



SPRAT

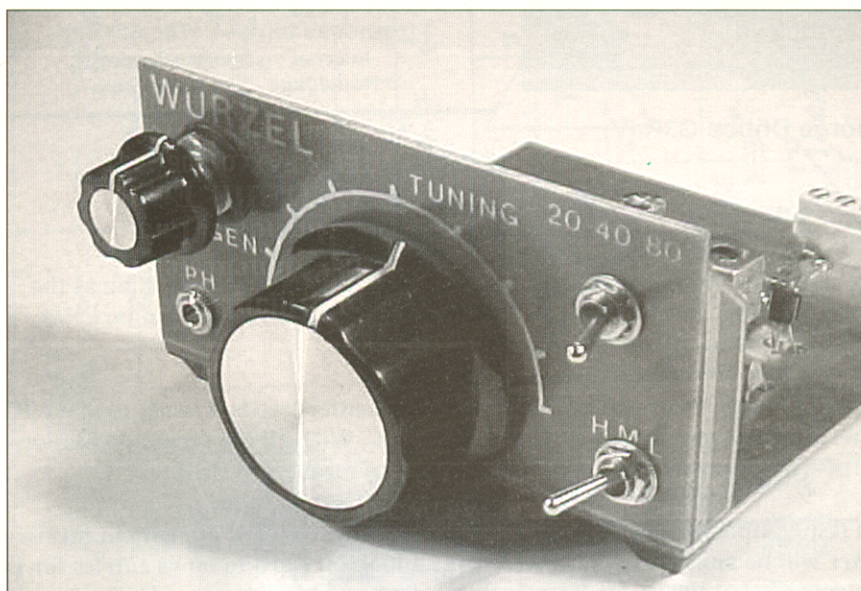
THE JOURNAL OF THE G QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

ISSUE Nr. 110

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SPRING 2002



THE WURZEL RECEIVER

Described in this issue- with special price kit offer for members

Simple L/C Bridge ~ Two Band Mixer ~ Multiband HF Portable Whip

The WURZEL Receiver ~ Islander & ICs ~ Manhattan IC Mounting

An End-Fed Dipole ~ QRP & S-Units ~ Boosting the LM386

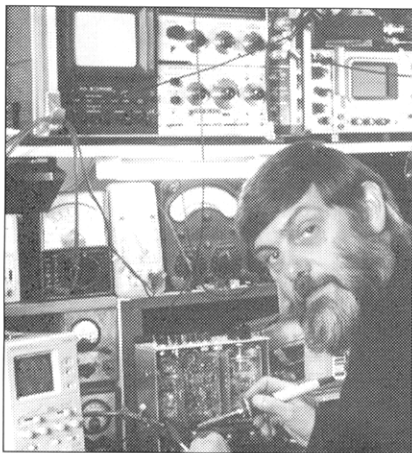
Once Only Sidetone ~ Antenna Change-Over ~ Sudden MKII Mods
Convert Power Meters to PEP ~ Measuring Peak Power ~ Club Sales

Antennas-Anecdotes-Awards ~ Communications & Contests

VHF Report ~ SSB & Data Report ~ Member's News

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THIS COULD BE YOUR LAST ISSUE OF SPRAT

JOURNAL OF THE G QRP CLUB



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Rev. George Dobbs G3RJV

EDITORIAL

Welcome to SPRAT 110,

It is surprising how many times I find members working on the same thing at the same time. This issue is interesting in that we have a number of pairs of articles dealing with the same, or similar, themes.

We have two approaches to using the NJ Islander Cutter [see last issue] to make IC pads. There are two versions of an End-fed Dipole. With all the recent discussion on measuring SSB power, we also offer two methods of measuring PEP.

The final test equipment article for the WIFB Memorial Award appears in this issue. The winner will be announced in SPRAT 111. I look forward to more entries for the same competition for 2002 – see later in this issue for the rules.

Enjoy your portable operation as the weather gets better.

72/3

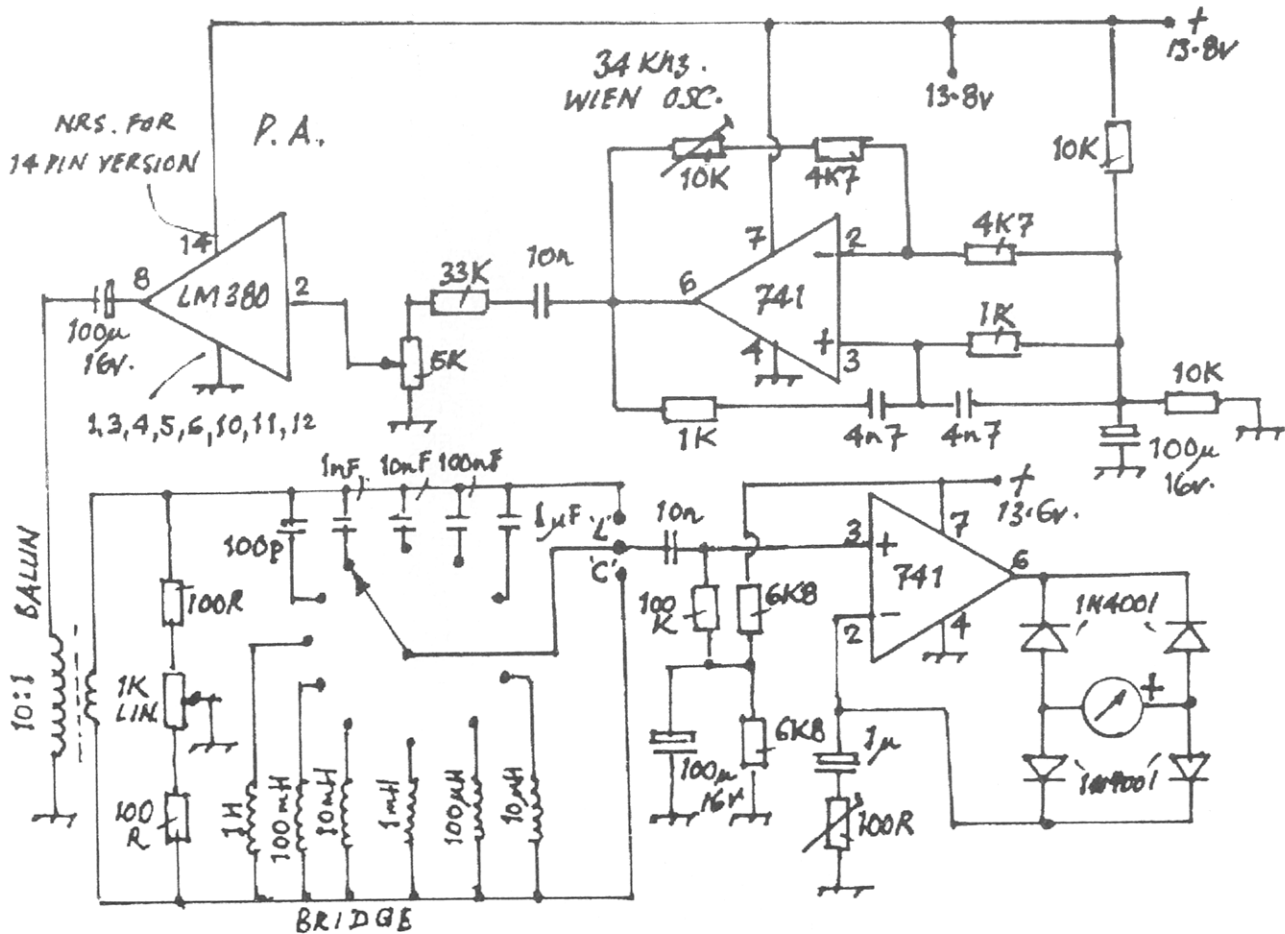
G3RJV

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



A Simple LC Bridge

David Procter GØUTF, 15 Church Cl. Tollereton, YORK. YO61 1QS



NRS. FOR
14 PIN VERSION

P. A.

34 KHz.
WIEN OSC.

+
13.8V

13.8V

10K

LM380

741

100µF
16V.

33K

10n

1,3,4,5,6,10,11,12

5K

1K

4n7

4n7

10K
100µF
16V.

SAVIN
1:01

BRIDGE

+
13.6V.

10n

100p

1nF 10nF 100nF

100R

1K
LIN

100R

1H

1000

1000

1000

1000

1000

100R

6K8

100µF
16V

6K8

1µF

100R

1N4001

1000

The ranges of this L/C Bridge are 10uH – 1H and 100pF – 1uF.

Using the balance pot, it will resolve 2uH – 5uH and 20pF – 5uF.

It consists of a 34kHz Lo Z oscillator feeding a bridge via a balancing transformer. The balancing is done by a 1KΩ calibrated pot and balance is shown on a simple millivoltmeter. The accuracy is governed only by [a] the linearity of the pot [b] the calibration of the pot [c] the onboard Ls and Cs for the bridge. Being a bridge circuit, the accuracy of the oscillator frequency is not important, neither is the meter sensitivity.

Setting up is simple:

- Adjust the 10kΩ pot for oscillator to run without squaring off
- Set 5kΩ pot for about 3V rms from the output of the LM380
- Tweek 100Ω pot for meter sensitivity
- See chart for calibration of pot

Dial Reading	% Rotation
0.2	10%
0.3	18%
0.4	24%
0.5	30%
0.7	39%
1.0	50%
2.0	70%
3.0	80%
4.0	86%
5.0	90%



A Reminder for the W1FB Award for 2002

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.

RED ROSE CONSTRUCTION CHALLENGE

This years Red Rose QRP Festival is on Sunday 26th May. (Details in Sprat/Radcom, etc). venue is same as last year, Formby Hall, Atherton. There is a challenge this year!" The Hz Sardine Selection". With all the interest in Altoid tins,(which cost a MINT), the poor old sardine tin has been neglected! (Remember the" sardine sender"?

A tin of sardines costs 19p in most of the local supermarkets. If you don't enjoy the contents, the dog certainly will, and what are you left with? That superb little metal container, the type which "Stack". My challenge is:

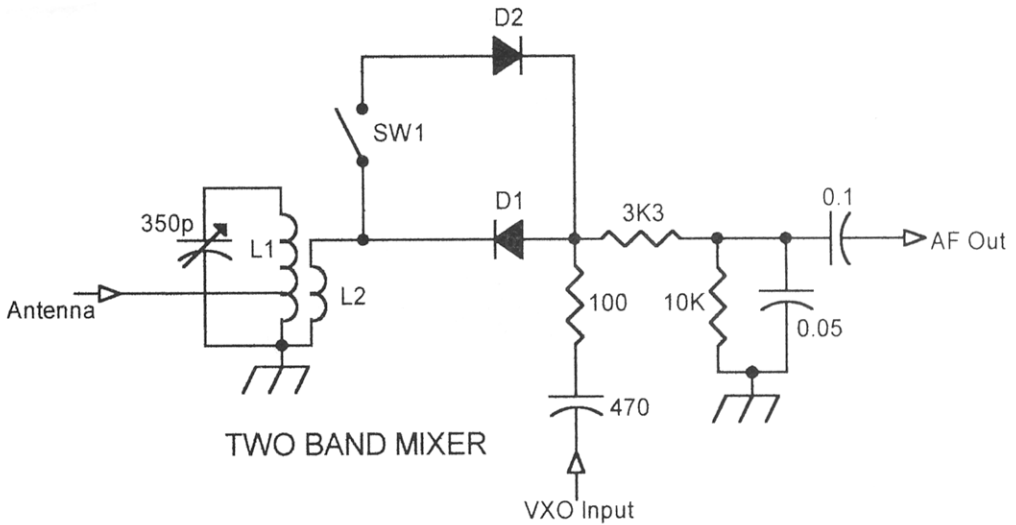
"Construct a project which incorporates one or more sardine tins." Bring it along to the QRP Festival at Atherton together with simple plans/description of the project. It will be displayed on the GQRP stand. Entries will be judged at 1pm. There will be a certificate and mystery prize awarded to the winning entry. Details of all entries will then be forwarded to Rev. George Dobbs for consideration of publishing in SPRAT, this being an appropriately named magazine for my challenge!) good luck, start building NOW!

FOR SALE: TEN TEC CENTURY 22 - In good condition £100 plus carriage at cost.

Gus Taylor, G8PG, 37 Pickerill Road, Gre: sby. CH49 3ND. Tele 0151 677 1818.

"Lauser-Plus" Two Band Mixer

Rudi Burse, DK2RS, Zähringerpl.2, 78464 Konstanz. Germany



The "Lauser" was a DC Receiver for 40 or 80m. This mixer modification permits coverage of both bands. The switch is closed [on] for 40m operation, the mixer becoming an "harmonic mixer". The switch is off for 80m operation. For both bands the VXO is constructed with a ceramic resonator – CSA 3.58MHz.

Radio Projects for the Amateur Volume 2 by Drew Diamond, VK3XU

- which follows on from "Radio Projects for the Amateur", is now available. The book offers "more plans for the construction of receivers, transmitters, antennas, test equipment and some handy workshop hints and tips" in a similar style and presentation to Vol 1. Contains details of about 30 projects including power supplies, a 3- HF band superhet receiver, low-power CW transmitters, 40 W MOSFET linear amplifier, "swinging-link" HF antenna coupler and several useful items of test equipment. The workshop section includes details of a neat little sheet-metal bender for radio/electronics and modelling work.

132 Pages, A4 format. Available direct from the author and publisher; Drew Diamond (VK3XU), 45 Gatters Road, Wonga Park, 3115, Australia. Price is \$24.95 (Australian dollars) which includes air-mail to Europe

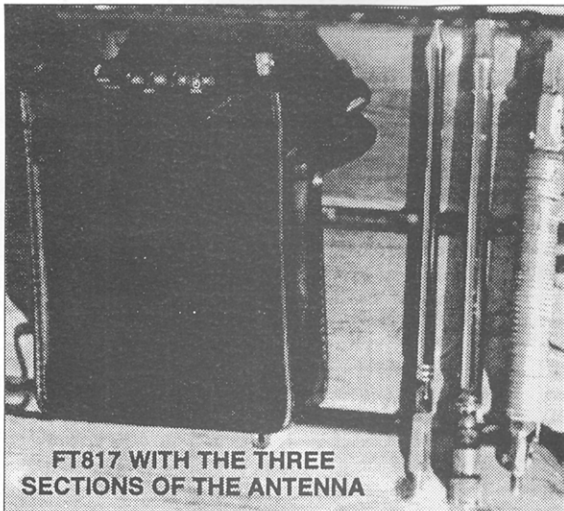
RF Probes To Go - see SPRAT 109p. 8: The correct email address should be vk3cca@arrl.net Tuck Choy MØTCC

MULTIBAND PORTABLE WHIP ANTENNA (14-430MHz)

Marco Eleuteri IK0VSV, PO Box 72, I-06059 TODI P), ITALY

Especially designed for the HF VHF man pack Yaesu FT 817 , this antenna is usable for any portable radio. History teaches us that miracles were only performed by one man- so we don't expect miracles from this whip! But his length and electrical design (centre loaded) permit very good results especially on HF and VHF 50 MHz.

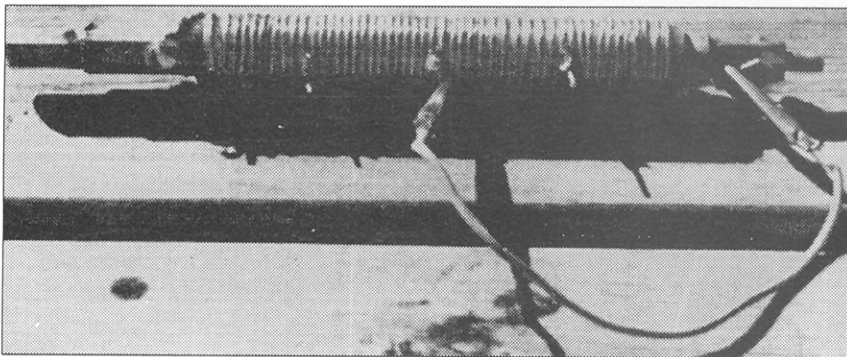
I used two telescopic antennas, the longer one is a 150 cm - ex wireless 49 MHz telephone, the shorter one is a piece of old surplus antenna stored in my laboratory for "any further use", this is 50 cm long.



A PL connector must be fixed at the base of the shorter element (external body insulated of course!) A female screw must be soldered at top of the element.

BASE CONNECTOR

At the longer element's base a male screw is soldered to permit it to be connected to the shorter element or to the loading coil described below.



CENTRE COIL

For HF operation a loading coil is necessary, I used a 20 cm long 22mm diameter PVC rod or Fibreglass, axially drilled on both sides.

In the holes a male and female screw is fixed with epoxy glue. The loading coil is 50 turns of 0.6mm silver plated wire , 2mm spaced and tapped at 11-22-35 turns from bottom.

Operation:

HF all parts of the antenna is used, two telescopic sections, full extended, the coil .

14MHz operation - no taps are used, for other bands the relative tap is used, shorted via a short wire with crocodile clips.

28 MHz operation - it is possible to use a 24 tap and decreasing length of the upper element to get better SWR.

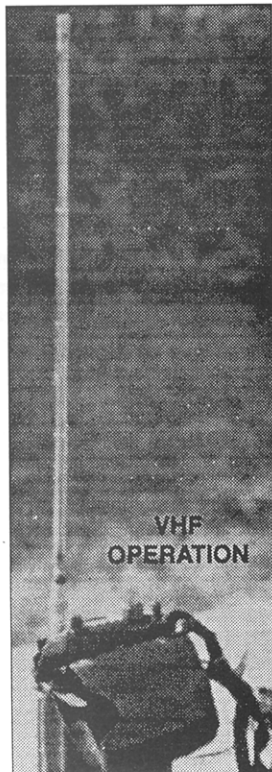
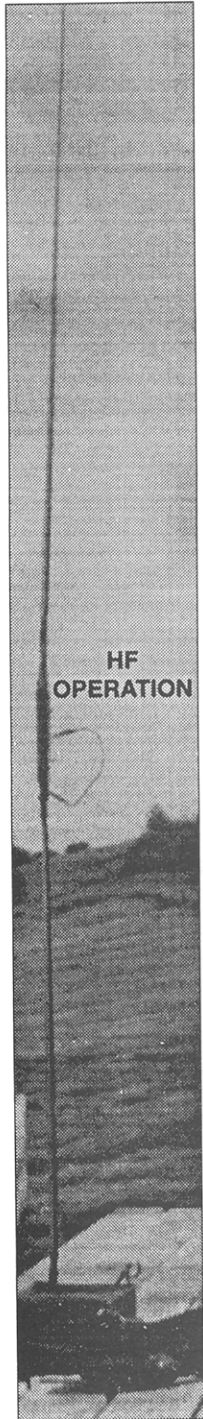
50 MHz operation - eliminate the coil, both antenna elements are connected together, then decrease the length to get a better SWR.

144 MHz - only the shorter element is used, totally extended is about $\frac{1}{4}$ lambda adjust the length for best SWR.

435 MHz - as on 144 MHz the shorter element is used but in this case it is totally closed to get $\frac{1}{4}$ lambda.

Used with the FT 817 , this antenna must be connected at the rear antenna connector via a 90°PL adapter to avoid damage to the front BNC socket, due his length and weight.

NOTE: It may not be possible for you to get the same length elements so some values may change, for example the taps on the coil or changing the turns and tappings on the coil.



On the V/UHF bands real DX is not possible but results are better than the usual rubber duck antennas often used with portable rigs.

The Wurzel 20, 40, 80m Regen TRF Receiver

Tim Walford G3PCJ, Walford Electronics,
Upton Bridge Farm, Long Sutton, Langport, Somerset TA10 9NJ

This is a simple low cost project for exploring the three most popular HF bands; it will also appeal to older constructors who have wrestled with awkward valve regen receivers! In modern designs the regenerative stage is separated from the detector so that the crucial point of oscillation, where selectivity is very high, is much more controllable than in traditional designs. It is capable of receiving either CW or SSB signals (and AM if you wish). The design uses only five discrete transistors in four main functional blocks - RF amplifier, detector, regen stage and the audio amplifier. The circuit is shown overleaf; it needs a supply in the range 8 to 16 volts.

The input attenuator permits reduction of those rig swamping broadcast stations just outside 40m! It can greatly improve the readability of wanted signals where BCI is a problem. The main purpose of the 2N3819 broadband RF amplifier is to isolate the antenna from the single tuned circuit, leading to better frequency stability and negligible radiation when the regen stage is oscillating.

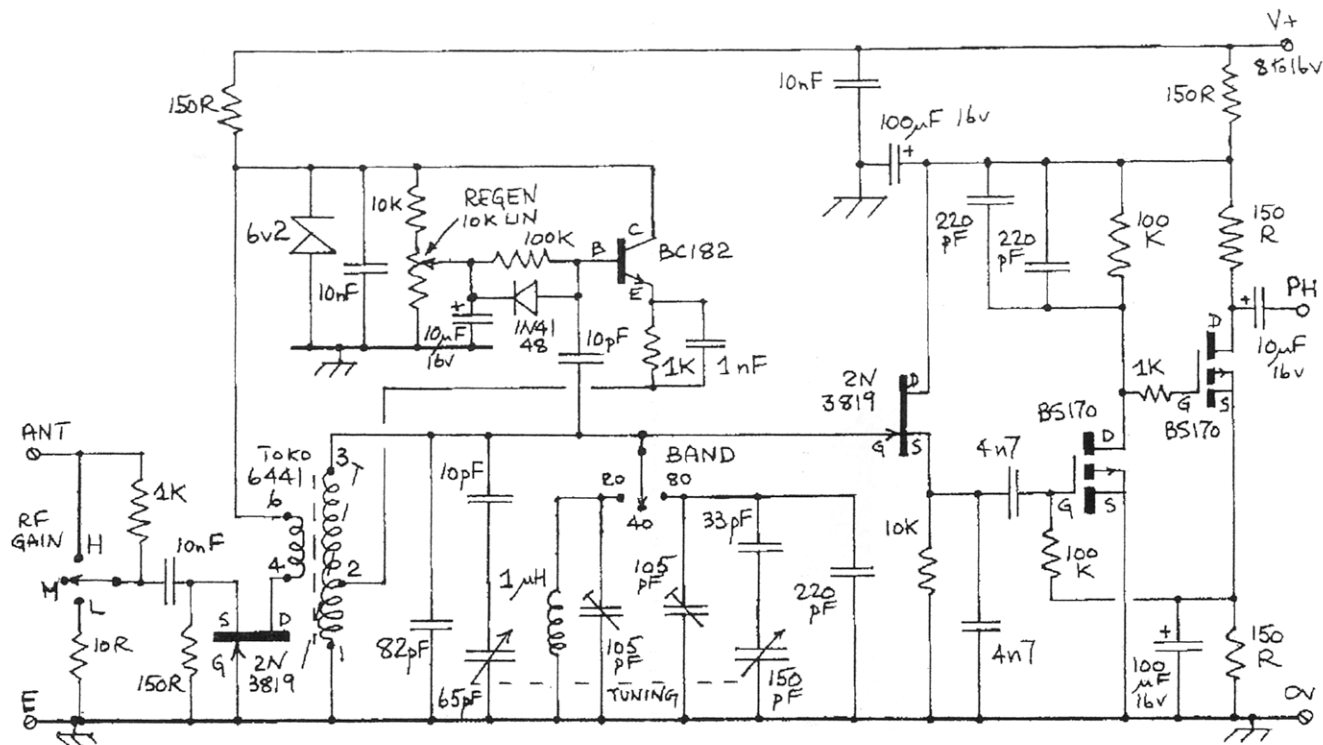
The main 6441 TOKO inductor is resonated on 40m with a small fixed capacitor and a limited capacitance change from the 65 pF section of the Polyvaricon. 80m uses the same 40m inductance but with lots more capacitance – fixed capacitors, a trimmer and a larger contribution from the other 150 pF section of the Polyvaricon. 20m uses the 40m capacitors but with inductance reduced by adding a lower value inductor and trimmer in parallel. Hence the setting up procedure is to adjust the 6441 for 40m first and then adjust the two trimmers for 80m and 20m. Rather than use a counter, it is better to use another receiver to listen to the Wurzel with its regen stage oscillating. The infinite impedance 2N3819 detector stage is connected directly across the tuned circuits. Its source time constant is chosen to filter out frequencies above about 3 KHz. The audio amplifier uses two versatile BS170 MOSFETs with DC feedback to control their bias conditions. It is suitable for driving series connected 32R stereo walkman type headphones or high impedance ones if you are lucky enough to have them! A LM380 or 386 LS driver stage can easily be added.

Thus far it will work quite well as a straight TRF receiver, but the real advantage comes from adding the regenerative stage. The BC182 is arranged as a Hartley oscillator connected to the tuned circuits, but with adjustable bias from the regen pot. With no bias, the stage will not oscillate and has no effect on the basic tuned circuit selectivity. However, as bias is increased, the regen stage attempts to oscillate so countering the losses in the tuned circuit leading to higher selectivity. Ultimately, at the point where it is just breaking into oscillation, the selectivity and gain will have improved dramatically. Separating the regen and detector stages allows this crucial point of oscillation to be finely controlled independently of tuning. For AM stations the stage should be set to just not quite oscillate; for CW and SSB it should be just oscillating since a carrier has to be present for proper detection. It is quite surprising what such a simple circuit can do!

Special Offer for GQRP Club Members

The Wurzel kit is available for UK members **from Walford Electronics** for the specially **discounted price of £35 including P&P**, please send your cheque **direct to Walford Electronics** – see advert in this issue. The kit includes all parts for the ‘small upright format’ with PCB front panel. The PCB is 100 mm square. It can be easily boxed if you prefer. There is also a suitable 1.5 Watt CW TX.

For Overseas Orders only, please send you full credit card details to Mr. Graham Firth G3MFJ, 13 Wynmore Drive, Bramhope, LEEDS. West Yorkshire. LS16 9DQ. Accounts will be debited by the GQRP Club for £40 and orders passed to Walford Electronics.



©G3PCJ
15/1/02

THE WURZEL RX

2N
3819
DGS

BS
170
SGD

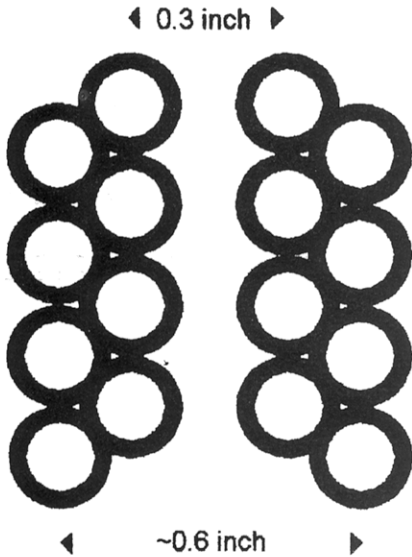
BC
182
EBC

Pin
Views



The NJ Islander and ICs

Ingo Meyer, DK3RED, Berliner Str. 63, D-14612 Falkensee, Germany



The last issue of SPRAT introduced the NJ Island Pad Cutter – a method of cutting small islands in the surface of blank copper clad PCB material. This article suggests method for mounting ICs on such pads.

Step 1

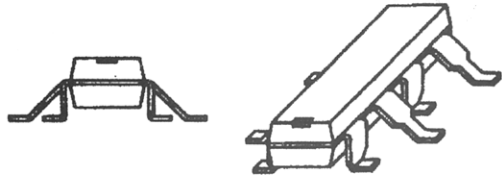
Use the NJ Islander to create a board as shown in the first picture.

Step 2

Bend the thin part of pins 1 and 3 and 5 etc at 90 degrees

The thin part of the pin is now parallel to the board

Cut the thin portion of the pin until it is about 0.1 inch



Step 3

Bend the whole pin of pins 2 and 4 and 6 etc at 45 degrees

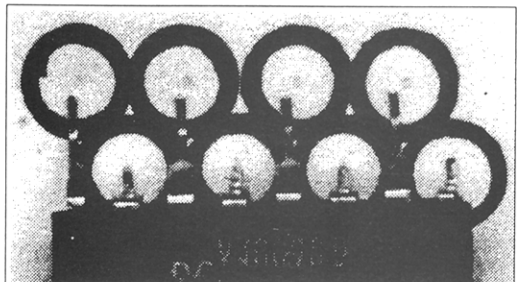
Bend the thin part of these pins in the middle at 45 degrees

The end of these pins are now parallel to the board

Step 4

Solder the IC to the cut board. The result looks like the picture below.

Note this picture is a test version on a sheet of paper with circle – not a PCB [hi]

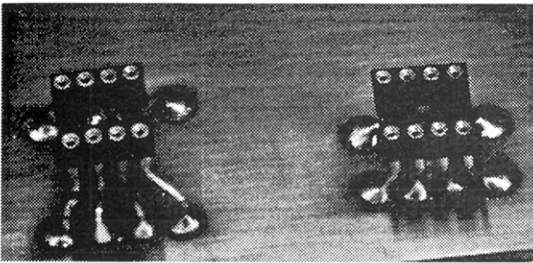
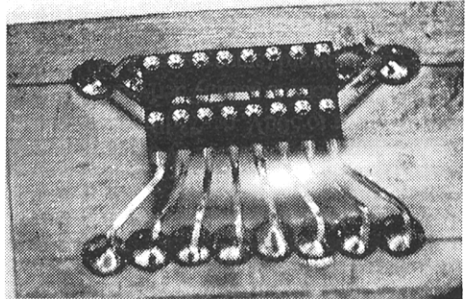


Mounting IC Sockets a la Manhattan

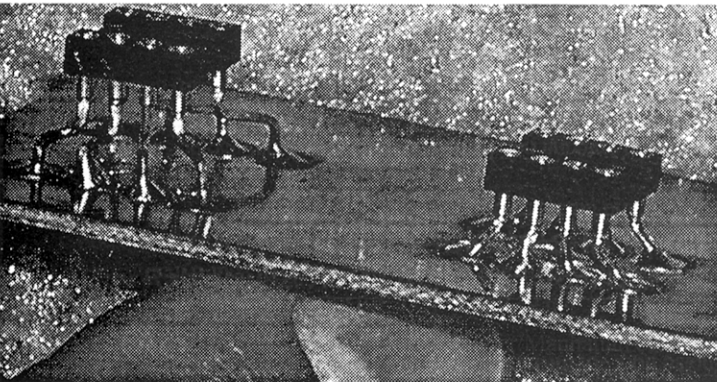
Dov Rabinowitz, ADØV [reprinted from QRP Homebrewer #7]

I have finally found a way to mount ICs for Islander/Manhattan construction. The method is really simple. You can use a wirewrap socket, which has longer leads – and then bend them out a little. Be careful because the leads are brittle and tend to break very easily. I am still experimenting with different types to see which work best. For my first try, I bent the leads out to the sides first and then bent them down – sort of like spider legs. However for an 8 pin socket, the leads just have to be spread apart slightly across the length and not bent to the side at all. The leads are then trimmed as appropriate and soldered to two parallel tracks each consisting of four island pads drilled in a line right next to each other.

A 16 pin IC socket with long [3-wrap] wire wrap leads. The legs are carefully splayed out and bent down, then trimmed evenly to allow the socket to sit elevated upon the legs. The ends of the legs sit dead-centre on dual rows of islands created about 0.75" apart



Side view of the two ways I mount IC sockets.



8-pin IC sockets can be mounted similar to their 16 pin cousins, or the short leaded version may be mounted by simply splaying out the leads and soldering to the pads

Left shows the "spider leg" approach
Be careful not to break the leads when bending.

Right shows the simpler lower and mount technique

An End-Fed HF Dipole

Dr Andrew Smith, G4OEP, 15 Dyrham Cl. Henleaze Bristol BS9 4TF
aj.smith@mail.com 2001

One of the fun aspects of QRP operation is that you can take a small rig with you on your travels and operate /P from anywhere in the world (where the authorities will let you). Ideally you want to take a minimum of other clutter with you and you need an antenna that can be slung out of a hotel window with minimal fuss. Here is an idea for a mono-band end-fed dipole that exactly fits the requirement, and can be used without an ATU, radials or an earth connection. Being essentially balanced, it is less likely to cause emc problems. The design is for 21MHz, but can be scaled for other bands. The basic idea is similar in principle to a UHF sleeve dipole in which the outer part of a coaxial feeder is used as a radiating element. The length of the radiating feeder must be defined by inserting a high impedance element at the appropriate point ($\lambda/4$ from the feedpoint). In the case of the sleeve dipole this takes the form of a transmission line choke, but in this HF version a resonant coaxial balun is used. To make the antenna proceed as follows –

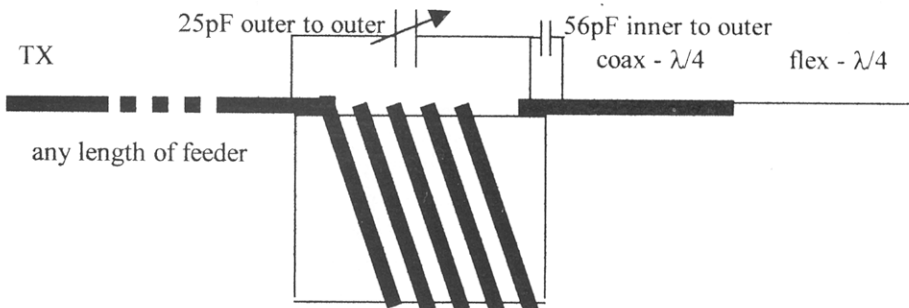
- 1) Prepare the end of a length of UR76 feeder so that the inner conductor is exposed, and connect on to it a $\lambda/4$ length of plain flex. Attach an insulator and support string to the end of the flex.
- 2) Measure back $\lambda/4$ from the prepared end, and coil the feeder 7 times around a short piece of 1.25 inch PVC water pipe, securing the ends of the coil by passing the feeder through suitable holes in the pipe.
- 3) Expose the braid at the beginning and end of the coil, and attach a 25pF variable capacitor to the braid at each end so as to form a parallel tuned circuit.
- 5) Extend the feeder to any required length beyond the trap (or Balun – call it what you like) and connect up the TX.

This arrangement should, with suitable fine tuning, produce at residual SWR of about 1.4 or 1.5:1 at the required 21MHz operating frequency, but you can refine the design by proceeding to step 4...

4) This is the magic bit. The trusty Smith Chart shows that a SWR of 1.5:1 on a 50 ohm line can be corrected at 21MHz by a parallel capacitor of 54pF (a reactance of 140 Ω if you want to scale for other frequencies) connected at a point 0.39 wavelengths from the 73 ohm point (i.e. the dipole centre). By a strange co-incidence, with a velocity factor, appropriate for UR76, of 0.66, this point comes almost exactly at the end of the radiator-feeder element, i.e. at the hot end of the trap. So cut the feeder at the point where it enters the coil on the antenna side, and reconnect it with a 56pF capacitor joined between the inner and the outer of the co-ax. This will reduce the SWR to about 1.1:1 which should satisfy even the fussiest of rigs.

This antenna was used with a 25W CW rig from a hotel room in Asmara (Eritrea) in 1996, where I operated as E3A30, and it performed very well. I am thrilled with the end-fed dipole, and feel that it could become a classic. The purists will no doubt whine about losses in the

tuned transformer, but the point is that there aren't any alternatives for a neat and simple sling-out job, and at least there won't be any losses in an ATU.



Bill Wigg, G5OW, is, at 91, perhaps the oldest member of the G QRP Club. His membership number, 210, is certainly an old one. Bill began operating CW in 1932 and in spite of a heart attack and a stroke and having to learn to talk, write and walk again, he is still operating CW on the bands. In the Summer of 2001 he was made an honorary member of the High Speed Club. Bill promptly went on the air in their autumn CW contest and sent in a log to assist the scoring for other members. Much to his surprise he received a handsome certificate that he was the leading "G" member in the contest. May I wish G5OW many more years of operating on the amateur bands.

For Disposal: RadComs, 1999,2000,2001. All good condition. small donation + postage.
 Sommerkampe FT277 [FT101B] no PA valves, everything works OK, good receiver, top band to 10m. Good box of spares, or fit new PA valve, your choice, good physical condx. £50
 Wanted: HW7 or HW8 for spares [knobs, relay connectors PCBs etc] Any homebrewed TX/RX
 WHY. Also transmitting equipment for 136kHz eg TX ATU etc - have RX.
 Rev. Adrian Heath, G4GDR - 01793-762970 [home] 01993-896673 [office]



NEW! 'Copper Island' Construction Outfit



Complete 262-Piece Outfit for 'Manhattan-Style' Construction,
 The Alternative "Surface Mount" Technology - Without the Eyestrain!
 No Etching With Messy Chemicals - No Drilling Tiny Holes - Simply Glue & Solder!
 Outfit contains 200 x 5mm Round Pads - 20 x 8 Pin, 15 x 14 Pin, 10 x 16 pin IC Pads,
 10 x Pads for KANK Series Coils, 48 Sq.Inches of Single-Sided Copper Laminate Board.
 Tools included: Tweezers, Adhesive, Solid Abrasive Block, Pressure Rod, Full Instructions.
 All You Need in a Handy Compartment Box with Hinged Lid - Just Add Your Components!

Complete Outfit Just £15.00 + £2.95 P&P, By Mail Order Only, From:-

Mr. D. J. Walters, 11 King George V Avenue, Mansfield,
Notts. NG18 4ER 01623 465443

E-mail: pentode@ntlworld.com

QRP and S - UNITS

Paul Harden, NA5N, PO Box 757, SOCORRO, NM 87801, USA

One S-unit is a change of 6dB in signal strength, which corresponds to double the VOLTAGE or four times the POWER at the receiver input.

HANDY-DANDY S-METER – VOLTS – POWER CHART

S-METER	VOLTS	POWER
S9+20dB	500uV	= - 53dBm
S9+6dB	100uV	= - 67
S9	50uV	= - 73
S8	25uV	= - 79
S7	12.5uV	= - 85
S6	6.2uV	= - 91
S5	3.1uV	= - 97
S4	1.6uV	= -103
S3	.77uV	= -109
S2	.39uV	= -115
S1	.19uV	= -121dBm

An S-METER is calibrated by connecting a signal generator to the antenna terminal and setting the output power to 50uV, or -73dBm, and adjusting the S-meter calibration pot for a reading of S-9. Since the S-meter is usually derived from the receiver AGC line, it *is* relatively linear from about S3-S4 and upward (since a good AGC usually "kicks in" around -100 to -105dBm). This linearity is also due to the diodes used for the AGC detector, once they are conducting in the linear region (again, around S3-S4). Statements that "S-meters are totally worthless" or "a change in 2 S-units means nothing" are thus actually quite incorrect. An S-meter *is* a fairly good RELATIVE power indicator for received signal strengths and noise levels.

SO WHAT-THE-HECK IS AN S-METER GOOD FOR?

The purpose of an S-meter is not to provide any absolute indication of power or voltage, but a RELATIVE indication between received signal strengths ... such as between two different signals, or between a signal and the "noise floor" of the band.

Example: On 40M, typically the "noise" will be S4, or about -103dBm. If your receiver has an MDS (minimum detectable signal) of -133dBm, it means you're losing 30dB of your dynamic range to the noise! (-133-103=30dB). In this case, the S-meter is more-or-less giving you an absolute power DIFFERENCE between it's MDS and the noise floor, in dB.

Example: A station claims his beam antenna has 12dB gain over his dipole. So he switches between the two and asks you for an "A-B" comparison. His signal goes from S7 ...a 6dB change. That ain't 12dB! 12dB should have shown 2 S-units of change. (I'm assuming his beam antenna *was* properly pointed at you -hi).

Likewise, YOU are comparing two antennas at your shack. You are LISTENING to a QSO in progress, switching between the two antennas. One antenna causes the S-meter to rise about 1/2 S unit. Well, that's 3dB, and that's not bad for most wire antennas. Or ... you are switching between two antennas and notice that the noise seems to be much less on one, in fact, the S-meter drops from S4 to S3. You have a problem with the antenna with the higher noise. If the noise drops 2 S-units, you have a BIG problem with that antenna! Obviously, you want to use the antenna with the lowest noise, because an S5 signal will be an S5 signal on the same receiver. The difference, is if one

antenna has an S4 to S5 noise, you'll be digging that S5 signal "out of the mud." With an antenna at S3 noise level, that S5 signal now has a 2 S-unit (12dB) improvement in signal-to-noise, and will obviously be much easier to work.

An S-meter also makes it convenient to make internal tuning adjustments to your receiver, such as peaking any IF cans, filters, etc. You can tune to a carrier or QSO in the S8 range, then tune above and below and mark the frequency where the S-meter drops 1 S-unit (6dB), 2 S-units (12dB), etc. to make a rough graph of your overall selectivity/filtering of your receiver. If your receiver claims the RF amplifier, when kicked in, provides 12dB of gain, well, you should clearly see about a 2 S-unit change. Or if the 3dB filter BW is 300Hz, then you should clearly see a 1 S-unit change over about twice that, huh? You can do the same with a DVM on your audio output, but an S-meter sure makes it more convenient, and quite easy to verify some of the specs and claims the rig/kit vendor is claiming. Or to check for a change in performance later on for troubleshooting purposes. It is ALWAYS beneficial to do some of these basic measurements when you put a new rig on-line, so you have a baseline to check performance later on if troubles begin. A simple S-meter is all you need to record some of these important specs.

WHAT ABOUT THIS QRO vs QRP THING?

You have to QUADRUPLE (X4) your signal to DOUBLE your signal strength at the receiver end. Likewise, if you drop your power by one-fourth, your received signal strength will be one-half less, or 1 S-unit. You are working a station running 100W and he is S8. If he drops his power to 1/4th, or 25W, his signal strength should drop about 1 S-unit, or to S7. If he drops another 1/4th, to about 6W, he should drop another S unit, or to about S6. Therefore, the difference between 100W and 5W QRP is about 2 S-units. Big deal. Dropping to 1W is about another S-unit, then to 250mW another S-unit, etc. OK, now you're getting down into the S4 noise level on 40M. Now you're hoping the guy on the other end has only a S3 noise level on his end :-)

Hopefully this answers some of the questions raised about S-meters and how to use them.

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 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.**

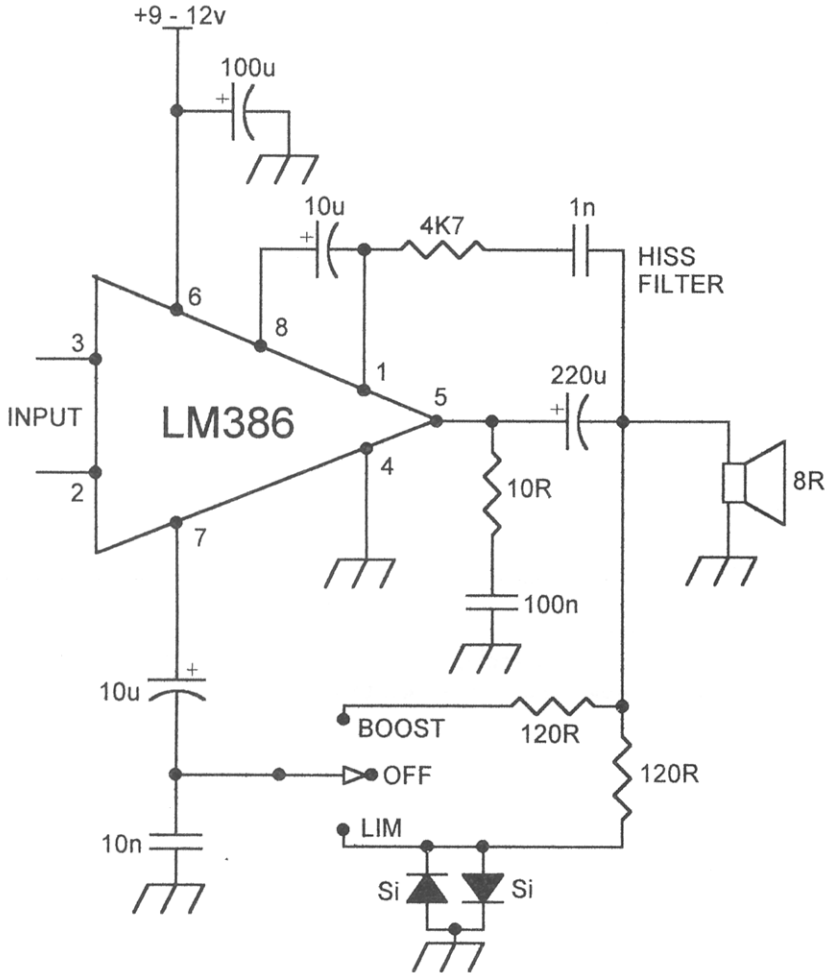
Cheques: "M.L. Prickett" [The G QRP Club benefits from each order]

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

Boosting the LM386

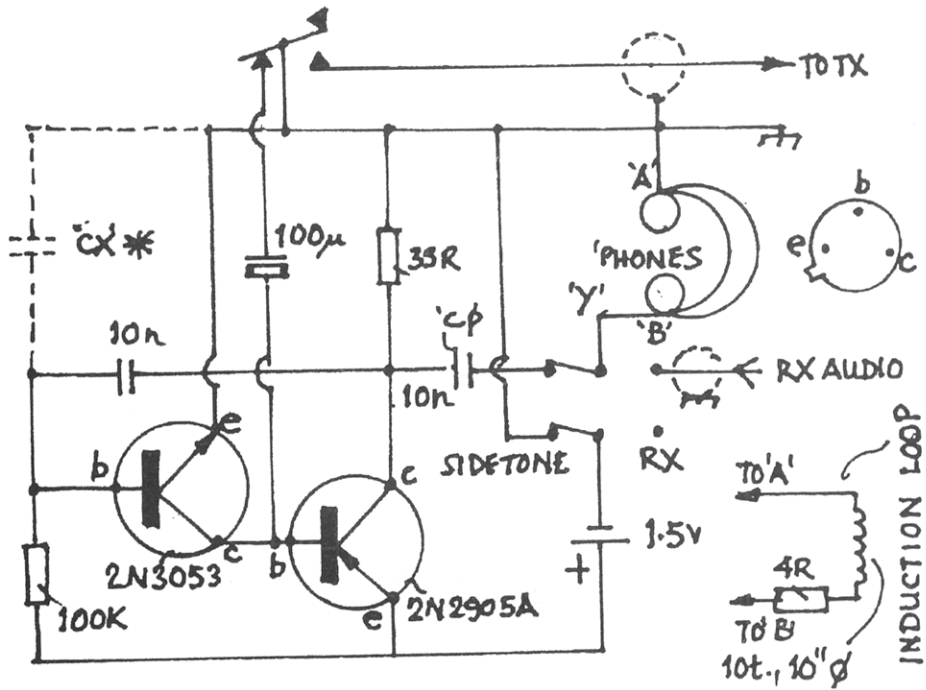
Bill Currie, VK3AWC, PO Box 5197, Mordialloc, Vic 3195, Australia



The gain of the LM386 audio amplifier chip can be increased 2 or 3 times by using a bit of positive feedback. If the output audio is fed via a capacitor to pin 7, which is usually bypassed for hum reduction, a significant boost in output will result. I have modified some of my two chip DC receivers to make use of this gain. You may have to adjust the resistor values if oscillation occurs. As you will see by the circuit, I have used an SPDT, centre off, switch labelled BOOST/OFF/LIM. The LIM position uses a couple of diodes to limit the amount of boost. This is a primitive type of AGC and prevents loud signals from over driving the LM386 and distorting. This 'boost' circuit may apply to the LM380 chip also as they have similar internal circuitry.

A "Once Only" Sidetone Oscillator

Bill Durham G3DNE, 16 Glasses Mead, Taunton, Somerset, TA1 5QH



*FOR LOWER TONE, ADD CX, 100n
 IF USING INDUCTIVE LOOP, DISCARD "CP", DISCONNECT 33R FROM EARTHY END
 AND CONNECT TO SWITCH AT "Y"

Wanting a sidetone that would always be available for use with CW transmitters with the facility, yet not interfering with normal keying, brought about this simple circuit. Based on an oscillator by Steve, G4RAW that appeared in SPRAT 92 in the Novice section very few changes have been made to Steve's circuit.

The key I use is a WW2 ex RAF unit with front and back contacts, the arm being common. The rear contact is used to block the oscillator when closed [key up]. A small DPDT switch selct[s] headphones from tone to RX output. Components are mounted on a piece of Veroboard and housed in a small plastic box, fitted to the wooden base of my key.

I no longer use headphones now due to having to wear hearing aids. I use an inductive loop instead. A modification is included for those who may require it.

CORRECTION – SPRAT 109 "The Frequency Finder"

1. The Frequency Finder should be powered from 6 volts regulated
2. Paragraph 6: 'wound' should read 'sound'
3. Paragraph 7: second last sentence. 'Inductance is now 253 (freq squared)' should read 'Inductance is now 253/(freq squared)'

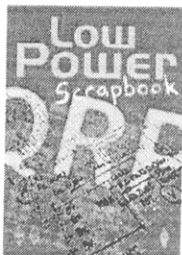
The QRP Homebrewer.

The QRP Homebrewer is a 64 page professional quality publication dealing with QRP construction projects, tools advice and guidance in the practical side of QRP home building. It is published quarterly (approx: November/February/May/August) by the New Jersey QRP Club as a service to the QRP community. There is no need to be a member of the New Jersey QRP Club to subscribe and the magazine encourages readers and article contributions from all round the world.

The editor of the QRP Homebrewer is George Heron, N2APB, who I know from his very lively input to the "Four Days in May" QRP symposiums at the Dayton Hamvention. George is a very active radio constructor and contributor of ideas and articles in the QRP literature. His aim in the QRP Homebrewer is two-fold. Primarily it is about the home building of QRP equipment, gadgets, antennas and accessories. But alongside this is the targeting of less experienced constructors with information, ideas and construction techniques to suit their ability. At the same time the magazine plans to run the more advanced projects to keep the experienced constructor interested. To see the topics covered in issue of the QHB look at http://www.njqrp.org/data/qrp_homebrewer.html. Original colour photographs and graphics from previous issue can be view at

www.njarp.org/qhbextra. The QRP Homebrewer costs \$15 a year for USA and Canadian subscribers and \$20 a year for those outside North America. To subscribe, make a cheque or money order payable to "George Heron N2APB" and sent it to George Heron, N2APB, 2419 Feather Mae Court, Forest Hill, MD 21050. USA. The email address for George Heron is n2apb@amsat.org.

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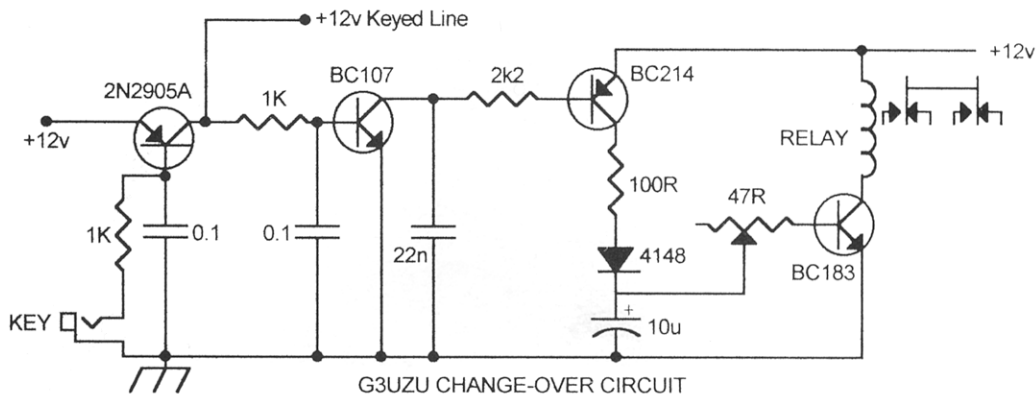
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Antenna Change-Over Circuit

Alan Upton G3UZU, 36 Robin Way, Woodchurch, Wirral, L49 7NA



On simple transmitters where the key is used to switch the positive line to the transmitter, I use this circuit. A variation of the standard circuit, it enables me to switch a negative line so I can use an antenna changeover/receiver mute. The circuit is based on the ONER antenna change-over.

A Tip from G3VTT

If anybody wants carborundum grinding powder for crystal grinding you can get 600 grade powder from: GEMSET 31 Albion Street, Broadstairs, Kent, CT10 1LU Ring: 01843 865360. Costs just a couple of quid. Any Sprat readers grinders? May have problems finding a suitable monkey!

FOR SALE: UNFINISHED PROJECT: White Rose TCVR, most parts to complete including case, transformer, all PCBs, plugs and sockets - £40.

MIZUHO/JIM MX14S, soft case, two crystals (SSB), speaker, mic, nicads - £130.

Chris Fawkes, G4VDG 31 Burland Road, Waterhayes, Newcastle, Staffs ST5 7ST 01782 560218.

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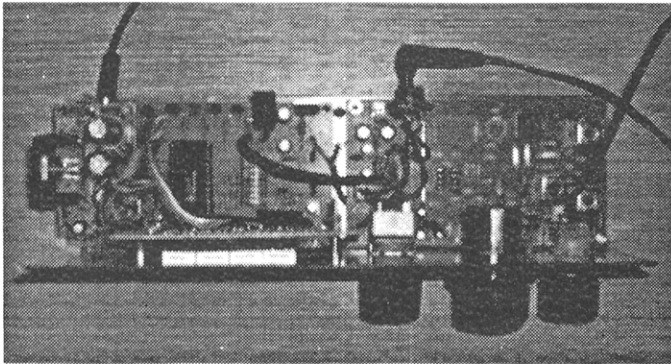
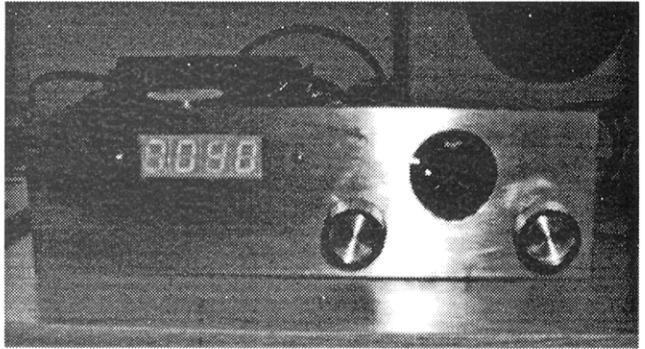
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Modifications to the Sudden 7 MHz DC Receiver Mk 2

Mike McGrath G8XLC, 28 Wythenshawe Rd. Cheshire M33 2JP
e-mail jam@mcgrath28.freemove.co.uk

The Sudden Mk2 is available from KANGA Products – see back page.

A frequency counter was added but is no longer available from Sprat but an identical kit is produced by HANDS ELECTRONICS who advertise in SPRAT. It is important not to introduce noise from the counter into the local oscillator and to prevent this, miniature 50 ohm co-ax was used to feed both the signal to the counter and also to feed the 9v dc. The counter has the least significant digit removed to provide a resolution down to 1 KHz. The counter is fed from the unused link winding on the oscillator transformer T3 (4173). PIN 6 is the high end and pin 4 is grounded.



My original prototype had a Maplin Velleman 15 watt amplifier kit using the TDA 2030A but this is no longer available so a smaller 7 watt hi-fi quality amp using the TBA 2003 is now used. This amp has a total harmonic distortion of 0.05% and gives very good audio quality. Full output power is taken

from the existing LM 386 by using a 10 K ohm fixed resistor. Having cut and isolated all the tracks of the existing volume control this then allows control of the input to the new amplifier. The Maplin 7 watt amp is a Velleman kit K4001 Maplin PART No.VF55K.

Finally the tuning rate is now near perfect by the replacement of a new precision 10 K 10 turn wire wound pot from JAB ELECTRONIC COMPONENTS who also advertise in SPRAT the part No. is TTP-10K. An important point is that the modules only work with a supply voltage of 9v dc .12v dc produces incorrect oscillation.

SALE: Silent Key Sale [G3NQE] – Heathkit HW8 – in good used order - £90. Clive Hardy, G4SLU, 01202 748360 [eve]

Convert your Power Meter to Read CW and PEP

Ian Keyser G3ROO, Rose Mount, Church Whitfield, Dover, Kent.

Those who have email and subscribe to the G-QRP list will know that since Sprat 109 there has been some correspondence re PEP and CW power measurements. I have no desire to get entangled into the various arguments but to state that CW means 'Continuous Wave' and is easy to measure on a power meter. Ideal for AM, CW and PSK31....which is a 'continuous wave' mode.

SSB however has a 'mean' output power of between 10 and 20 percent of the peak output providing the amplifiers are not being over driven. Our output powers for various modes as far as our license is concerned was calculated for SSB as being the same total output power of a fully modulated 150 watt AM transmitter. Back in the 70's when QRP SSB was rare in the G-QRP club and I was SSB manager long frank discussions were held on this subject and finally the levels were set at 10 watts PEP and 5 watts CW.

Measurement of your PEP is not difficult and never has been! All we require is our power meter to display the peak voltage from its detector. Of course during SSB measurement the meter does not have time to display this reading and so will indicate a much lower level. All that is required is a simple 'sample and hold' circuit with a time constant of one second or so enabling the moving coil meter to indicate the reading. The meter, then calibrated under CW conditions, will indicate the peak readings during SSB conditions.

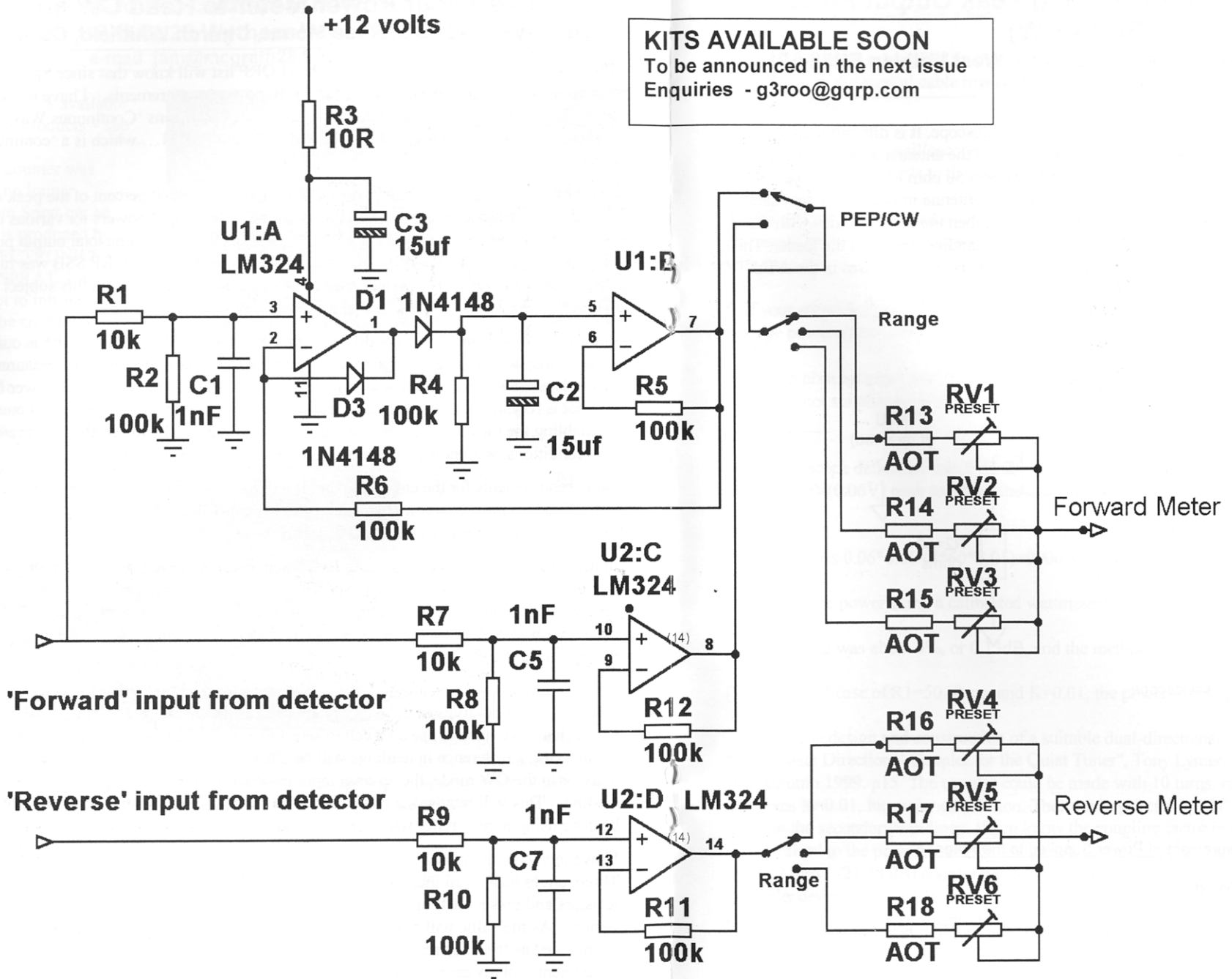
Other requirements for the circuit are that it will have an overall gain of one, enabling it to be 'retro fitted' to most power meters, and a single supply line. My circuit has been tested with the Stockton power meter and works superbly.

In my station I have a switch on both forward and reverse meters and usually run with the forward power on PEP and reverse on CW. This enables me to read CW output power while sending CW (meter remains reasonably steady) and I am unable to retune the ASMU without switching back to CW on the reflected power meter. The 'hang' when switched to PEP makes tuning very difficult!

A single LM324 quad op amp is used. Two amps used on the forward PEP meter and the other two spare op-amps in the package are used as drivers in the CW mode. The reason for this is that if we were to use a switch to select PEP from the module, and then CW direct from the detector, a difference in readings will be obtained. This is due to the meter loading the detector in the CW mode, the op-amp input impedance being very high causes negligible loading. This will require the meter to be recalibrated for full scale deflection. This can easily be done using a transmitter with known output.

I have included on the PCB range resistors and presets in series to enable easy calibration. Three ranges have been included as my meter has FSD of 1, 10 and 500W. The value of the resistors and presets will have to be obtained by observation of the component values in the old design. As the value will have to be increased to compensate I would suggest the same value be included as the fixed resistor and a preset of 25% of that value would be sufficient for adjustment. In my case the value was less than 10%. Each range resistor is selected by panel mounted two pole, three way switch and an additional single pole two way switch is required for PEP or CW selection

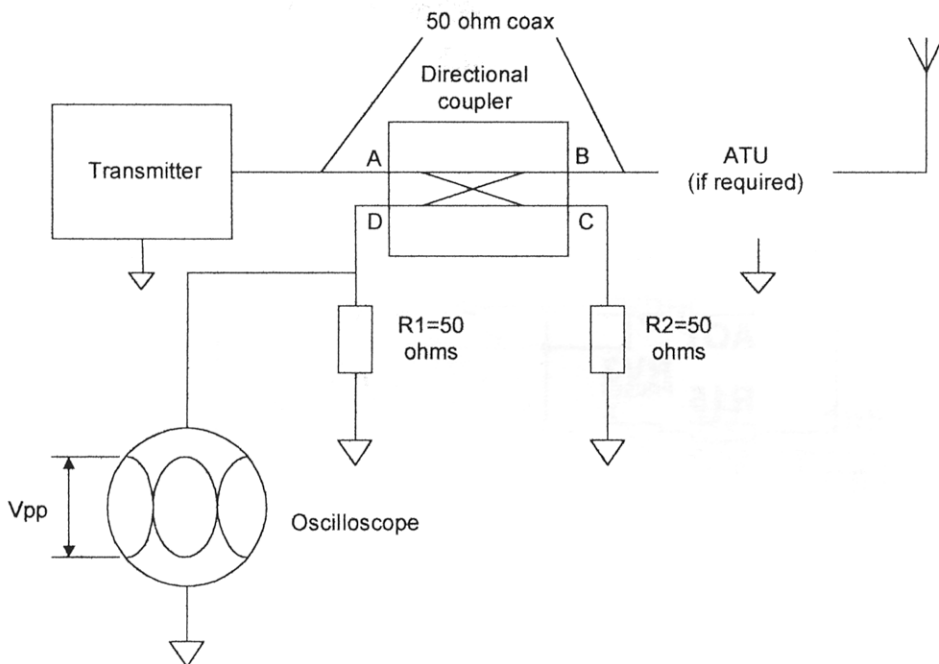
KITS AVAILABLE SOON
 To be announced in the next issue
 Enquiries - g3roo@gqrp.com



A Simple Method for Measuring Peak Output Power for SSB (& CW)

Tony Lymer 16Gerson Park, Broxburn, West Lothian EH52 6PL
tony_lymer@agilent.com

The measurement of PEP can be made simply, using an oscilloscope. It is difficult to measure the power right at the antenna, because the exact impedance of the antenna at the operating frequency is usually unknown. Measuring the transmitter into a 50 ohm load can also be misleading as the transmitter output power may change if the antenna impedance is not exactly 50 ohms. (or if the VSWR is not 1:1) If a coupler is not used, then the voltage varies with the position of the tapping point along the feeder, because of the standing waves on the feeder. This method measures the power in the coaxial feeder, but does not account for losses in the ATU.



Measurement of Power Supplied to the Antenna

$$\text{Power} = \frac{(V_{pp})^2}{(8 * K * R1)} \text{ Watts}$$

V_{pp} is the peak to peak voltage read from the scope. K is the coupling factor of the directional coupler.

$R1$ is the resistor that the scope is connected across.

Notes:

1. The oscilloscope must have a bandwidth of at least five times the transmitter frequency.
2. Use the marked value of R1 in the formula. R1 must be non-inductive, and should be the same value as the coaxial cable impedance. (Use two 100 ohm resistors in parallel to make a 50 ohm resistor.)
3. If possible, use the oscilloscope's internal 50 ohm resistor, if it has one. Otherwise place the resistor as near as possible to the oscilloscope.
4. This set-up measures Peak Envelope Power. For cw, the PEP is equal to the average power. So the method works for both modes. (For cw, the height of the oscilloscope trace does not vary with time.)
5. If your scope does not have the required bandwidth, you can calibrate it against an accurate average power meter using cw.
6. For 75 ohm systems, use 75 ohm coax and 75 ohm resistors for R1 and R2. The directional coupler is not suitable for 600 ohm feeder.

Example:

The oscilloscope deflection was 6 divisions at 10mV per division.

This is 60mV(0.06V) peak to peak. The coupler had a coupling factor of 0.01 (10 turn windings).

The power was $0.06*0.06/(8*50*0.01)=900\mu\text{W}$.

I measured the power using a calibrated wattmeter (Agilent E4416A and E9300A sensor) as 873uW.

The difference was about 3%, or 0.13dB, and the method seems to be quite accurate.

[In the special case of R1=50 ohms, and K=0.01, the power is simply $(V_{pp}/2)^2$ Watts.]

The design and construction of a suitable dual-directional coupler can be found in: "A Compact Directional Coupler for the Quiet Tuner", Tony Lymer. SPRAT Issue No. 100. Autumn 1999. p15 The coupler could be made with 10 turns, rather than 12, each side, and gives K=0.01, for easier calculation. The coupling factor is $1/N^2$ where N is the number of turns on the secondary windings. If you know the coupling factor in dB, $K=10^{-(dB/10)}$. [^ means raised to the power]

So, a 12 turn (-21.58 dB) coupler has K=0.006944.

A coupler design for the 100W power level can be found in David Stockton's article in SPRAT 61, P12. There are also similar designs in the ARRL Handbook and RadCom, March 2001.

~~~~~  
FOR SALE: KW MkII Vespa, good working order with Power Supply. Wanted SPRATs from issue 1 to 50. W. L. Stuart, MØLOG, 9 Charminster Cl. Great Sankey, Warrington. WA5 1JY



## FROM THE CLUB MEMBERSHIP SECRETARY

John Leak. G0BXO. Flat 7. 56 Heath Crescent. HALIFAX. HX1 2PW

Tel: 01422-365025. Email:- g0bxo@ggrp.com

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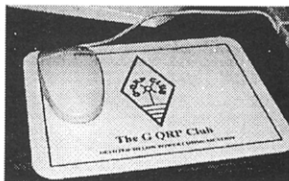
[Special offer UK members only - the above crystals - 1 first class stamp each - no extra for postage!!!]

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**SORRY** - All toroids, LT700 transformers and the Mini Circuits TAK-893 mixers are now sold out I'm afraid, also, all kits previously advertised have now all gone.

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mouse mats



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# ANTENNAS - ANECDOTES - AWARDS

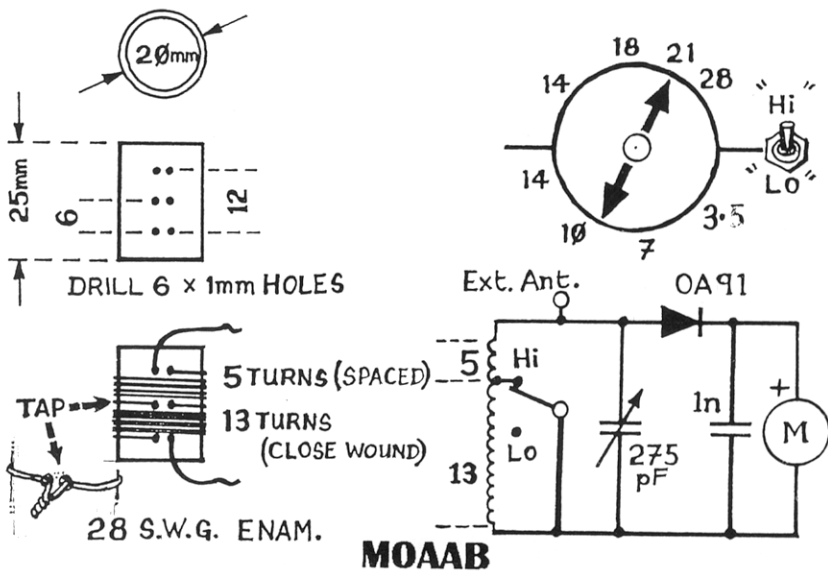
Gus Taylor G8PG 37 Pickerill Road, Greasby, Merseyside, CH49 3ND

## CAMPUS RADIO - A DIFFERENT FORM OF QRP

A recent letter from Albert, G3ZHE, tells us he has been approached by a local High School with a request to help them set up a student radio station. The licence should be issued by the end of January 2002, and its main conditions will be as follows. The operating frequency will be 1350 kHz (medium wave bc band), the maximum power must not exceed 1 watt erp, the antenna must be a vertical not exceeding 60 feet in height, and the service area must not exceed a radius of three miles. On the actual site to be used the antenna cannot exceed 20 ft in height, and may be shorter. Albert did not include a sketch, or give any idea what sort of area might be available for a counterpoise. He has done some experiments with small diameter (1.5 inch) helical verticals, but could not get down to the medium waves. He asks for advice. Owing to family commitments it has not been possible to carry out full tests, but our immediate reaction was that using a helical with turns of a much greater diameter should have a marked effect on lowering the frequency. A couple of coils, one of 2 inch diameter and one of 6 inch diameter therefore wound, and their resonant frequencies were measured in a circuit including a small series capacitor. The measurements showed that the larger coil produced resonance at around twice the wavelength of the smaller diameter coil, so using a larger diameter winding could be the answer to the problem. Our own inclination would be to use a 6 inch diameter coil of 540 turns on an 8 foot long former. It may not be easy to find such a former, however, but it should be fairly easy to make a 6 inch SQUARE former, which would give even greater inductance for a given number of turns. The winding itself should be attached to a short metal topmast. In an installation of this type counterpoising will play a very vital roll. As many radials as possible should be used, with their ends soldered to a copper plate or ring. The connection from the ring to the antenna (or tuner) should be made with heavy duty copper braid. It may be possible to make some of the radials from self-adhesive copper tape which could be attached to walls or roofs and would be much less obtrusive than wires. ( See below for information about such tape). Our aim would be to make the whole installation as efficient as possible. If this meant that the 3 mile service area was exceeded it would be quite simple to reduce the TX power output. We hope to report further on this project in a subsequent AAA.

## SELF-ADHESIVE METAL TAPE SUPPLIES

Self adhesive aluminium tape (burglar alarm tape) is available from the component suppliers Maplins. It is 7mm wide, but cannot be soldered. Copper tape, 1/4 in. wide is available in 99 foot rolls from W. Hobby Ltd, Knight's Hill Square, London, SE27 0HH. The cost is about £6-00 per roll. (Note this is NOT Hobbies, the toy and model chain of shops) Our thanks to Alan, GM4FLX for this information. He says that apart from being solderable the copper tape is easier to lay than the aluminium. We have already suggested it for earth radials aboard a yacht with a glass fibre hull. It should have many other uses, particularly as once laid it can be painted over, thus making it invisible.



#### A FEW IDEAS ON RADIATION METERS/ABSORPTION WAVEMETERS

Mike Austin, MOAAB, 18 Lindores Croft, Monkston, Milton Keynes, MK10 9ER

I have built several of these useful instruments during the past few years, and a couple of my ideas may be of interest to other members. Covering 3.5 to 28 MHz with only a single-pole changeover switch normally means that the higher frequency calibrations on the tuning dial are very close together, and the tuning range itself may not cover all the required frequencies. This second problem was overcome by using the tuning coil shown in the diagram above. It is wound on the commonly available 20mm diameter plastic water overflow pipe. Using the number of turns shown in the diagram the frequency range of 3.5 to 42 MHz was obtained. The problem of overcrowded dial space was solved by using one 180 degree segment of the tuning dial for the lower frequencies and the other for the higher frequencies, as shown in the diagram. As there is a slight overlap 14 MHz appears on both segments. The tuning capacitor is one half of a 275 twin gang capacitor; the other half is not used. The meter is a 0-250 uA meter; the popular "VU" meter is suitable. With a metre of wire connected to the "Ext. Ant" terminal reading can be obtained several metres away from the rf source being checked.

## SIMPLE BUT STRONG FEEDERS FOR OPEN-WIRE LINE

John Seager,GoUCP, 2, Waterford Road, Oxton, Birkenhead.

Spacers can be made from plastic clematis netting sold by gardening suppliers.It is very strong and available in several widths. It can be cut to the required length and the feeder wires bound to it using thin wire. It is light and has low wind resistance.

## A SIMPLE TWO BAND NVIS ANTENNA

Bernd Zander,DL6YCG, Ilizacher Weg 11, 12109 Berlin, Germany.

The basic antenna consists of two inverted V dipoles erected at ringtangles to each other and fed through a common co-ax feeder. The original model used 40m and 30m dipoles with the centre 6m high and an apex angle about 130 degrees. These appeared to give complete all round coverage with a service area of some 500 km. With an 80m dipole substituted for the 30m dipole good results were again obtained. Note that NVIS work requires the frequency to be about 20% below the MUF for the path. ( National Societies please note we need a 5 MHz frequency for full NVIS efficiency. G8PG).

## AWARD NEWS

APOLOGIES TO G3ZNR QRP MASTER 115.

In the recently published Master list his call appeared as G3XNR.

QRP MASTER. Congratulations to G3KZR on admassin to the Worshipful Company.

QRP COUNTRIES. 100 PE1HMO (All 50 Mhz), YO2VA (ssb); 75 OZ1BXM, 2Eo000 ; 50 MoDCP ; 25 MLDUD ( 50 MHz), M5ACF,G3JSR.

WORKED G QRP C. 560 LZ1SM ; 380 G3ZHE ; 340 G4PRL; 280 GM4OSS; 260 G3BPM; 200 Gi4SRQ ; 120 G3SOX ; 100 G3HOH; 80 GW4ALG ; 60 G3ZKR .

TWO-WAY QRP. 30 G4PRL , 2Eo000 ; 20 OZ1BXM , MoCDP , G3KZR, RN3BC; 10 GW3LHK , MMoBDA.

## A HALF CENTURY OF AWARDS

A recent check on our Award records shows that the Club has now issued Awards to Members in fifty different DXCC countries. Yet it only seems yesterday ( actually 1974 ) when G3RJV wrote to G8PG and asked him to think up an Award scheme for the Club. How time flies !!

## COMMUNICATIONS AND CONTESTS

Peter Barville G3XJS e-mail: g3xjs@ggrp.com

40 Watchet Lane, Holmer Green, High Wycombe, Bucks HP15 6UG.

### WINTER SPORTS

As ever – one of the most enjoyable events of the year! It is always well supported, and this year was no different, although slightly fewer logs received than last time. With apologies for any omissions, I would like to thank the following members for submitting theirs: 2E0ATZ, G0NTR, G0OTE, G0KRT, G0TPH, G3CWI, G3JNB, G3LHJ, G3MCK, G3ZHE, G4MRH, G8PG, M0CDP, M5AEF, GM3OXX, GM4OSS, GM4XQJ, GW3SB, GW4ALG, MW0IDX, AB8FJ, CT4CH, DJ0GD, DL2BQD, F6UIG, I7CCF, K2JT, OE6GWG, OK1AIJ, OK2BMA, PA9RZ, SM0FSM, SM6HDY, W3TS, W2JEK and W4/G0FSP. That's 20 logs from the UK, and 16 from overseas – a splendid effort. As is usually the case, by far the most activity was HF QRP CW, but other modes and bands are represented amongst the entries. Other 'high profile' events on the bands within the same period often attract detrimental comments from members, but I'm quite sure that a good time was (once again) had by all.

Space prevents me from quoting from as many of the logs and comments as I would like, but I do feel they are of interest to members, and so here is a selection. Steve GW4ALG says that it was his first Winter Sports, and that the highlight for him was working GM3OXX on 160m with a balloon supported vertical. Pavel OK2BMA made one QRP/QRP PSK31 QSO, as well as working GM3OXX on each of the 8 bands he was qrv. Don W2JEK had a very special 2m QSO during Winter Sports. It marked 50 years exactly since his first QSO, which was also on 2m (AM). In 1947 he built a 117N7 Tx for 40m, which he has since converted to 80m, and he used this rig during WS as part of the celebrations. Many congratulations Don.

Joe K2JT made several contacts with his 200mW Pixie II rig, including one with W2UW running 20mW! Robin M5AEF used 1 watt of SSB throughout WS, and although he found no other station calling "CQ QRP" on that mode, did raise 5N6NDP and CN8KD on 15m, ZS6BAF on 12m, and was called by (and worked) KL7J on 17m. Richard G3CWI decided to run his K1 at just 100mW (mostly on 80m) and was surprised "just how easy it was to make QSO's at this power level", although he found only one other who was running less than 1 watt (M0CWY with 500mW). At one point, Richard says he generated a mini pile-up! Jim G0NTR was only able to send an SWL log, as his loft aerial "is no good for transmitting". Gus G8PG reminds us that WS is one of the very few events that allows people to socialise whilst taking part. Gerald G3MCK enjoyed running his 5 watt valve rig on 80m, but commented that he found that netting skills sometimes left a little to be desired, Hi. Dieter DL2BQD submitted an all QRP PSK log showing some fine contacts, including one with FR5HA on Reunion Island. John W4/G0FSP found 10m to be pretty busy with QRP activity, but this will be his last Winter Sports log from Florida. Understandably, he took one day off from the radio in order to take advantage of the local beach!

George GM3OXX discovered on Christmas morning that his antenna feeder was in need of repair, and had to brave the -10C temperature in order to carry out a repair. It was so cold that only his 40 year old 100W soldering iron was man enough for the job. Dedication indeed, but if the weather was cold, George's log is hot! Several other members have commented how impressed they were with George's signal on the various bands during WS, and his log shows why. You won't be surprised to hear that his log is full of contacts (364 of them) on all bands

between 160m and 10m, with almost every part of the world – all achieved with a massive 1 watt (from a homebrew tcvr) and wire antenna.

I was amused to see the note at the end of his log, “Enough is enough!” Well, our congratulations go to George because, for the third year running, his log was “enough” to be awarded the G4DQP Trophy. I think I’ve made the comment before, but George is a wonderful ambassador for the world of QRP.

### **FISTS STRAIGHT KEY WEEK**

It’s not my practice to include details of non G-QRP Club Contests, particularly non QRP events, but Tony G4FAI has asked me to mention that the event is now open to non members, and that he hopes that many members of other EUCW-clubs will be able to take part. The prize for the "best fist" is a Morse key.

If anybody would like full details, then please contact the FISTS Contest Manager, Keith Farthing M0CLO, 86 Coldnailhurst Avenue, Braintree, Essex, CM7 5PY, UK (keithm0clo@hotmail.com), or I can supply them if you drop me a line. Briefly:

FISTS CW Club invites all licensed radio amateurs and short-wave listeners to take part in its yearly Straight Key Week. This is a leisurely, relaxed, event and QSOs need not necessarily be of the "rubber stamp" variety if participants wish to chat and exchange more than the basic information required by the rules.

Dates: The SKW runs from Sunday 16th June till Saturday 22<sup>nd</sup> June 2002.

Times: From 0001z on the Sunday, to 2359z on the following Saturday.

Frequencies: Any licensed amateur frequency, except WARC bands.

Mode: CW, using straight key only.

Exchanges: RST / Name / QTH / FISTS Nr (Non-Members, send NM) / Day Number. Note: Sunday is Day 1, Monday Day 2, and so on up to Saturday Day 7. This allows duplication of working the same station on different days.

### **2002 GACW CW DX CONTEST**

Similarly, LU6EF has drawn my attention to this new event, which is being held for the first time this year in celebration of 25years of GACW. There is a QRP section (maximum 5 watts output), and brief details are shown below. I can supply full details if you wish.

Date: Third weekend of April each year. 20th/21st. April 2002

1200z Saturday until 1200z Sunday – 24 hours period.

Bands: All bands, 80m through 10m, no WARC bands.

GACW Address: GACW DX CONTEST, P.O. Box 9, B1875ZAA Wilde Buenos Aires, ARGENTINA.

Email: Alberto U. SILVA LUIDZ – “uranito@infovia.com.ar”

Website: <http://www.geocities.com/gacwar>

### **POWER MANAGEMENT CHALLENGE 2002**

This is a fascinating challenge for owners of portable radios, and looks like good FUN to me. The concept is simple – make as many contacts as you can during the IARU Region 1 Field Day (CW or SSB). But here’s the catch: you can only use 8 AA size cells, and you operate until your batteries run flat!

Date: CW – First full weekend in June. SSB – First full weekend in September.

Time: CW – June 1-2, Saturday 1500z – Sunday 1459z. SSB – Sept 7-8, Saturday 1300 – Sunday 1259z.

Bands: 160m-10m (no WARC).

Mode: CW (June). SSB (September).

Categories: PMC Portable: only one Rx/Tx, and only one antenna max 10 metres high. The equipment should be capable of being carried in a backpack to the site, although this need not actually be done. PMC Fixed: only one Rx/Tx. Battery power in both classes is restricted to 8 size cells. These can use any battery technology, but must not be changed or recharged at any time during the contest.

Exchange: RST + serial number.

Points: QSO's with European fixed stations count 2 points, with non European stations 3 points. QSO's with portable stations in Europe count 4 points, with portable stations outside Europe count 6 points.

Multipliers: Each DXCC, and WAE country, counts 1 multiplier per band.

Final Score: Total QSO points times total multipliers.

Logs: Send logs within 10 days after the Contest to ARS-Eu by email to [g3cwi@tesco.net](mailto:g3cwi@tesco.net).

Logs should include section entered, QSO total, score, equipment used and battery technology (NiMH, NiCad etc).

I would like to leave the results of Chelmsley 2001 until next time - you might even have time to scramble me a late entry for this (often over-looked) event! The closing date for the next issue is the beginning of May. In the meantime, enjoy your QRPing.

72 de QRPeter

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## VHF MANAGER'S REPORT

John Beech G8SEQ, 124 Belgrave Road Wyken Coventry CV2 5BH

024 76 273190 & Fax: 024 76 272709

E-mail: john8seq@discover.co.uk; Packet: G8SEQ@GB7COV

Sorry there was nothing from me for the last two editions. Not much to report on radio except some 6m operating and trying to revive packet radio in our local area. With the advent of the Foundation Licence, I have been busy teaching and also taking the Morse Assessment myself.

### The "EIGHT ESSEQUE " Antenna.

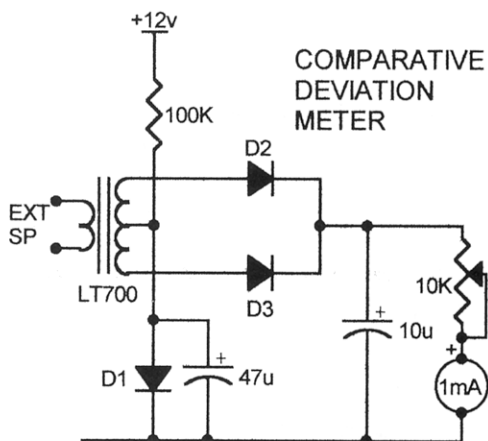
By the time you read this I should have an M3 call and to that end I have been experimenting with an HF antenna, the idea for which I had several years ago. I discussed it with Peter, the Dutchman, who was going to try it on 6m. I cut mine for 3.5 MHz, as this is the biggest half-wave dipole which will fit in my garden. I don't claim that this will work any better than any other dipole, but it does have advantages: 1) Shorter feeder when shack is at one end of antenna run.

2) No heavy feeder in the middle. 3) No balun, less weight again at centre. 4) No ATU required, unless multiband operation is required ( It will load on some harmonically related bands.) Like any other dipole it can be cut to suit any band and can be mounted horizontally, sloping, L-shaped or vertically and fed upwards or downwards. 5) radiation from the feeder is virtually non-existent (except the part intended) and 6) if horizontally mounted, there is no vertical feeder section to cause TVI. 7) because 75 co-ax outer conductor is invariably larger than the usual antenna wires, the ohmic losses are lower and the antenna is broader band than the usual HF antenna ( opposite effect on VHF, where self-supporting Al tubes are usually fairly large diameter.) 8) only the two ends need be supported.

So far I have only done listening tests but Bob G4GEE, 5W SSB worked G4IFR, 15 W SSB & long wire, with 58 reports both ways on my antenna, 80 m band.

### Comparative Deviation Monitor

This circuit from Rodney G7OLE needs to be calibrated by adjusting the volume control on the rig in use when receiving a signal of known deviation. The position of the volume control is marked for correct deviation, chosen as (say) half scale on the meter. Received signals above this are over-deviating and below under-deviating. Alternatively, if a line o/p socket which is unaffected by the AF gain control is available, this could be used. Basically, it is a Foster-Seeley discriminator with DC reference voltage provided by D1.



# THE "EIGHT ESSEQUE" COAXIALLY END FED DIPOLE FOR HF UPWARDS

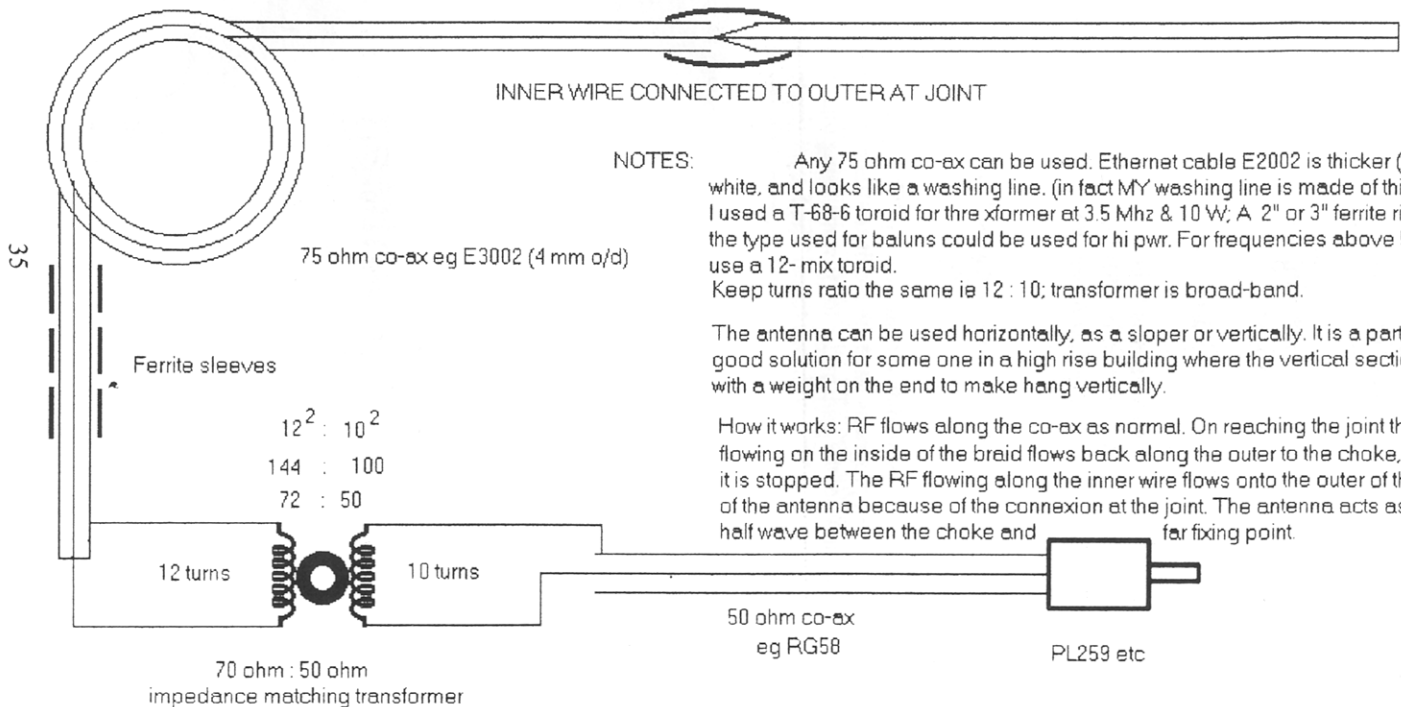
## DIAGRAMMATIC – CAN BE MOUNTED AT ANY ANGLE.

Hi-Q Choke  
12 turns 100 mm diam. NEAR END

JOINT RE-INFORCED WITH  
SELF AMALGAMATING TAPE

FAR END

INNER WIRE CONNECTED TO OUTER AT JOINT



### NOTES:

Any 75 ohm co-ax can be used. Ethernet cable E2002 is thicker (6 mm) white, and looks like a washing line. (in fact MY washing line is made of this!) I used a T-68-6 toroid for the xformer at 3.5 Mhz & 10 W; A 2" or 3" ferrite ring of the type used for baluns could be used for hi pwr. For frequencies above 50 MHz use a 12- mix toroid. Keep turns ratio the same ie 12 : 10; transformer is broad-band.

The antenna can be used horizontally, as a sloper or vertically. It is a particularly good solution for some one in a high rise building where the vertical section is fed with a weight on the end to make hang vertically.

How it works: RF flows along the co-ax as normal. On reaching the joint the RF flowing on the inside of the braid flows back along the outer to the choke, where it is stopped. The RF flowing along the inner wire flows onto the outer of the far section of the antenna because of the connexion at the joint. The antenna acts as a resonant half wave between the choke end and far fixing point.

# SSB & Data Report

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

Well, they say no news is good news and in this case there has been no news to me for some time, if you have sent anything I apologise.

This and all columns rely on you the readers to give me the news and views you want to share.

On the power level front there still seems to be some confusion, Gus G8PG said in his column in the last Sprat that the power limits for SSB QRP will not change and intimated that I had changed them. His comment of *'if it aint broke; don't fix'* it brought for a few comments to me about 'what is happening.

Let me stress strongly. The power levels for award and contacts to qualify as QRP have not changed!

Because of the huge interest in data modes such as PSK31 there has been confusion in what is QRP using these. Most programs have the facility to 'tune' the transmitter and this uses a single tone. If we now set the transmitter to 10-watts using this single tone we shall be well in excess of the 10-watt PEP limit with two tones! The 5-watt single tone limit is the equivalent of 10 watts SSB.

Richard Bolton comes up with one method of measuring this power level: "The way I do this for CW is very simple. I have a Kanga Dummy Load at 50 Ohms. Put an OA91 or similar small signal diode on the coax inner and a .001 or something on the diode output to ground. Simply measure the voltage across the capacitor with a meter. Use Ohms law to calculate the power. I have made up a table and 5 watts is 15.8 volts across 50 Ohms. If the transmitter is set to this level it doesn't matter what sort of modulation is used, it will still not exceed the setting because that is the basic carrier power." Over to you guy's

That's it for another quarter; please your emails and news to me at the above address.

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[www.theantman.co.uk](http://www.theantman.co.uk)

# MEMBERS' NEWS



by **Chris Page G4BUE**

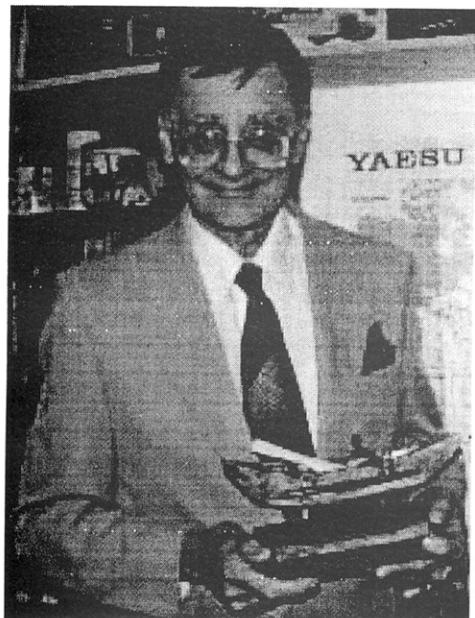
Highcroft Farmhouse, Gay Street,  
Pulborough, West Sussex RH20 2HJ.

Tel: 01798 815711 Fax: 01798 813054

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

Packet: GB7DXS on UK DX PacketCluster


Congratulations to **G3JNB** for winning first place in the 'UK - Low Power Section' of the Nevada Comoros Trophy. Victor actually worked **D68C** over 30 times running from 500mW up to 100W with a 40m extended doublet, using CW, SSB, FM, RTTY and PSK31. He was presented with the trophy, a handcarved model of a Comoros fishing boat, at the RSGB HF Convention.



In the last *Members' News* I said a virus was present on some messages sent 'to' the Club Reflector. **G4WIF** correctly points out that while that may well be the case, it has never been true where a virus was sent 'from' the Club Reflector. Tony says, "The settings we have in place are such that no attachments are allowed and if one were sent it would be stripped off before the message was forwarded to list members. If Chris got a virus he didn't get it from the G-QRP Reflector. If you have ever wondered why some messages have the following: *[Non-text portions of this message have been removed]* it is because attachments have been removed - although this is usually because the message was sent in HTML format. If Chris had received a virus from the list then we all would have, including me, and I would know about it". My thanks to Tony for saying what I was trying to say!

Did you take part in the CQ CW Contest? If you did, you may have QSO'd *Team Vertical* in Jamaica. The team was made up of **K2KW**, **KE7X**, **N6XG**, **W0YK** and **N6BT** who were QRV on separate bands with a K2 transceiver at 5w. It looks as if they have broken the five existing North American single band QRP records and four of the world records. For instance, the claimed score for **6Y1A** on 10m was 843,700 against the previous world record of 431,060 points. Ed, **W0YK**, has written an excellent article about it called *QRP is! Confessions of a QRO op gone QRP* that describes how they did it, and how five confirmed kW+ QRO operators were converted to QRP. The story is on the Web at <[http://www.elecraft.com/DXpeditions/QRP\\_is.pdf](http://www.elecraft.com/DXpeditions/QRP_is.pdf)>. **G2HLU**, "Had a go on 15m in the CQ CW Contest with 5W output". Harold worked four all-time new countries (OA, XU, 4U1 and 5R8). He says, "I chickened out from using homebrew equipment and wound down the TS-940 for the purpose, because of its great selectivity available on receive. I was quite chuffed to get through the pile-ups with QRP and my low doublet!".

**M1DUD** has been "quite surprised by the spectacular openings on 6m in October and November". Robin says, "Low power operation on 6m



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**Robin, M1DUD.**

is always a challenge. In recent openings I have worked stations, which many would have considered impossible with just 2W. But that's the 'Magic of Six'. I am simply using a FT-690, just 2W, into a three element Cushcraft Yagi". **MØBLT** has also been working DX on 6m with QRP. Mark had a couple of SSB QSOs into VE1 and VE2 and says, "I'm quite pleased with the modest set-up I am using: a FT-290 Mk1, Mutek transverter and a loft dipole! Who says you need fancy set-ups to work the DX? Even more pleasing as it was QRP!"

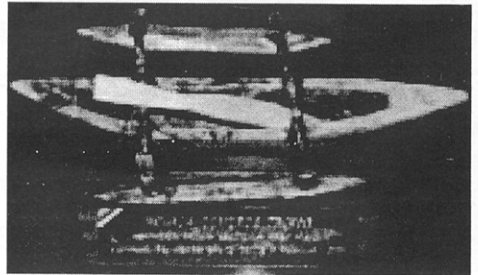
**PE1MHO** reports that Simon, **HB9DRV**, has just released a new version of his FT-817 Commander CAT program, (technology preview #4, build 103) which is available at <<http://www.kns.ch/sysgem/radio/FT817Build103.exe>>. Pete says, "There's no point in going into all the features that it has, I would be typing all day! We have been testing this program for quite a while, and this is pretty much the definitive version. A later release will have integrated PSK31 and log-book, plus some other exclusive features. You will need an RS-232 interface to connect the FT-817 to the computer". **K8ZT** is writing a monthly QRP column for the ARRL online *Web Extras*. Anthony says, "The column is called *QRP Community* and the first article ran in late January 2002 and was an introductory article describing QRP organisations (including, of course, G-QRP). You can read the articles by visiting the ARRL site at <[www.arrl.org](http://www.arrl.org)> or on my web site at <[www.qsl.net/k8zt](http://www.qsl.net/k8zt)> and clicking the QRP Community link".

**MØCZP** uses his DSB transmitter coupled to a DC receiver with outputs of under 1W on 80m for PSK31. In December Tim was "delighted with a QSO with Cromer (100+ miles) but then capped that with a long rag-chew with an EI2 in Wicklow. He started off running 40W

but then progressively reduced power to 1W. Great fun this 'milliwattin' business!". **G4DPH** recently completed the club's Epiphyte 3, 80m SSB transceiver. "Three evenings of easy construction and alignment," says Graham. He finished aligning it at midnight on 1 December and five minutes later was in QSO with **G4DEZ** in Spalsby Lincolnshire receiving a 58 from Byrn. Over the weekend he worked throughout Europe and the UK and was "quite astonished with the results on just 2W of SSB into a G5RV. (The regulator sent in the kit, for the driver and PA bias was wrong, being 6V instead of 9V, hence only 2W out). I have built a number of QRP CW rigs over the years (the Malta 40 is terrific), so I know what the potential of QRP CW is, but working Goran, **HB9FBS**, and getting 59+ really surprised

me, however getting a 46 from Tom, **K1JJ**, on just my 2W to a G5RV on 80m has truly astounded me! In 36 years of holding a licence it counts as one of the most exciting QSOs for me".

**G3MXN** worked P4, two W1s and W8 on 6m with 2.5 watts from his FT-817 and HF2 x 15 metre doublet antenna, "2 x 15 metres fed with 300 ohm line into a Classic Z Match by G4RJV. If you short out one turn on the air spaced coil with a solder blob, the HF coil tunes 14 to 50MHz. The doublet gives extended lobes off the ends giving a bit of gain". **G4GZG** occasionally gets on 40m with his "WW2 CO/PA ex SOE B2 Transmitter" and either an HRO from 1939 or an Eddystone EC958 (1970s solid state ex-Government receiver). The B2 runs a bit more than QRP, but Larry says "it is great fun and surprises lots of other operators with its T9 signal and stability after 60 years! The only big drawback is the CO bit - it is difficult to find a clear crystal frequency at weekends!". **GØKYA** uses a 1.7m diameter magnetic loop in the loft for 80m which "works quite well". Steve says, "Received signals are generally about S9, sometimes S9+20 and I can usually work what I can hear. The noise level is about S5. It is about



**The Nevada Comoros Trophy won by Victor, G3JNB, see story on page 1.**

12db down computed. It also works on 40m, but isn't as good as my wire dipole. I am also experimenting with a crossed field loop design which is only 90cms in diameter. It can tune 80 and 160m and I can get 1:1 on 160m".

**PA9RZ** has been using a FT-817 since the end of 2000 as his 'working horse'. When Robert changed his callsign three years ago, he started all over again with awards and since then has become a QRP Master, got QRP DXCC, QRP WAC and 1000 Miles per Watt. His current goal is WAC 2xQRP and is looking for VK and ZL members at weekends. His next project is 6m where he has four continents and best DX is **JA4LKB**, **9G5AN**, **OX3OX** and several W and VE stations. He is also trying for WAS QRP and has 30 States confirmed. In the ARRL DX CW Contest Robert worked 92 mainly US stations of which six were on 80m and 15 on 40m, his first trans-Atlantic QRP QSOs on 80m. **G4VDG** spent time with his SGC2020 operating CW and SSB between his caravan outside Buxton and his home QTH and worked some "good stuff" with dipoles. Chris made SSB QSOs to VE3, VK6, UA9 and W7 and CW QSOs to W4, JA, 9K, VE7. He worked **IK1RDN** and found Pier was also using a SGC2020.

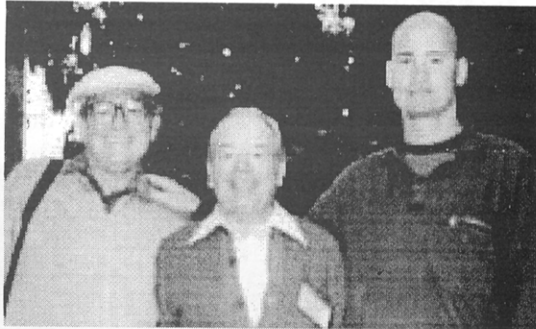
**DL2FI** says DL-QRP-AG have published their new eight band CW transceiver, the Tramp-8, in *CQDL*. Peter says, "It is a very small hybrid technic transceiver (130x45x150 mm), all bands are switched from the front plate. We use lots of SMD parts plus standard parts for all sections where we need a high Q. It is a double conversion superhet based on a TCA440 chip. The first IF is 4.9152MHz and the second IF is 479kHz. The TCA 440 gives us more than 90 dB dynamic. In the front-end we use a three can bandpass filter, first mixer is an NE612. Due to the excellent bandpass filters our prototype shows no inter-modulation problems on 40m, even with big antennas. The VFO is a cap-diode type, stabilised with a small band PLL. At the end of February or early March we will have an English manual, but if you are interested in details, have a look at our homepage, <<http://www.dl-qrp-ag.de>>, where you will find all schematics and photographs of one of the prototypes".

**G0TAK** worked **BZ4DHI** on 9 January on 17m with 5W into a G5IJ arranged in a long loop - 240 feet but only about four feet AGL. Roy ([g0tak@thersgb.net](mailto:g0tak@thersgb.net)) is querying whether the QSL information via 11YRL is correct? **G0NCS** rejoined the Club in December and has returned to QRP using mainly data modes with a FT-817, Rascal 3 interface by **K4ABT** and an R6 vertical 12ft above ground. Tim worked LU, PY, VK5 and SU among his QSOs. While in south Devon visiting relatives in force 9

winds, driving rain and no chance of operating QRP from the clifftops ("Yesterday the Magmount blew off the car roof, twice!"), **G3XBM** decided to "Have a go from the bedroom on 10m SSB with a FT-817 on the MTX15 whip but only extended about 2ft so it resonated on 10m". In just over an hour, Roger managed 10 DXCC in the UBA contest and got told to 'go away' by a 4Z4 station working US stations! "Not bad for such a 'Heath-Robinson set-up'", he says.

**G4HZJ** says this year's *Red Rose QRP Festival* on 26 May at the Formby Hall, Atherton will have a challenge this year, the *HZJ Sardine Selection!* Les says, "With all the interest in Altoid tins, the poor old sardine tin has been neglected! My challenge is to construct a project which incorporates one or more sardine tins. Bring it along to the QRP Festival at Atherton together with simple plans/description and it will be displayed on the G-QRP stand. Entries will be judged at 1pm and a certificate and mystery prize awarded to the winning entry". **G4GZG** has been "Playing with the K1 on 40 and 20m CW". Larry has "Worked all Europe on 40m as expected plus a JA at 339, **VK5MD** who came back to a five watt CQ on 14060kHz and **FY/DJ0PJ**". Using his IC-756 PRO at 5W Larry worked **W8DIZ** on 12m who was also running 5W to a 470 feet horizontal loop.

Finally, this Winter's bad luck story has to go to **G3UGF!** Writing in February, Richard says, "Just thought I would check to see how my Cushcraft R7 was surviving the winter weather, so I looked out of the window and couldn't see it! I went out into the garden and it wasn't there, I looked in the adjacent field and went looking everywhere. It's gone, lock stock and flaming barrel! Yes - you've guessed it, some unprincipled, inconsiderate jealous 'B' has taken it, complete with the 12 foot supporting mast and everything. I sincerely hope he doesn't understand the concept of VSWR and destroys his rig!". Let me know how your Spring goes, by 20 May please.



(l to r) Jan, **OK1NR**, his brother Franta, **OK2BBB**, and his son Jan, **OK1QM**.

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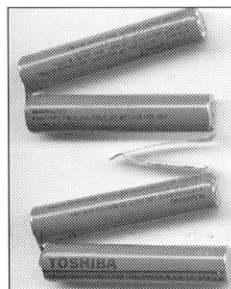
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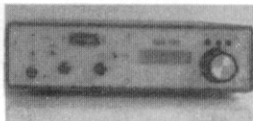
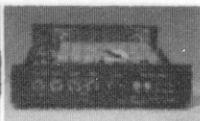
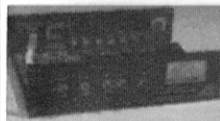
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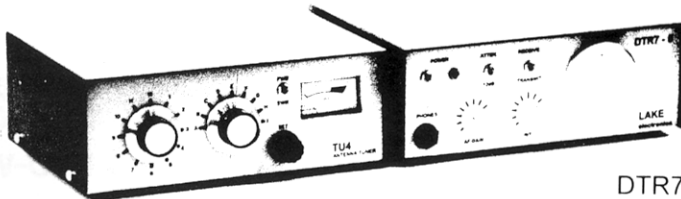
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