# SPRAT

THE JOURNAL OF THE G QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

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**Two QRPeters meet at Friedrichshafen**
**Peter Mitrovic S53MA (S5 QRP Club) and Peter Barville G3XJS**

MINI-CONVENTION – SMD CONSTRUCTION – CUB ATTENUATOR
LED RF PROBE – ISLAND PUNCH – MARATHON 136kHz TX
PULLING CRYSTALS FURTHER – L-TYPE ATU – ET1 TRANSCEIVER
NiMH CHARGER – TAK893 DBM – VK7LF 160m TX – SMD OSCILLATORS
CLUB SALES – A. A. A. - COMMUNICATIONS NEWS – CLUB ACCOUNTS
SSB & DATA COLUMN – MEMBER'S NEWS

# JOURNAL OF THE G QRP CLUB

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## EDITORIAL

Welcome to SPRAT 108,
Amateur Radio has changed a lot over the years and we like to reflect those changes whenever possible. One difficulty for the amateur radio constructor in recent years has been the gradual disappearance of many "leaded" components. This issue contains two articles on Surface Mount construction and a kit for experimenters to try SMD techniques. I have received several good entries for the W1FB Memorial Trophy. So the next edition of SPRAT will be something like a Test Equipment Special featuring the best of these entries. The competition for 2002 is laid out below.

## The W1FB Memorial Award 2002

For 2002, the project is to

**Design a Simple Viable HF Band Transmitter to introduce a beginner to QRP operation**

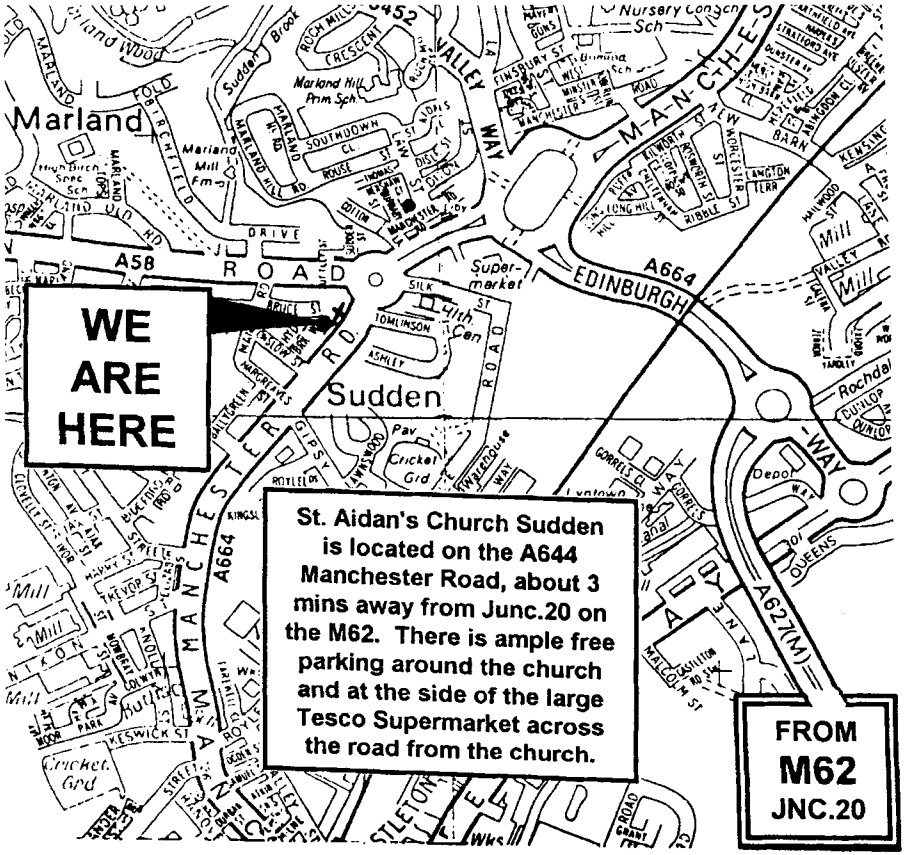
Please submit your design to G3RJV as soon as possible, with circuit sketch, all values and brief notes.
The project will be published in SPRAT and the winner will receive an engraved plaque.

72/3

G3RJV

EDITED BY GEORGE DOBBS G3RJV ARTWORK BY A.W. (MAC) McNEILL G3FCK
Printed & Distributed by G QRP Postal Mailing

# THE G QRP CLUB
# MINI-CONVENTION
## SATURDAY 13th OCTOBER 2001
### ST. AIDAN'S HALL SUDDEN ROCHDALE
**ADMISSION £1 - DOORS OPEN 10am - TALKIN S22**
**LARGE SOCIAL AREA - LECTURES ON QRP SUBJECTS**
**BRING & BUY - SURPLUS - JUNK - COMPONENTS - KIT TRADERS**
**FOOD & DRINK ALL DAY - INCLUDING THE FAMOUS PIE AND PEAS**

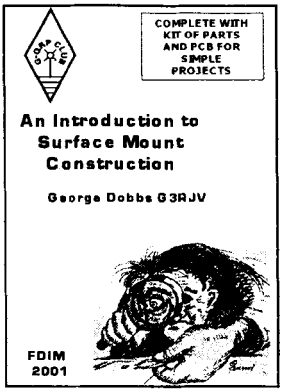



**LOCAL ACCOMMODATION**

Note The Royal Toby Lodge is full at the time of the convention.
Travel Inn (Rochdale) about 10 min drive away down the M62
has double & twin rooms at £41.95 per room. 01706-299999. www.travelinn.co.uk
Also within close range of the site : Oakenrod House : 01706 - 642115
The Norton Grange Hotel : 01706 - 630788

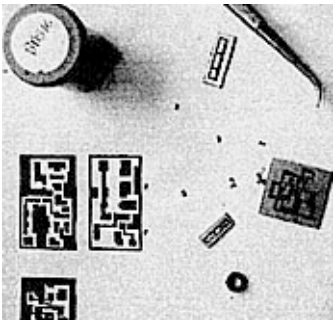
# Try Surface Mount Construction [with Kit Available]

George Dobbs, G3RJV, 498 Manchester Road. Rochdale, OL11 3HE




I think it was W.C. Fields who said, "I've seen a lot of change in my time and I've been against it all." Certainly the world of electronics has changed a great deal since I made my first projects. Valves have given way to solid-state devices, digital techniques have replaced many analogue techniques and methods of construction are now very different. I recall someone saying, "Once electronic construction was a work of art, now it looks like robot's vomit". Why should we innocent amateur constructors be concerned about SMD techniques? Well... we are moving towards a time when SMD components may be the only ones we can obtain. Yet amateur constructors have been reluctant to try SMT.

The projects described below were designed for the **FOUR DAYS IN MAY** presentation at the Dayton Hamvention when I was invited to do a presentation on surface mount construction. Alongside the presentation, a handbook and kit were produced which are now available to SPRAT readers – see below. The circuits are offered to SPRAT readers who could, if they wish, build them with leaded components.



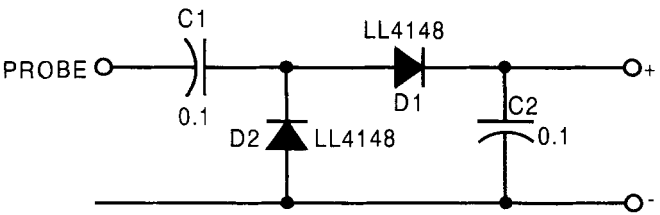
**Some Simple SMT Projects**

The projects described below are all capable of being built by the newcomer to SMT.

**1] Soldering Practice – A Diode Probe**

A beginner needs some practice in soldering those little parts to the board. What could be better than a project that only uses 4 parts! The diode probe is a useful addition to a multimeter in the shack – you probably have at least one of them – so why not build a small one and practice SMD parts placement and practice soldering?

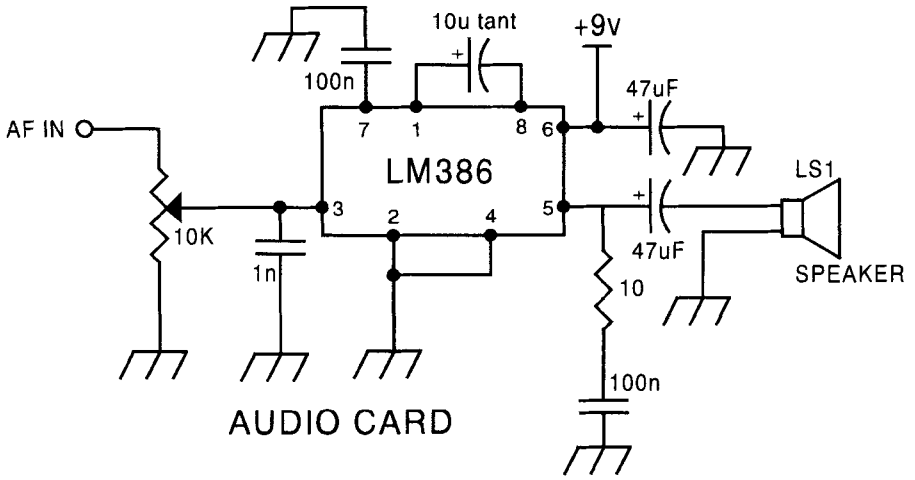
**A Peak Reading Diode Probe**




Two boards are supplied for this project. There is a large board using SOT23 diodes, which has plenty of room for the inexperience constructor to mount the parts.

Alongside this there is a smaller board that uses MELF (SOD80) diodes. This is more difficult to work but it does produce a diode probe that can be mounted inside a 3.5mm jacket socket to make a small test unit.

**2] An Audio Amplifier Card.**




The good news (or is it?) is that the LM386, the cockroach of audio amplifiers, is readily available in SMD format. So an obvious second project is a little audio card using the LM386. The schematic is one we know and love and the SMT version fits on to a pcb less than one-inch square.

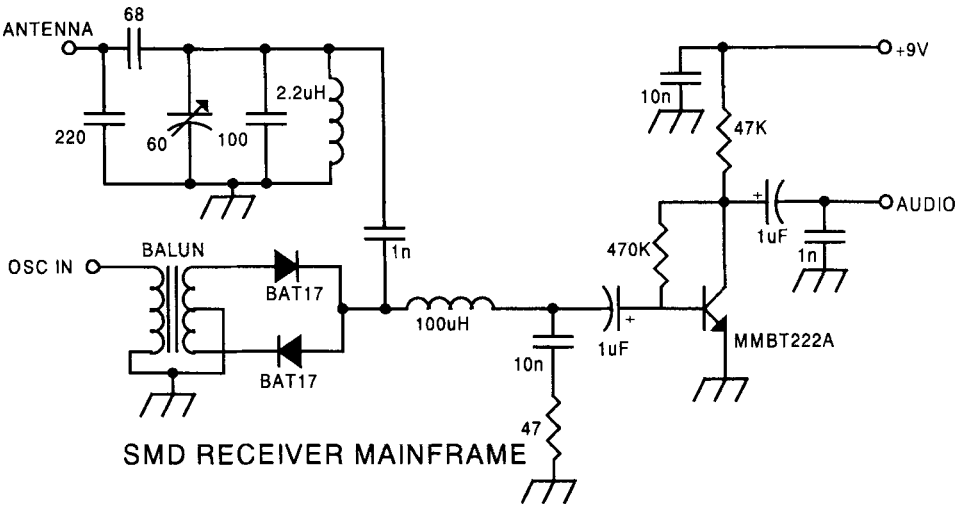
Building this board is a little trickier. The chip is easily mounted if held down to the board and one of the pins is soldered. The other pins can then be soldered once the chip is firmly in place on the board. The Audio Card is suitable for all sorts of applications around the shack as final stage of the next project.

**3] A Receiver Mainframe**

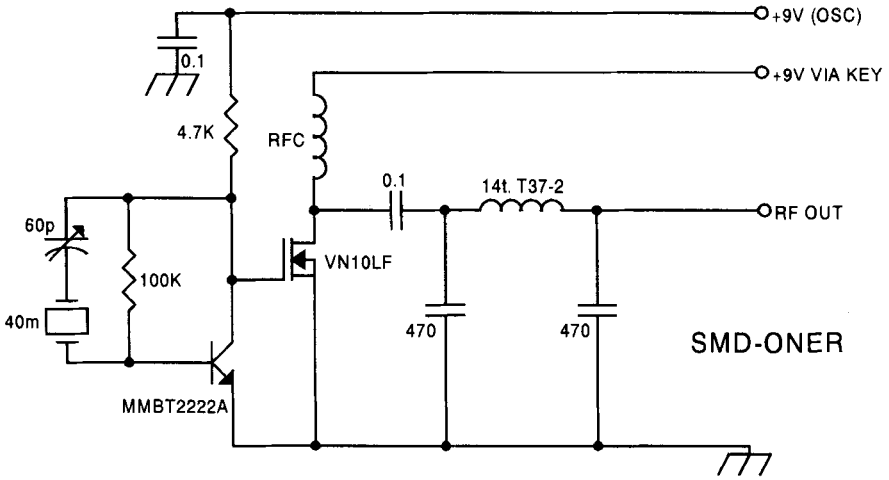
The schematic shows a simple direct conversion receiver "mainframe" – the basis of a viable amateur bands receiver. A local oscillator at the required frequency feeds a pre-wound SMD balun to a pair of Schotty diodes acting as a mixer. This is mixed with the antenna signal which comes via a simple bandpass filter. After basic RF decoupling, the resultant audio signal is fed to a single stage audio amplifier. This offers plenty of audio drive for the SMD LM386 board.

This circuit could be used for any band – although the kit version gives input filter values for 40m. The local oscillator can be any VFO or VXO on the 40m band. In the prototype I used the Tormet OSC7 module [see note at end].

This produced a very useful little 40m receiver with the minimum of parts and effort. It is also possible to use the VXO section of the transmitter to be described below.
The only setting up required for the receiver is to peak the bandpass filter trimmer capacitor for maximum in-band signals. The receiver gave a good account of itself even on the 40m band in the evenings in the UK.




**4] An SMD ONER**




The schematic shows the SMD version of the famous ONER transmitter. A simple bipolar VXO drives a single VMOS power amplifier. This SMT version uses the SMD VN10LF which is a tiny device for a power amplifier! Here we can run it to its maximum power dissipation of around 300mW. The transmitter is QRPp and typically gives some 200 to 300mW of RF output, which is a fun-amount of power for 40m. The transmitter is terminated with a simple lowpass filter. The values supplied in the kit are for 40m.

The board allows separate supply lines for the oscillator and the PA sections which enables the oscillator to run alone to "net" the transmitter with the receiver or to use the VXO to drive the receiver described above.

If the VXO is used to drive the receiver – take an output from the collector of the MMBT2222A via a capacitor of about 100pF to the oscillator input on the receiver board. This version has no keying transistor because I opted for simplicity and simply keyed the power (a 9 volt battery) to both stages.

**COMPLETE SMD INTRODUCTION KIT**

**Complete with Handbook**

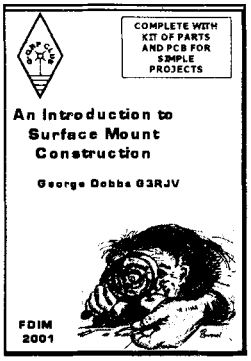
including all SMD parts and printed circuit boards for the projects is available from –

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

**SMD Kit and Handbook – members price: £21 inc p/p**

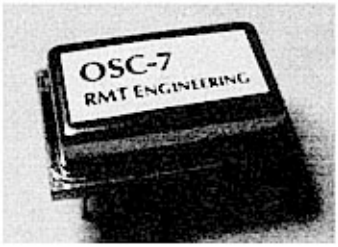
**Make out cheques to "G QRP Club"**

**US MEMBERS – some kits are available from Bill Kelsey N8ET [kanga@bright.net]**



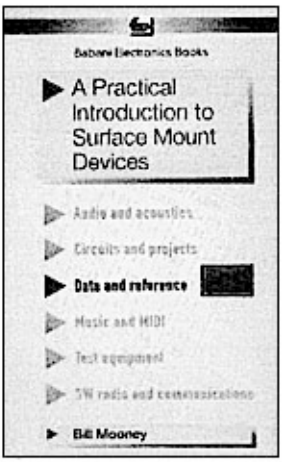

**The OSC7 SMD VFO**

Dick Tormet, N8YSK, is well known for his excellent Tormet's "Electronics Bench Reference" book. This year Dick's company, RMT Engineering, has produced an interesting new range of SMT modules for the amateur radio constructor. The modules are now available from Kanga US. I have tried two of the modules: a 3.5MHz variable crystal oscillator (VXO-3.5) and a 7MHz VFO (OSC-7). Both are well built and housed in the mountings frequently used for clock oscillators. The 7MHz VFO unit is designed for varactor tuning with a potentiometer or it may be used with a variable capacitor. Further information can be had from **Kanga US - Bill Kelsey N8ET, 3521 Spring Lake Drive, FINDLAY. OH 45840. Kanga@bright.net.**




**RMT Engineering website at www.ohio.net/~rtormet/index.html**

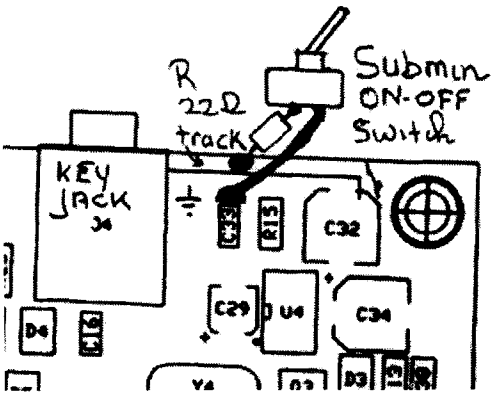
**FOOTNOTE:** Bill Mooney, G3VZU, was the UK pioneer of SMD construction for the radio amateur. His company Blue Rose and his articles in SPRAT [from as early as 1989] encouraged many people to try SMD projects. Bill still retains his interest in SMT construction for the radio amateur. His WebPages at www.billssmd.mcmail.com, offer useful advice to the radio amateur contemplating the use of SMT for home building.




Perhaps Bill's most useful contribution is his excellent book, "A Practical Introduction to Surface Mount Devices" published by Babani Electronics Books (catalogue number: BP411) in 1996. (ISBN 0-85934-441-8). The book takes the reader from the simplest possible starting point to a high level of competence in handworking with surface mount devices. It deals with PCB design, chip control, soldering techniques, specialist tools for SMD working and ends with an extensive appendix of devices, specifications and pcb footprints. An excellent book for anyone beginning SMD construction.

# RF Attenuator for MFJ CUB Transceiver

**Jan Verduyn, GØBBL, 14 Ragleth Grove, Trowbridge, BA14 7LE**




At the Yeovil QRP Convention I obtained a used MFJ CUB (9340) 1 watt transceiver for 40m. The rig performs very well indeed during the day, however at night performance suffers due to overloading of the NE602. Tests during the week showed that inserting a 10dB attenuator in the antenna path during receive transformed the CUB's performance. Adding a switchable RF Attenuator is simple. The modification consists of switching in a 22Ω resistor between junction of C15 and C14 and ground.

**Parts required: 1 subminiature single pole on/off switch**
**1 22Ω resistor**

1] Mount the subminiature switch on the back panel next to the Keying socket J4 about 10mm above C33 and R15 on the PCB

2] Locate the PCB track running along the side of the PCB near C33 and R15 and scrape around 5mm of track bare.

3] Solder one end of the 22Ω resistor to the track, the other end is connected to the switch.

4] Connect the other end of the switch to ground. A convenient ground pad is the earthy end of C33.

I found the 22Ω resistor is a good value when using the CUB with either a 40m dipole or multiband halfwave vertical in my shack. However you may want to change that to 15Ω or less when using a better antenna or in a better location.

Perfectionists may consider switching in a poper 10dB pi attenuator using three resistors. However this would require cutting the track on the PCB and wiring in a double pole switch.



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WANTED: Any LF band crystals either in or just LF of bands suitable for regrinding. FT243, 10X or 10XJ types only. 160/80/40/30 metres. Will buy or swap for components or spare valves. Crystals needed for valve restoration projects. G3VTT 01634 719703 or g3vtt@aol.com
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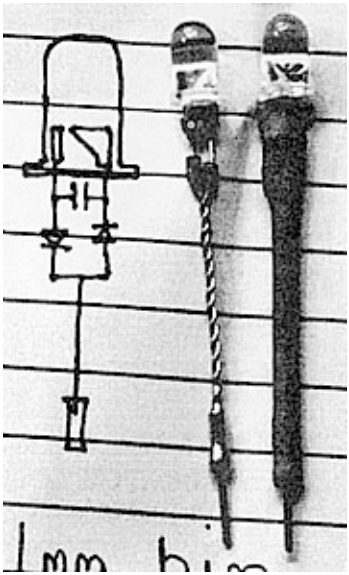
# LED RF Test Probe

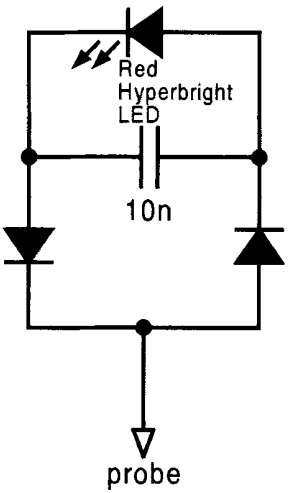
**George Burt, GM3OXX, Clunie Lodge, Netherdale By Turriff. AB53 4GN**



This is a version of the G4TKV probe described in RadCom Technical Topics for May 1997. I used BAT86 diodes and a Hyperbright LED from Maplins [red at 1.6cd]. The capacitor is a miniature disc type but surface mount could be used.

The original circuit had a 6p8 capacitor in series with the probe. I use a 0.1mm PCB pin and covered the twisted wires with heat shrink tube and eliminated the series capacitor.

For best results hold the probe by the junction of the diodes and the LED to provide a groundplane.




In the original RadCom article, G4TKV commented, *I found that Superbright/Hyperbright LEDs will illuminate on low microamp levels. I tried one on the output of a crystal set and was amazed to see a dim glow. This probe glows quite brightly when held a few inches from the output transistor of a 0.5W transmitter and by touching can indicate oscillation in any circuit.*

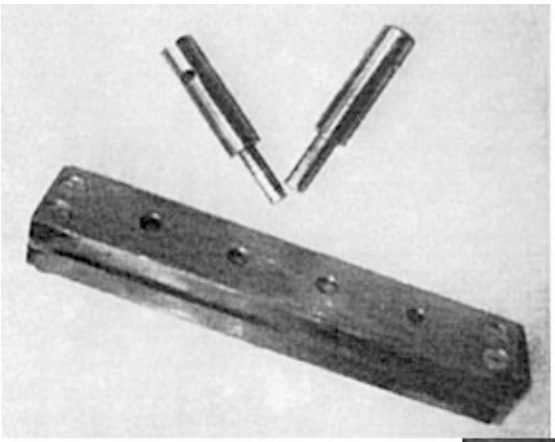
# AN ISLAND PUNCH

**Wynn Hirst G3YXK, 7 St Jude Close St Johns Estate Colchester CO4 4PP**

This is not a drink but an easily made device to make copper islands for circuit board construction.

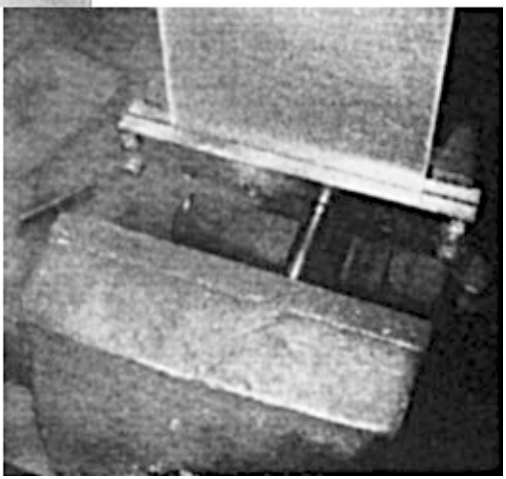
First cut 2 pieces of steel 4" long x 3/4" x 3/16" or whatever you have nearest or cut the long length to suit the width of your vice jaws.

Clamp these two pieces together and square up. At 1/4" from each end drill 2 holes 4 BA clearance and countersink the 4 holes on one piece to take the 4 bolts, fasten the two pieces together with the bolts and mark a centre line from end to end on the face of one piece, drill through the 2 pieces along the line 4 or 5 holes with a drill the size of the islands you wish to produce.



My holes were drilled 4 & 5 mm making sure the holes are at right angles to the 3/4" face. Now assemble the two pieces together with a spacer between the two pieces on each bolt so the copper board you wish to punch can slide between the two pieces, this finishes the die.

All that is now required is a punch to fit the holes previously drilled. Mine are turned from a piece of steel 5/16 dia and about 2" long turned down at one end to fit the holes in the die, an old drill shank about 1 "- 11/2" long the same diameter as the holes squared at both ends will work the same.



Now put your piece of scrap circuit board between the plates put the punch into the hole in the die and place between the jaws of the vice, tighten the jaws of the vice until you feel the punch go through the board and you have a perfect island ready to cement on your circuit board.

If you are punching single sided board put the copper side in away from the punch. Don't forget to wear eye protection during any of the procedures above.

A number of layouts for circuits have been featured recently using the Manhattan Island technique of construction. For those with Internet access then the following web sites are worth a visit.
[left: examples of islands produced by the punch]

The Chuck Adams home page.
http://www.qsl.net/k7qo/
The Preston Douglas WJ2V.
http://hometown.aol.com/pdouglas12/page/index.htm
linked from the **NORCAL** home page.

## Radio-controlled Clocks

**These clocks feature 24hr readout, offset to GMT with continuous seconds and date display.**
**Dual alarm with snooze facility.**
**Ideal for the shack or for Field Day.**
**£14.95 each + £1 p&p any quantity.**
**Cheques payable to Martin Peters,**
**11 Filbert drive, Reading. RG31 5DZ**
**Check into:**
**http://freespace.virgin.net/martin.peters1**
**or SSAE for more details.**
**Email - radio.clocks@virgin.net**
**(G4EFE/GQRP 1176)**




FOR SALE: Mizuho 14.S HF QRP Rig. 20m SSB/CW Transceiver with 2 xtals, with AN14 telescopic ant. DC/DC converter, CW 2S CW semi-break-in Circuit & Sidetone + instructions. £130.00. Edward Ball G4UOZ, 01482 872755 [E. Yorks]

# The *Marathon* 136 kHz QRP Transmitter

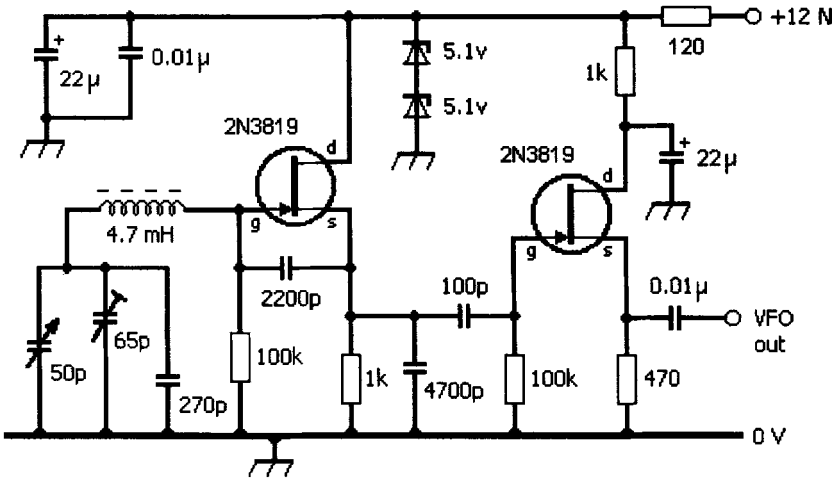
**Steve Rawlings GW4ALG, 14 The Paddock, Chepstow, NP16 5BW, UK**

Those still looking for a winter project need look no further! Add a new dimension to your QRP station by constructing this VFO-controlled long wave transmitter. With this rig, you can start experimenting on our newest and, perhaps, the most challenging of our amateur bands. As well as providing an excellent signal source for those initial antenna tests, this five-watt transmitter delivers enough power to make your first low frequency (LF) contacts. When used with a typical back-yard antenna, this little rig will enable you to make CW QSOs over about 40 km – about the same distance as that covered by a marathon runner.

But how far will QRP signals travel at 136 kHz? Well, my best DX using the *Marathon*, and a simple 12 m vertical antenna, is to John G4CNN in Berkshire - 122 km away. Those with bigger antennas will do much better. For example, the well-equipped station of Mike GW4HXO (174 km away) puts a very fine RST 559 signal into my QTH when running five watts. And GW4HXO is still 549 when running just one watt!

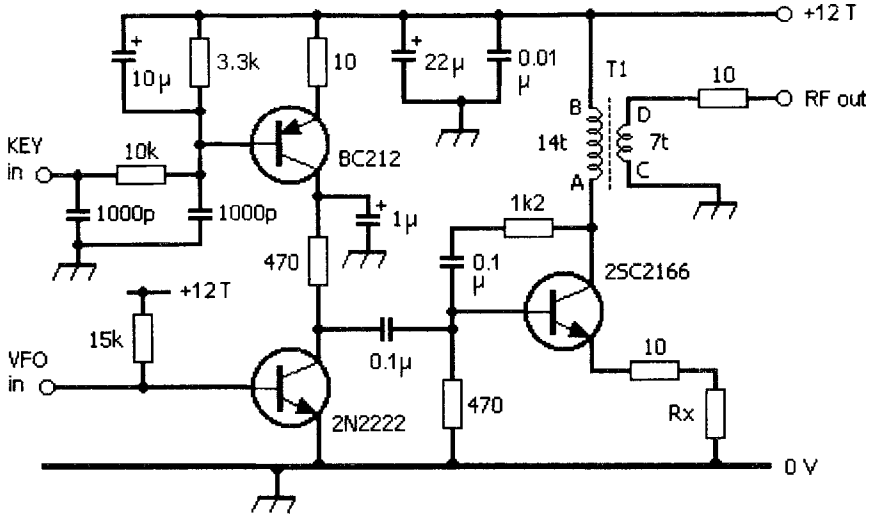
## VFO and Buffer Stage

The VFO components should be screened from the PA/LPF ring cores to avoid frequency pulling on transmit. The capacitors associated with the gate and source of the FET oscillator should be polythene types; and a 4.7 mH RF choke may be used for the VFO coil.



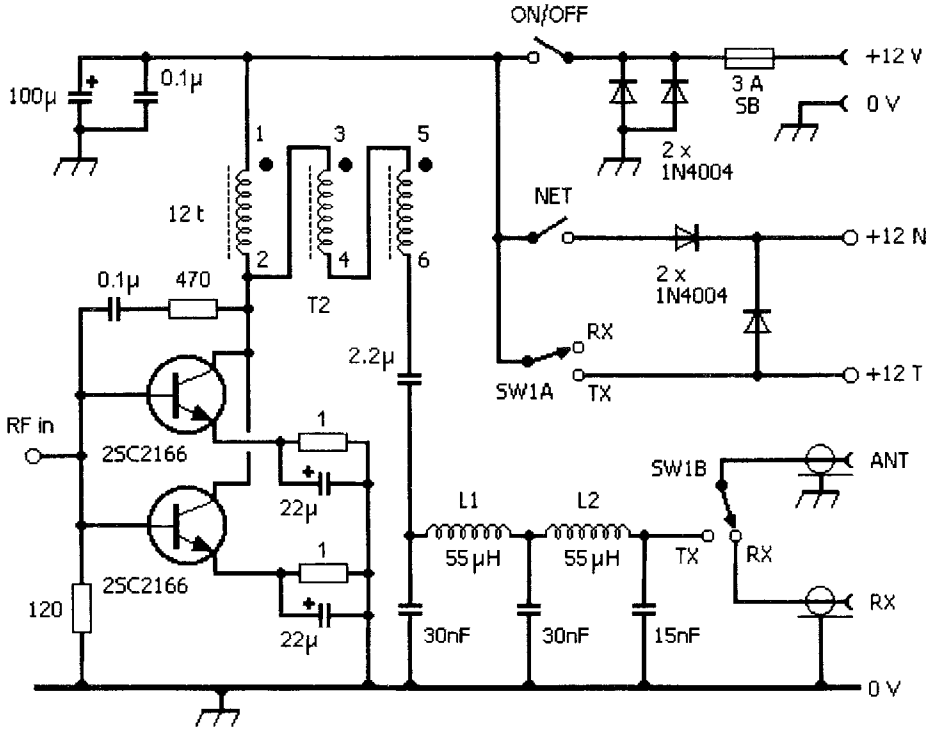

## Keying Circuit and Driver Stage

A novel feature of this TX is the use of the BC212 keying transistor to provide shaping of the keying waveform. The result is click-free CW having a rise time of 3 ms, and a fall time of 6 ms. The gain of the driver stage is set by the 1200 ohm feedback resistor. For some brands of 2SC2166, you may need to increase the gain of this stage by using a 4700 ohm feedback resistor. The drive level is set by adjusting the emitter resistor, Rx. If variable output power is required, a variable resistor of 250 ohms may be used in place of Rx. The 2SC2166 is driven by a rectangular wave, and does not need a heatsink.



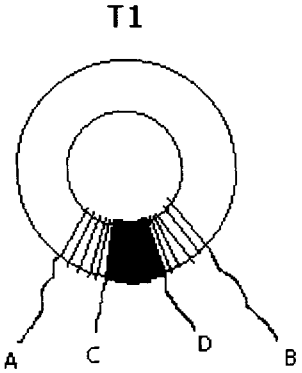

## Power Amplifier (PA) and Low Pass Filter (LPF)

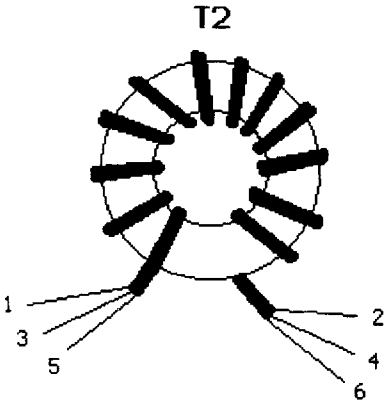
The PA transistors must be mounted on a substantial heatsink using TO220 insulating kits. The low pass filter uses series/parallel combinations of 10 nF MMK 400 v polycarbonate capacitors, or similar.

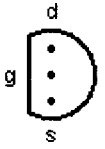


Rx in the driver stage should be set so that, on key down, each PA transistor draws 600 mA. This can be checked by measuring the voltage across one of the 1 ohm emitter resistors: 600 mV corresponds to a current of 600 mA. To reduce the PA emitter current, increase the value of Rx in the driver stage. The gain of the PA is set by the 470 ohm resistor. For some brands of 2SC2166, you may need to increase the gain of this stage by increasing the 470 ohm resistor to 1200 ohms.

For L1; L2; T1; and T2, use 22 or 24 SWG enamelled copper wire, or PVC-insulated (solid-conductor) wire salvaged from internal telephone cable.
L1 and L2: 60 turns on Amidon T130-2 ring core.
T1: 14 turns on 25 mm OD 3C85 ring core, plus 7 turns for the secondary winding.
T2: Twist three wires together at about one twist every 15 mm. Wind 12 turns on a 25 mm OD 3C85 ring core, and label each of the three wires at the start of the winding with the identification numbers 1; 3; 5. Then label the other end of each wire with 2; 4; 6, respectively.

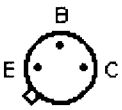


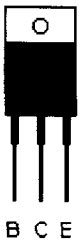




2N3819
(bottom)


BC212
(bottom)




2N2222
(bottom)




2SC2166
(top)

## Support

Those needing help with the construction or use of this transmitter are welcome to write to me, enclosing an SAE. Updates and useful tips from other *Marathon* constructors will be maintained on the GW4ALG web site at: http://www.alg.demon.co.uk/radio/136/qrptx.htm

# Pulling Crystals even Further

**Dr Andrew Smith G4OEP. Email: aj.smith@mail.com**

Issue 107 of Sprat contained an article by Ian Braithwaite (G4COL) drawing attention to variable crystal oscillators (VXOs) as frequency control elements in home brew equipment. VXOs are extremely stable, but can only be adjusted over very narrow frequency ranges. G4COL shows how a 10.106MHz crystal can be pulled by about 1 part per thousand (1ppt), but in fact stable VXOs can give 5ppt coverage, and this article shows how. The circuit is the Colpitts design shown below.

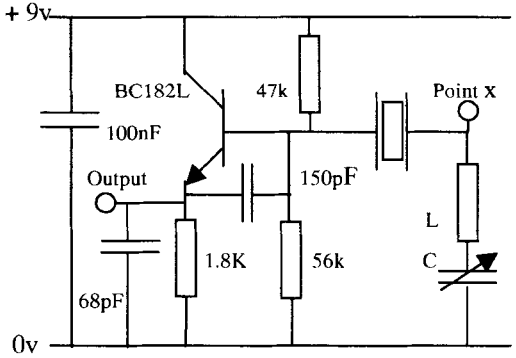



**Fig 1. VXO**

HF crystals are operated with a standard 30pF capacitance in series, without L. If the capacitance is variable, the frequency can be trimmed to exactly the value marked on the crystal, the trimmer compensating for variations in circuit design and layout. This is the basic VXO. However, the range of variability with a series capacitor alone is very small, and depends critically in the range of capacitance which can be achieved. At the maximum end, the limit is zero reactance represented by a very large capacitance or a short circuit. In low-gain circuits the limiting minimum capacitance is reached when the crystal stops oscillating, but in the present circuit the limit is the minimum capacitance of a variable capacitor or varicap.

Some experimenters use two or more nominally identical crystals in parallel. In circuits with series capacitance only, the advantage of using multiple crystals is greatest when the minimum value of series capacitance is rather large. If a truly small value of C can be achieved, the effect of adding a second crystal is disappointing. However, some useful results can be obtained if inductance and capacitance are both used.

Adding an inductor is in series with the crystal(s) and the capacitor increases the pulling range, but the circuit becomes more sensitive to stray capacitance around Point x in Fig 1. There is a trade-off between pullability and stability. I have achieved excellent results in VXOs designed for a variability of 2 ppt, and recommend that as a good compromise. You could design for more, but the circuit would begin to behave more like a conventional L-C oscillator, and less like a true crystal oscillator. How far down this road you go is up to you.

In order to illustrate what can be achieved, I include results obtained with crystals marked 6.000MHz, and 14.318MHz, but similar results can be obtained up to about 20MHz. My crystals were taken from my scrap box and were all HC18U packages. Three variations on the basic VXO technique were described – (a) variable series capacitance only (b) series L and C (c) series L and C with two or three nominally identical crystals in parallel (6.000MHz results only).

The variable capacitor was a 19-150pF type but the minimum of 19pF is larger than ideal.

In order to illustrate the effect of a smaller minimum capacitance, I have included some results obtained with a fixed 2.7pF capacitor (joined directly to the crystal to minimise strays). I have also included results obtained with a short-circuit representing the maximum capacitance.

Results 1. Series Capacitance alone – Single 6MHz crystal.

| Capacitance (pF) | Frequency (MHz) | Difference (kHz) | Parts per 1000 |
|---|---|---|---|
| 150 | 5.999,467 | | |
| 19 | 6.003,445 | 3.98 | 0.66 (relative to 150pF) |
| 2.7 | 6.005,955 | 6.49 | 1.08 (relative to 150pF) |
| S/C | 5.999,216 | 6.74 | 1.12 (relative to 4.7pF) |

These results show the importance of achieving a low minimum capacitance – the pulling range is increased by 63% if the minimum capacitance is reduced from 19pF to 2.7pF. Relatively little (6%) is gained by increasing the maximum capacitance above 150pF.

Results 2. Series Capacitance, Two 6MHz Crystals in Parallel.

| Capacitance (pF) | Frequency (MHz) | Difference (kHz) | Parts per 1000 |
|---|---|---|---|
| 150 | 6.000,390 | | |
| 19 | 6.005,914 | 5.52 | 0.92 (relative to 150pF) |
| 2.7 | 6.008,177 | 7.79 | 1.30 (relative to 150pF) |
| S/C | 5.999,849 | 8.33 | 1.39 (relative to 2.7pF) |

The effect of using two crystals in parallel is greatest if the minimum capacitance is relatively large. Thus the pulling range is increased by 38% with the variable cap in circuit, but by only 20% when the capacitance ranges from 2.7pF to a short-circuit. Adding an extra crystal shifts the frequency of the oscillator upwards; the centre frequency was raised by 1.7kHz in the circuit using the variable, while the lower limit was raised by 923Hz.

Series Capacitance with 14.318MHz crystal.

| Capacitance (pF) | Frequency (MHz) | Difference (kHz) | Parts per 1000 |
|---|---|---|---|
| 150 | 14.317,494 | | |
| 19 | 14.326,885 | 9.39 | 0.66 (relative to 150pF) |
| 2.7 | 14.331,842 | 14.3 | 1.00 (relative to 150pF) |
| S/C | 14.316,884 | 15.0 | 1.04 (relative to 4.7pF) |

The importance of achieving a low minimum capacitance is greater at the higher frequency. The residual capacitance of the variable capacitor presents a lower reactance at this frequency, and this compromises the results. But with the 2.7pF capacitor, the result in terms of ppt is only slightly lower than the 6MHz case. The swing in terms of kHz is proportional to the frequency.

Series L and C. In these tests a series inductor was added, adjusted to give a pulling range of approximately 2ppt with the 19/150pF capacitor

Results 4. 6MHz, L = 85μH, Q = 90, C = 19/150pF

| Frequencies (MHz) | Difference (kHz) | Parts per 1000 |
|---|---|---|
| 5.985,677 - 5.998,964 | 13.29 | 2.21 |

Results 5. 14.318MHz L = 12.8μH, Q = 75, C = 19/150pF

| Frequencies (MHz) | Difference (kHz) | Parts per 1000 |
|---|---|---|
| 14.292,2 – 14.321,0 | 28.8 | 2.01 |

These results represent very successful oscillators which are close to the limit to which a single-crystal VXO should be pushed. They are sensitive to stray capacitance around point x on Fig 1. This sensitivity was quantified by setting the oscillator to its mid-frequency and then adding a 2.7pF capacitor between point x and ground. In the oscillator described in Results 4, the frequency shifted by 6.36kHz, whereas the same test with the oscillator yielding Results 1 gave just 200Hz. This might seem alarming, very stable oscillators can nevertheless be built even if only a small amount of care given to rigid construction and shielding.

VXOs with 2 or more crystals in parallel, and L and C in series. I have several 6MHz crystals, and these provided the opportunity to experiment with L-C VXOs with 2 or more crystals in parallel. Furthermore, the dependence of 2-crystal VXOs on crystal matching could be tested. In a standard test oscillator the closest pair were 6Hz apart, while the widest pair differed by 260Hz. These two pairs were tested in a 2-crystal VXO using the variable capacitor and an inductor adjusted to give approximately 3ppt pulling range. Sensitivity to stray capacitance was tested using a 2.7pF test capacitor as before.

Results 6. Two 6MHz crystals in parallel with L & C in series. L = 55.5μH, C = 19/150pF

| Frequencies (MHz) | Difference (kHz) | Parts per 1000 | 2.7pF Sensitivity |
|---|---|---|---|
| a) Closest Pair | | | |
| 5.986,596 - 6.004,047 | 17.45 | 2.91 | 1.4kHz |
| b) Widest Pair | | | |
| 5.981,622 - 6.004,084 | 22.46 | 3.74 | 2.58kHz |

Wider crystal differences give greater pullability with a given inductor. Even with a range of 3.7ppt, thisVXO is more stable than the 2ppt single-crystal design, but no conclusions were drawn from the difference in stability between the two 2-crystal realisations, since the association of pulling range with stray capacitance sensitivity is expected. Either of these oscillators would make a very satisfactory VXO, and the pulling range could possibly be extended to 4ppt (using a larger inductor) without seriously impairing the stability. Apart from controlling the required inductance, the degree of matching between the crystals is not a major consideration.

Three-Crystal VXO.

The crystals chosen for this test had the following deviations from 6.000MHz in the test oscillator; +798Hz, +650Hz, +538Hz i.e. the widest pair, and one approximately in the middle. For the test, the inductor was adjusted to give a range of 5ppt with the variable cap.

Results 7. Three crystals, series L & C. L = 44.4μH, C = 19/150pF

| Frequencies (MHz) | Difference (kHz) | Parts per 1000 | 2.7pF Sensitivity |
|---|---|---|---|
| 5.975,510 - 6.005,699 | 30.2 | 5.0 | 3.46kHz |

This VXO with a pulling range of 5ppt has less sensitivity to stray capacitance than the single crystal oscillator with a range of 2ppt.

Conclusions. The extreme range of variability for an HF crystal with series capacitance only is about 1ppt (1kHz per MHz), but less than this might be achieved (say 0.7ppt) with a practical variable capacitor. If inductance is also added, the pulling range can be extended, but at the price of stability. The exact trade-off is under the control of the constructor, but 2ppt in a single-crystal circuit is a guide if good stability is to be retained. Using two or three nominally identical crystals in parallel increases the pulling range to about 4 or 5ppt respectively, without loss of stability. There is no great advantage in selecting the crystals, but more inductance is required if the crystals have very similar frequencies.

# An Effective L-type ATU

**Jesper Fogh Bang, OZ1XB, Elmevej 10, DK-3500, Vaerloese, Denmark**

I have made a number of experiments with L-tuners and the one described is somewhat special compared to the ordinary textbook types. It has the benefit of both balanced and unbalanced output and it can tune both capacitive and inductive loads effectively. The theory behind the L-network is well described in most handbooks such as the ARRL and RSGB.

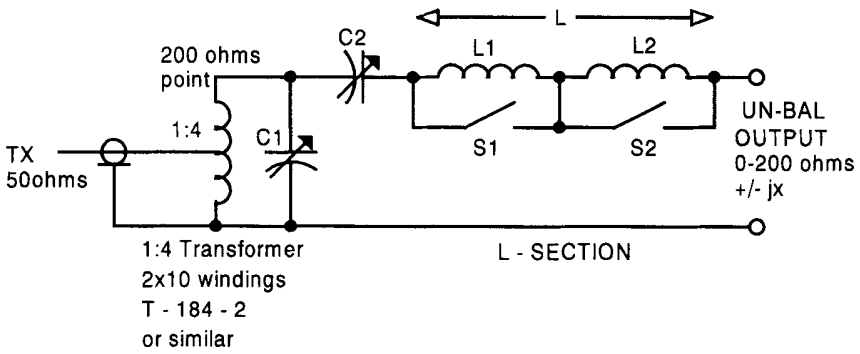
The main features comprise:

- Simple and effective
- Low pass type
- Balanced or unbalanced output
- Tunes both capacitive and inductive loads
- Operates with lowest possible loaded Q

The only drawback of the ATU is the limited output range of 0-200 Ω. If a bigger range up to 450 Ω is needed the transformer can be made as a three winding 1:9 auto type, but then the output can only be unbalanced.

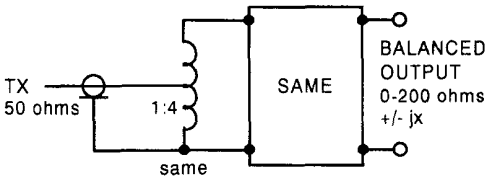
The design is based upon an ordinary step-down L-type network with a variable capacitor and a variable inductor. The variable inductor is made up with one or several switched coils in series with a variable capacitor. See my comments in RadCom TT, July 1995, page 69. The arrangement with the variable capacitor has the benefit that the network can also tune heavily inductive loads, even loads with a built-in inductive part which is bigger than the L-value in the network required for a certain match. In such instances the L-coil may not be required at all!

Also the L-network always operates with the lowest possible loaded Q for a certain impedance match. The loaded Q cannot be chosen or designed arbitrarily as is the case for most other networks.

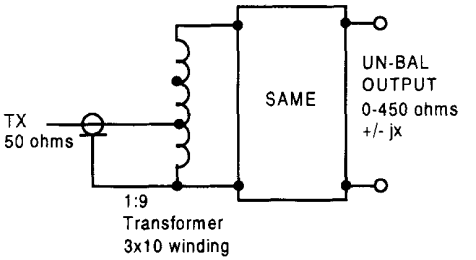



The ATU is easy to tune with only two variable components once the right coil value is selected. The tuning procedure is similar to the load and dip known from the Z-tuners and π-networks. The coil L should be chosen such (minimum value) that C2 has maximum value (lowest possible impedance) when a match is obtained.

The input side comprises a 1:4 step-up transformer connected either as a balun for balanced output or as an auto type transformer for unbalanced output. This can easily be switched by reversing the XCVR coax connection. The transformer only operates with resistive loads which keep the voltage and core requirements at a minimum.




In my experiments I have used a T-184-2 core for the balun because the ATU is also used at high power levels. For QRP work much smaller cores can be used such as the T-157-2 or even smaller. The L-coil(s) can be made as either air core type or with iron dust cores. The number and size should be found by experiment for each application, band and impedance requirements. Plug in coils would be handy. The capacitors are small dual gang receiver type approx. 2x365 pF salvaged from BCLs.




See also: "Save your tuner for two pence" in RadCom, May 2000 page 20
OZ1XB can be found on email at foghbang@tiscali.dk

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## Two Way QRP QSL Labels and Blank G-QRP QSL Cards

**QRP Labels:** Black Lettering on Gold with Club Logo : 200 labels £2. Post inc.

**Blank QSL Cards:** You complete your own address and call.
Blue lettering on white card, 5.5" x 3.5". 100 cards £4. Post inc.
Sample from : **M.L. Prickett [Max] G3BSK, 260 Haslucks Green Road, Solihull, West Midlands. B90 2LR.**
Cheques: "M.L. Prickett" [The G QRP Club benefits from each order]

## 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 £4 (or £3 plus a recent SPRAT wrapper) to Dave Gentle, G4RVI, 1 Sunny Hill, Milford, Derbys. DE56 0QR, payable to "NBTVA"
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# An Experimental Transceiver - the "ET-1"

**Glen Yingling W2UW, PO Box 62, Newark Valley. NY13811-0062. U S A**

**The ET-1 has appeared in 73 magazine and is reproduced by permission of the author**

## PROJECT OVERVIEW

Did you ever want to see what you could do with a just few parts? Well, here is one experiment that you might find interesting. I decided to see what I could do towards making a small transceiver that would operate from the power of one "D" cell flashlight battery. This article describes how successful I was in reaching that goal. My approach started out with the following plans:-Use one (1) transistor and switch it between the receiver and transmitter sections of the transceiver. -Design both to operate from 9 volts dc. -Find a good switch and mount the transistor directly onto its common terminals. -Since a transceiver is defined as a transmitter and a receiver that share common parts, I will claim that what I have built can be called a "transceiver" not a "trans-receiver." Hi. -To minimize the parts count and complexity, design the ET-1 to be a one band, 40 meter rig.

## TRY IT YOURSELF

This project is easy to build. You don't need any special printed circuit cards because for 40 meters the layout is not overly critical. You can use "ugly" construction if you desire. I chose to use pieces of the Radio Shack project card No. 276-150A because it makes everything a little neater. You can even build this project on a "pine board" if you like and it will work fine on 40 meters.

## DESIGN SOURCE

The circuits described come from everywhere! Of course, as the project developed, I had to make my own engineering changes to make everything work to my satisfaction.

-The receiver circuit is a regenerative detector (Regen). The Regen approach provides the best trade off when considering parts count, sensitivity, and cost. It will receive both CW and SSB and it will compete in sensitivity with your main rig. Sounds impossible, but it is true. I have heard weak signals on my main rig and have then verified that I can also hear them on the Regen. In fact you can tune in a signal on both sides of "null" or "zero beat" on the Regen, thereby getting two for the price of one! Hi. Of course, you should use high impedance earphones for this Regen since there is only one transistor in the circuit.

-The transmitter circuit is essentially a Pierce oscillator. This circuit is made up of ideas given in the ARRL handbook, the QRP notebook (W1FB), and the SPRAT magazine No. 69 (GM3OXX).

-The resulting circuit for the ET-1 has the following parts count: Receiver section----------8, Transmitter section---------6, Common transistor---------1,Total----------15

-The antenna connection for the ET-1 is a coaxial cable connecting directly to my normal 40 meter antenna system. My antenna is a centre fed Zepp with open wire feeders and a home brew tuner.

## DETAILED ELECTRICAL CIRCUIT

-Fig. 1 shows the electrical schematic of the ET-1. Please note that the MPF-102 transistor (Radio Shack, 276-2062) is mounted directly on the Triple Pole Double Throw (TPDT) common switch terminals. It is used for both the receiver and the transmitter sections. I selected the FET transistor because it works well in the Regen.

## RECEIVER NOTES

-For the 40 meter band, tuning is set with the following:

-The 320 pf cap gets you to the 7.0 MHz range.

-The 6-70 pf cap lets you home in on the frequency of interest- -in my case, 7040 KHz.

-The small variable cap (one plate) lets you tune around 7040 KHz as a bandspread control.

-The 5-50 pf variable cap provides feedback to the oscillator for sensitivity control. Adjust it until the Regen is on the verge of oscillation. Any "squeal" indicates that you have gone too far!

-This circuit works good and the layout for 40 meters is not critical, but try to keep your wires short.
-You will hear a signal on both sides of "zero beat" allowing you to hear each signal "twice" on your dial, unlike your superheterodyne .
-The 9 component (including the transistor) Regen receiver will bring in signals comparable to those received by your expensive receiver. But, the selectivity will not be as good.
-The downside of this story is that it is so sensitive that a strong signal or a nearby station can easily overload it. ( I didn't care, so I did not try to put in any attenuation or volume control!) Hi. Also, at night with a contest on, the Regen is pretty much unusable.
-With the limited frequency range that I wanted ( 7040+/- 15 KHz.), once you set the Regen control, you don't need to adjust it again.

**TRANSMITTER NOTES**
-Adjust the 50 K Pot and the 6-70 pf trimmer for maximum output of the transmitter into a 50 Ohm resistor.
-The transmitter puts out approximately 20 milliwatts. Power is calculated as follows:
1.-(Peak to Peak volts)/2 x 0.707 = volts rms.. (ET-1) 3 volts/2 x 0.707 =1.06 vrms
2.-(vrms squared)/50 ohms = Power in watts
(ET-1) (1.06 x 1.06)/50 = 0.022 w = 22 mw

**GENERAL NOTES**
-The 100 micro henry rf chokes are somewhat non critical. Try whatever values that you have that are greater than 100 micro henrys. I happened to have a lot of the 100 micro henry chokes that cost me a penny each.
-The 50 k ohm pot is also somewhat non critical. Try any pot up to 500 K ohm.
-When I run this rig, I use one "D" cell from a flashlight for power. However, I cheat because I use a DC-to-DC converter to boost the voltage up to 9 volts dc. You can use a 9 volt battery.
-I did not even put a "power on/off" switch on the ET-1 , instead I use the external power supply switch.

**INITIAL SETUP**
Initial setup consists of connecting the ET-1 to a 50-ohm dummy load and, using an oscilloscope or an rf probe plus your multimeter, adjusting the transmitter for maximum output. Adjust the 50 K Ohm pot first and then adjust the trimmer cap. No adjustments to these controls will be needed again. Set the receiver frequency to 7040 K Hz. by adjusting the variable trimmer on the top deck of the chassis. You can use a Grid Dip Oscillator or a frequency meter or you can even listen to the receiver oscillator on your main receiver. Next adjust the "Regen control" on the receiver until just on the verge of a "squeal". Then adjust the antenna trimmer cap (C1) for best reception. One more tweak of the "Regen control" may be required. After that no further adjustments of these controls will be needed.

**ON-THE-AIR PERFORMANCE** - - It is hard to believe how well the ET-1 performs on the air. I have had no reports on chirps or clicks and the frequency is stable as a rock since it is crystal controlled. My crystal is listed as 7040 KHz. but since I did nothing to "pull" it to that frequency, it ended up transmitting on 7040.7 KHz.! Since I am "rock bound" I usually call a lot of CQ's or wait around until someone calls on my frequency.

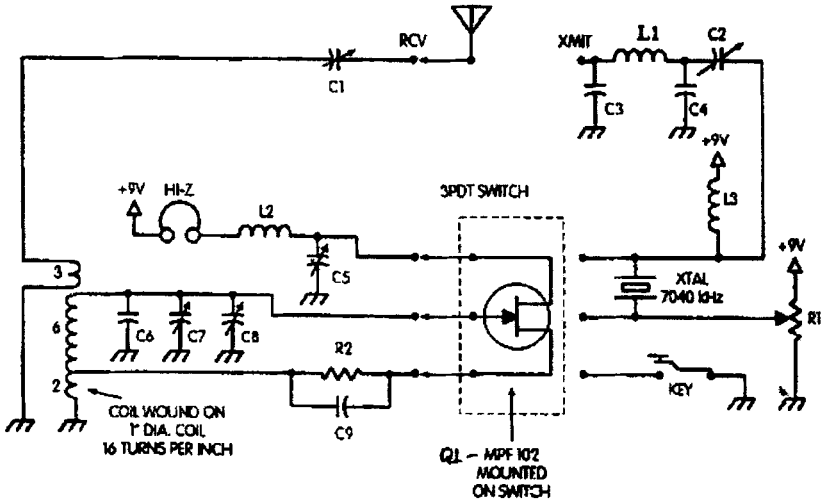
All of my contacts were made using a 1.5 vdc "D" cell connected to a DC-to-DC converter that I got from the Electronic Gold Mine (Part No. G6344) which boosts it up to 9 vdc. You may want to use a 9 volt battery instead. Most of the contacts that I have made were the result of my calling CQ. This speaks well for a rig that only puts out 20 milliwatts. I estimate that 80% of the contacts were made by calling CQ. All of the QSOs were made using the Regen for reception.

The Regen is somewhat broad and other signals can always be heard but it gives good performance. In fact if there is interference you can always tune to the other side of "zero beat" to get rid of it! Using my centre fed Zepp antenna tuned to forty meters I have worked 23 states and Canada averaging about 1 QSO a day. However, in my defence , I would give the following as a reason for the poor showing: After every QSO, I would sit back, pat myself on the back, and marvel for a long time , revelling in the glory of making a QSO with such a mini rig. However, the most credit should be given to those on the other end who were willing to put up with such a weak signal station.

Most of the QSOs were 1/2 to 3/4 of an hour duration with solid copy on both ends. Only once or twice was a QSO terminated for poor copy on the other end. My reports ranged from RST 339 to 569. In general, my best luck was making QSOs in the morning and afternoon hours, probably because of lower noise levels on forty meters during those times.

My best dx was with WØUW (Dave) in Cape Girardeau, Mo., a distance of approx. 750 miles (as the crow flies), or 37,500 miles per watt! States worked were, CT, DE, GA, IL, IN, KY, ME, MA, MD, MI, MO, NC, NH, NJ, NY, OH, PA, RI, TN, VA, VT, WI, WVA, and ONT. Canada.

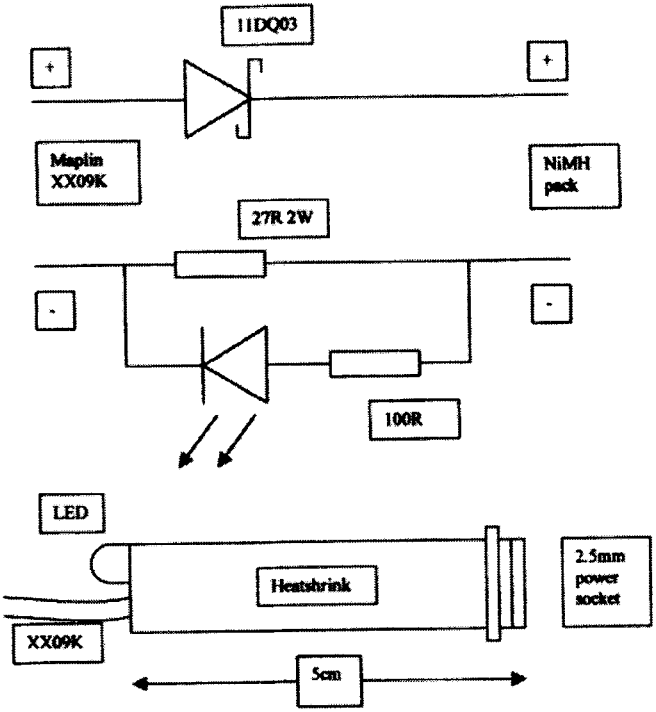
During most of my QSOs, when I commented that my transceiver consisted of only 15 parts, and that it was running only 20 mw, and that the power was coming from a "D" cell flashlight battery, I expected some statements of amazement. Instead, I mostly got a big "Ho-Hum"! So I guess that it may be true about ham radio operators being mostly "appliance operators". However, I would like to give a special thanks to "Lenny", (W2BVH) who gave me a "HOLY COW" and "congrats"!




| Part | Description | Count | | | |
|---|---|---|---|---|---|
| C1, 2, 7 | 6-70pf trimmer | 3 | C9 | 0.1 mfd | 1 |
| C3 | 820pf | 1 | L1 | T50-2 core with 14 turns | 1 |
| C4 | 560pf | 1 | L2, L3 | 100 micro henry inductor | 2 |
| C5 | 5-50pf variable | 1 | Q1 | MPF-102 FET (Radio Shack) | 1 |
| C6 | 320pf (band select) | 1 | R1 | 50 K Ohm Pot. | 1 |
| C8 | Tiny one plate variable | 1 | R2 | 22 K Ohm Resistor | 1 |
| | | | Total---------- | | 15 |

# Simple NiMH Charger

**Fraser Robertson, G4BJM, 2 Tamworth Stubb, Walnut Tree, MILTON KEYNES. MK7 7DD**




I recently bought four packs of AAAL size NiMH cells from JAB Electronics, as advertised on page 40 of the last Sprat. I made up a compact battery pack using twelve of the cells. The battery pack measures 3x4.5x5.5cm, and gives a nominal 14.4V output. I wired a 3 Amp fuse inside the pack to protect it against accidental short circuits.

AAAL cells typically have a capacity of 700-800mA/Hr. I made up this simple circuit to charge the battery at the 1/10C rate, around 70mA. The battery can be safely left on charge continuously, although an overnight charge is sufficient. The LED gives an indication of charging, and almost extinguishes when the battery is charged. The battery and charger get only mildly warm during charging.

A cheap unregulated wall adapter is used, set to its 12V position. This actually gives an off load voltage of 22V, dropping to about 18.5V with 70mA load. I cut the plug off the end of its flying lead, and fitted the charger components to the back of the output socket, then covered it with heatshrink sleeving.

I use the pack to power my 20m QRP rig, which is based on a SW20+ kit. The battery voltage rises close to 17V when charged, which may be a problem with some rigs. My rig draws 10mA on RX and 330mA on TX, and will run for several days of casual use on one charge. When the off load voltage falls to 13V (1.1V/cell) it is no longer usable for TX and needs recharging.

**Parts list:**

| | |
|---|---|
| Mains adapter | |
| 1A Schottky diode e.g. 11DQ03 or 1N5818 | Maplin XX09K |
| LED red 5.1mm 30mA | Maplin JA47B |
| 27R 2W WW resistor | Maplin WL84F |
| 100R 0.6W resistor | Maplin W27R (3W) |
| 2.5mm power socket | Maplin M100R |
| 2.5mm plug for battery pack | Maplin JK10L |
| | Maplin HH62S |

# The TAK-893 Double Balanced Mixer

## Story - Graham Firth G3MFJ, Technical info - Paul Harden NA5N

As you may have seen elsewhere in Sprat, the club has acquired a quantity of these double balanced mixers for members.

The first I heard of this was a triumphal e-mail from G3RJV, on his arrival back from Dayton, announcing the acquisition of some of these and would I sell them to members via Club Sales. I agreed and a few days later, a small parcel from George arrived, together with a little note giving the possible connections. I looked through the Mini-Circuits data book – and found nothing, however there were enough clues to guess at the connections. I then knocked up a test jig with a couple of crystal oscillators & Tony (G4WIF) lent me his spectrum analyser just so that we could see what they would do. I discovered that whilst they seemed to be 50 ohm impedance – they needed a lot of drive from the LO, however, with a volt or so, they seemed to be giving out all that they should. I decided that expert help was needed, so I contacted Paul Harden NA5N to see what he knew, and sent him a few samples to play with.

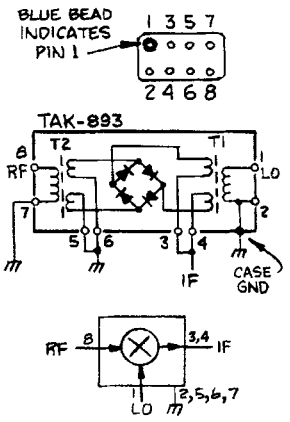
Paul e-mailed me back with some initial results which confirmed what I had discovered – that is, they were level 17 mixers which meant that they needed +17dBm (around 1.5v rms) of LO drive, but if given that, they gave a conversion loss of only 5dB. (The more common SBL-1 is a level 7 mixer which needs +7dBm from the LO). Our TAK-893 is, we understand, based on the TAK-3H which shows LO/RF input - 0.05 to 300MHz, IF - DC to 400MHz. The size is 20mm x 10mm x 8mm high which is identical to the SBL-1.

Paul then offered to produce some club data sheets that we could send out with the mixers. We now have those sheets and he has done a fantastic job on them. Members with Internet access, can download an Adobe PDF file of the data sheets from the club website (www.gqrp.com).

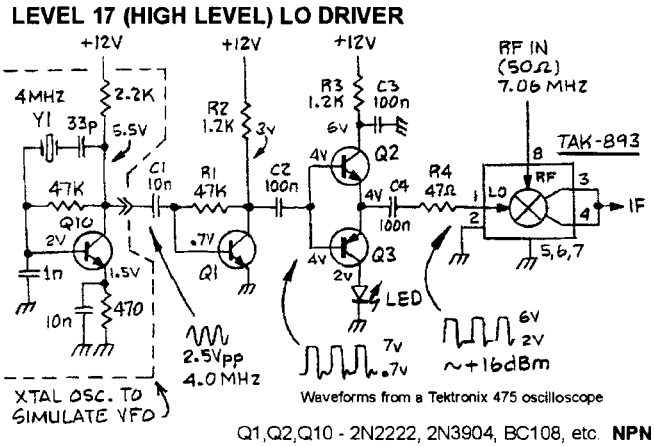
Paul is now going to look into some typical circuits for this device & we plan that they will be published in a future Sprat.

Now some of the data as we know it, the pictures/circuits are taken from Paul's data sheets:

**Pin connections:**




**Paul's test circuit:**




Q1,Q2,Q10 - 2N2222, 2N3904, BC108, etc. **NPN**
Q3 - 2N2907, 2N3906, BC212, etc. **PNP**

LED limits current and visual indication of LO drive
Total current draw approx. 15mA, including Q10 crystal oscillator
Q1 8-10dB amplifier Q2-Q3 NPN-PNP "totem pole" emitter follower

# GQRP Club Sales

(For all items listed formerly from G3YCC)

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

**(Non-members prices are in brackets)**

**Radio Projects for the Amateur by VK3XU. £6 (£7.50)** } plus postage per book: UK - £1.25;
**GQRP Club Antenna Handbook. £5 (£6.25)** } EEC - £2.90; DX - £3.50

**6 pole 9MHz SSB crystal filter 2.2kHz @ 6 dB, 500ohm in/out £12 (£14)** } plus postage: UK – 50p;
**6 pole 9MHz CW crystal filter 500Hz @ 6dB, 50ohm in/out £12 (£14)** } EEC - 80p; DX – £1

**Pair LSB/USB carrier crystals HC18U wires - [9MHz ± 1.5kHz] £6 (£7) pair** } plus postage
**MC1350 at £2.25 (£3) each; SA602AN at £1.75 (£2);** } (any quantity)
**IRF510 FETs £1.25 (£1.50) each;** } UK – 30p; EEC -
**3.579545MHz fundamental and 48.0125 3rd overtone – 25p (30P) each** } 40P; DX – 60p

*[Special offer UK members only – the above 3.5 and 48MHz crystals - 1 first class stamp each – no extra for postage!!!]*

**88mH Toroids - £1 (£1.20) each** [+ post each – 30p UK, 50p EEC & DX]

## NEW ITEM – With BOGOF! *(Buy One Get One Free)*

**Mini Circuits TAK893 mixers - £2.50 each** (Plus postage: UK – 30p; EEC – 40p; DX – 60p)
These are Level 17 mixers and need a higher LO drive than the SBL – 1(which are level 7). However, on test, with +17dBm drive (1.5vrms into 50 ohms) and an input of –50dBm, they gave a conversion loss of 5dB. **They are available to members only** – and as a special offer, when you buy one - you get one free! **We have a limited quantity, so, one (pair) per member until further notice.**
**A data/applications sheet on these mixers, written by Paul Harden (NA5N), will be included with each order.**

**Back issues of SPRAT – 50p each.** *At the time of printing, I have most issues from 80 (except 84 & 98)*
**Plus postage:**

**UK : 1st magazine 33p + 17p each extra magazine**
**EEC : 1st magazine 75p + 24p each extra magazine**
**DX : 1st magazine 75p + 30p each extra magazine**

**Cheques (UK and payable to G-QRP Club** (cheques payable to me will be returned!)
**or Visa/Mastercard. Please quote full card number/expiry date. We can only send the goods to the card owner's registered address!**
**UK members only – to help reduce our bank charges, please can you use cheques/credit cards only for orders over £5. For orders less than £5 – please use uncrossed postal orders or postage stamps (any denomination 50p or less please)**

**You can check availability (or even order) on (+44) (0)113 267 1070 or e-mail to g3mfj@gqrp.com. Fax to the same number (by arrangement only)**
***If, with your order, you give me an e-mail address, this allows me to inform you of any problems with supply.***
**US members may order from me, but pay our US rep – Bill Kelsey N8ET**

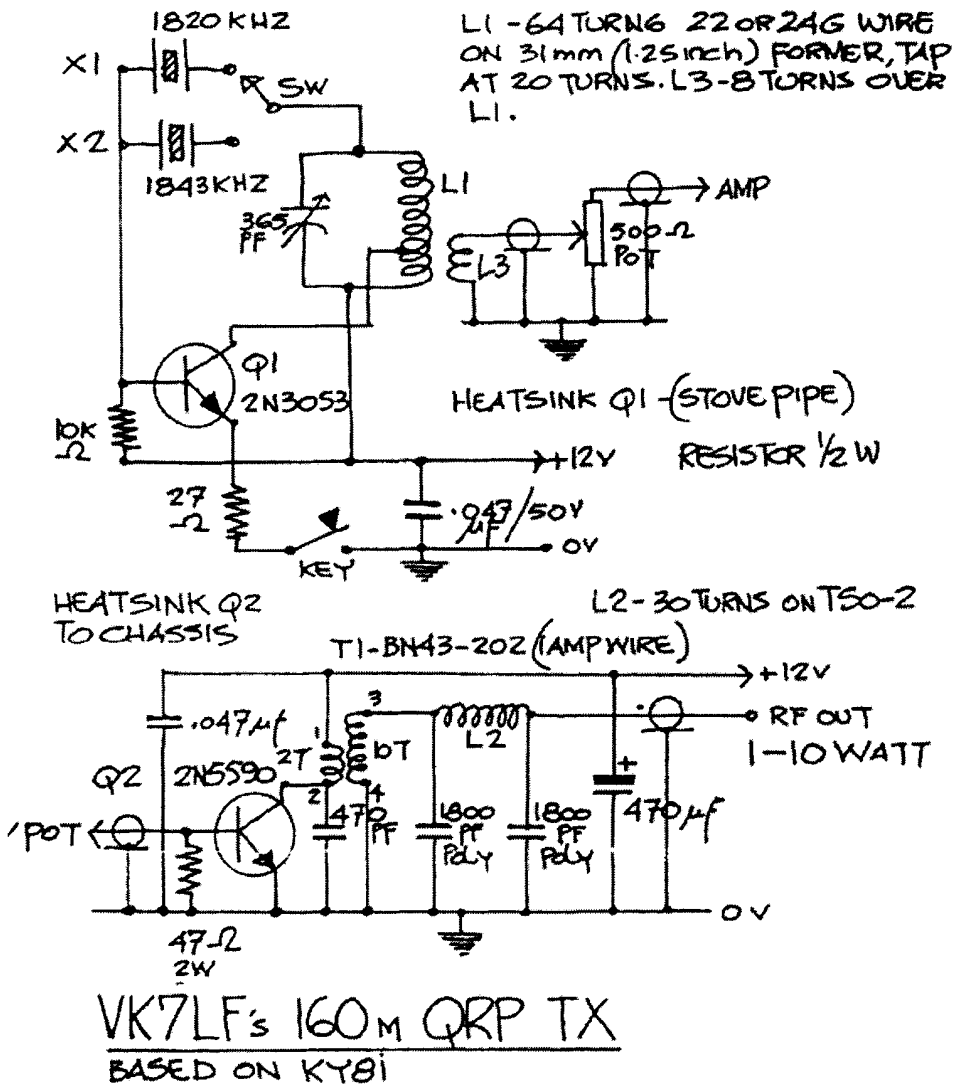
FOR SALE: TenTec Corsair II – 516, HF transceiver, WARC, 0-100w out, Internal keyer, TenTec PSU, Vibroplex Paddle, Desk Mic. Complete HF station in gwo, clean, no handbook. Excellent CW rig, full SSB capability. Call John, G4GMZ QTHR (Cheshire) on 07850 154204 acting for OT ex-op, with offer near £300 the lot. Will haggle, buyer collect or delivery at cost. Sold as seen, tested and agreed.

FOR SALE: ULTIMAST with autobrake winch and Cobweb + yards of coax. £100 ono, buyer collects. G4KUU 01287 635278 [Cleveland]

WANTED: RSGB Amateur Radio Handbook 3rd Edition Nov. 1961. G4KUU 01287 635278

# VK7LF's 160m QRP TRANSMITTER

Tom, VK7LF, 794 Cynet Coast Rd. Petcheys' Bay TAS 7107

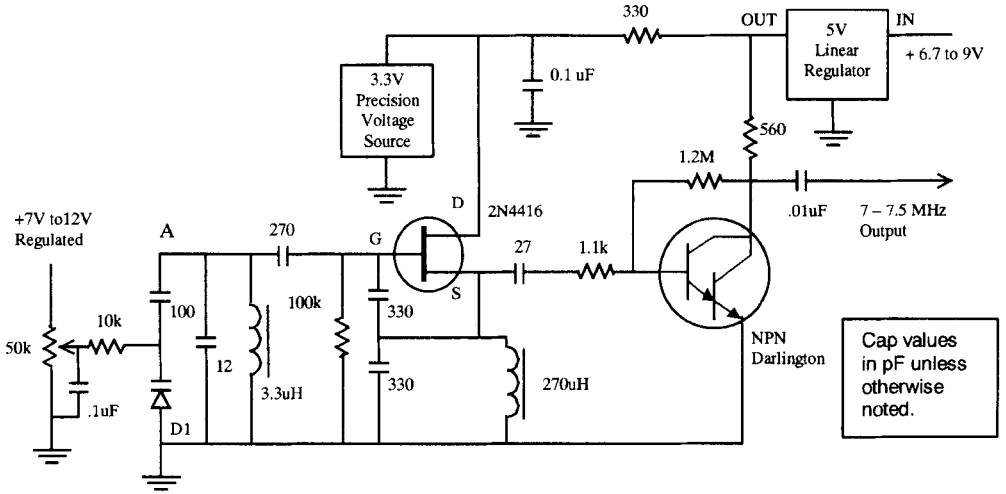



Reproduced from the **LO-KEY** December 2000, Tom uses this transmitter to an 80m long wire tied between the apex of his 2 storey house and a tall gum tree, through a homebrew SPC antenna tuner. It lives in a "pretty box" together with a home built superhet receiver (both get on well together).

**Lo-Key** is the journal of the Australian **CW Operators QRP Club**
**www.users.on.net/zietz/qrp/club.htm**
or.c/o Kevin Zietz, VK5AKZ, 41 Tobruk Ave. St. Marys, SA5042. Australia.

# Considerations in the Design of Surface Mount Oscillators

**Richard Tormet, N8YSK, 6863 Buffham Rd., Seville, OH 44273 USA**
**e-mail: rtormet@ohio.net website: www.ohio.net/~rtormet/index.html**




The above oscillator circuit was developed over a period of several months. The goal was to develop a miniature oscillator module that could be tuned by voltage or capacitance, and would be stable enough for CW work. All the components are surface mount type -- the FET and Xistor are SOT-23, most of the caps and resistors are 0603 (.060" X .030"). Of course readers will recognize the Colpitts design. Initially I had serious problems with frequency drift as the circuit warmed up. I tried different inductors, capacitors, operating voltages and even different circuit types like the Clapp). Stability was finally achieved by doing two things. The first was the use of SMD inductors that are wound on a ceramic core. These are available from Miller and Panasonic (at DigiKey). Do not use ferrite core inductors here unless stability is unimportant. The second was to lower the operating voltage – notice that the FET runs at 3.3V, with the voltage tightly controlled by the 3.3V precision voltage source. Of course the tuning voltage needs to be stable, and I enclosed the module in an oscillator cover to eliminate the effects of air currents.

Since most of the inductors of this size have low Q (about 15 to 25) it is more difficult to start oscillation. Raising the "link cap" value (note the larger than normal 270pF link cap) helped in this regard. Side by side testing was done to see if the "Gate to Ground" diode frequently used in this type circuit would improve stability – in my tests it did not, so it was left out. Note the simple buffer circuit. It is lightly coupled to the FET through the small 27pF cap. The buffer design has a low part count, has been very reliable and provided enough output to drive the passive mixers we like to use.

Provision was also made on the module for capacitor tuning by cutting a trace between D1 and the 100pF cap, and connecting a tuning capacitor to the circuit at point 'A". This also somewhat improves stability since the tuning diode and its semiconductor junction are taken out of the circuit. **[See the OSC7 Module on page 7 of this issue]**

THE BASIC ST. LOUIS VERTICAL


Dave Gauding, NFoR, 14220 Tullytown Court,Chesterfield,MO63017.

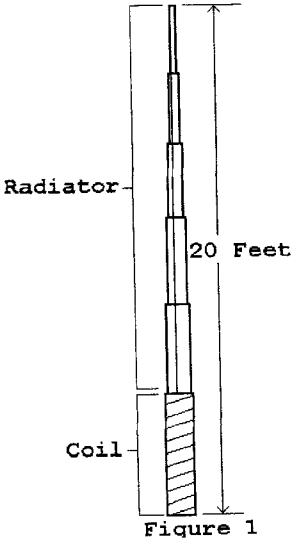




Figure 1

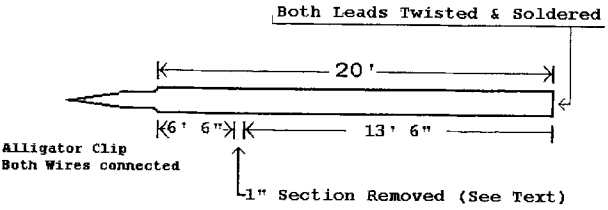
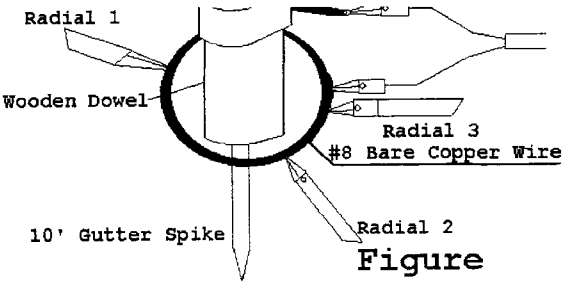



Figure 2




Figure

The antenna is designed for portability and speed of erection. It is supported on a 20 foot fishing pole, and consists of a 4 foot long helical section, a 16 foot top section, and a counterpoise assembly. In the original version the helical section consists of 51 feet of lightweight 300 ohm feeder wound on to the bottom section of the collapsible fishing pole. The feeder is close wound, and is covered with waterproof tape when the winding is completed. The two wires in the feeder are joined together at the top of the winding and soldered to a suitable connector. A few inches of spare wire are left free at the bottom of of the winding and connected to a crocodile (in the U.S. Aligator) clip. The 16 foot top section consists of a length of similar 300 ohm feeder cable. The top of the

section has the two wires soldered together and a short length of fishing line attached ro allow it to be tied to the ring at the top of the pole. The two wires at the bottom of the section are also connected together and soldered to a connector which mates with the connector at the top of the helical section. The counterpoise wires (Fig. 2 ) consist of three, 20 foot lengths of the 300 ohm feeder. The wires are connected together at one end, and both connected to a crocodile clip at the other end. One wire is broken at a point six and a half feet from the crocodile clip end by having an inch removed from it as shown in Fig.2, Be careful to do as little damage as possible to the insulation when doing this. The counterpoise connecting area consists of a ring of heavy gauge bare coppe wire as shown in Fig.3, The bottom of the helical section is connected to one side of the feeder connecting the antenna to the tuner, and the other wire of this feeder, plus the 3 radials, are connected to the copper ring by means of crocodile clips. (See Fig 3). All joints and connectors should be thoroughly waterproofed after assembly. The mounting support for the pole consists of a 12 inch hardwood rod of suitable diameter to fit into the lower section of the pole when its bottom cap is removed. A 10 inch metal spike is connected to the bottom of this spigot and driven into the ground to provide a base for mounting the pole. Note that this is the basic construction of this antenna. Users have incorporated many modifications; no doubt our readers will produce many more.
(Credit. The above article is based on information originally published in "Peanut Whistle",journal of the St Louis QRP Society to whom we extend our sincere thanks and acknowlegement)

DRAWING YOUR ATTENTION TO A VERY IMPORTANT LETTER.

Recently we received an Award application and letter from Roy, 2Eo000 of the Scarborough Special Events Group.The Group recently obtained the call in order to demonstrate H.F. operating techniques to its Class B and M5 callsign members. In the first six months of operation interest from the above groups has far exceeded expectations, especially as 2Eo000 has already contacted all continents. To enhance the interest the Group is applying for operating Awards, starting with those of G QRP Club, and also entering the main H.F. Contests. The need for this type of demonstration becomes apparent when one realises that many M5 licencees arrive at the Group convinced that little DX can be worked with the HUNDRED WATTS their licence allows them to use !! We have offered our full support to this excellent project, and can only hope that other Clubs and Groups will do something similar. It is good to see that all Class B and M5 members coming into contact with the Group are encourage to join a Club such as G QRP C, FISTS, RNARS,RSARS or a similar organisation. Let us hope that other organisations follow this excellent example set by our friends in Scarborough so that those joining our hobby can be guided by the example of real amateurs.

GoNTR de G8PG. Pse let me hve ur new address in GM. K

AWARD NEWS

QRP MASTER. We welcome GoBXO and F6BLK to the Worshipful Company. It is particulary nice to have our Membership Secretary John aboard.

QRP WAC. YO2VA (ssb).

QRP COUNTRIES. 250 DJoGD (puts him with the world leaders), 100 G3JNB,YO2VA (ssb). 25 2EoOOO .

WORKED G QRP CLUB. 1300 G4JFN (and he finds time to sort all those QSLs !!) , 200 DL1HTX. 120 GoTAK, 60 F6BLK,G3HOH. 20 2EoOOO.

TWO-WAY QRP. 80 DJoGD (nice), 40 F6BLK. 20 GoUTF. 10 2EoOOO.

Congratulations to all the above on their Awards.

"THE QSL IS THE FINAL COURTESY OF THE QSO".

So says the Radio Amateurs Code, and most of us try to abide by it. Unfortunately a few of our members are not doing so. A plea from one of our members who is trying to qualify for Club Awards with very restricted antenna facilities says that although he QSLs 100% he has a big backlog of outstanding QSLs. In defence of not QSLing some may cite the cost of having cards printed. You do not need to go to this expense. Buy a pack of plain white postcards (35 pence) and to QSL write on one of them your call, the call of the other station, date ,time, qrg, and RST of the other station, then your power, and sign it. You can send about 20 of such cards to our Bureau for the cost of a 2nd class stamp, so really it is not difficult or expensive to add the final courtesy to your QSOs.

ANYONE HAD PERSONAL EXPERIENCE OF ANTENNAS MADE FROM BURGLAR ALARM TAPE ?

Some designs for antennas using this tape have been published, but there seems to be little information about its use in QRP operations. The tape itself has one side which is adhesive and one side which is covered with metal foil conductor. It can therefor be stuck to gutter boards, loft beams etc to form an antenna. If you have personal experience of using antennas made in this way please drop AAA a line to tell us about it. We can then pass the information on to our readers.

FT 817 - THE PIONEER IN THE NEXT PHASE OF AMATEUR RADIO ?

This rig, less than 6 inches (15 cm ) square and only 1 inch (2.5 cm) high covers all 9 hf bands plus 50,144 and 420 Mhz on vhf. Modes are cw ssb,fm and am. There is a built in keyer and internal batteries for ultra portability. The receiver also gives general coverage. Ragchewing for 20 minutes with a WB2 who was using this little box proved an eye opener. By giving ultimate QRP portability it may well open an entirely new phase of high performance "you can carry it with you" hf QRP operation. (For full review see "Radcom", June 2001)

# DL Section Meeting in Pottenstein

56 members from all over Germany and Austria attended the Pottenstein meeting from 27th to 29th April. A get-together on the Friday evening was followed by the lecture programme on Saturday and Sunday.

Helmut, DL2AVH, described a new QRP transceiver with a supply voltage of 1.5 volts. Fred, DJ3KK, and Bernd, DK3WX, presented a Super-Keyer, which, using a PIC16F876, can be set up for frequency counting, and for measuring supply voltage, transmitter output and SWR. DL2JWL dealt with a 2m/10m converter project. Karl, DJ9HO, looked at the possibilities of shortened full wave loops for portable use. The highlight of this year's meeting was the first homebrew display with many interesting designs brought by members. A well-equipped testing point was provided. Franz, DJ9EO, gave a demonstration of the milling of circuit boards.

Oliver, DF6MS, showed a 75MHz spectrum analyser which can be made with simple components. There was also a discussion about the situation concerning amateur radio in Germany following the Federal Government's licensing of PLC (Power Line Communication).

A floodlight mast at the district sports club could be used as a hanging point for an 80 metre long wire. Following an explanation of the technical requirements for use of the long waves by Ha-Jo, DJ1ZB, the lecture ended with a QSO with a station in Erlangen, using an output of 3 watts. Each participant took home a 76-page folder covering the weekend's activities.

During the weekend the club station DL0VLP operated with the special DOK number, QRP. Everyone seemed impressed with this year's meeting and all are looking forward to meeting again next year.

Many thanks to all who contributed to the success of the event.

***Report by Rudi, DK4UH - roughly translated by David G4HYY and XYL, with apologies for any errors!***

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## Tunable CW/SSB Filter (SPRAT 107) Modification by DF1GN

Norbert noticed some problems with oscillation if varying the frequency fo over about 450Hz. The supply current was rising, raising the voltage at R9 [1K] so the voltage at R4/R5 decreased. Norbert solved this by changing R9 to a 78L09 regulator.
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# COMMUNICATIONS AND CONTESTS

**Peter Barville G3XJS, 40 Watchet Lane, Holmer Green, High Wycombe, Bucks HP15 6UG.**
**E-mail: g3xjs@gqrp.com**

**REGION 1 INTERNATIONAL QRP DAY**

This event usually falls on a weekday, when many are not able to spend much time on the air, and maybe as a result it can tend to catch us unawares. It's a pity we don't make more of this 'special' day (June 17th every year), and one or two suggestions have been made to encourage greater participation. One suggestion is to hold the event during the weekend closest to the 17th, but this seems to detract from having one day each year 'given' to our particular interest. Another (and this one will have to be down to me!) is to give the day greater publicity, perhaps in co-operation with one or two sister publications. Maybe even some sort of combined participation. What do you think?

Turning to International QRP Day 2001, I received two interesting logs that unfortunately could not be considered, as they did not fall within the rules of the event. GW8ELR/MW0ELR worked an impressive list of stations, but all were on 6m and not on the HF bands (as the rules require). G4EDG worked a pile of HF dx, but all the qso's were with stations outside Region 1! VU2OB would have submitted a log, but also lacked qso's with Region 1 countries on that particular day.

That left just two 'valid' entries, from G0VJH (Jeff) and EI5IY (Stan). Surprising as it may seem, Stan's total of two IARU Region 1 countries worked that day have secured him the International QRP Day Plaque. Stan says that he can't always get on the bands on 17th June, as it's his birthday. So, it's a belated birthday present from the G-QRP Club, and a good reason to remember the event in the future!

**EUCW FRATERNISING CW QSO PARTY 2001**

This will be the 2nd QSO Party, and as the G-QRP Club is a member of the EUCW Association (an organisation of European CW clubs which seeks to promote and encourage amateur CW) we should all do our best to give it as much support as possible. Indeed, why not put in a serious entry? You might be a certificate winner!

Although there is a contest element, in the sense that certificates will be awarded to top performers, its real purpose is to give members of EUCW clubs the opportunity to meet each other, and to demonstrate that amateur Morse is still alive and well. There is a specific class for QRP operation, and it would be nice if G-QRP members were to turn out in force to demonstrate just what QRP can do. Remember, in fun events like this it's more important to take part (and to send an entry) than to win!

Look out for members of the following clubs: AGCW-DL (Germany); Benelux-QRPC; BTC (Belgium); CT-CWC (Portugal); EA-QRPC (Spain); EHSC (Extremely High Speed Club); FISTS; FOC (First Class Operators); G-QRP; HACWG (Hungary); HCC (Spain); HSC (High Speed Club); HTC (Switzerland); INORC (Italy); I-QRPC (Italy); ITC (Italy); MCWG (Macedonia); OE-CWG (Austria); OHTC (Finland); OK-QRPC (Czech Republic); RTC (former GDR); SCAG (Scandinavia); SHSC (Super High Speed Club); SP-CWC (Poland); UCWC (Russia); UFT (France); U-QRQC (Ukraine); VHSC (Very High Speed Club); YL-CW-GP (Germany); 3A-CW-G (Monaco); 9ACWG (Croatia), and work them as follows:

**Dates, Times, and Frequencies:**

| | | | | |
|---|---|---|---|---|
| 17th Nov | 1500-1700z | 7010-7030 | & | 14020-14050 kHz |
| | 1800-2000z | 7010-7030 | & | 3520-3550 kHz |
| 18th Nov | 0700-0900z | 7010-7030 | & | 3520-3550 kHz |
| | 1000-1200z | 7010-7030 | & | 14020-14050 kHz |

**Classes:**

- A - Members of EUCW clubs using more than 10w input or 5w output.
- B - Members of EUCW clubs using QRP (less than 10w input or 5w output).
- C - Non-members of EUCW clubs using any power.
- D - Shortwave listeners.

**Exchanges:**

- Class A & B, RST/QTH/Name/Club/Membership number.
- Class C, RST/QTH/Name/NM (ie, not a member).
- Class D, Log information from both stations.

Call: CQ EUCW TEST. Stations may be worked or logged only once a day, per band, during the contest.
Scoring: Class A/B/C - 1 point per QSO with own country, 3 points per QSO with other European country. Class D - 3 points for every complete logged QSO.
Multiplier, all classes: 1 multiplier point for each EUCW-club worked/logged per day and band.
Logs: to include date, UTC, band, call, info sent, info received, and points claimed per QSO.
Summary: to include full name, call, address, total points claimed, station details, power used, and signature. Entries to be received by the EUCW Contest Manager, Guenther Nierbauer DJ2XP, Illinger Strasse 74, D-66564 Ottweiler, Germany, not later than 31st December, 2001. Certificates will be awarded to the three highest scorers in each class.

**Worked EUCW Award**

Additionally, this event offers a good opportunity to make contacts qualifying for the prestigious "Worked EUCW" Award, printed on heavy parchment type paper depicting the map of Europe "at the time of Samuel F.B. Morse". There are three classes of award, "Standard", for contacts made using any authorised transmission power; "QRP", for contacts made using not more than 5 watts rf output transmission power; and "SWL", for shortwave listeners".

The requirements of the award are confirmed CW only contacts (SWLs - CW stations heard) with 100 different stations who are members of EUCW clubs, over 3 different amateur bands with a minimum of 20 stations worked or heard in each band. The total of 100 stations worked or heard over 3 bands must include at least 3 members of six different EUCW clubs. Only contacts made on or after Morse bicentennial day, 27th April 1991, count for the award, with up to 40 stations worked or heard on that day counting for double points. Full details of the award can be obtained by sending an s.a.e. to Tony Smith G4FAI, QTHR (or e-mail g4fai@connectfree.co.uk).

**YEOVIL QRP CONVENTION 2002**

Please note that next years Convention (the 18th ) will be held on **Sunday April 21st 2002**, with the annual dinner the evening before. Mark your diaries now!

The summer (and perhaps the opportunity for portable QRP operating) may be over for another year, but let's hope some good propagation on the bands will cheer us up. I hope you have plenty of QRP FUN.

72 de QRPeter

# G-QRP CLUB ACCOUNTS

## 1999 - 2001

| INCOME | £ | EXPENSES | £ |
|---|---|---|---|
| Bank interest | 490.42 | Artwork & drawings | 21.62 |
| Donations | 43.80 | Awards and trophies | 1,065.20 |
| Misc. income | 295.99 | Bank charges | 1,908.02 |
| Sales at rallies etc. | 2,921.21 | Books | 987.22 |
| Sales by post | 4,271.66 | Capital expenditure etc | 1,416.36 |
| Subscriptions | 42,912.19 | Components for kits/sale | 2,672.38 |
| | | Duplicating & copying | 490.11 |
| **TOTAL INCOME** | 50,935.27 | Miscellaneous expenses | 1,069.69 |
| | | Officers expenses | 1,456.43 |
| | | Postage | 2,381.35 |
| | | Rally costs etc | 707.79 |
| Bank c/f | 17670.25 | SPRAT printing & mailing | 39,480.00 |
| Bank b/f | 22815.00 | Stationery etc | 2,423.85 |
| | -5,144.75 | **TOTAL EXPENSES** | 56,080.02 |

First may I offer an apology. My work load last year was so great that I did not get the annual report done (among many other things). I've thrown in the towel and retired now so I'm working at living instead of living at work. On to the figures ...

The shortfall in the figures above are misleading since our U.S. account holds over $20000 and the German account DM 13736.55. Most of these funds will be transferred to the UK when we can take advantage of the most favourable exchange rates and our overall trend continues to be towards modest growth. Therefore again subscription rates for next year will not be affected in spite of rising postal costs. Subscriptions alone cannot sustain this situation and it is a tribute to the folks who assist our income by giving their time at rallies, giving so much of their time at home to sell components, searching to find difficult parts, negotiating to buy them, and so on, that we are in such a healthy state.

Over the 2 year period 24.7% of subscriptions were paid by standing order, 12.6% by VISA or MasterCard, 41.6% by cheques etc to GØBXO, 4.3% by direct transfer, and the rest by cheque or cash at rallies. Card payments are quite costly but very useful when collecting subscriptions in unusual currencies. Could I reinforce the recent appeal by John, GØBXO. John handles a tremendous amount of mail each year and deserves sincere thanks from all of us. It would help us considerably, both financially and in terms of John's time, if UK members would consider paying by standing order. The subscription rate has only changed once during the last 13 years.

We are also indebted to our overseas representatives, DK4UH, N8ET, ZL1ABS, PE1MHO, F5OQO, OE6JAD and ON4KAR. The contribution they make to the efficiency of the club is invaluable.

Capital expenditure included a computer for the production of SPRAT, a printer for SPRAT labels and software for the production of the club web page.

Once again our thanks are due to Peter and Betty Jackson (G3KNU and GØNYL) who have been kind enough to check the club accounts.

G3PDL, Hon. Treasurer. July 2001

## Novice News

**The Novice News for this issue has been held over to the Winter issue**
**PLEASE SEND YOUR NOVICE NEWS – TIPS – CIRCUITS – IDEAS to**
**Steve Ortmayer G4RAW 14 The Crescent, Hipperholme, Halifax. HX3 8NQ.**
**Tel: 01422-203062 email: ortmayer@hotmail.com**

## GQRP CLUB WINTER SPORTS

### EVERYDAY – DECEMBER 26th to JANUARY 1st

### Call "CQ QRP"

**on the International QRP Frequencies**

**CW: 1843, 3560, 7030, 10116, 14060, 18096, 21060, 24906, 28060**
**SSB: 3690, 7090, 14285, 21285, 18130, 24950, 28360 kHz**

**Logs and reports can be submitted to G3XJS – QTH on page 32**
**The G4DQP Trophy is presented for the best overall individual contribution**

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**FREE SOFTWARE** - **HAMCALC version 53**, released 20 JULY 2001 with many new programs and upgrades of existing programs. Over 250 Painless Math and Design Programs for Radio Amateurs and Professionals, used worldwide as a design, reference and learning tool since its introduction in 1993. Most programs can be run in either metric or Imperial/USA units of measure. Contains much information not readily found in current Amateur handbooks and literature. Easy to use by non-technical hobbyists.
How to order:
**For a free HAMCALC CD-ROM send US$8.00 check or money order (no stamps or IRC's please) to cover cost of materials and airmail anywhere in the world, to George Murphy VE3ERP, 77 McKenzie St., Orillia ON L3V 6A6, Canada (e-mail ve3erp@encode. com).**

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# SSB & Data Report

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


First the good news Peter PE1MHO has at last received his DXCC- QRP for 6m single band operations. The best part was that he got number 1! His comment " I would have thought that at least Randy Rand AA2U would have beaten me to that one yonks ago". Congratulations Pete! SHELDON MW0ELR's SSB sked with W1BFA gave 56 on 14MHz, 54 on 18MHz and 55 on 21MHz. There was no propagation on 24/28Mhz. He spent a frustrating few minutes working PR7SM on 7MHz QRP ssb. Although he completed OK at 56/58 he had great difficulty getting across the E of my call, it being misread as an I. Several variations of the phonetics have been discussed on the Internet.

Chris G4LDS is active on QRP SSB, using an SGC 2020 @ 8W pep and an IC706 also at 8w pep. He now runs a Cobweb at about 28 feet. So far, his total countries worked on QRP stands at 95W 77C with the J3/PA0ZH being the latest worked. Slowly & surely he is heading towards the 100! He usually works on the upper HF bands but still looking towards my first VK/JA/ZL etc on QRP SSB and managed to work D68C on 4 bands SSB as well. As for the SSB QRP level down to 5W, he thinks that it should be kept at 10W as it can be proven that 10W pep is an acceptable level to the 5W CW. One good contact was when he worked TR8IG on 28MHz during the ARRL contest and on receiving the card found he was also running QRP.

My own highlight was a chat with Art GD3FXN on PSK31. He agreed that this mode might well overtake CW as the one to get through where all else fails. He has only been active on the mode for a few weeks and told me he had worked more DX in these few weeks than in years past.

**Power levels**

The amount of emails received about the current power levels for data modes was larger than I have received for any other debate. The actual difficulties of measuring output power in Data modes and on SSB were the subject of notes from Peter PE1MHO and Chris G4LDS. However by far the majority of those that replied were in favour of a 5-watt limit on all data modes in fact only two who contacted me were in favour of a 10-watt limit.
Discussions about an overall limit of 5 watts for SSB were less clear with many writers opting for keeping the 10-watt PEP level. Again the difficulties of Joe Average being able to measure this were mentioned.
The QRP power levels for all data mode and SSB contacts will be discussed by the club officers and will be reported back to you in the next issue of Sprat. Whatever is agreed it will not be made retrospective. Your news & views to me via the contacts above.

# MEMBERS' NEWS

## by Chris Page G4BUE

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Packet: GB7DXS on UK DX PacketCluster

QRPers have often described what they see as their 'ultimate QRP challenge' and most have mentioned making DX QSOs with milliwatts and even microwatts. The May edition of *World Radio* published a report about QRP EME. Has anyone ever tried this? EME is something that I have always wanted to try, I guess partly because it is similar to QRP work in that you are trying to dig very weak signals out of the noise, but I have never considered doing it with QRP. The *World Radio* report says Washington stations **W7LHL** and **W7SZ** completed an EME QSO on 25 February while running 5W on 1296MHz using the PUA43 mode with their DSP-10 transceivers (a September 1999 *QST* construction project), transverters and 10 and 12 feet TVRO type dish antennas. More information at <http://www.proaxis.com/~boblark/dsp10.htm>

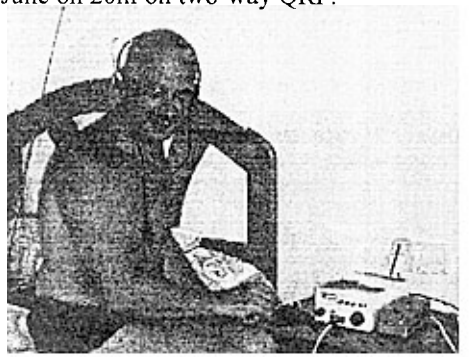
Congratulations to **MWØELR** who worked **ZL4DJ** in May and **EM1HO** in the Ukraine Antarctica on 20 July on 17m SSB with his RDX109 to give him WAC. Congratulations also to **G3JNB** who has made DXCC QRP at last! Victor has been experimenting with the multi-band 37.2m 'Small Delta Loop' described by **VK6VZ** in the September 2000 *Radio Today*. It has "proved most successful on HF and the suggested modification for its use on 160m yielded an immediate 559 from an OH6 station on one watt! Congratulations to **IZ3CQI** on making his first QRP QSO with ZL on 24 June. Christiano worked **ZL2TX** on 17m and used 5W and a 55ft dipole with balanced feeder.


Congratulations now to **GW4ALG** for his first QSOs on 136kHz with 5W and a 12m vertical with no top loading. Steve's first QSO was "with Tom, **G3OLB**, in Devon - 97 km away! I was so excited that it was hard for me to maintain control of the Morse key!" Tom's transmitter uses a FET VFO (2 x 2N3819 FETs in a source-coupled oscillator, using a 4.7mH RF choke in the tuned circuit); FET buffer; 2N2222 amplifier + BC212 keying transistor; 2SC2166 driver; 2 x 2SC2166 PA (the two transistors connected in parallel, with individual one ohm emitter resistors, each decoupled by 22uF). Tom has also worked **G3YXM** (105km) and **G8IK** (101km) with QRP. Pictured above is Tom's transmitter, he says, "The Altoids tin is not just included for size comparison - it is actually part of the transmitter! It provides a screened compartment for the PA output transformer and low pass filter inductors".

Congratulations to **MØCDP** for making his first VK SSB QRP QSO on 12 July. Paul was listening on his WM20 and heard a CQ from **VK5VL**, "It was a struggle but we made a proper QSO, so I'm pretty pleased with my 4W PEP of unprocessed SSB, a contact of around 2500 miles per watt". **ZL1ABB** was working Europe again in the middle of August and has made two-way QRP QSOs with

**EA3EGV** (twice), **LY2FE**, and **CT1DRE** (four times) plus **W7CNL**, **W6ZH** and **KØEVZ**. After 1 October, Bryce will be calling CQ on 14060kHz at 0600z daily.

**GØVXG** took his newly completed 30m 2W transceiver on holiday to Cala en Porter, Menorca. Richard used an inverted vee at 22 feet and was able to keep daily skeds with pals in the UK as **EA6/GØVXG** and worked 6 DXCC operating 30 minutes daily. **GØDBI** worked **8P6AZ** on 30 May on 15m, both stations using FT817s at 5W. Kevin used a dipole and although he received 559, the 8P station was only 419 at best with him. He is wondering whether it was a case of "one-way propagation or my receiver is a bit deaf?" **G3XJS** worked **8P6BX** on 17 June on 20m on two-way QRP.



**GØVXG on holiday in Menorca.**

**M5TIM** is using an 80m DC receiver with a simple DSB 500mW transmitter for PSK31 and made QSOs in the UK with an 80m dipole at 25 feet. **LU7HHE** <luqrp@ tutopia. com> reports a new QRP club in Argentina and would like to exchange bulletins and information with other QRP clubs. **OJØ/SMØHLP/P** was QRV with 3W on 20m from Market Reef at the beginning of July. **VQ9PO** was QRV in July with 5W to a 14 element log periodic antenna and **VQ9NL** has also been QRV on 10 and 15m CW with 5W from the same station. **EC5ACA** (<ec5aca@ wanadoo.es>) is now **EA5CHQ** and looking for SSB skeds on the HF bands. Juanjo is using 9W PEP.

The Miracle Antenna Company announce the release of *The Miracle Whip* for the FT-817 (1.8 – 450MHz). It is 50 inches high and, "uses a uniquely designed C-VAT, a continuously variable autotransformer, to match the whip to the 50 ohm output of the radio. Tune-up may be accomplished simply by peaking the one-knob tuning dial for maximum signal strength on receive, the antenna is then tuned for transmitting". The July *QST* has an article by the designer, **VA2ERY**, on how to build one. The *Miracle Whip* sells for $109.95, <www.miracle antenna.com>. **RV3GM** says The Lipetsk Technician Group (Russia) has just announced a new QRP kit, the Putin-20; a little CW/QSK transceiver with VFO for 160 to 20m and 1W output. More information at <http://www.qsl.net/rv3gm/>.

***"What do you mean, 'QRO is bull shit!'?"*** (from DL2BQD)

**Vytas, LY2PU.**

**LY2PU** would like to "express my gratitude to my G-QRP 'Godfather' Hans-Joachim, **DL1SDZ**, who acquainted me with the G-QRP Club, SPRAT, and paid for my membership". The picture above shows Vytas's IC-720A (which he can reduce to 20mW on any band but usually runs at 1W), PSU, TS-130SE (for camping), FT-980 (main radio and also able to reduce to under 900mW), SWR/PWR meter (above the IC-720A), homebrew ATU to the right, IC-

290A 2 metre all-mode transceiver on top of the ATU and the key is ex-Russian military which Vytas suspects is an exact copy of a German or English military key. **DL2BQD** was QRV from the Czech Republic for two weeks in July with his K1 as **OK/DLØPCK/P**. Dieter made some good DX QSOs during the IOTA Contest including **3W2LWS** and a two-way QRP QSO with **JA1KGW**. **G4OJS** was QRV from Tenerife as **EA8/G4OJS/P** with his new FT-817 in August. John made SSB QSOs on 15m with his long-wire antenna around Europe and to HI and VE.

**GW3WSU** says, "I worked a guy in Chicago from my hand held on 70cm while walking the dog! There is an Internet gateway over the water from me in Weston-Super-Mare! Not as rewarding as working **KB1DQT/VE2** this morning on 20m two-way QRP. My antenna is a bent 40m loop around a typical small garden on a new estate and he was using an Outbacker at his holiday QTH". **GØTAK** says the Rev Bill Burton **T88BA** is now on the air using the Norcal 20 generously provided by the GQRP club. He has a temporary dipole up and has already worked into JA several times.

**M1DUD** made 105 QSOs with 250mW and a three element beam at 20 feet on 6m this Sporadic E season from his Suffolk QTH, the best being 1983kms to **ER6A/P** during the 7 July opening. Robin also uses 2W and says, "There was no significant difference between the signal reports received for using 2W and those using 250mW". He made two-way QRP QSOs on 6m with **YU1LR**, **GM4VVX** and **F1RLF** and made his first double-hop QSO on 6m using 2W to **5B4FL**. He says, "I hope my exploits encourage others to give 6m QRP a go. You really don't need an antenna farm. A single dipole or a loop is a good start, three elements works well here in the sporadic openings. In three years I have 40 DXCC on 6m".

**G3XBM** continues to be impressed with the FT817. Roger uses it with a MFJ 15m Cub and a VX1 2m/70cm handheld. During portable operation from Wales in August he made handheld SSB QSOs into Europe on 15,12,10 and 6m and from home on 2m he worked into GD on SSB using a handheld HB9CV in the bedroom. Autumn plans are to erect the long-wire and try 160 and 80m with the FT817 from home and to erect small beams on 2m and 70cms "to see what can be done on VHF SSB/CW". Roger has worked four continents on 15m SSB handheld "without really trying too hard". **GWØVMR** has an all homebrew station with a vertical OCF on a fishing rod that he used to make a 25mW QSO with **S59DXX** on 20m. Patrick says the S5 station "asked me to check my power as the signals were so strong! Got to make a real QRPp power meter now that will read lower than 25mw so I can go lower".

**G4UNL** is moving to the Philippines at the end of August and should be QRV as **DU/G4UNL** in September, initially using a Carolina Windom loop with a FT817, TS570 and IC706 and a four element Cushcraft A4S with 40m add-on kit will be put up later. Richard hopes to get a DU call later with his XYL, who is **GØWWZ**. **MWØIDX** was QRV from Bardsey Island (EU-124) during the first week of August with 5W and a dipole (see picture below). Roger has more details at <www.geocities.com/mw0idx>.

**Roger, MWØIDX QRV from Bardsey Island, EU-124.**

That clears the files once again, apart from a couple of photographs I am holding over for the next column. Please keep the news, views, information and photopgraohs coming and let me know how your autumn goes, by 20 November, please.

*The Kits with ALL the Bits !*

# LAKE Electronics

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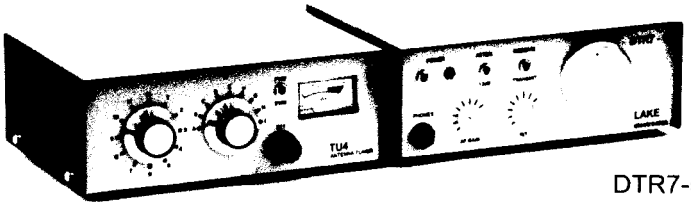


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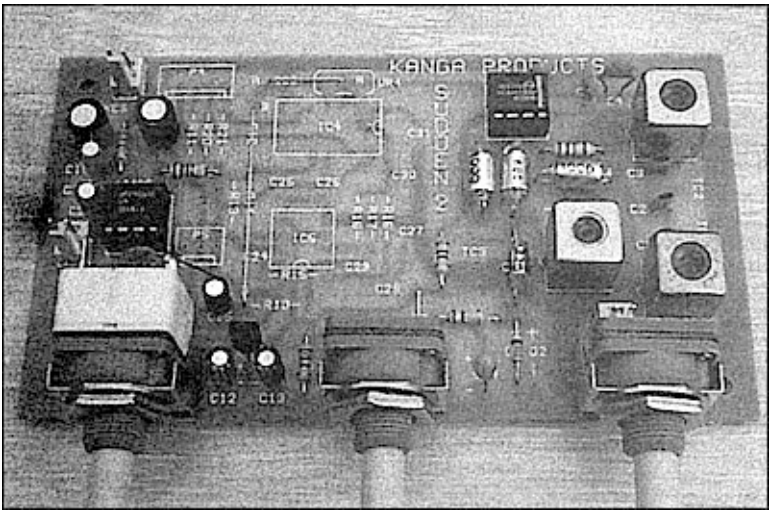


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