BKW Multiband HF Antenna Revisited".
2) Louis Varney, RSGB Bulletin, 34, 7, 19-20, 1958, "An effective multiband aerial of simple construction".
3) Brian Austin, J.IERE, 57, 4, 1987, 167-173, "An HF multiband wire antenna for single-hop point-to-point applications".

Captions

Fig 1: The configuration of the multiband antenna L1 and its impedance matching section L2 of characteristic impedance Z2. It should be noted that the physical length of L2 is less than its "electrical" length by its particular velocity factor VF; i.e. L2 (phys.) = L2 (elec.) x VF.

Fig.2: The lengths of L1 and L2 (elec.) that will produce a better than 2:1 SWR on five HF bands between 7 and 28 MHz. The hatched areas indicate the value of Z2 required to achieve this optimum matching condition. L1 < 29m requires Z2 of 400 ohms whereas antennas longer than 29m work better with Z2 of 300 ohms.

Membership Secretary News

Tony Fishpool G4WIF

- New French Representative wanted.
- New Subscription renewals
- New Standing Orders
- New Paypal

Please look carefully at your Sprat label. Does it at least say "2007"?
If it does not then this is your last Sprat unless you renew your subscription.

After more than 13 years our representative in France will be stepping down at the end of 2007. Jean-Michel Yeromonahos F5OQO has done a superb job and we will miss him. If you live in France and are interested in becoming our representative please contact Tony G4WIF.

I get a huge amount of postage during the months of January & February – enough to fill several buckets which I work through each day. In addition there are renewals via email from our overseas representatives and then sheets of bank statements to work through looking for standing orders. For this reason, members should not worry that their cheque hasn't been presented or their credit card not debited – it will eventually. Your clue is the date on the label of this issue of Sprat. If you have paid and I haven't updated your status by this issue then (and please only then) contact me. There really isn't time for me to deal with letters (usually without the courtesy of return postage and envelope) asking why cheques haven't been cashed.

We encourage payment by standing order which must be timed for 15th January. In order that your membership is updated it is important that we can identify who you are from our bank statement. Sometimes banks have corrupted references and then we rely on the name of the payee to corroborate identity. If there is room for your callsign include that too.

So please ensure that those two (or three) pieces of information are clearly stated by your bank. Look on your statement and see what it says. Is your membership number quoted? If you pay by standing order and your membership status has expired on this sprat label then that will be the reason why – we just couldn't tell it was you!

One further thing about standing orders. We see some payments year after year from members who have moved and we don't know their new address to send their Sprat. If you move please let me know. I cease sending Sprats to any member that has their copy returned by postal authorities.

Finally, the club is truly 21st century as we now have online payments for membership (and club sales). See www.gqrp.com/paypal/ - Please note that we can only accept funds in pounds sterling (GBP).

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

WANTED: Good quality 100pF variable capacitor with threaded shoulder to fit a chassis hole. G8OTW/M0LOG, 9 Charminster Cl. Great Sankey, Warrington. WA5 1JY.
Tel: 01925-659946

WANTED: Small commercial all-band rig at reasonable price. Ted, G3GWC,
Tel: 01737-832263

Credit Card payments to the club (and standing orders)

Graham G3MFJ – Club Treasurer
g3mfj@gqrp.co.uk

As you will all know, the club is registered for Credit Card payments. So far, these have been very little trouble – except for the bank charges they involve of course. I say so far, because we are now having difficulties. The banks have got rid of most of their problems with fraud by bringing in "chip 'n pin", but as we are mail order only, we are not in this loop. It means that for every transaction, I have to ring the bank and request approval for it. Not only is this a pain (I really have better things to do!), but it seems to ring alarm bells at the members' banks as quite a few members have had their credit cards frozen as some alien (me!) has tried to deduct a measly amount from their account, and usually at some odd time (when I have a spare minute).

The net result is that I have decided that although we will carry on with Credit Card accounts, I will not accept them when the member has an easy alternative means of paying. This means that if you are a UK member, you cannot pay your subs, or order from club sales using your credit card. If you are a member in a country where we have a rep, then you will have to pay your subs through the rep. We have reps in a lot of countries now – look at the members' handbook. For anyone else, then a credit card is ok. I will still accept telephone orders for sales, but you will have to promise to send me stamps or a cheque asap. For those with Internet access, we now have PayPal, and you are encouraged to use this method if possible. The relevant email address is g3mfj@gqrp.co.uk.

I'm sorry about this – it's not really our fault, but it has been very embarrassing when I have had to apologise to a number of members because we have caused their bank to freeze their credit card.

Whilst I still have my treasurer's hat on, I have just done my first lot of standing orders (over 100 full bank statements!), and there are quite a few that have caused me problems – mainly no club number, but a few others as well. I shall be sending, by post, a new, ready filled in (as far as I can) standing order form to all those who are affected by this. Please will those members who get one from me, fill in the rest of the form and send it to their bank – requesting that the bank destroy the old standing order – thank you. I take my hat off to Tony's & my predecessors – they must have struggled every year!

Thanks

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

FOR SALE: Realistic DX394 Receiver, recently bought reconditioned from Waters & Stanton for £99. £60 inc postage. John D Noble, 35 The Queen Mother Court, Borstal Rd. Rochester, Kent. ME1 3JF. [01634] 401472.

RESTORATION PROJECT: Old Telequipment double beam scope. All working, but some leaky caps. in power supply.4" Dia.tube. £ Donation to club funds. Alan G3SLS 0151 420 1183 (N. Cheshire)

COMMUNICATIONS AND CONTESTS

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

2006 WINTER SPORTS

There's no doubt that HF conditions were very poor, which I'm sure did not encourage the high level of participation normally enjoyed during this event. I received 23 logs, which represents a significant drop in numbers compared to previous years, but that's not surprising in the circumstances. As band conditions improve over the coming years (and they certainly will) I know Winter Sports will prove as highly popular as ever. However, it's worth noting what George **GM3OXX** has to say on the subject: "The HF bands may be poor, but that's no excuse for not making LF QSO's, Hi!". He also comments that he read in a well-known newsletter that 200 Club members had signed into the Internet chat room during a single evening. "Would have been better if they'd called in on the bands!"

The following members, to whom I am very grateful, sent me their logs: **G0KQK, G0KRT, G0OTE, G0TPH, G3JFS, G3MCK, G3NUA, G3VTT, G4ARI, G4IKR, GM3OXX, GM3YLN, GM4XQJ, MI0BPB, AB8FJ, DK5RY, DL2BQD, DL6EBP, EI8FH, IK2CGH, PA0RBO, W2JEK** and (last, but definitely not least) **W3TS**. Every log is a winner in its own right, representing QRP fun time spent on the air, and many include fascinating detail, some of which (as much as space will allow) I reproduce here for you to read:

For Snip **G0KQK** it was his first G-QRP event and he comments on the friendly and relaxed nature of the event that, he says, has to be the QRP highlight of the year. Alan **G0TPH** included some 2m QRP QSO's in his log, reminding us that the event is not only for LF/HF contacts. Peter **G3JFS** made QSO's from 160m to 10m using 8 different modes! Gerald **G3MCK** ran a homebrew station called "Son of Sipi", inspired by a 1960's Finnish parliamentary set called Sipi. The station consists of a JBS Tx with an 80m version of the S7C by W7ZOI from EMRFD. Colin **G3VTT** declined to venture out into the poor weather this year, but hopes for better Wx and to be out and about during the next Winter Sports. Tim **G4ARI** comments that his wife goes wobbly at the knees whenever he works George Clunie. Talking of whom, George (in Clunie) **GM3OXX** worked 5B4AGN for a new 2-way QRP country, and gave G3BST his first ever 160m QSO despite the fact that he has been QRV since 1947! G3BST was using 20W and an indoor mag loop.

Using his K2, Chris **GM3YLN** worked W3TS and 5B4AGN, and Brian **GM4XQJ** had a 160m QSO with OY3QN. Albert **AB8FJ** maintained his "Get The Rigs On The Air" style of Winter Sports operating, and this year added a Howes AT-160 to the list, making two 160m AM QSO's with it. His Tuna-Tin 600mW Tx and Grundig YB400Rx produced a couple of QSO's on 7044kHz. For Walter **DL6EBP** it was his first Winter Sports, while the highlight for **EI8FH** was working DK3UZ who was using an old Drake 2-NT Tx and ex Merchant Navy Siemens E311 Rx. Mike **W3TS** had no fewer than 5 QSO's into Europe, despite the poor conditions, proving that Dx contacts were still possible.

As usual, the log from George **GM3OXX** was truly outstanding, in terms of the 299 QSO's he made, the Dx he worked, and the stories behind the log entries. He is a frequent winner of the

G4DQP Trophy, but was pipped at the post this year by Peter **G3JFS.** To summarise Peter's log, he made 235 QRP contacts with 49 countries in 5 continents using CW, FM, SSB, Hellschreiber, PSK31, PSK63, Olivia and RTTY. The antenna used was a 66ft doublet with balanced ATU, or a rather bent 120ft E/F with Smartuner. Power output was 4W CW, 5W max for FM and data modes, and 5-10W pep SSB. The rigs used include a homebrew single valve Tx.

My thanks go to all who supported the event, and I'm sure we all congratulate Peter **G3JFS** as the deserved winner of the G4DQP Trophy for Winter Sports 2006.

2007 LOW POWER SPRING CONTEST (SS Contest)

My thanks to Alex G4FDC / OM6SA for the following information:

Organizer : Slovak Amateur Radio Association (S.A.R.A.) - QRP Section.
When : **Easter Monday, 9th April 2007.** (Yearly every Easter Monday)
Time : **14.00 - 20.00 GMT**
Operators : Single Operator Only.
Mode : CW (A1A, Telegraphy)
Bands : 1,8 3,5 7 14 21 and 28 MHz on IARU recommended Contest Band Segments.
Power Categories: **A : 1W C : 5W Q : 25W X : 50W Y : 100W** These are maximum outputs.
Band Categories : **1. Single Band 2. Two / Three Bands 3. All Bands**
Exchange : RST, IARU Locator (first four designators) and Power Category. (example: 579 JN98 C)
Reception of RST is sufficient from non-contest stations. *Ask them also for a Locator. You could gain a multiplier.*
Points : **3 points per QSO with own continent**
9 points per QSO with other continents
18 points per QSO with OM station
Multipliers : are scored per band and consist of:
a. IARU locator - first four designators (example : JN98)
b. Prefix (according to WPX rules).
Scoring :
1. The final score is the total QSO points for all bands added together, multiplied by the number of multipliers from all bands added together.
2. Unmarked duplicates are penalised by deduction of ten times the QSO points claimed.
3. Cross-band contacts do not score.

Logs :
1. Separate logs, with separate page numbers, for each band
2. Log Sheets must be headed with Callsign, Band and page **x** of **n**.
3. Log pages should contain at least 40 QSO, with columns as follows:
Date, Time(GMT), Callsign worked, RST, Exchange sent, Exchange received, New Locator, New Prefix, and QSO points. Any RST column left blank will be taken as 599.
4. Logs from bands used but not entered in a particular band category will be treated as check logs. Please mark them "Check Log".
5. Sample Log and Summary Sheets available from the adjudicator on request. Send envelope with your address on it. Alternatively, use your own Log and Summary sheets. Check Logs from all stations not submitting an entry, will be appreciated

Summary Sheet : showing Contest, Date. Number of valid QSOs, points and multipliers on each band. Final score. Entrant's name, Callsign and address, Power Category, Band Category, IARU Locator, Output Power, RIG and ANT description, Signed Declaration.
Entries: Must be sent to the adjudicator: Radioklub OM3KFV, P.O.Box 3, 038 61 VRUTKY, Slovakia, Central Europe, and postmarked no more than 30 days after the end of the Contest. Indicate "SS Contest" on the envelope. E-mail address for logs in text format: <om3kfv@zoznam.sk>
Adjudication : Points may be deducted or entries disqualified or excluded for any breach of the rules or spirit of the Contest. The decision of the S.A.R.A. is final. Only one Power/Band combination Category per entry is permitted.

Awards: Certificates will be awarded to the highest scoring station in each Power/Band combination
Category a. In every participating Country and Nation
b. In each call area of the U.S.A., Canada, Australia, Japan and Russia

EUCW QRS PARTY 2007

Robert (M0BPT, FISTS ECM) has kindly sent details of this event, 23rd – 27th April, but space does not allow me to include them here. However, I will be happy to supply details if you drop me a line, or they are available on these Websites:
"www.m0bpt.pwp.blueyonder.co.uk" (follow the "Activity calendar 2007" link) and
"www.fists.co.uk" (follow the activity calendar link).

2006 CHELMSLEY TROPHY

I will include the results in the next issue of SPRAT. Any (very) late entries?

Items for inclusion in the next SPRAT should be sent by the beginning of May; in the meantime I hope you all have plenty of QRP FUN! 72 de QRPeter

2007 QRP CALENDAR

15th April Yeovil QRP Convention
23rd April to 27th April EUCW / FISTS QRS Party
9th Apr 1400z-2000z (Every Easter Monday) Slovak Low Power Sprint
30th Apr Last Day for CZEBRIS logs to G3XJS and OK1AIJ
17th May 1900-2300z (Each Ascension Day) 7th QRP-Minimal Art-Session
17th Jun IARU Region 1 International QRP Day Contest
16th Jul Last Day for International QRP Day Contest logs to G3XJS
6th Oct Rochdale QRP Convention
18th Nov 1300-1700z QRP Contest Community HOT PARTY (3rd Sun in Nov)
26th Dec - 1st Jan 2007 G-QRP Winter Sports

Please advise G3XJS of any errors, or omissions.

VHF Manager's Report

John Beech G8SEQ 124 Belgrave Road Coventry, CV2 5BH
Tel. 024 76 273190 or johng8seq@ntlworld.com

At a recent club talk we were discussing with the RSGB rep. activity on VHF. The consensus of opinion was that the lack of activity on VHF was down partly due to the old Class B licencees migrating to HF. However all is not lost. Two newish groups are promoting activity on VHF. One is the AM group, which have been a bit quiet of late and the other is SOTA, which has been running in its present form since 2002. It is basically an award chasing group which started as a UK National group but is now spreading world wide. For more information see: URL http://www.sota.org.uk/ & http://www.sotawatch.org/beta/

I can justifiably claim to have invented SOTA, though I have never had anything to do with the Award Scheme. Way back in the late 1980's/early 1990's we used to holiday in the Yorkshire Dales and I once did the Three Peaks Walk inside the time limit for the Badge (not that I claimed it), but I decided to take a 2m handheld radio with me and work a minimum of two stations from each of Pen-y-Ghent, Whernside and Ingleborough. This was done entirely un-announced. I have a mobile log book somewhere with a record of the contacts.

The current rules for award chasing stipulate a minimum of four contacts from each summit on any band to qualify an "activation". Chasers just clock up points by receiving activating stations. Summits have to be "Marylins" or higher and there are various grades and bonus points for Winter activations. Extra points can be gained by working "summit to summit" or S2S

Last Easter Simon Brown HB9DRV/GD4ELI & I activated all but one of the IoM summits (I declined one being overweight and having a dodgy knee) and I have since done the odd bit of chasing. There is a planned activation of these summits by a German station this coming Easter, but every weekend/bank holiday you will find people on hilltops calling "CQ SOTA" using anything from Top Band to 23 cm and possibly even 10 GHz. In order of popularity it is 2m FM, 40m SSB, 40m CW, 2m SSB & 5 MHz USB (NoV required) from a rough survey I have done.

For some reason 144.333 MHz is used as a calling frequency rather than 144.300 although there is nothing in the rules. I'm sure SOTA operators would welcome contacts even if you are not too bothered about collecting points.

Lastly most activations are QRP but not all, so be careful if you are going use SOTA contacts for an award that requires two way QRP contacts. You need to ask the activator what power he/she is using or look on the website as some stations are reluctant to send much information over the air for various reasons.

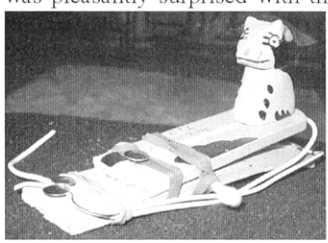
Good listening de John G8SEQ.

MEMBERS' NEWS

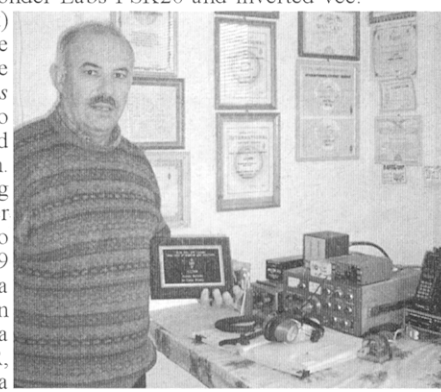
by Chris Page N4CJ (G4BUE)

312 Quail Avenue, Sebring, Florida 33872, USA.
E-mail: <g4bue@adur-press.co.uk>

Congratulations to **G3ICO** for a QSO with **K8CW** on 17m on 23 February with his K2 at 500mW output into a 2 x 20 metre doublet. George says the QSO followed a discussion on QRPp working at his local radio club the previous evening and that he regularly works into eastern USA with his K1 at 3W on 17m. **G3LHJ** made 126 QSOs and 35 multipliers in the ARRL DX CW Contest, which was an improvement on last year. **G1HSM** treated himself to a new FT-817ND for Christmas and had his first QSO with it running 5W on 4 January with **S51PL** on 20m SSB. Leon used, "A sort of dipole diagonally across the top floor bedroom, with the other conductor mostly at right angles to it, running under the eaves", and was pleasantly surprised with the 58 report he received.



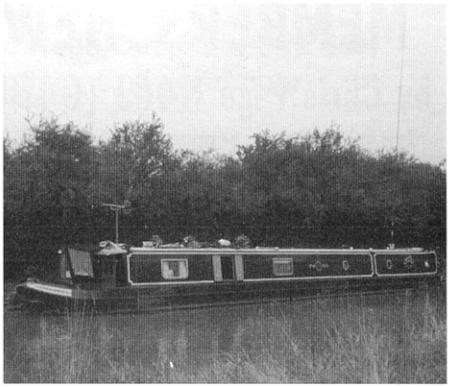
When **GOCWM** was QRV from Portugal in early 2006, his iambic keyer broke and Mike built the wooden one shown in the picture to get back on the air. He returned to Portugal on 7 November and his first QSO as **CT1/GOCWM** was with **GOPSE** who turned out to be just 550 yards away and also on holiday in Portugal! Mike's best DX has been QSOs with **W3QN**, **K1RX** and **W5ZR**. His antenna is a half-size vertical dipole. **K7TUT** was QRV as **YI9TU** with QRP until 12 December and again from early January for two months. Mitch's QSL manager is **N2OO**. **G8HWI** planned to be QRV for four weeks in February and March as **9H3JS** with a Small Wonder Labs PSK20 and inverted vee.



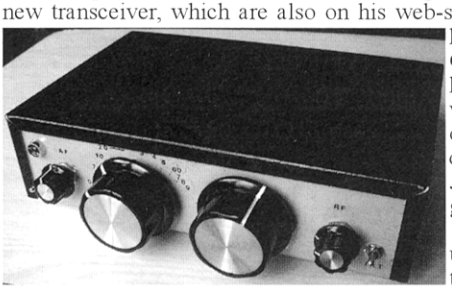
Congratulations also to **LZ2RS** (pictured right) holding the special plaque presented to him by the RSGB for winning the CW QRP DX section of the 21/28MHz Contest 10 times in a row - *thanks **GM4HQF***. And congratulations to **GM3OXX** who worked the VU7 DXpedition on 20, 30 and 40m and to **GM4YLN** who worked them on 15, 20 and 30m. Chris has also been working DX on 80m, including **6W1RW**, **9Y4AA**, **8P5A**, **ST2BF** and ex-member **4X4AN**, and on 24 January he worked **G3HBN** who was using a home-brew five-band rig with a 2N3819 running at just 20mW output! George reports a good week for DX in the middle of February when he worked **R1AND**, **DK8YY/6W**, **VP8/LZ1UQ** a new one on 40m, **TU2/F5ZDY**, **EA9EU**, **J2ØRR**, **5T5DY**, **5Z4/9A3A**, **KL7VO/VP9** QRP and quite a few USA QRP stations, but did not work the DXØ DXpedition, the one he really wanted!

AB8FJ in Ohio has built the Howes AT-160 TX and matching VFO and has been using it on 80m CW. Ted joined his local AM 'round table' on 3885kHz on 26 November and surprised all the other participants (5 to 104 miles distance) on how well the 2.5W AM carrier performed on the band. He used the DDS3 VFO to get on frequency and housed the TX in a Ten-Tec TP-50 case; he wonders if any other members have any experience of this TX? **M1KTA** is QRV for six months from 1 March as **HB9/M1KTA** while working in Zurich, and from some new SOTA peaks at weekends through the summer. **GM4CXP** was QRV 31 January/14 February as **EA8/GM4CXP** with his FT-817ND and 30 feet end-fed antenna a few feet above ground and tuned via a 'Miracle Ducker' against 20 and 15m counterpoises. Look for Derrick to be QRV from EA8 two or three times a year when he can take advantage of cheap flights. **G3VTT** was QRV 22 February/1 March as **EA8/G3VTT** with a K1 and K2 to a **W3EDP** wire and 40m dipole.

G3ILO is retired and lives on a 65 feet narrow boat and has been QRV with his K2 at 5W for about 18 months on various canals in England with a 33 feet roach pole vertical mounted on the stern, plus bits of wire to resonate on 80 and 160m (see photo above). Steve worked 99 DXCC in 2006 and has worked 55 DXCC so far in 2007, including 34 DXCC on 160m, the best being a VY2. Other DX has been **VU7RG** and **9M2MRS** on 40m and **9M2RS**, **ZD7BG** and **V51AS** on 30m. **G8SEQ** has moved his FT-817 and some batteries into a room at the back of his house in preparation for his convalescence. John has also put up a 40m Esseque antenna at a low height and might change it for a 60m version soon. He worked SOTA on 5MHz as well as PSK31 on 40 and 20m around Europe without an ATU! **MØHBR** (**N2CQR**) will be QRT from London this summer while Bill and his family move to Rome. He says the move will provide him with better short skip opportunities to the UK than he has now.



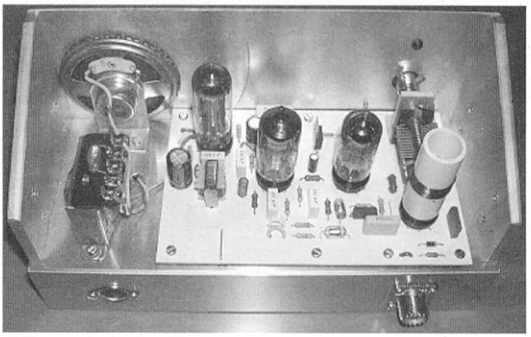
KB9JLO is building the BITX20 (6W SSB TCVR for 20m) and says there is a very active Yahoo group for the rig (<http://groups.yahoo.com/group/BITX20/). Farhan, from India (the originator), has a BITX20 web-site at <http://www.phonestack.com/farhan/bitx.html>. Dan says Doug Hendricks of QRP Kits plans to market a board mounted parts kit. The BITX20 is Dan's first real home brew project and the ease of the design, plus the vast number of people all over the world also building them, gave him enough confidence to finally try scratch building. The rig is easily modifiable for other bands and CW too. **G3OOU** is using a stub loaded 80m dipole fed with open-wire feeder that works down to 160m and is tuned with a wideband Z match, see <http://www.qsl.net/g3oou/id96.htm>. Bob has been doing a lot of homebrewing, including rebuilding a SB301 and some ideas on using the H-mode mixer as a self-contained module for his new transceiver, which are also on his web-site. The *Electronic Design Centre* link contains a host of interesting and useful ideas and projects. **G3JNB** has built the Walford Brent 1.5W CW TCVR kit for 80m and has been working all round Europe with it at night with his HF loop (see photograph on left - nice knobs, Victor!). He says the rig is a delight, covers 3503-3615kHz with a lovely old Jackson 150pF air-spaced 'condenser' and has a good IRT/bandspread swing.



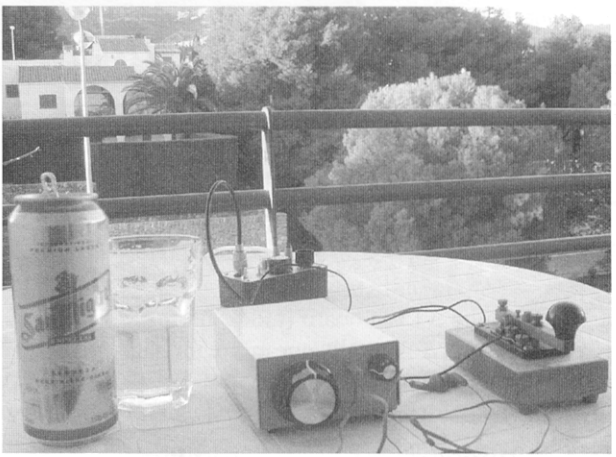
At the end of November **WA6HHQ** of Elecraft uploaded the free Windows control program for the W1 Wattmeter, <http://www.elecraft.com/software/W1/elecraft_w1_software.htm>. **AL7FS** says the 3W beacon he activated on 14 June 2006 on 28239.2kHz is now permanent from a better location and antenna. Jim says the message is "AK AK AK de AL7FS AL7FS AL7FS bcn" between four second pauses and reports are welcome to <beacon2@AL7FS.us>. **GØUPL** has moved his popular web-site to <http://www.hanssummers.com/>. A welcome back to the Club for **F5NZY** who is now QRV /PM (pedestrian mobile) CW with a FT-817ND. Steph is using a 'walkabout' antenna but has just ordered a 40 feet fibreglass pole to support a centre-fed antenna.

GM3MXN reports a replacement knob called the Kranker Knob is available for the FT-817 from Finger Dimple (**K8FF**) in the USA, cost $25 including shipping. Tom says, "What a difference it makes to the tuning, no problem with big fingers and takes just a few minutes to change over". The FingerDimple web-site at <http://www.fingerdimple.com/_mgxroot/page_10731.html> has a picture of the knob fitted to a FT-817. **K8FF** says the Kranker Knob will also fit the Elecraft K2 since it is bored to 6mm, but you would need to use the rubber ring from the Yaesu knob around the outside.

G4DFV has built his new designed *Glowbug Three*, a three valve TRF RX which Duncan says, "Gives a very good account of itself on 160 to 20m SSB and CW reception. I aim to make the entire receiver run off 12VDC, the valve heaters are already wired for 12V operation, and the



100V HT is going to be provided by a small invertor unit", see photographs above. The RU-QRP Club were QRV in FYBO-2007 on 3 February as **RU9QRP/3** from Zvyozdny Gorodok near Moscow with a FT-817ND. Their story is on the Internet at <www.qrp.ru/fybo2007.htm>. **GØEBQ** was QRV from EA5 in January with his balcony antenna (25 feet twin cable with the outer stripped at 12.5 feet to form what is claimed to be an integral counterpoise) and was able to work around Europe on 20m with just 1W with it, see photograph below. Back home in the UK, Nigel worked four USA stations in half an hour on 20m on 4 February using his Cub Clone and G5RV loft antenna.



The 23rd Yeovil QRP Convention is planned for 15 April, including the *Fun Fun* (which it was initially thought would not be held this year) and special event station **GB2LOW**. **G4HZJ** reports this year's Red Rose QRP Festival will be held on 3 June at Atherton, the same venue as previous years. If you can read Italian, a free on-line QRP magazine is available at <http://www.arimontebelluna.it/i_qrp/bollettino.htm> and **G3LLV** says if RF is your thing, then have a look at the web-site <http://www.rfcafe.com>. **DL2BQD** reports the annual DLQRP meeting will again be held at Waldsassen at the end of April. Dieter will be QRV 5/13 September from GD while on holiday, with his K1 on 20 and 40m, and perhaps some SOTA activity on 2m.

After reading about **HB9FAE**'s home-brew valved TRX in the last SPRAT, **PA3CRC** made a sked with Greg and had a QSO on 80m with him amongst the contest QRM, with both using simple valve equipment. Gert copied Greg's 5W on his 1V1 RX and says his signals were of very good quality. Antennas on both sides were just a half sloper. **OK1IF** worked **GM3OXX** on 13 February for his 21 DXCC on 80m using his Rockmite at 500mW. **GØBON** is QRV with a 30m superhet designed by **DL2YEO** using cheap broadcast type capacitors. Ivan has added a second variable capacitor to enable him to switch in a second VFO/RIT. The rig gives 800mW using 2x2N3906s in push/pull. Not having much luck with QSOs, he built the NB6M Miniboots adjusted for 4W output, using ugly construction for the first time. Ivan says it was quite easy to put together and use in one afternooon. Ivan has also built the Stockton bi-directional wattmeter and replaced his W3EDP long-wire with a 100 feet doublet that has made an improvement in working/receiving stations, as a QSO with **EA9EU** on 80m confirms.

That clears the files again, apart from a couple of photographs I am holding back to the next issue. Enjoy your summer and please let me know how it goes for you, together with any interesting photographs, by 20 August, 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)

GQRP Club Sales

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

HW-8 Handbook - £10 (also has info on HW7 & HW9) plus postage per book: UK - £1.50; EEC - £3.20; DX - £3.80

6 pole 9MHz SSB crystal filter 2.2kHz @ 6 dB, 500ohm in/out **£12** } plus postage: UK – £1.00;
6 pole 9MHz CW crystal filter 500Hz @ 6dB, 50ohm in/out **£12** } EEC – £1.20; DX - £1.50

Polyvaricon capacitors – **2 gang – 140pF + 60pF c/w shaft ext and mounting screws - £1.20 each** } plus
Pair LSB/USB carrier crystals HC18U wires - [9MHz ± 1.5kHz] **£6 pair** } postage
Crystals – HC49/U wire - **3.579MHz - 30p each; 10.111MHz - 50p each** } (ANY quantity)
SA602AN - £1.75, MC1350 - £2.00, IRF510 FETs - £1.25 } 50p (UK),
MAR-4 RF amplifier - £1.50 } £1.00p EEC,
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 forward volts for up to vhf/uhf detection **20p each** } items
Varicap diodes – **MVM109** – 40pF @ 9v, 500pF @ 1v. **75p each** } max of 2 } use that
– **MV209** – 5pF @ 12V, 40pF @ 1v **25p 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
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 one pack of 10)

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.

To keep within second class postage limits, orders may be sent in more than one package!
Cheques (UK) and payable to G-QRP Club. Sorry, but cheques in other currencies are uneconomical to us due to bank exchange charges!
Visa/Mastercard. Please quote full card number plus expiry date & security number. We can only send the goods to the card owner's registered address.

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

MINIMUM ORDER for cheque or Visa payments is £5

For orders less than £5 – please use postage stamps (any denomination £1 or less please)
We can also accept cash in GBPound, or US$, or uros – but please send securely!
You can order via e-mail to g3mfj@gqrp.com and if you wish to send credit card details over e-mail, you can send them, split into two parts (for security), to me, via my two different ISPs – g3mfj@gqrp.com and g3mfj@gqrp.co.uk. My PGP public key is on the G-QRP website.

NEW – you can now pay by PayPal – send to g3mfj@gqrp.co.uk - show clearly what you want with the payment – and your membership number