SPRAT

THE JOURNAL OF THE G QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

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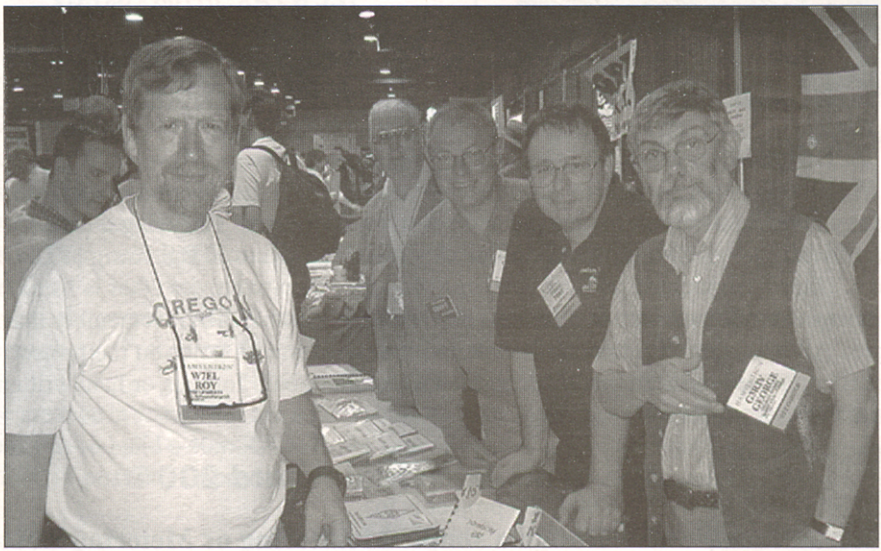

**The G QRP Club booth at Dayton 2003
with George, G3RJV [right] serving Roy, W7EL [left]**

**Ceres Receivers ~ Easy Overtone Oscillators ~ Linear Amp 80m TX
Comp Pair RF Amplifiers ~ LED Product Detector ~ 817 + Whip
20m HBA ~ Micro-Scope RX ~ Viking-500 TX~ Simple Varicap Tuning
Antennas-Anecdotes-Awards ~ Communications & Contests News
SSB & Data News ~ Member's News ~ Club Sales**

**IF YOU HAVE NOT PAID
YOUR SUBSCRIPTION FOR 2004
THIS WILL BE YOUR LAST SPRAT**

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Rev. George Dobbs G3RJV

The W1FB Memorial Award for 2003 [design a simple superhet for one or more amateur bands] yielded a variety of interesting and worthwhile circuits. Choosing a winner was very difficult but after much consideration the award will go to **K P S Kang [VU2OWF]** for the **"TOFF Superhet"** SPRAT 116, pp. 12 & 13. The Award for 2004 is listed below. If entering this competition, or offering your latest project to SPRAT, remember that it is simple. All we require is a circuit drawing with all values with notes on the project. Sprat is composed in Word but we can accept most electronic formats or handwritten and hand drawn contributions.

The W1FB Memorial Award 2004

For 2004, the project is to

Design a simple Monitoring or Metering Device of practical use in a QRP Station

Please submit your design to G3RJV as soon as possible, with circuit sketch, all values and brief notes.
The project will be published in SPRAT and the winner will receive an engraved plaque.

72/3

G3RJV

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Printed & Distributed by G QRP Postal Mailing

The Ceres Receivers

Ian Macpherson GM3RXU, Kirklands, Balcomie Road, Crail, FIFe, KY10 3XL

Designing and building a QRP rig to meet your own requirements is now easier than ever given a basic interest in construction and willingness to experiment with radio and electronic circuits. In the past, basic experimentation, chat on the bands and magazine publications were the main sources of information but now we also have the internet. As an amateur radio resource, this is a wondeRFul library available directly in your own home. The last 10 years or so have seen the prolIFeration of personal and common interest web sites where huge amounts of information can be gleaned. Manufacturers all have large information bases available on-line giving datasheets and application notes on all the readily available electronic components.

The circuits published in Sprat and its equivalents cover just about everything one might wish for from home brew equipment but there is always that little bit extra (or, for QRPers, less) that you feel can be incorporated. My own interests have always included the use of ceramic resonators as frequency control elements, hence the name which, coincidentally, is the name of an attractive small town nearby. At lower HF frequencies these give very satisfactory stability and can simplIFy construction so any new project is likely to incorporate these devices. Availability of components is also a motivation for trying new things. There are signIFicant dIFferences between the devices available in North America and in Europe and many other countries find our common components hard to get. For receivers, the popular NE602 and similar devices are found in most homebrew projects and large numbers of receivers follow the general outline of Scheme 1.

NE602=→Xtl Filt=→NE602=→LM386

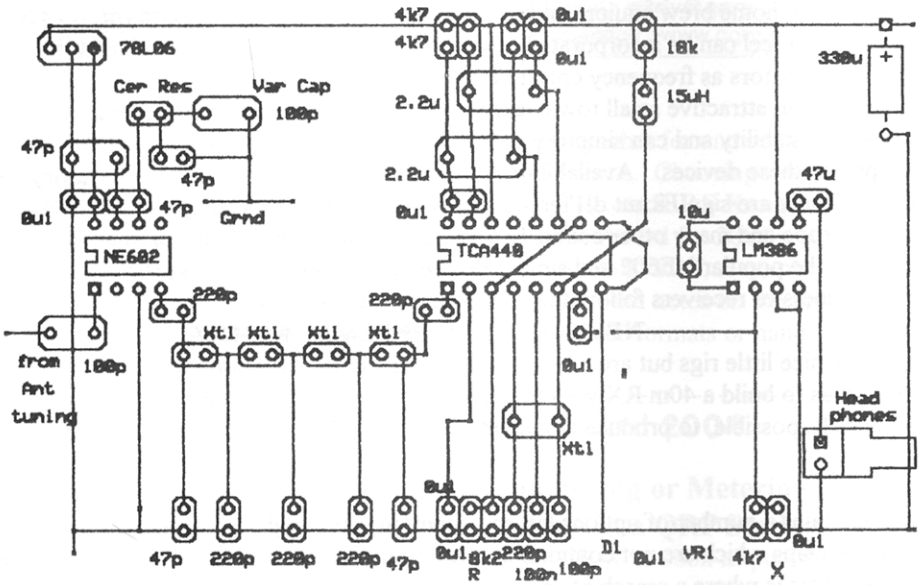
These are nice little rigs but are a little short on gain so the question I set myself for this project was to build a 40m RX with the general framework of Scheme 1 but with more gain and, IF possible, to produce a template which could be easily translated to other bands.

Sprat contains a number of options but my attention was caught by the appearance of a couple of chips which are not common in UK designs but are more favoured in continental Europe. This is where a search of the internet provides some fascinating circuits. The TCA440 is an older 16-pin am radio chip which has been used for many purposes such as complete receiver RF/IF sections, IF only, BFO/AF strips and bat detectors. It has featured in the HB9BWF RX in SPRAT 102 and in the DJ3KK ELBC-TRX in SPRAT 95. This is available for about 50p and is a really versatile chip. Another ic which has been around for a while but has not appeared in many homebrew articles is the NE592. This is a linear video amplifier in an 8-pin pack. The only place I have come across its use in homebrew is in the excellent German site http://www.QRP4u.de/index_en.html where DL2YEO demonstrates a number of very useful configurations for this device. Both the NE592 and the TCA440 are available in the UK for about 50p each – an added incentive to investigate them.

The result is a couple of really neat little receivers with high gain and excellent selectivity where translation to other bands is quite straightforward.

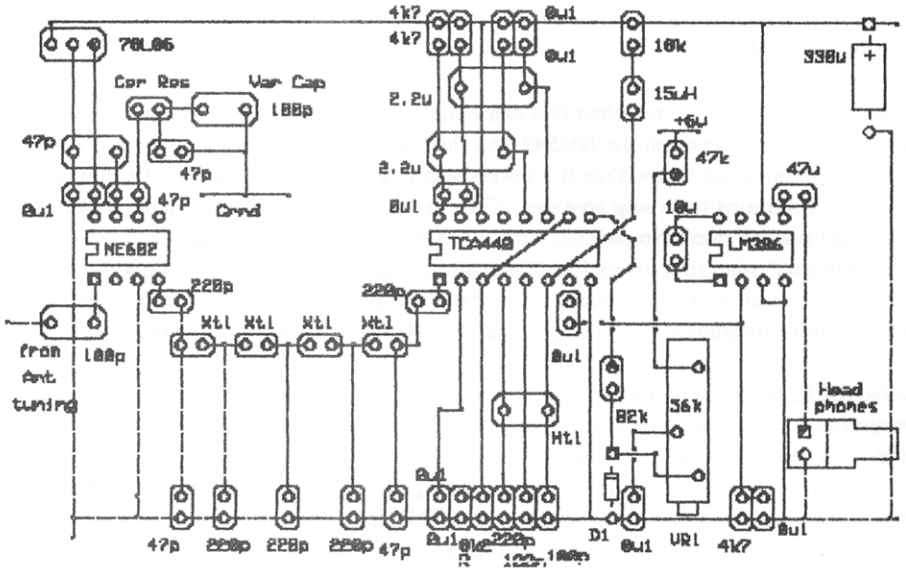
In the first circuit which is illustrated for 20m operation, the TCA440 was used as a product detector and AF stage following the 4 MHz crystal filter. From its datasheets it seems that the TCA440 was intended for use with coil/capacitor combinations in the oscillator section but is used here with either a 4 MHz crystal or 4 MHz ceramic resonator.

The capacitor on pin 6 of the TCA440 should be about 100pf for a crystal and about 16pf for the resonator, a trimmer is recommended at this point for use with the resonator. The rest of the circuit is straight forward with the NE602 oscillating between 10 and 10.1 MHz with the capacitor values shown and a 47pf cap between the junction of the variable cap and the 10 MHz resonator to earth. The 0.1uF capacitor identIFied at X can be replaced with a 100mH choke with a 1.0uH capacitor in parallel for sharper audio.

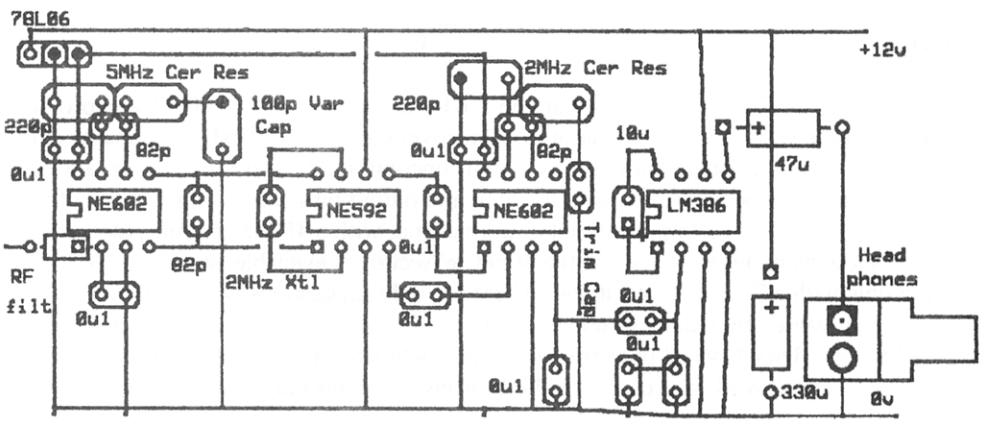


The use of a ceramic resonator at 10 MHz does not mean that the builder can ignore good vfo construction practice but, with a good "natural" layout and the little heat generated in the nearby components, stability should be quite acceptable. IF using the same oscillator for transceiver it is necessary to check that stability is good enough which will normally be the case for resonators below about 6 MHz.

This circuit provides more than enough gain although most of it is at AF which gives a slightly dIFferent feel to the receiver. An electronic gain control (automatic IF desired) can be added at pin 9 as follows.



The second receiver uses the NE592 as an IF amplifier as described by DL2YEO. This is an amazing IF circuit and deserves to be a lot more popular since it provides about 40db gain across the HF spectrum with good selectivity from one low cost chip, a crystal and a bypass capacitor. With a little care over the supply voltages it even connects directly to the NE602 output pins – magic! This circuit was built with a single 2MHz crystal across pins 2 and 7 of the NE592 following the ubiquitous NE602 front end with a 5MHz ceramic resonator. This combination provides full coverage of the 7MHz CW band. The capacitor for tuning a 2MHz crystal as BFO is 15pf but for a ceramic resonator it is better to use a 5-



50 pf trimmer so that an appropriate audio offset may be chosen. The layout follows the circuit diagram below.

IF more selectivity is required then this can readily be obtained by replacing the two coupling capacitors between the NE592 and the NE602 product detector with crystals of the same frequency but this makes it a very sharp RX and you will need to search either side for some stations returning to a call. The components at "X" can be either a resistor or a 100mH pot AF choke in parallel with a 1.0uF capacitor giving additional selectivity at AF. I prefer listening to a lower frequency audio signal and this lower frequency tuned circuit removes much of the unwanted hiss from the audio, care is of course required to adjust the audio frequency from the product detector to that of the AF filter.

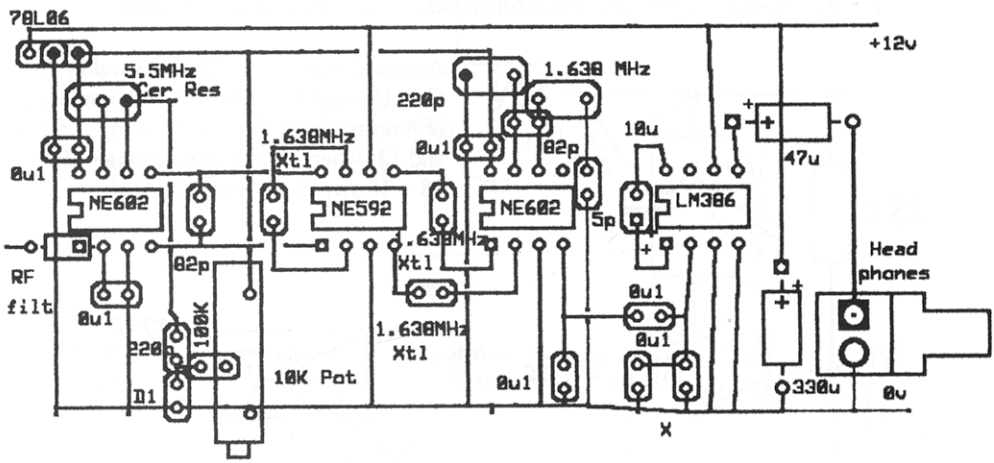
I use halved IC sockets as resonator mounts; this offers easy band switching for constructors requiring a two band RX. At various times resonators have appeared on the market with the following frequencies :-
2.0, 3.578, 3.64, 4.0, 4.195, 4.45, 4.915, 5.0, 6.0, 7.337, 8.0, 10.0, 11.0, 12.0 MHz
so that, with the IFs selected from cheaply available crystals, it is possible to cover the 7, 10.1, 14 and 21 MHz bands. Some examples are as follows :-

Band	RF Osc. Ceramic Resonator	IF Filter and BFO Xtal
7	5	2
7	12	5
10.1	12	2
14	12	2
14	10	4
7	11	4
14	8	6
21	11	10
10.1	6	4.095 [20p SPRAT sales]
10.1	6	4.195

What can we do for 80m? Crystals at 455.2 KHz are advertised in SPRAT and provide 80m coverage with a 4MHz resonator or 40m coverage with a 7.38MHz resonator at the top end of its tuning range but the selectivity is uncomfortably sharp. However, a 455 KHz ceramic filter may be connected with its input and output pins across pins 2 and 7 of the NE592 and the filter earth pin earthed as normal and, with a 4MHz ceramic resonator tuned below its nominal frequency, the 80m CW section is available and 40m CW coverage is possible with a 7.38MHz resonator. These are only suggestions where all the component values are readily available at low cost but are not in any way limits to the possibilities. They have all been tried with small adjustments to the capacitors around the oscillators and all work successfully in both receiver designs but the NE592 system is so easy to set up and the selection of oscillator capacitors to achieve the appropriate bandspread is so straightforward that this has become the scheme of choice. The oscillator in the TCA440 is a little more critical to adjust to the dIFferent crystal

frequencies but this can be overcome very easily by the use of a separate transistor oscillator feeding into pin 5 of the ic. The single crystal filter in the NE592 design provides adequate selectivity though certainly not so sharp as the 4-crystal filter in the TCA440 system (which is too sharp with a 2MHz IF where it can be reduced to 2 crystals) but this can be sharpened a little for higher IFs by replacing the two coupling capacitors between the NE592 and the NE602 product detector with crystals of the same frequency. This makes it a very sharp RX with the lower IFs and you will need to search either side for some stations returning to a call. Alternatively the component at "X" can be a resistor or a 100mH pot AF choke in parallel with a 0.47uF capacitor giving additional AF.

One of the simplest front-ends I have used makes use of a 5.5Mhz TV ceramic IF filter connected directly across pins 6, 7 and 8 of the first NE602 and tuned with a parallel variable capacitor. The IF uses a 1.6384 MHz crystal which is one of the standard surplus types normally available at low cost. This RX tunes from about 7.034 down to about 7.014 MHz and with the additional crystals between the NE592 and the product detector easily separates stations during a 7 MHz CW contest.



Where several bands are covered with a common IF, (e.g. 7, 10.1 and 14 with 2MHz IF or 7 and 14 with a 4MHz IF) it is an easy step to make a 2- or 3-band RX by switching the ceramic resonators and arranging that the input tuning covers the appropriate bands – not dIFficult since a single tuned circuit is adequate with the higher IFs used here.
The extra gain from these receivers transforms a fun or backpacking RX into a serious station RX for low cost and about 18mA additional current

Overtone Oscillators, the Easy Way

John Hey G3TDZ, 8 Armley Grange Cres. Leeds. LS12 3QL

Many overtone crystal oscillators seen in amateur radio literature appear rather complicated with awful warnings about achieving correct feedback. One hears of circuits going off at unwanted frequencies or multiple frequencies; even worse things happen once coupled to further stages.

A simple reliable circuit first suggested 22 years ago by G8UHW has been used extensively with never a hitch. Feedback is via inter-electrode coupling only with no critical feedback circuitry employed; the secret is the very low value of the emitter bypass at 4p7 typically. Oscillation takes place when L and Ct are resonant at the crystal's marked frequency.

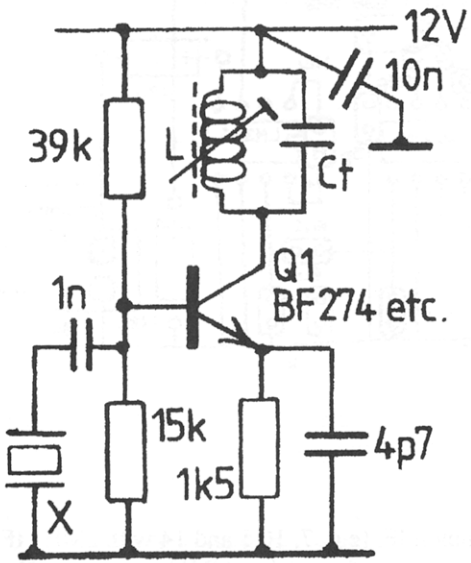
Choosing L and Ct

$$CpF = 750/f_{MHz}. \quad L_{uH} = 25330/f^2C$$

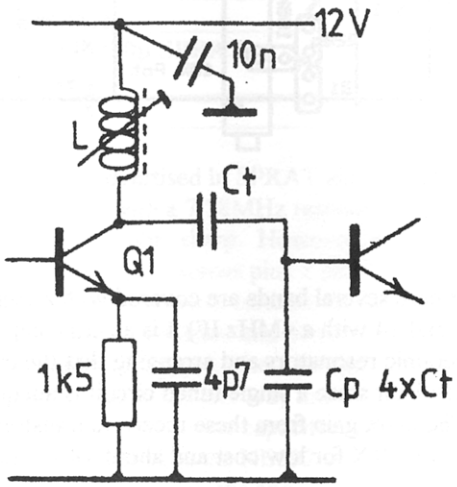
Using the 3/16" or 5mm formers (old TVs are full of them) number turns:

$T = 5\sqrt{Luh}/0.2$ - if an iron dust slug is used;

$T = 7.6\sqrt{L}/0.2$ - where no slug is fitted and tuning is by trimmer capacitor

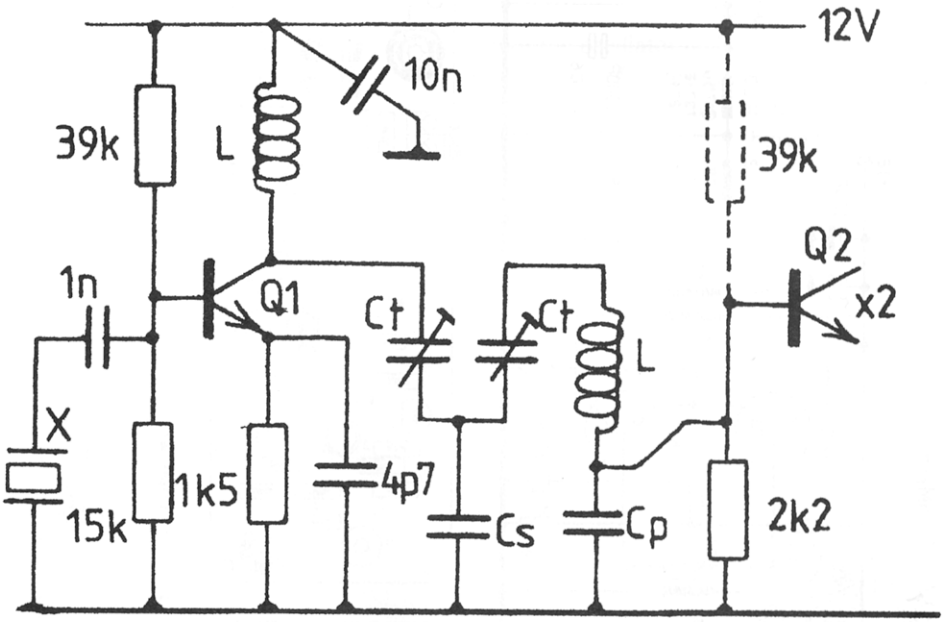


A typical example at 72MHz would yield Ct = 10p and L = 0.488uH with windings of 8 turns where the iron dust slug is fitted and 12t where tuning if by trimmer. Use 28 – 30 swg close wound,



Of cause, an oscillator is not use until coupled to an amplifier, a multiplier or a mixer. A capacitive divider avoids tapped coils and messy link coupling; a good rule of thumb is to make Cp 3.5:1 or 4:1; in our example, Cp will be 39p.

A double tuned circuit is recommended where achieving pure waveforms is encouraged to avoid whistles in receivers and converters. The methods: mutual coupling – difficult to get right the first time; top capacitance coupling – capacitors become impossibly small at VHF; bottom coupling – easy at all frequencies and good for reducing unwanted harmonics.



At VHF and UHF where there are so few turns on the coils, these can be wound on a small drill shank, slid off and fitted into the circuit. Tidy or straighten them up and dope with RS varnish for a solid and stable circuit.

In a transmitter there should be sufficient drive from the oscillator example to turn on hard the following doubler. If however a little more seems appropriate, adding the 39K shown dotted lifts the base voltage to about 0.5V allowing easier drive, while still in class C.

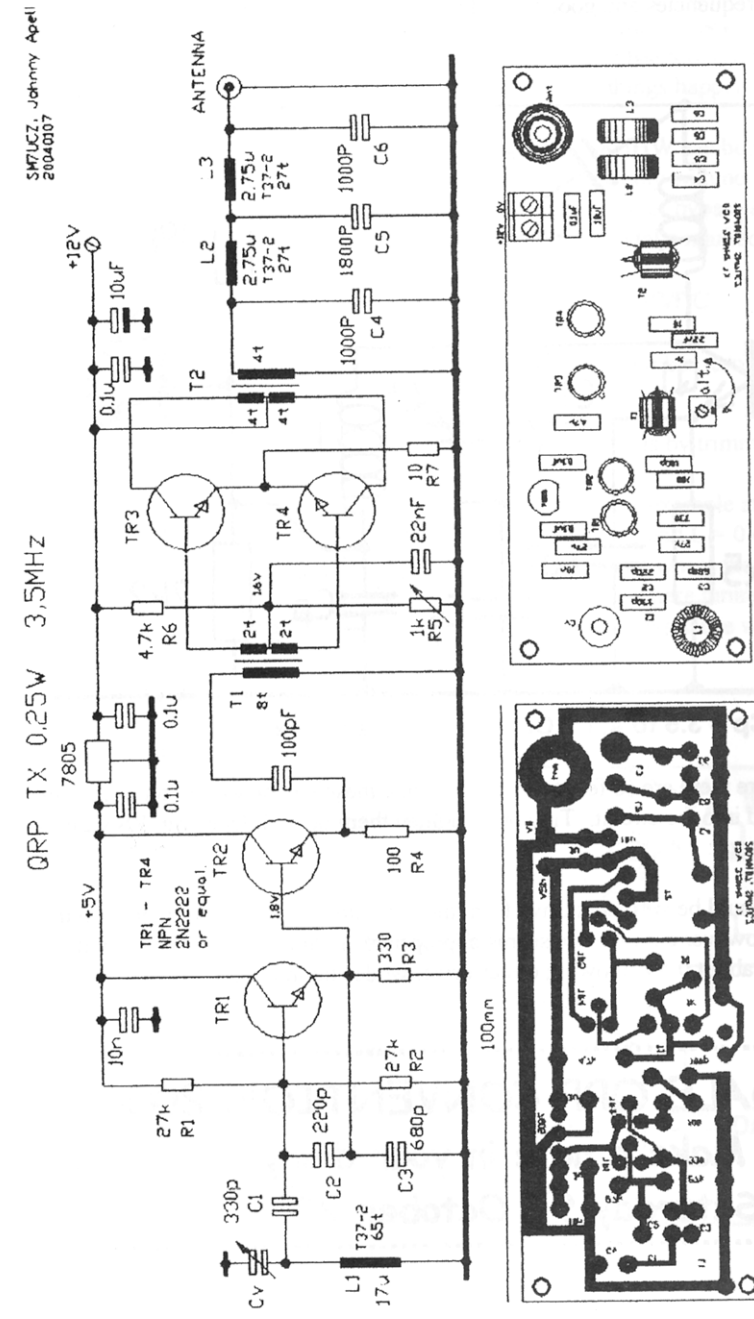
ROCHDALE QRP CONVENTION 2004

Make a note in your diary

Saturday 9th October 2004

A 3.5MHz QRP Transmitter with Linear Amplifier

Johnnv Apell SM7UCZ Ekedalsvagen 11 S-373 00 JAMJO SWEDEN



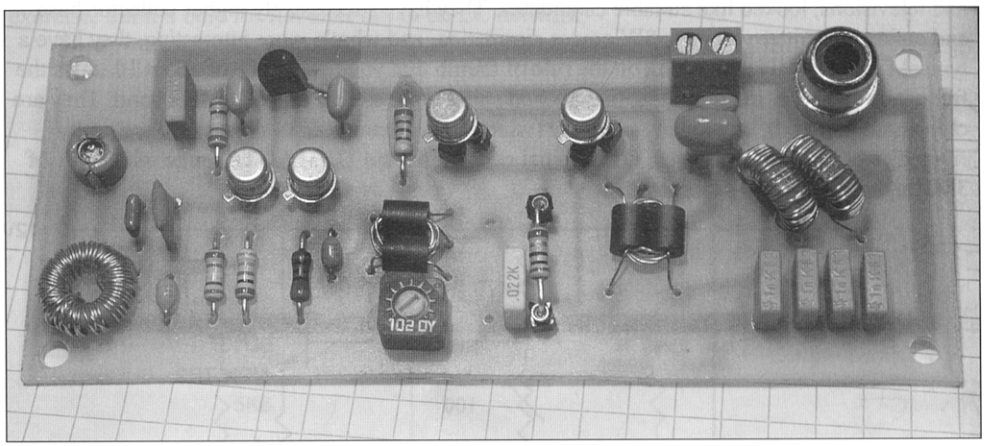
After looking at SM0VPO, Harry's home page I made this linear amplifier.
_1, L2 and L3 on T37-2
T1 and T2 on small ferrite beads, 4mm dia. 5mm long

My Christmas project this year was a small linear amplifier which I decided to build after looking at the calculations on Harry's (SM0PGO) webpage.

My version shown here can deliver about 0.4W with a BCY59. I did not have a key so could not test the amplifier on the air but tested it with a dummy load with oscilloscope and spectrum analyzer. It looks good.

This version is for 80 metres but a re-calculation of the oscillator and filter values could put it on to any band from 3.5 – 14 MHz. I only built the board to test the linear amplifier circuit and used small ferrite beads of unknown data. During testing I mounted small sections of IC-holders for easy changing of components. In the board shown below this is done with the output transistors and emitter resistor.

L1 [65t], L2 [27t] and L3 [27t] are wound on T37- 2 cores
T1 [8t : 2t+2t] and T2 [4t+4t : 4t] are wound on small ferrite beads 4mm dia, 5mm long.



N.B.T.V.A

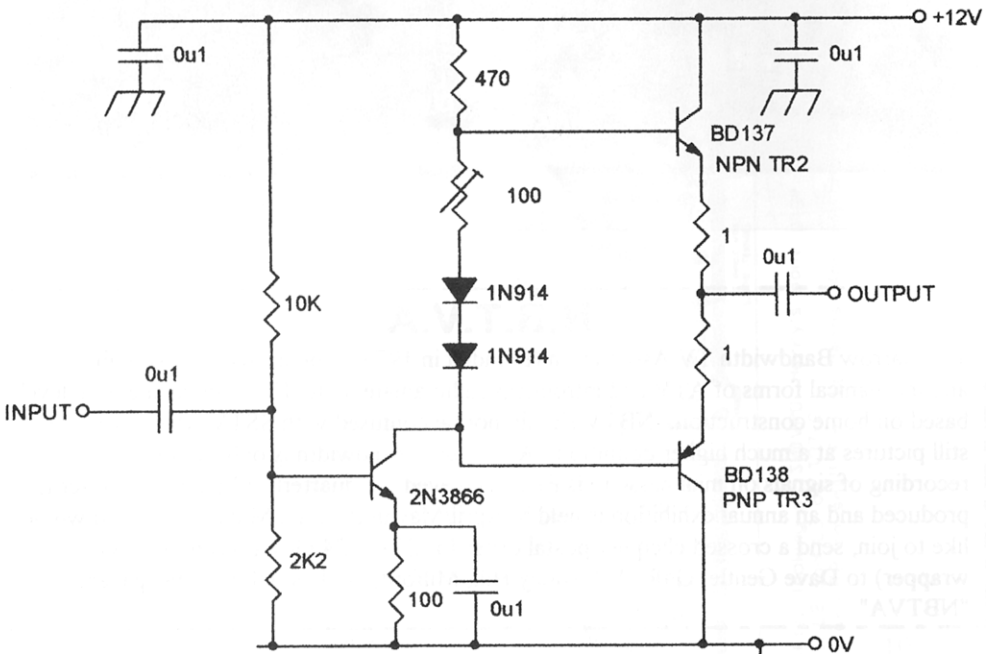
The Narrow Bandwidth TV Association (founded in 1975) is dedicated to low definition and mechanical forms of ATV and introduces radio amateurs to TV at an inexpensive level based on home construction. NBTV should not be confused with SSTV which produces still pictures at a much higher definition. As TV base bandwidth is only about 7kHz recording of signals on mini cassette is easily achieved. A quarterly 12 page newsletter is produced and an annual exhibition is held in April/May in the East Midlands. If you would like to join, send a crossed cheque / postal order for £5 (or £4 plus a recent SPRAT wrapper) to Dave Gentle, G4RVI, 1 Sunny Hill, Milford, Derbys. DE56 0QR, payable to "NBTVA"

Complementary Pair Push-Pull RF Power Amplifiers

Stef Niewiadomski, Saddlestones House,
Faringdon Road, Stanford-in-the-Vale, Oxon.

Without any implied criticism of published designs, push-pull RF power amplifier design reminds me of good old OC81D/OC81 audio amplifiers designed in the 1960s. They are almost always transformer coupled with a centre-tapped transformer doing the phase-splitting at the bases of the PA transistors and another transformer merging the collector waveforms. The audio versions of these designs were all but killed off in the late 60s by the introduction of matched complementary pnp/npn pairs of transistors which didn't need the transformers any more, simplifying designs and improving frequency responses. What doesn't seem to have happened (I'm prepared to stand corrected here) is the introduction of matched complementary pnp/npn pairs of RF transistors, suitable for use in RF power amplifiers.

I thought I'd try to adapt a couple of audio amplifier designs to RF use and see what the results would be. First of all, I needed some suitable transistors. The npn range of BD135/137/139 and pnp range of BD136/138/140 transistors, designed as matched pair drivers in hi-fi audio amps and televisions, looked like suitable candidates. They have successively higher collector-base and collector-emitter voltages, 8W power dissipation, and what's more interesting, they have a typical fT of 190MHz. Working on the rule of thumb that you need an fT of about 10 times the frequency you want to amplify at, they looked suitable for use up to the 18MHz band. They are only about 30p each, so blowing up a few (which I never managed to do, so they are pretty rugged) wouldn't be disastrous. Other initial candidates, the TIP31A/32A range with an fT of 3MHz, didn't look too promising.



BASIC COMPLEMENTARY PAIR PUSH-PULL RF AMPLIFIER

I searched around for some typical AF circuits and Figure 1 shows a push-pull amplifier based on a basic audio version, with a 2N3866 fitted for TR1 and 0u1 capacitors substituted for the electrolytics typically used at AF. The 2 IN914s are meant to reduce cross-over distortion, which is an important consideration at AF since there is no filter between the amplifier and the load, ie the loudspeaker. The 100ohm preset allows the quiescent current of the amplifier to be varied, which again helps reduce cross-over distortion. I used the BD137/138 pair, with 1ohm emitter resistors to give some protection from thermal runaway, each mounted on about 2 square inches of aluminium L-angle (from B&Q). The circuit was build ugly-style on the upper side of a piece of PCB material, making sure the collectors of TR2 and TR3 were insulated from the ground plane.

The maximum output from this circuit was about 9Vp-p from 2MHz-14MHz into 50ohm via appropriate lowpass filters, down to about 5Vp-p at 21MHz. This represents power levels of 200mW down to 60mW. The input needed about 1Vp-p to give these output levels, which could easily be provided by an oscillator's buffered output. The circuit was very well behaved, with no sign of instability. I think this circuit is capable of greater power levels, with the use of an output matching broadband transformer (which I suppose defeats the whole object of the exercise, but it's only for fun after all) or an LC network.

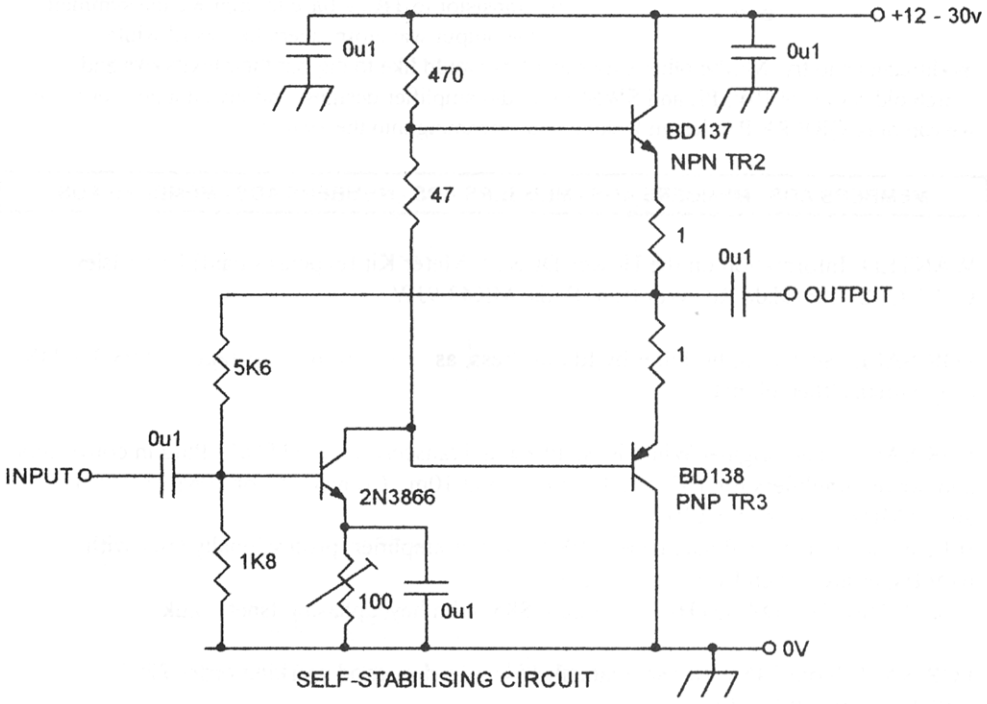
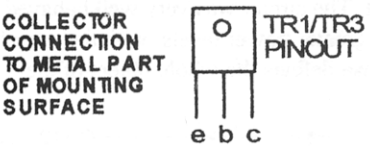


Figure 2 is a slightly modified version, based on a germanium transistor circuit originally published in the June 1966 issue of Practical Wireless, where the output DC voltage point is automatically stabilised by feedback to TR1's base resistor network. Note that the diodes have

been removed and in my experience don't make too much difference in RF circuits. The emitter resistor of TR1 has been replaced by a preset which is used to adjust the quiescent current and the symmetry of the output waveform.

The circuit gives about 11Vp-p with a 12volt supply from 2MHz – 7MHz into 50ohm, equating to about 300mW, and useful QRP output levels at 14MHz and 21MHz.. Again, I think more power could be extracted with an output matching network.

I raised the supply rail to 30volts, adjusted TR1's emitter preset to give about 100mA quiescent current and fitted a small heatsink to TR1 as it now felt rather warm. I could now get 23Vp-p (1.3W) from 2MHz-7MHz, dropping off to 18Vp-p (800mW) at 14MHz and 11Vp-p (300mW) at 21MHz, all into 50ohm via LPFs, so all the power measured was at the desired frequencies. Again the circuit was very well behaved, with no sign of instability.



I found these experiments to be encouraging and intend to continue further, particularly with getting more output power with a 12V rail. Also replacing the 2N3866 with a cheaper type and adding an active pull-up transistor to TR2's base to improve the symmetry of the output waveform seem like worthwhile modifications to try. Maybe other experimenters would like to dig out their textbooks and search old copies of PW, PE and SWM for audio amplifier designs, and give it a go. Let's see if we can drag QRP RF PA design kicking and screaming into the 1970s!

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

WANTED: Information on the Howes DCS2 S Meter Kit [expenses paid] Eric Elsley, G3YUQ, 25 Elmsdale Rd. Wootton, Beds, MK43 9JW.

FOR SALE: Scaf 1 Audio Filter by Idiom Press, as new, £30 plus postage. 01698 330248 or gm3mxn@thersgb.net

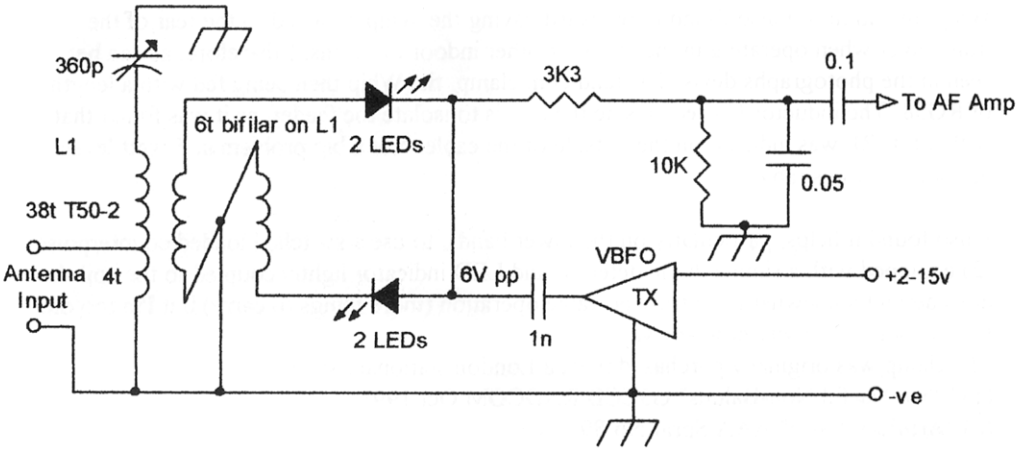
FOR SALE: The original White Rose Phasing Transceiver by G3TDZ. Plug in converters and power amplifiers for 160, 80, 40, 20, 15 and 10m. Converters for 10MHz, 18MHz and 25MHz. The lot for £100.
If I dare say it in a QRP magazine – 100W power amplifier, professionally built with 6146Bs, easily driven from the above rig. £100.
John R. Hey, G3TDZ, QTHR, 0113 2637885, john.hey@phasing.fsnet.co.uk

FOR SALE Icom 745 with mic, manual, power lead in good working order £295,
BNOS 25 amp PSU £70
WANTED unmodified recent Yaesu 817 with case, mic, charger, DC lead, dry cell case, etc
Mike Bowthorpe G0CVZ (Peterborough) 01733 324411 g0cvz@bowthorpe.org

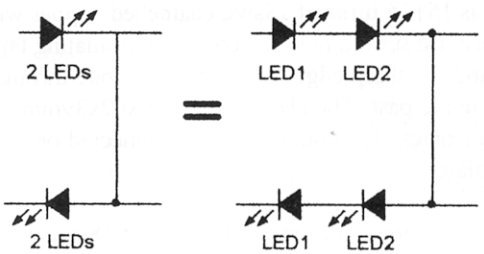
Direct Conversion with LED Product Detector

Rudi Burse DK2RS, Zähringerplatz 2, 78464 Konstanz, Germany

An interesting and experimental circuit from Rudi.



TWO LEDs ARE USED



A direct conversion receiver with LEDs as the product detector.
The tuned circuit is for 3.5 .... 3.6MHz

The VBFO is actually a QRPP CW Transmitter.
Power is reduced and easily adjustable with a variable power supply.

Rudi used two green LEDs

Rudi sent the circuit saying.....
"... for those experimenting with high level mixers.
Green bright "eyes" show when it is percolating!"

Using the FT817 and Miracle Whip

Ted Landon G3MHT, The Meadows, Smithy Lane, Bigby, Barnetby, S. Humberside DN38 6ER

Two years ago, I purchased an FT817 and Miracle Whip, the Whip performing as well as could be expected from such a device and has provided some very satisfactory contacts. However, the best operating position seems rarely to coincide with the best position for the Whip. In addition, I also found it awkward having the Whip attached to the rear of the transceiver when operating in the shack or other indoor locations. I therefore, as can be seen in the photographs devised a stand cum clamp, the Whip then being fed with a length of RG58. The inductor (1) seen inside the box is to isolate the feeder, as it was found that without it, RF was induced on the outside of the cable. Not a big problem at 5 watt levels but not really desirable.

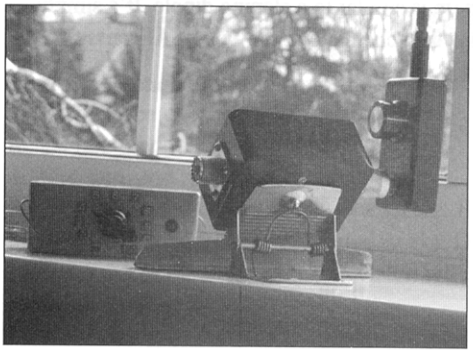
I also found it helps, particularly on the lower bands, to use a switched loaded counterpoise (2) equipped with a simple diode detector and LED indicator lightly coupled to the coil. It does detract somewhat from truly portable operation (more things to carry) but I'm too old for that sort of activity now anyway.
The clamp was originally purchased from a London stationary store.
(1) "Two Useful Non-Baluns" G3CCB RADCOM Oct 1993.
(2) "Artificial Earth" AAA Sprat No.89

Notes:
The inductor is 15+15 turns of 18swg enamelled copper wire wound side by side on an FT114-61 core. Be sure to bind the core with insulating tape first as most ferrite cores are conductive and the sharp edges of the core can bite through the enamel. This has caused me problems in the past. The plastic box is 79x62x39mm and can be obtained from Maplin or Farnel Electronics. The counterpoise is connected on the aerial side and not the feeder side of the isolator.

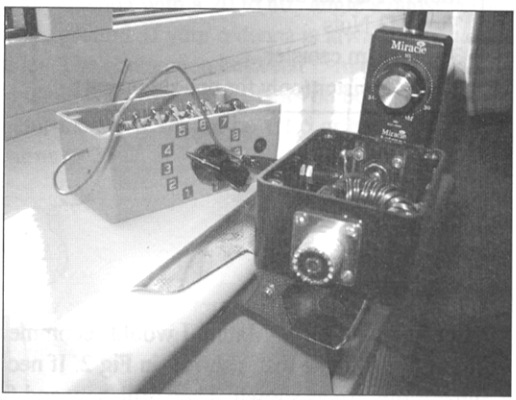
The loaded counterpoise consists of 40 turns of 18swg wound on a 25mm former tapped every 4 turns and eight feet nine inches of stranded copper wire. The coil is progressively shorted out by an eleven way switch and on 28mc/s is completely s/c leaving the length of eight feet nine inches of wire as the counterpoise. On my arrangement the coil is inserted nine inches from the aerial with eight feet of wire on the other side of the coil. This tunes from 40 to 10 metres. The indicator consists of an FT50-2 iron dust core wound fully with 26swg enamelled wire, leaving the usual gap between start and finish, it is then pushed down between the end of the former and case. The eight feet length of wire is then threaded through the core before connecting to the coil. A germanium diode is connected to one end of the coil (anode to coil) and a 0.1mfd capacitor is connected from the cathode to the other side of the coil. An LED in series with a 180ohm resistor is finally attached across the capacitor. I used a germanium diode as it has a lower forward conduction than silicon. No doubt there are better ways of achieving the same end but I used trial and error and what came to hand.

I have used the counter poise successfully with other indoor aerials, vertical and end fed, but if higher power is used, the diode and/or the series resistor in the indicator may need to be changed.

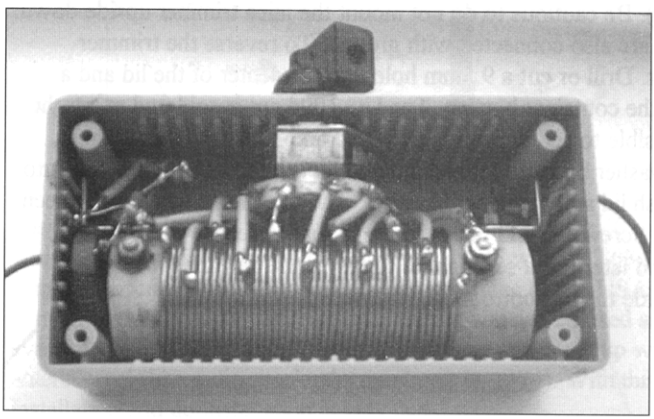
The plastic box measures 104x54x44mm from Maplin.



Miracle Whip, Inductor
and Loaded Counterpoise



Miracle Whip [back]
Inductor with clamp [front]
and Loaded Counterpoise [on ledge]



Inside the
Loaded Counterpoise Tuner.

The 20m HBA

Gottfried Kloyer, DL2MFJ, Schulstr. 21, 82234 Wessling , Germany
Jeff_Kloyer@yahoo.de

HBA stands for Hiker and Biker antenna, but is suitable for every QRP station. The main advantage of this antenna is that it is small, lightweight, easy/fast to install and nearly invisible at campgrounds. The performance and radiation pattern is similar to a sloping dipole. It's simply an end feed ⇔/2 wire with a L-Match. Fig 1 shows the schematic of the Tuner. All parts fit perfect into a 35mm film canister.

The necessary parts are as follow:
J = UG 1094 BNC Connector
L = 27 turns Nr. 24 enamel wire on T68-2 toroid
C = Mica Trimmer Capacitor Nr. 463 (20 – 180pF)
Ant wire = 10.1 Meter LIY 0.14mm^2
M3x10 Pan hat screw
Two M3 Nuts
35 mm film canister
3.1K∠ resistor (only for pre-alignment)

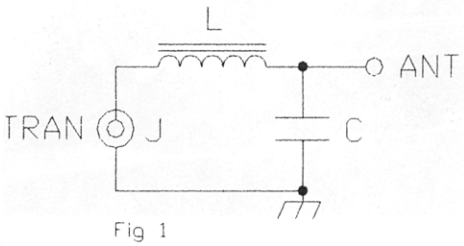


Fig 1

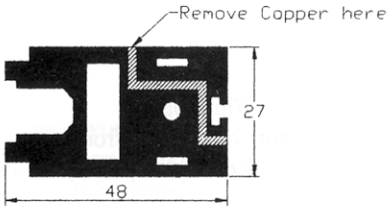
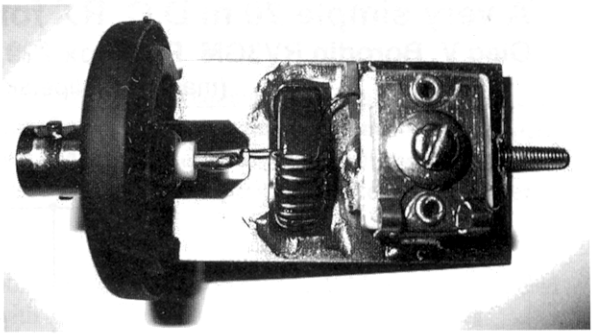


Fig 2

Start first with the L-Match. I would recommend soldering all parts onto a one sided PC-board like the one that's shown in Fig 2. If necessary, scale the layout until the outer dimensions are as shown. Then drill, saw and file all slots and holes as shown in Fig 2. Use a grinding tool to remove the unwanted copper along the hatched channel. All parts are soldered on top (copper side). Be cautious to do not mount the mica trimmer upside down. The two small capacitor feet are also connected with ground. To reverse the trimmer would result in a short circuit. Drill or cut a 9.5mm hole into the center of the lid and a 3mm hole into the center of the container bottom. The UG 1094 nut is soldered at a right angle to the PCB, so it's possible to screw the lid, UG 1094 and PCB together without using a wrench (use a lock washer between lid and nut). Solder the M3 Pan hat screw into the circuit board also and push lid and container together. The M3 thread can now be seen at the container bottom side. Screw one M3 nut onto the thread to secure the film container against opening, and later use a second one to fasten the antenna wire. The mounted PC board, still outside the can bottom is shown in Fig 3

Fig 3 – L Match with mounted PCB without housing



The L-match is very sensitive to align, so I recommend to pre-align it. This can be done easily with a little help from an antenna noise bridge or an antenna analyzer. A dipole has a feedpoint impedance of approximately 73∠. If you move more in direction to the antenna end the impedance rises. I could measure a feedpoint impedance of 3.1K∠ with end feeding the wire.
So all you have to do is to connect a 3.1K∠ Resistor between tuner output and connector ground (3K∠ or 3.3K∠ should also work). Drill a little hole directly above the mica trimmer screw in the can and adjust the L-Match with an alignment tool to nearly 50∠ or best SWR. Remove the resistor.
You are nearly on the air now. Install the antenna wire with a cord like shown in Fig 4. I prefer a simple slingshot for doing this. I normally use the antenna with a 20 to 40° angle against vertical and the L-Match approximately 30 – 50cm above ground. If your antenna is always mounted in this position, the L-match hasn't be retuned at all. The connection between L-match and Transceiver is approximately 5 Meter RG 174 cable with BNC connectors on both sides. After final careful aligning the HBA with a SWR meter the SWR should be 1:1,5 or better. If it isn't better than 1:2 try to reduce the number of L turns to 26

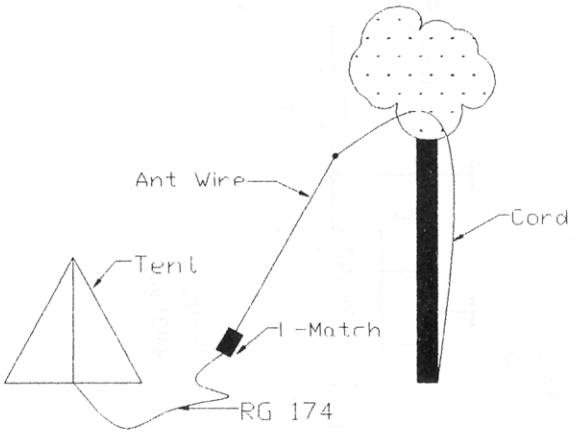
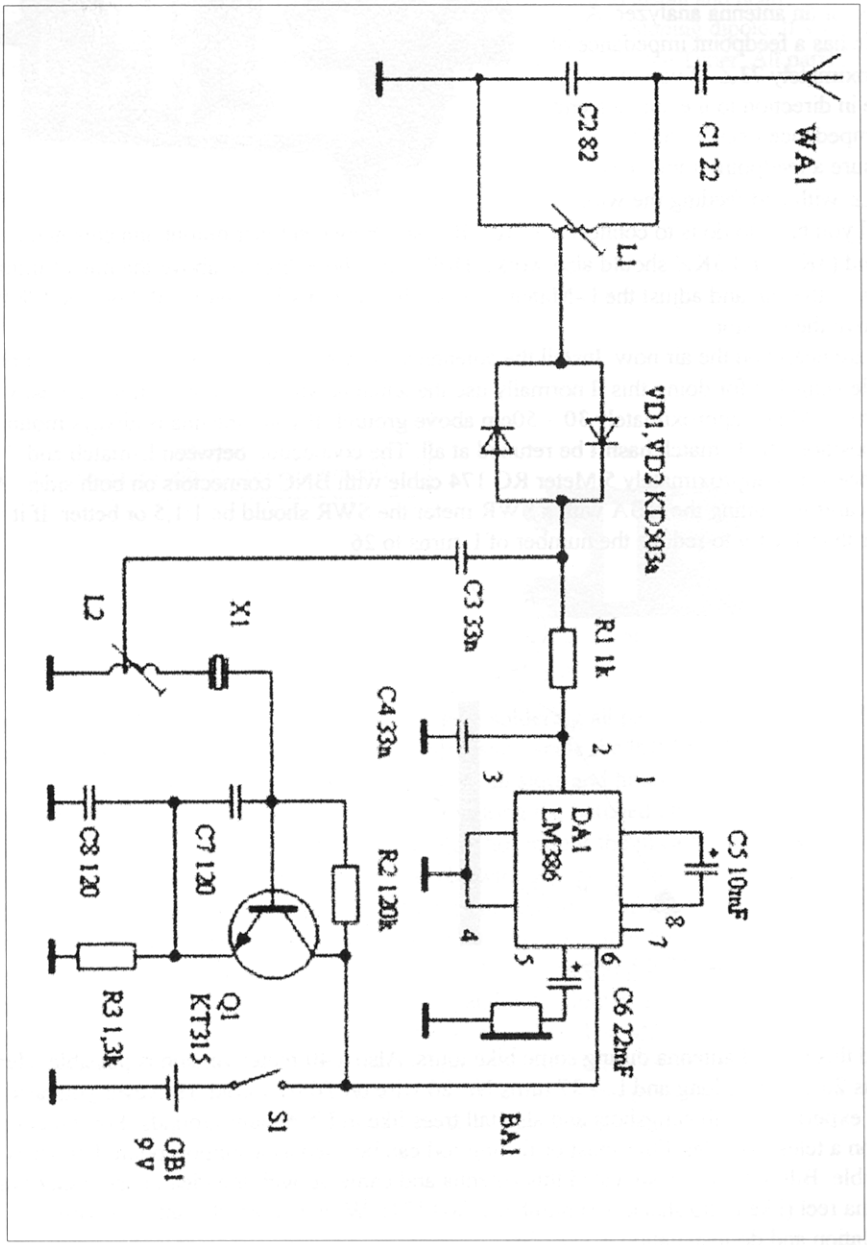


Fig 4

I used this type of antenna during some bike tours. Also a 40 meter version is possible. Here the wire is 20.2 meters long and L = 37 turns Nr. 26 wire on T68-2 toroid. However you need here some experience with slingshots and also tall trees like in USA campgrounds. For the 20m version a telescope glassfibre mast or fishing rod can be used as a support point if no trees are available. Bill, KD6JUI also tested this antenna and came up with the idea to use a shortwave antenna reel (like radio shack part number 278-1374). With this reel the antenna wire installation and de-installation is very fast.

The "Micro-Scope"
A very simple 20 m D.C. RX for portable operation

Oleg V. Borodin RV3GM P.O. Box 229, Lipetsk, 398043, Russia
(master72@lipetsk.ru)



This is a very simple direct conversion receiver for the 20 m band QRP calling frequency 14060 kHz. The mixer based on opposing - parallel diodes is used. Such mixers also act as frequency doublers.

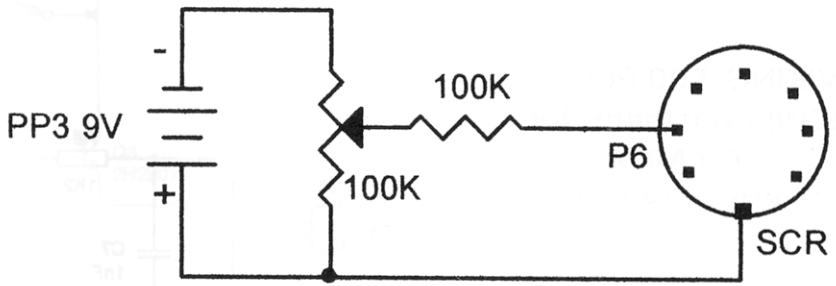
The VXO generates a frequency at half the receiving frequency (a crystal for 7030 kHz is used). The receiver may be used for any frequency by changing components L1,C2,X1,L2. Audio-amplifier is based on well known LM386. Headphones or a small speaker 8 to 32 Ohms may be used. Components R1,C3,C4, make a low-pass audio filter. The receiver is powered with 9 V battery.

L1 & L2 are wound on PVC cores 6mm dia with dust cores, using 0,27mm dia. enameled wire. Both inductors have 18 turns with tap at the 5th turn from the ground points.
VD1 & VD2 may be any RF silicon type. Q1 could be a 2N2222 or 2N3904.

The receiver is brewed on a piece of PCB using "dead bug" methods and may be enclosed in any metal box or soldered on PCB material box.

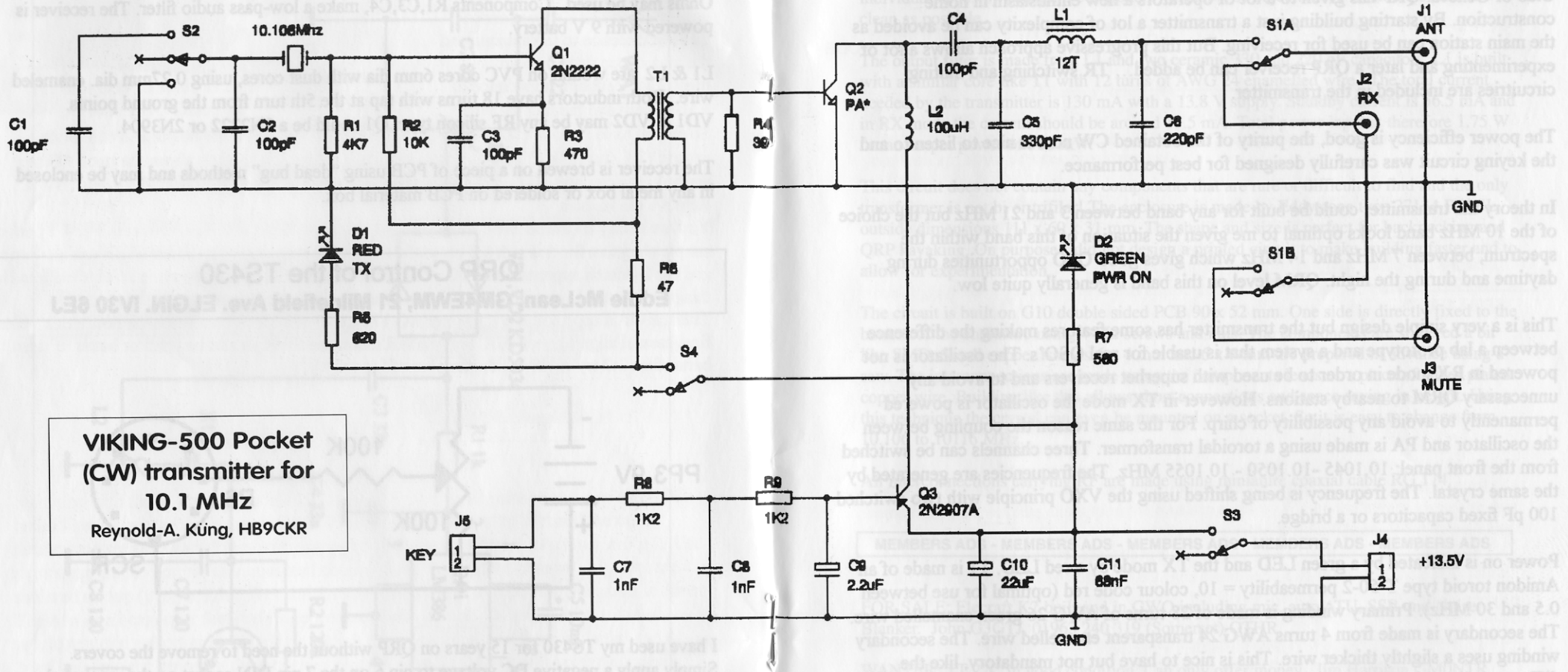
QRP Control of the TS430

Eddie McLean, GM4EWM, 21 Milnefield Ave. ELGIN. IV30 6EJ



I have used my TS430 for 15 years on QRP without the need to remove the covers. Simply apply a negative DC voltage to pin 6 on the 7 pin DIN socket on the rear panel.

This is the ALC control for a QRO linear ("Out of the strong came forth sweetness"). A 100K pot, PP3 battery and screen lead to the DIN plug via the 100K resistor is all that is required.


VIKING-500 Pocket
(CW) transmitter for
10.1 MHz
Reynold-A. Küng, HB9CKR
S2
10.106Mhz
Q1
2N2222
T1
C1
100pF
C2
100pF
R1
4K7
R2
10K
C3
100pF
R3
470
R4
39
Q2
PA*
C4
100pF
L1
12T
L2
100uH
C5
330pF
C6
220pF
S1A
J1
ANT
J2
RX
GND
D1
RED
TX
R6
47
R5
620
S4
D2
GREEN
PWR ON
S1B
R7
560
J3
MUTE
R8
1K2
R9
1K2
Q3
2N2907A
J5
KEY
C7
1nF
C8
1nF
C9
2.2uF
C10
22uF
C11
68nF
S3
J4
+13.5V
GND

VIKING-500 Pocket (CW) transmitter for 10.1 MHz

Reynold-A. Küng, HB9CKR

The idea of the Viking-500 is to provide a compact, easy to build, low cost, add on transmitter for any receiver even commercial transceiver to get a first hands on experience using low power. This little project was originally developed for HB9G, the local radio Club of Geneva. QRP has given to a lot of operators a new enthusiasm in home construction. By starting building just a transmitter a lot of complexity can be avoided as the main station can be used for receiving. But this progressive approach allows a lot of experimenting and later a QRP receiver can be added... TR switching and muting circuitries are included in the transmitter.

The power efficiency is good, the purity of the obtained CW note is nice to listen to and the keying circuit was carefully designed for best performance.

In theory the transmitter could be built for any band between 3 and 21 MHz but the choice of the 10 MHz band looks optimal to me given the situation of this band within the spectrum, between 7 MHz and 14 MHz which gives good QSO opportunities during daytime and during the night. QRM level on this band is generally quite low.

This is a very simple design but the transmitter has some features making the difference between a lab prototype and a system that is usable for real QSO's. The oscillator is not powered in RX mode in order to be used with superhet receivers and to avoid any unnecessary QRM to nearby stations. However in TX mode the oscillator is powered permanently to avoid any possibility of chirp. For the same reason the coupling between the oscillator and PA is made using a toroidal transformer. Three channels can be switched from the front panel: 10.1045 -10.1050 - 10.1055 MHz. The frequencies are generated by the same crystal. The frequency is being shifted using the VXO principle with two switched 100 pF fixed capacitors or a bridge.

Power on is indicated by a green LED and the TX mode by a red LED. T1 is made of an Amidon toroid type T-50-2 permeability = 10, colour code red (optimal for use between 0.5 and 30 MHz). Primary winding is made of 28 turns of AWG 26 green enamelled wire. The secondary is made from 4 turns AWG 24 transparent enamelled wire. The secondary winding uses a slightly thicker wire. This is nice to have but not mandatory, like the different colours for the wires. It just makes things easier. Once tested it is advisable to fix the turns using Superglue. The core can also be glued to the circuit. To maintain the highest possible Q however it is recommended to avoid gluing the core directly to the ground plane.

About the PA different types of transistors have been selected for their characteristics and tested: 2N3866, 2N4427 and 2N1711. The latest made by Motorola, is best in this application with an Ic = 1000 mA, Ptot = 0.8 W and a gain between 100...300. At the time of the first build the price was also very low 0.75 CHF. To allow experimentation it might

be worth adding a transistor socket. A small black anodized circular clip on heat sink (max. diameter 19 mm, height 5 mm) with a little thermal grease helps to keep the PA cool during long QSO's.

The keying is accomplished with a PNP transistor type 2N2907A a shaping circuit made of two 1.2 K resistors, two 1 nF capacitors and a 2.2 uF capacitor connected to its base. This circuit is based on the fact that the transistor does not change instantaneously from saturation to cut-off. The resulting keying is quite soft with no clicks. It can be adapted to individual needs by changing component values. The objective is: It should sound as clean as possible.

The output filter is made from L1 and two ceramic 330 and 220 pF capacitors. L1 is built with a similar core like T1 with 12 turns of AWG 24 enamelled wire. The total current needed by the transmitter is 130 mA with a 13.8 V supply. Standby current is 56.5 mA and in RX mode the current should be around 19.5 mA. Total power input is therefore 1.75 W for an output power of 500 mW.

This circuit does not contain any components that are rare or difficult to find and the only transformer is not bi or trifilar! The enclosure is made by Eddystone type 27134 PW/SL outside dimensions 111 x 60 x 31 mm. The shape and size is perfect for backpacking and QRP kayaking. On purpose I did not design a printed circuit to make building faster and to allow for experimentation.

The circuit is built on G10 double sided PCB 90 x 52 mm. One side is directly fixed to the bottom of the enclosure using 4 M2 screws and nuts. The components are soldered a bit like SMD. Small copper islands 6 x 4 mm and 6 x 6 mm are prepared in advance using a saw. The interconnections are made using the components leads or a piece of silver plated copper wire. Building like this allows short connections and space saving in height. Using this technique the crystal can even be mounted on a socket. So it is easy to change from 10.106 to 10116 MHz.

All interconnections carrying RF are made using miniature coaxial cable RG 174.

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

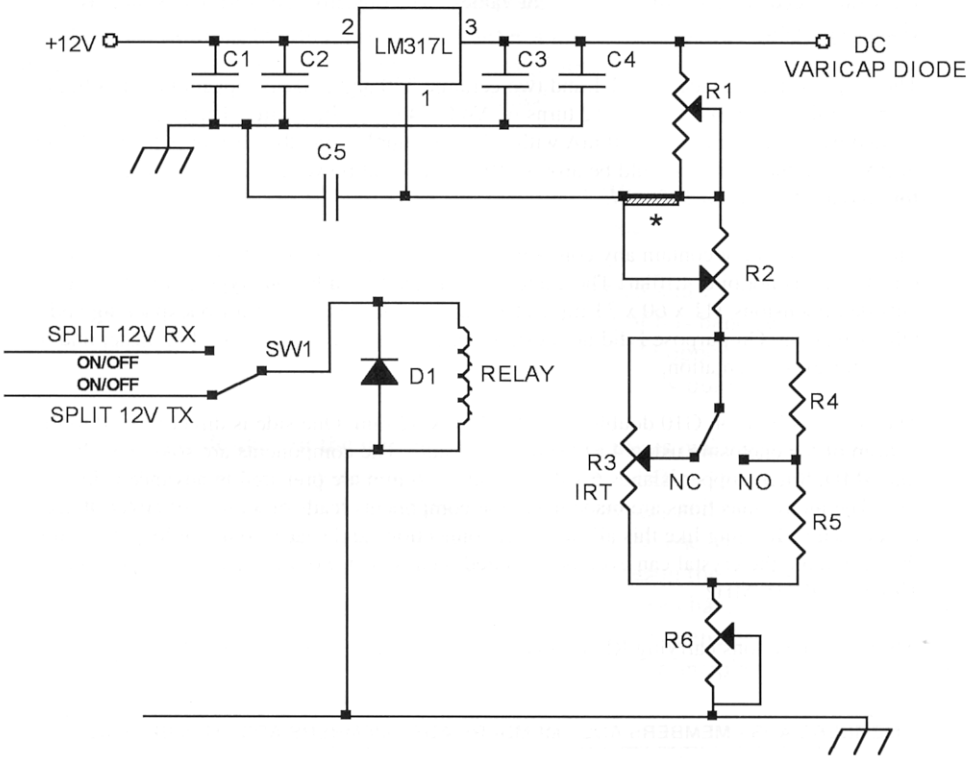
FOR SALE: Elecraft K2 built and in GWO including mic, auto ATU, SSB and Noise Blanker. John G3GTJ, 01963 240 319 (Somerset) QTHR.

WANTER: TT 22C in good condition. Can only offer money. Jim Harrison GM0NTR, 17B High Street, OBAN, Argyll, PA34 4BG

FOR SALE: Howes kit built DCRX80 & CTX80, Howes ASL5 circuit board complete & hardware kit, Teme ATU/WSR, CIRKIT FET Dip Oscillator kit, Lake DTR7 40 transceiver, factory built S/L.A. battery & charger, Datong Morse practice oscillator, Trio 2300 2m portable. Offers to GØHUK 01274 510858.

SIMPLE VARICAP DIODE TUNING

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



PARTS LIST

C1 47uF
C2 0.1uF
C3 0.1uF
C4 1uF
C5 10Uf
D1 ANY SILICON
RELAY 12V REED RELAY SPCO
SW1 SMALL SPST SWITCH
* SEE NOTES

R1 5K 25 TURN CERMET PRESET
R2 5K 10 TURN LIN VARIABLE
R3 5K 10 TURN LIN VARIABLE
R4 2.7K
R5 2.7K
R6 10K 25 TURN CERMET PRESET

If only using for RX - Relay and SW1 plus R4 & R5 are not needed and IRT becomes Bandspread

After spending several months playing with VXO's in an attempt to build a four band switched VXO, tuning 19.00MHz to 19.20MHz in four 50kHz bands for use in a 28.000MHz to 28.200MHz transceiver, to make a start in replacing my old main station transceiver that is now getting past its best a wee bit like myself.

When the VXO was finished I started to try all the standard varicap diode control circuits using variable pots, then using dc amplifiers, all of which worked but never satisfactory. After putting a few pcb's in the bin, and then when I was adjusting the voltage of the LM317L on one of the op amp boards, I thought why not use the power pack as the adjustable source for tuning the varicap, so the following circuit is the result of a wee bit of trial and error.

It works really well and allows you to have full control of the varicap diode in RX or tx or RTX mode, and all for 27p Hi. (Better not tell you the cost of good ten turn's pots.)
Now to line up the circuit, clip a voltmeter set at ten volts (or the max voltage needed by your varicap) at the dc varicap voltage out.

Then connect the output of the VXO or VFO to a frequency meter, it you don't have a frequency meter then listen on your RX, remember that a high voltage will be the high frequency and a low voltage will be the low frequency, next put R3 the IRT pot in its mid position 5 turns then set R2 for max voltage, next adjust R1 for max value you want for your diode, then set R2 for min a then adjust R6 for the min voltage, it takes a few goes of adjustment to R6 and R3 as they are interactive but its easy to get the band spread you want.

Now if you are going to use the circuit for a TRX, then you must set up the correct mid point for the IRT control, apply 12 volts to the relay coil and read the frequency, then switch off the supply then adjust the IRT pot till it reads the same frequency and that's it set up.

You may be wondering why on the voltages to SW1 say ON/OFF these voltages must come from the switching circuits in the break in system. If you don't want to use the split frequency facility then all you have to do is to leave the 12 volt RX on of SW1, but what are you going to do when the dx station says ten up.
On this part of circuit *, again found out by a bit of luck, that if you use the pot as just a variable resistor the output voltage is linear, but if you use the pot as a variable potentiometer the dc output voltage becomes non linear, and it just happened in my circuit the non linear voltage was a better match for the varicap diodes, though not making them totally linear, but not bad for a VXO tuned with a varicap diode.

As I am using four VXO's meant that I needed to switch four different circuits, I made up a board keeping in mind the fact that I was going to do all the switching with a four pole, four way switch, after the board was done, I then looked up all the current electronic suppliers cat's only to find that you could not but a four pole, four was switch any more. (And if you could a good quality switch like this would cost well over £30).

Next thing was to try using reed switches to switch the circuits, this worked out like magic. Less wiring and switching and the reed switches only cost around £1 each for a really good switch and I needed 8 of them.

This only takes care of two of the switching circuits, but I had some nice small elma 2 pole 6 way ceramic switches with index stops that allowed me to make them into 2 pole 4 way switches, as all I need to do not is to switch the dc feeds to the VXO's and reed relay's. I also included another LM317L to provide a 6v supply for the VXO.

Can I pass on one wee tip, once you put a coil in series with a crystal, the crystal can never oscillate at the marked frequency, this means if you want to run IRT control when you reach the band edges then your crystal must have much higher frequency than you need it to tune to, I did lots of trials on different frequencies and for 19 MHz you need your crystal to be higher by about 10 to 20kHz on the highest frequency you want, this head room gives you IRT control at the band edges.

There are some other things you can do with this simple circuit one it to bring R1 and R6 out to the frond panel then you have adjustable band spread, and if you want fine tune then just add a small value pot in series with R2.

PS The VXO is very good, very clean, and stable though a wee bit not linear but I can live with that, at 90db down it is very narrow at the base and the second harmonic is 54db down.

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

FOR SALE: INDEX QRP plus, boxed, handbook, £250. GØCEY 01843 833705

FOR SALE: Drake 2B receiver, good working condition with WARC band crystals £130. Kanga Cheriton Rx, built and boxed but no dial (has output for freq counter), ssb & cw filters fitted - offers ? Roger G4BZI 01270 666224

FOR SALE: CR70A and 9R59D valve radios £35 each. WANTED: FT480R
Tom Williams, M3EHA, Tel: 07956 060377.

FOR SALE: Uniden 10M transceiver HR2510, 100% OK, boxed & complete. Very little use & unmarked. £125 plus P&P. Mike Bowthorpe 01733 322227 qrp@bowthorpe.org

WANTED: ICOM 10.750Mhz crystal filter as sold by Club Sales recently, FL34 possible type Nr. G3NHR QTHR or htr@rogersh.fsnet.co.uk or 01507 607958 to negotiate".

FROM THE CLUB MEMBERSHIP SECRETARY

John Leak. G0BXO. Flat 7. 56 Heath Crescent. HALIFAX. HX1 2PW
Tel:- 01422-365025. Email:- g0bxo@gqrp.com

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Less thanks to about one third of those members paying by cheque who did not write their membership number and callsign on the back of the cheque, thereby causing me much extra work!!

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RB001 Regenerative SW Broadcast Radio Now upgraded with band switch £10.80

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RB00480m SSB/CW Regenerative Receiver *** *New* *** £11.50

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ANTENNAS - ANECDOTES - AWARDS

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

OUR OWN MINI JAMBOREE

Up from the ashes in the Netherlands.

Gert de Gooijer, PA3CRC, St. Adriannusstraat 8i, 5614EN Eindhoven, NL.

For the 2002 JOTA the Eindhoven Graaf Folke Bernadotte Scout Group had a fine array of antennas. By the morning of December 16, 2002 they had none. Fire had completely destroyed their headquarters and all the antennas.That is why I had the task of finding a cheap and efficient antenna to cover all bands 1.8 to 28 Mhz so that we could take part in JOTA 2003. Co-ax cable was too expensive and too lossy, so I turned to the all band doublet with open-wire feeder. Such an antenna requires a good atu, and the circuit I eventually used is shown in Fig.1. Transformer T1 was wound on a large toroid using RG58 co-ax as we were to use QRO. For QRP a smaller toroid using twisted pair would be adequate. Coils L1 and L2 both consist 25 turns of 2.5 mm bare copper wire wound on 3 inch diameter formers and with the turns spaced. They are tapped at 2 turns, 5 turns and every 5 turns thereafter, and connections are made via crocodile clips. C1a/C1b are the two halves of a 500p twin gang bc capacitor. I tested the antenna using a 30ft mast and a top section 90ft long. The feeder was spaced 5 inches. It worked very well indeed. For JOTA 2004 we used a 300 ft top at about 50 feet height. Top and feeders were made from 2.5mm insulated wire with a feeder spacing of 5 inches. This antenna gave an amazing performance on both QRP and QRO, really putting us back in the JOTA again.

The Swedish Experience

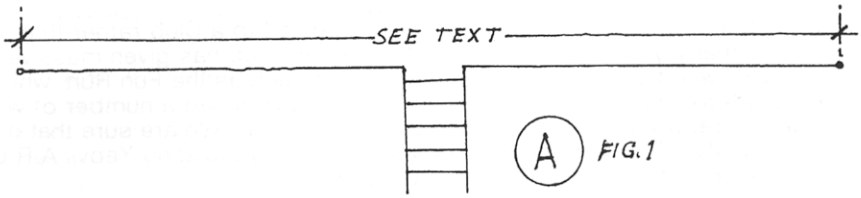
E.H.Sandwall,ISM6RXZ, Dalbergsgaten 16, SE-441 35, Alingsas, Sweden.

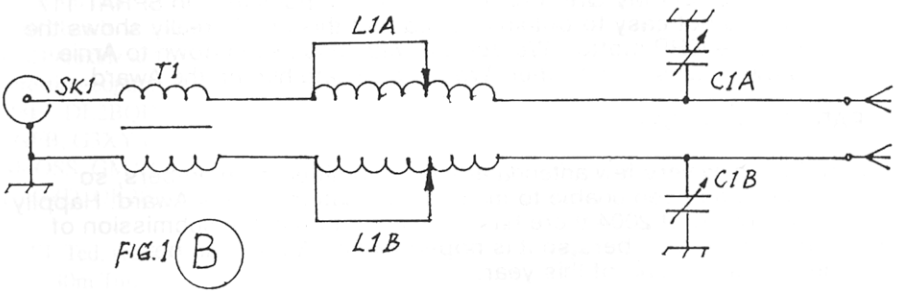
I needed a multi-band antenna for my Scout Group to use in JOTA, but wanted to get rid of the atu as my scouts had trouble operating it. The off centre fed dipole (also called FD4 orWindom) seemed easiest to build, so I built one. The results were disappointing - high swr and erratic reactive components. I then borrowed a commercially made FD4 and copied its lengths. Using my HB balun (See Fig 2) results were still still hopeless, with a very high swr. Much more research eventually located a design with a 120p fixed capacitor connected between the long leg and the balun, so I tried this. Success at last . and we now had a low swr over almost all of the 3.5 MHz band and the whole of the higher bands. They say a Scout never gives up in the face of difficulties and in this case it really paid off !

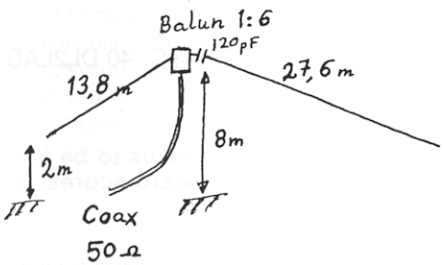
A DIFFERENT JAMBOREE

G8PG

In 1908 General (later Lord) Baden-Powell raised his first Scout Troop in the town of Birkenhead. In 1928 an International Jamboree was held in Arrowe Park, Birkenhead, to commemorate the event. Though we did not know each other at that time our parents took both my future XYL and myself to to see the Scouts from all over the world. Little did we know that 20 years later, married and with a family, we would settle in a house less than a mile from the Park and which is still the G8PG QTHr (it is just outside the Birkenhead boundary, hence no mention of Birkenhead in the address.)

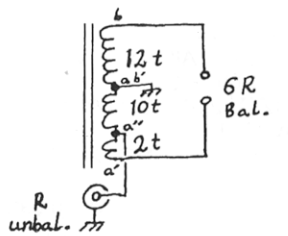


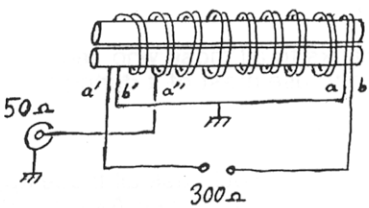




OFC Antenna

Fig. 2





ANNUAL AWARD OF CLUB TROPHIES

THE G2NJ TROPHY

This year for the first time the G2NJ Trophy is awarded to a Club rather than an individual For many years the Yeovil Amateur Radio Club has given massive support to QRP with trainng and well known events such as the Fun Run which has aroused international participation .. It has also produced a number of well known QRP operators and is affiliated to the G QRP Club. We are sure that the Members of G QRP Club will join the Committee in congratulating Yeovil A.R.C. on this recognition of their efforts over many years.

THE SUFFOLK TROPHY

The award this year is made to Arnie Coro,CO2KK, for his SPRAT article "The Six Socket Gem - My QRP Fun Transmitter...", published in SPRAT 117. Components are not easy to obtain in Cuba, but this article really shows the application of the QRP motto " We domore with less", even down to Arnie winding his own mains transformer. We congratulate him on the Award.

THE PARTRIDGE TROPHY

The year 2003 saw very few antenna articles submitted by members, so the Committee has been unable to make a nomination for this Award. Happily since the beginning of 2004 there has been an upturn in the submission of antenna articles by Members,so it is hoped that an Award can be recommended at the end of this year.

OPERATING AWARD NEWS.

Congratulations to the following on their Awards.

QRP Countries.
270 GM3OXX (All with 1 watt) ; 50 DK6NC. 25 G5TTY.
Worked G QRP Club.
400 G4JZO; 200 GWoMMY; 120 DL2BQD; 100 F6ACC; 80 DK6NC; 40 DL2LAB.
Two-way QRP.
40 G4JZO; 30 DK6NC; 20 G4TTY; 10 M1DUD.

Conditions seem to have greatly improved recently, so now seems to be a good time to chase up some new contacts to improve your Award scores.

THANKS

Many thanks to all those who sent in material on antennas for use in SPRAT. We hope to use most of it during the current year.

REQUEST

Once again we would ask all those applying for Endorsements to Awards to include the number on their Award certificate with their application. This saves the Award Manager a great deal of time, and ensures that the application is dealt with asquickly as possible.All that is needed is instead of just saying "50 country Endorsement to my Two-way QRP Award" saying "50 country Endorsement to my Two-way QRP Award No. 777" (or whatever number is).

COMMUNICATIONS AND CONTESTS

Peter Barville G3XJS e-mail: g3xjs@gqrp.co.uk
40 Watchet Lane, Holmer Green, High Wycombe, Bucks HP15 6UG.

WINTER SPORTS 2003

The gradual decline in HF band conditions is inevitably reflected in the Winter Sports logs submitted, of which there were 33 – exactly the same number as last year! Many members take the opportunity to participate in the 'O' QRP Contest (and/or the HNY Contest) and include those QSO's in their Winter Sports logs which, of course, is perfectly acceptable but it is worth remembering that Winter Sports (The Original QRP event at this time of year) is not a contest, but more a festival of QRP, offering a relaxed QRP activity period, and chance to renew acquaintances and meet new friends. As always, the event gave rise to good levels of QRP activity on many of the bands, although we still tend to overlook the undoubted attraction of the WARC bands. Although plenty of activity can often be found around 10116kHz, 18096kHz and 24906kHz are too easily ignored. I wish I had the space to include full details and interesting comments that I am privileged to see in the logs received (with thanks) from AB8FJ, DL2BQD, DL4NSE, F5SSI, F6UIG, G0KRT, G3ICO, G3JFS, G3JNB, G3MCK, G3NFB, G3XYS, G3ZHE, G4ARI, G4HMC, G4HSO, G8PG, GM0NTR, GM3OXX, GM4OSS, GM4XQJ, K2JT, LA3ZA, M5AEF, MI0BPB, MW0IDX, OE6GWG, OK1CZ, OK1DZD, OK2BMA, PA9RZ, W2JEK and W3TS, but can only offer a small sample.

AB8FJ, Ted, stuck to his principles and used the period to construct, as well as operate, and built a 40m Tuna Tin, and low pass filter for his 80m rig. He also sent off his membership renewal for 2004! DL2BQD, Dieter, and DL4NSE, Tom, can claim the first (?) Father/Son Winter Sports entry combination. G3JFS, Peter, used QRP SSB to work ZL3GS (40m), PZ5RA and FG5GP (12m), PSK31 to work A22BP and RTTY to work 3B8CF. Peter also worked into HI7 with QRP CW on 30m and 15m. G3MCK, Gerald, used the late G3SYC's 500mW CO/PA rig for every QSO. G4HMC, David, has (like me) built the excellent G3XJP design Picastar DSP tcvr, and must be the first to submit a Winter Sports log compiled entirely with QSO's made using a h/brew DSP rig. David made 89 contacts and his log is one of those made more interesting by the inclusion of equipment details for each station he worked. LA3ZA, Sverre, made 13 160m QRP QSO's as part of his Stew Perry Distance Challenge. OK1CZ, Petr, worked into VE6 on 20m. OK1DZD, Zdenek, included details of the h/brew 'GM47 Simple Tcvr' he used during the event. OK2BMA, Pavel, worked into W3 on 80m, while W2JEK, Donald, also worked across the pond (into ON4) with QRP CW on 80m. It's worth saying, by the way, that many of the logs included VHF QRP contacts, which is good to see.

I've not yet mentioned that master of Winter Sports, George, GM3OXX. Not for the first time, his contribution to the event was truly outstanding, not just in the QRP radio sense (227 QSO's), but just wait until you hear about some of the problems he had to overcome: 27th Dec, 15 hour power cut, temp –8C, find the candles, cuddle the Aga, find spare car battery - but no soldering iron to make-up power lead for the rig! Eventually made 6 battery powered QSO's. After 20yrs of trouble-free operation, one of the capacitors in the atu shorted and needed urgent attention. Internal connectors in the keyer came adrift. 31st Dec, still –8C but Aga packed up and needed de-coking. Tried to go shopping, but cans of Diet Pepsi that had been left on the front seat of the car had exploded as a result of the low temperatures. 2ft snow drifts to and from the shop. Not easy to get out of bed on New Year's Day (this is Scotland, don't forget!) so no activity.

As ever, George was running 1W with his homebrew rig, and wire antenna. Amongst his log entries, George's best DX was a 12m contact with YA8G. He nominates CT4CH as his "man of Winter Sports", and his most unusual QSO was with RA3AL/M running 5W with an IC703 to a mobile whip in the middle of Moscow. For his supreme efforts (and dedication), the Club is pleased to award George the G4DQP Trophy.

A Certificate of Merit is awarded to Peter, G3JFS, for his CW, SSB, NBFM, PSK31 and RTTY entry, which covered all bands 1.8 to 30mHz (including the outstanding DX mentioned above), and 144mHz. Many congratulations to Peter, and to George.

CHELMSLEY TROPHY 2003

Regrettably, I have only received three logs for this event, but they were all excellent entries, and the result a very close-run thing. I believe the phrase these days is "Down to the wire"! In total Peter, G3JFS, worked 144 separate DXCC entities, Steve, GW4ALG, 90 (but 350 'band slots') with 20 2-way QRP countries, and Dave, G3YMC, worked a total of 145 DXCC (597 'band slots'), and also worked 20 2-way QRP countries. Steve reports a wide range of QRP activities during the year, including new construction projects, writing articles for SPRAT, bicycle portable operation from several different locations around Chepstow, and (of course) plenty of time spent on the bands. Peter concentrated on an "all mode QRP activity year", including 72 countries with 5W RTTY. His 40m SSB ZL QSO was a particular highlight. All three enjoyed success in one or more of the major HF contests but, as last year, Dave's fine effort over the year have once again earned him the Chelmsley Trophy. Steve squeaks home for the Runner-Up Certificate, but they all deserve our congratulations.

SOMERSET HOMEBREW CHALLENGE

I've received no response following the notice in SPRAT 117 about the possibility of instigating a new constructional challenge, in place of the traditional Somerset Homebrew Contest. One idea is that judging (by a suitable panel of judges?) could take place at the Rochdale Convention. Please let me (and/or Tim Walford) have any thoughts you may have.

EA QRP CW 2004 CONTEST

Lack of space means that I am unable to give complete information here, but the 2004 event takes place during the weekend of 17th-18th April, and I can supply full details upon request.

HF INTERNATIONAL "SPRINT SPRINT" LOW POWER CONTEST

Alex, G4FDC, has kindly sent me full results of the 2003 event; please let me know if you'd like a copy. I was sorry to note the lack of UK stations (apart from G4FDC) listed amongst the winners in the QRP sections.

FARNE ISLANDS, GX4NOK/P

Not strictly QRP related, but you might like to look for this expedition station operating from Inner Farne (EU-109, WAB NU23NLD) between 17th and 18th April.
During their activity, they will be displaying their operating frequencies on
http://www.g4nok.org/

RED ROSE QRP FESTIVAL – CORRECTION

My apologies for quoting the date of this event in the QRP Calendar as the 8th June instead of the correct date, which is the 6th June.

Enjoy your QRPing, 72 de QRPeter

SSB & Data Report

Dick Pascoe GØBPS. Seaview, Crete Road East. Folkestone. CT18 7EG
Tel 01303 894390 – Email gØbps@gqrp.com

First the 'good' news; all the class 'B' amateurs in the UK now have access to the full HF bands. It appears that there is now no distinction between he old class 'A' and class 'B'. Many other countries are dropping the Morse requirement I am glad to say not because I dislike CW but I am firmly in the camp that feels it is not the modern way to enter the hobby. This can only be good news for the HF bands but probably very bad news for the VHF and UHF bands. As the 'old B's' vacate VHF and UHF to join in on the HF bands and widen their scope the upper bands are likely to fall by the wayside and slide out of the 'ham' spectrum.

However, for those that didn't have to learn Morse to gain their licence there is still the opportunity to get further afield than SSB by using one of the data modes available such as PSK31, even RTTY and still have great fun. (All this can run beside you as you learn the code, you will won't you?). Just because CW is not a requirement does not mean that it will vanish, we shall continue to use it when required.

Brian GØNSL is a 100% ssb operator with 5 watts, he have never had any problem working DX, often breaking pile-ups, so far 258 DXCC countries confirmed, so it works Rig is a TS-130V (1984 vintage,) modded the ALC line to give 5 watts 40m -10m Antenna is a 40m full wave horizontal wire loop, diamond shape, 8m AGL. It is good to hear the M3's about the bands.

Darren MW5HOC was in the Midlands helping his club do VHF NFD running 400 Watts on 2, 4, 6 and 70. There was a tremendous feeling of power when running the 144 MHz station. It was great knowing that he would get heard first time every time, he loved it! He also took along his FT-817 and Sandpiper MV10 portable antenna, set the 817 up on a camping table for something to do on the Saturday evening during the BBQ period First of all he worked into GM on 40M and then worked into
EA on 20M. This got other people's attention and before long the 817 and my little antenna were very popular. Various people had a go and most came off with a different view on QRP operation. A couple of guys worked well into Europe on various bands, and one was quite pleased with working YU on 5 watts he then pointed out to him that the rig was set to 2.5 watts to conserve the batteries.

On 2147 UTC, 13 July **Rick M1RAL** made contact with Igor 4K5D in Orfu, Azerbaijan using PSK31, and into the log went my first contact using this mode. He writes: "For those members who like me have recently been troubled by propagation difficulties, I would definitely recommend having a go with digital modes. They may be pleasantly surprised by he results".

W2AGN writes: Today I was messing around with an old SB104 my Dad built a long time ago. Got the receiver working, and was fiddling with the drive. I didn't even have the jumper in back for the "High Power." I was on 10M SSB, and kept hearing 7X4AN calling CQ. He worked a few, but no pile up. As I was just messing around, I gave him a call, just using the driver, about 1 watt...and he answered and gave me a 53 report! Amazing! Something to do while snowed in.

Charlie Wardale wrote: "After many months of gathering components together, I've finally had the time to put together a 40m SSB transceiver using the excellent design from VK3XU

book and had my first QSO today with an M0 in Birmingham, what a thrill it is to have a 2-way QSO on home built kit. Incidentally, as part of my test kit I built the RF probe from the also excellent publication, "Simple Test Equipment for the QRPer". This enabled me to find my mistakes straight away and rectify them easily."

SIMPLE TEST EQUIPMENT FOR THE QRPer

"A wonderfully useful book by G3MFJ and G4WIF .... A must for any QRP library .. in fact, I wish I had written it!" – G3RJV

"Don't be mislead by the title, this book will be useful for any amateur... excellent source book" - Review in R.S.G.B's January 2003 Radcom.

20 projects in a 58 page book. The U.K. price is £6.00 post paid. The EU & DX price (surface mail) is £6.50 post paid. Airmail £7.50 post paid. EU & DX orders International Money Order only. Make cheques & money orders payable to "G.Firth" and post to 13, Wynmore Drive, Bramhope, Leeds, LS16 9DQ UK - see www.fishpool.org.uk for U.S. orders.

PRACTICAL AND TESTED AERIAL SYSTEMS

Ian Keyser, G3ROO

"It is no-nonsense practical book – good technical information for the 'non-professional' radio amateur with lots of practical ideas" – G3RJV.

80 pages of what you need to know to start understanding aerial systems. Covers transmission lines in an easy to understand format. Simple test equipment for use while constructing aerials. Practical designs. Supporting your aerials. ASMU's (ATU's) and Baluns and lots more.

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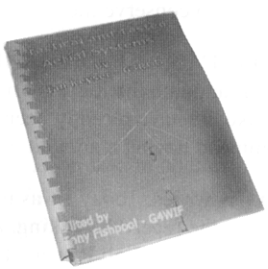
I Keyser and post to @Rosemount', Church Whitfield, Dover, Kent, CT16 3HZ.



MEMBERS' NEWS

by Chris Page W4/G4BUE

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

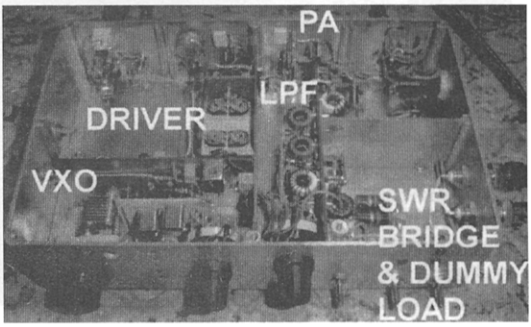
PH1PH has announced that *Ham Radio Deluxe* is now Freeware. Pete says the software is the logical evolution of the immensely popular and ground-breaking FT-817 Commander program. Unfortunately the FT-817 Commander was only capable of controlling Yaesu's FT-817, and there was a clear requirement for a CAT program with comprehensive support for various rigs. This led to development of *Ham Radio Deluxe* being started in early June 2003, since when the program has been rapidly evolving. Included in the package are *PSK31Deluxe* and *Mapper* (a sophisticated PSK31 program based on Moe Wheatly's PSKCORE.DLL and an amateur radio mapping program capable of printing customisable maps of up to 10 x 10 sheets of paper, but its main function is the capture and display of Maidenhead locator information from PSK31 Deluxe). Almost all popular Japanese rigs are supported and the K2 and Ten-Tec Argonaut.

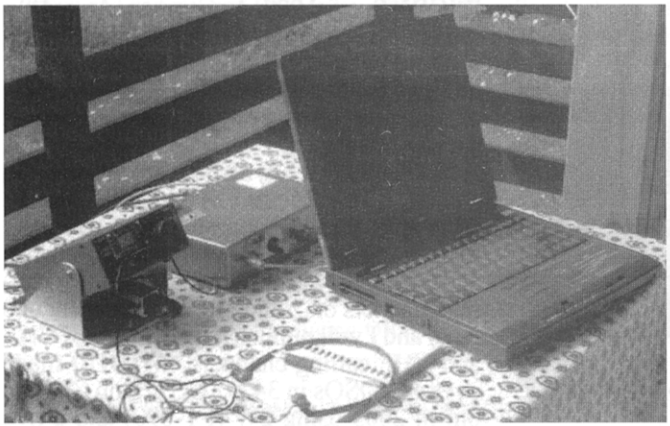
You are invited to join the *Ham Radio Deluxe* users group at <http://groups.yahoo. com/group/ham-radio-deluxe/> where you will find a great many enthusiastic users who can help you with (almost) any questions you may have. Congratulations to Simon, **HB9DRV**, and Pete on being awarded the RSGB's Special 90th Anniversary Award "In recognition of their significant contribution to the development of amateur radio technology" for this package. The latest version of the programs can be downloaded at <www.hb9drv.ch>.

G4LVK uses 5W SSB on 4m and has had some QSOs on 24cms FM with just 280mW! Alan asks that I encourage more members to try using QRP on the VHF and UHF bands and encourage agreement for some QRP calling channels on 2 and 4m. Consider it done Alan and I will publish suggestions for UHF and VHF calling channels. **M1DUD** made over 440 QSOs in 34 DXCC (22 on CW) on 6m in 2003 using 2W (FT-690) and a five element beam. Robin also worked 154 Maidenhead locators including some rare ones like JN51, JM79 and KO50 and says, "Recently, several operators have claimed that 6m is dead for another ten years, so I guess the moral of the 6m story is to stick with it! It is certainly not all over - yet!".

GW4ALG's current project is a four band VXO TX for 80, 40, 30 and 20 metres, which Steve is building as a Christmas gift for a friend (see photo bottom of page). It will run 5W and have two crystals for 80m and 30m, but just one on 40 and 20m. The design includes a built-in antenna changeover; RX muting; sidetone generator; SWR bridge; and dummy load. Steve has added the Elecraft automatic ATU to his K2 and is installing a data module to link the K2 band information to the SD-DOS contest logging program. Steve is grateful to member Dave, **G3YMC**, for his advice and encouragement in implementing these improvements.

G4DMP took about a day and a half to build his Elecraft KX1 with the automatic



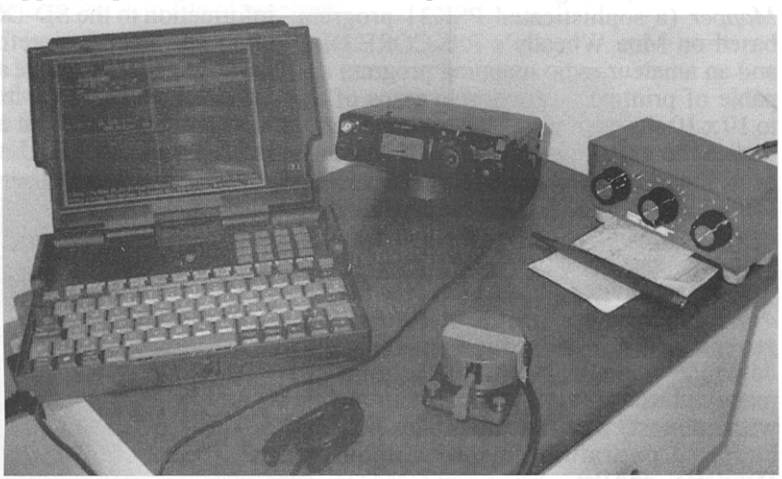


May when he will be QRV as **EA8/GM4XQJ/P** from Fuerte-ventura around 14060kHz. June bought me a K2 for Christmas and I have added the KPA/100, 160m, DSP, SSB and noise blanker options to it. I have been kept busy building it out here in Florida, and despite having some problems in getting it to work properly, I have been thoroughly enjoying my first construction work for over 20 years and can confirm the excellent after-sales service given by **AB7MY** mentioned by **GM4FQE** above. The only disadvantage is that my on-air time this year has been drastically reduced because of the K2!

ATU, key paddle and 30m options. David describes it as "A piece of magic" running about 2W out with its six AA internal batteries or just over 4W with an external PSU. He says, "The keying characteristics are superb and QSOs throughout Europe on 30 and 40m are without difficulty with a random length of wire". **GM4FQE** used his K1 on holiday in France last summer to QSO **GM4ELV** who was running just 100uW, and to keep daily skeds with **G2HDU** and **G4IHF**. Eric also used a RX2 weather satellite receiver which can be seen in the photograph (above) behind the laptop, and a Morse key is just visible under the K1. He speaks very highly of the Elecraft service, especially the help he received from Gary, **AB7MY**, in their support department.

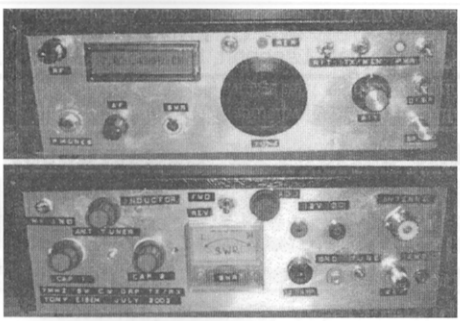
MØCLH was planning to be on holiday in Tenerife at the end of February and QRV as **EA8/MØCLH/P** with dipoles for 20, 17, 15 and 12m - *thanks Daily DX*. **OK1CZ** was QRV from Vulcano Island in June 2003 for a week as **ID9/OK1CZ** (see his mini-shack below). Petr says, "I used 4W, but made over 400 QSOs using a FT-817, ATU, an old Olivetti notebook PC for logging and an end-fed wire antenna fed via the ATU. My QSO total included 183 QSOs on six metres during some good Es openings". **HB9BQB** passes the sad news that **HB9XY**

VK3CBO has also built the KX1 and his best DX so far is **VR2ALC** who gave Rod a 539 over the 4636 miles path. Another K1 owner is **GM4XQJ**, who has been spending most of his time on 20 and 40m since he finished building it. Brian will use it during the last three weeks of



became a Silent Key in January after a serious illness. Hans was a famous Swiss QRP pioneer, contester, an avid home-brewer and a QRP-Master.

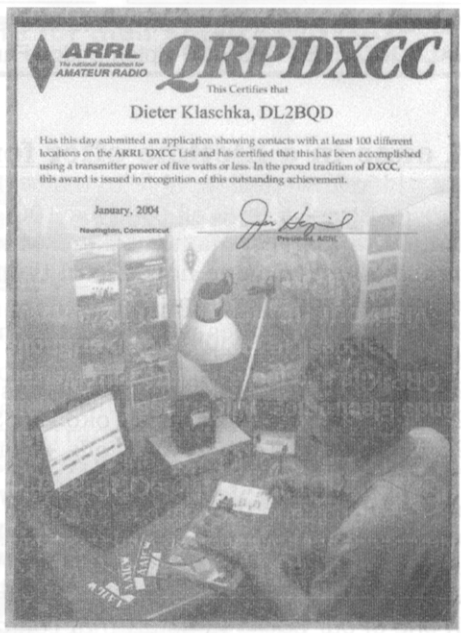
Congratulations to **G3CWI** who carried out tests with a transmitter running just under 3uW (three microwatts). This small signal on 30m to a low quad loop was positively identified by two stations in Germany, one in Holland and one in Belgium. Richard used very slow CW with 30-second dot lengths, a technique widely used for LF communications at 136kHz but less common on the HF bands. He was encouraged to try this low power after receiving 'complaints' that earlier test transmissions using 150mW were "too strong"!. There is an active group of HF QRSS experimenters in Europe and details are on the Internet at <http://www.cnts.be/knights_qrss/>.



EI5EM's latest QRP project is a 40m superhet based on the NorCal 40-40 (see front and back panels above), although at this stage he says it bears no resemblance to its ancestor. Coverage is 6998 - 7062kHz and Tony has added a 5W amplifier and tighter IF and audio filtering. The box has its own SWR meter as well as an ATU. The ATU and SWR controls are on the rear panel. He has added RIT and a Curtis Iambic Memory IC (500 characters memory) and has incorporated an LCD frequency counter. In August he had had over 100 QSOs with it, many on two-way QRP with Club members. **GW4ALG** spent the summer renovating a Racal-Dana Model 1991 frequency counter. After changing all 33 front panel switches, Steve says it is now working perfectly! He has also been experimenting with the new FD-01 frequency counter module from Cumbria Designs, and getting very good results when used with his analogue rigs.

Despite being an active HF CW operator, **G3SES** is looking forward to his first QSO with an ex-Class B operator on the HF bands since the abolition of the Morse test for HF operation. Phil wonders if he has been listening on the wrong bands and/or at the wrong times and invites skeds (<philg3ses@aol.com>). He does not want to be still looking for his first ex-Class B QSO at the end of 2004! **G3LHJ** made 162 QSOs in the O-QRP Test, nearly all on 20m.

Congratulations to **GM3OXX** on making a two-way QRP QSO with **VE1QY** at 2340z on 19 February on 3560kHz and to **DL2BQD** for getting his QRP DXCC (see photograph below).



We return to the UK on 20 March for a couple of weeks and will be back in the USA until near the end of May. My e-mail address remains the same for your news and pictures for the column and I will be home in time to collect snail mail for the Summer SPRAT column, by 20 May, please.

Some QRP Trader Changes

Please Note:

G3TUX (Chris) has retired and ceased trading.

Chris, G4BUE, has also retired from trading as ADUR VILLAGE PRESS
The SPRAT Binders once supplied by Chris are available as Club Sales items, see the back page.

Duncan, G4DFV, has ceased selling the COPPER ISLAND CONSTRUCTION KITS.

Our thanks to the above traders for their services to QRP.

GQRP Club Sales

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

HW handbook by Mike Brice – new edition. £10 } plus postage per book: UK - £1.35;
GQRP Club Antenna Handbook. £5 } EEC - £3.20; DX - £3.80

6 pole 9MHz SSB crystal filter 2.2kHz @ 6 dB, 500ohm in/out **£12** } plus postage: UK - 50p;
6 pole 9MHz CW crystal filter 500Hz @ 6dB, 50ohm in/out **£12** } EEC - 80p; DX - £1

Polyvaricon capacitors – 2 gang (A = 8 – 140pF, O = 6 – 60pF) c/w shaft ext & mntg screws **£2** } plus postage

Pair LSB/USB carrier crystals HC18U wires - [9MHz ± 1.5kHz] £6 pair } (**ANY** quantity).
Colour TV crystals – US (3.579MHz) **25p each** } 30p (UK),
4.096MHz crystals /2^{12} = 1kHz) – 20p each, SA602AN - £1.75 } 60p EEC,
HC49U crystals for all **CW** calling frequencies – 3,560, 7,030, 10,106, } 80p (DX)
14,060, 18,096, 24,906, & 28,060 - **£2.00** each } All
Ceramic resonators – 3.68MHz – **50p each** } post
Varicap diodes – MVM109 – 40pF @ 9v, 500pF @ 1v. **75p each** – max of 2 per member } free
CA741 op-amps 8pin DIL – **5 for £1; CA3046** quad transistor array – **5 for £1** } if
IRF510 FETs £1.25 each; Electret mic inserts – 10p each } ordered
2SC536 transistors (npn) T-100MHz, hFE-320, VCBO+40V) - **5 for 50p** } with
BFX29 transistors (pnp) T-100MHz, hFE-125, VCBO-60V) - **5 for 50p** } heavier
MK484 radio on a chip - £1.00 inc postage & circuit diagram. } items

Toroid cores – Priced per pack of 5 – max of 2 packs of each per member
T37-2 – 75p; T37-6 – 75p; T37-7 – 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
Plus postage – up to 5 packs = 30p (UK), 50p (EEC), 75p (DX); 5 – 10 packs = 60p, £1, £1.50 etc.
Please note some more slight price adjustments on these. (The packs may have the old prices on them!)

Sprat on CD (1 to 109) - £10 inc postage.

G-QRP Club mouse mats £3.50 each inc post UK £4.00 EEC & DX

MAR-4 RF amplifier – 8dB gain at DC to 1GHz! £1.75 each inc postage – Limited stock – one per member!

Calling frequency crystals
(watch crystal size – very low power) – 3.560, 7.030, 10.106, 18.096, 21.060, 24.906, 28.060. These should be used in very low power circuits – they are tested before dispatch & no returns can be entertained. All £2 each, plus postage as for IRF510 Very limited stock – one of each frequency per member.

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 – 75p, EEC – £1.50, DX - £2.00. More – add 50p, 75p, £1 each)**

Back issues of SPRAT are still available as previous ads

NB I am temporarily out of stock of the Drew Diamond book, also, I am out of stock of MC1350 & 7.2MHz resonators (no more supplies expected), and 14.060 miniature crystals (it could be 4 months before I get any more of these)

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 Euros are uneconomical to us due to bank exchange charges! Visa/Mastercard. Please quote full card number/expiry date. We can only send the goods to the card owner's registered address. Sorry, we do not accept Debit Cards such as Switch or Connect.

Minimum order for cheque or Visa payments is £5 – this will cut down on our bank charges. 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 Euros – 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
You can check availability (or even order) on (+44) (0)113 267 1070 (But please do not expect my family to be able to discuss club sales matters or take orders!!).
If you give me an e-mail address with your order, this allows me to inform you of any problems with supply.