SPRAT

THE JOURNAL OF THE G QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

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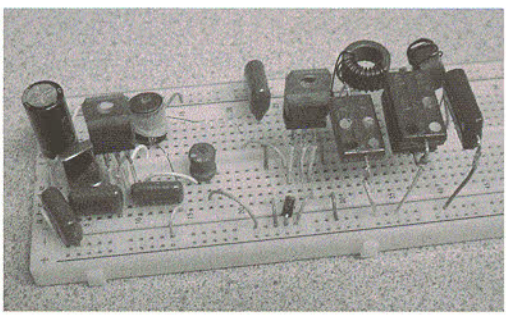
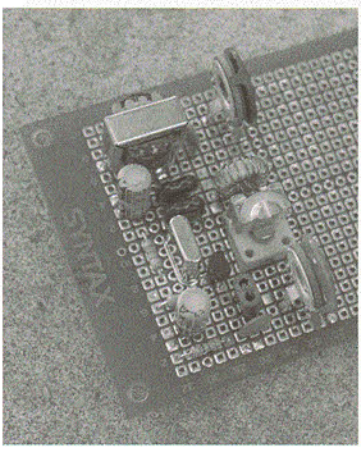


Das DereLicht Transmitter

More Minimalist Projects



The "Gnat" Transceiver

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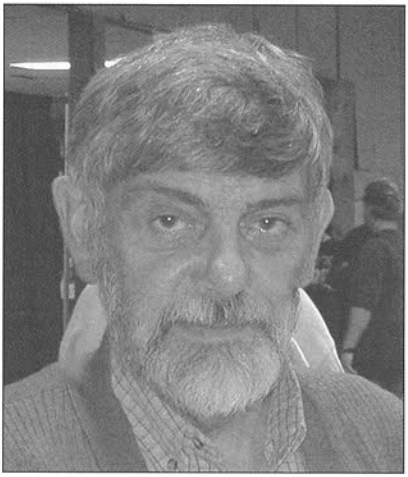
JOURNAL OF THE G QRP CLUB



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Rev. George Dobbs G3RJV

Welcome to SPRAT 138. Still no workshop picture for this page so readers will have to endure a G3RJV picture. Once again we have two fine articles (both from the USA) that follow the minimalist ingenuity trend of the last issue. The feedback I get from such articles has prompted me to suggest it as a theme for the next W1FB Memorial challenge. The winner of the current challenge (test equipment) will be announced in the next issue.

But - whatever your interest we invite any member to submit their projects to share with our readers. We can accept most formats. If you would like a blank MS Word page formatted "SPRAT style", just send me an email request.

72/3

G3RJV

The W1FB Memorial Award 2009/2010

The project is to **Design a QRP station (transceiver or transmitter – receiver combination) using a minimalist approach. Produce a log of 10 QSOs** Significant improvements on existing designs could be accepted. Please submit your design to G3RJV within the next year, with circuit diagrams, all values and brief notes.
The projects will be published in SPRAT and the winner will receive an engraved plaque.

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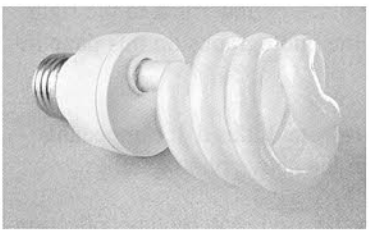
Das DereLicht

A CW Transmitter made from a Light Bulb

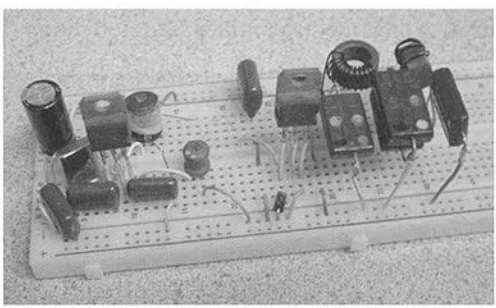
Michael Rainey AA1TJ [mjrainey@gmail.com]



This electronic puzzle was a result of my changing a defective compact fluorescent lamp (CFL) in my kitchen. For some reason, I began to wonder if it would be possible to build a QRP CW transmitter using the electronic components salvaged from this derelict lamp.

Indeed, I'm pleased to report that a perfectly serviceable transmitter may be constructed! The only additional components required were the quartz crystal, and four of the five components needed for the output lowpass filter. The resulting transmitter produces up to 1.5 watts on 80m.

This photo was snapped moments after completing my second QSO with the breadboard version of my prototype. A few minor changes were made since this picture was taken. The schematic (available at the end of this article) diagrams the most recent version. I like the resulting circuit well enough to want to move it into a permanent cabinet. I hope to complete this task in the near-future.



My defective CFL was labelled, "TriMax Electronic Fluorescent Lamp," Model #SKT320EAH, 20W, 120VAC, 60Hz. It was made in Korea by, or for, *MaxLite*. In order to gain access to the components I made a shallow, continuous, hacksaw kerf around the joint in the plastic base shown in the above photo of the lamp.

One must be careful not to break the glass bulb; especially as these bulbs contain a small amount of toxic Mercury!

As soon as I had freed the circuit board, I checked for signs of component overheating. Finding no unusual discoloration, I set about unsoldering and cataloguing the components. Of course, the exact type and value of the components you find will depend upon the make of your lamp. The useful web page **<http://www.pavouk.org/hw/lamp/en_index.html>** shows some typical CFL schematics and part values.

I spent most of a pleasant day piecing together this little puzzle. The *BUL128B* transistors, found on the board, are aptly named, as these little "bulls" barely break a sweat hitched to this rig. The measured (Class-C) PA efficiency is approximately 50%. There's no need for

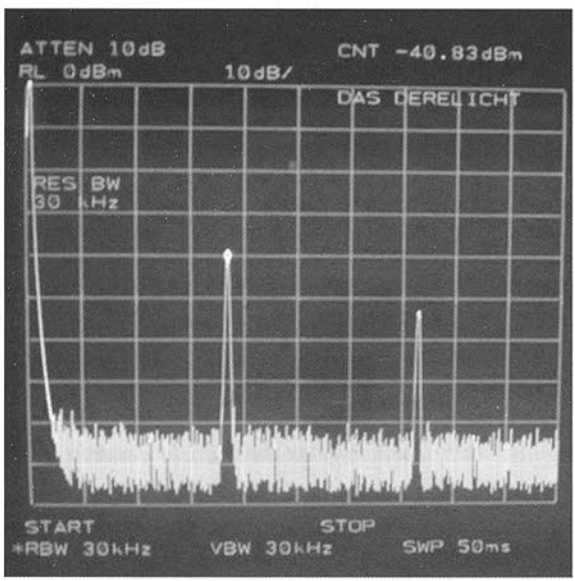
a heat sink, and with a Vceo of 400V, they'll shrug-off any mismatch-induced collector voltage rise this circuit is capable of delivering.

T1 began life as a radial-leaded, ferrite-cored inductor. Through trial and error I found that a 7 turn secondary winding steps-down the impedance to roughly 15 Ohms. This provides a reasonable match to the base of Q2. T1 is the black cylinder just to the right of Q1 in the above photograph. Please "click-on" any of the photographs on this page in order to enlarge them.

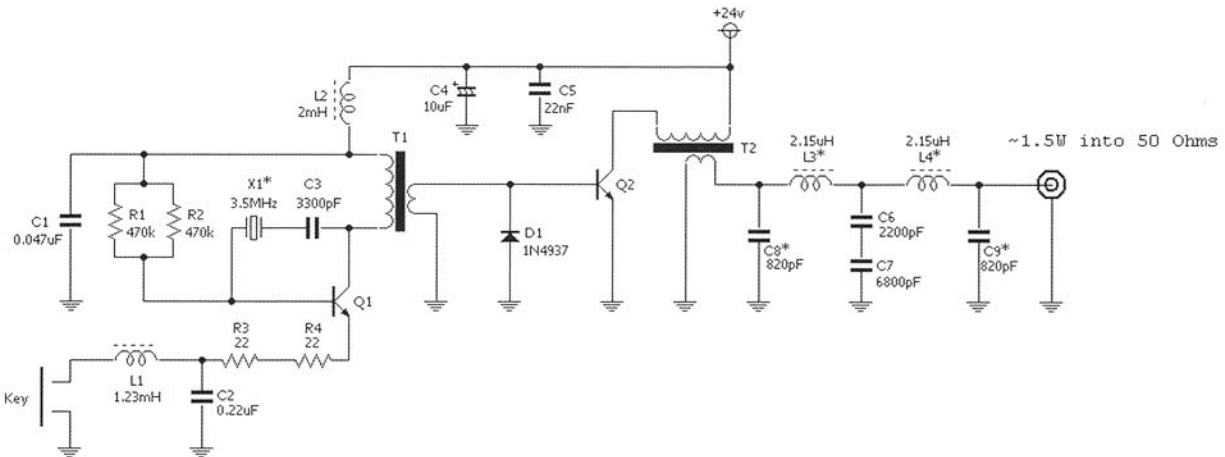
T2 is a ferrite, toroid-cored conventional transformer. I rewound it as a 4:1 impedance step-down transformer. T2 is mostly hidden behind Q2 in the above photograph.

The output power varies with the activity of the quartz crystal used. My motley collection of crystals produce outputs ranging from approximately 1.0 to 1.5 watts with a 24Vdc supply.

As indicated below, the second harmonic output signal amplitude is -40.8dB below the fundamental, and the third harmonic is down by at least 52dB. This measurement was made whilst the transmitter was delivering 1 watt into 50 Ohms via a 30dB pad.



More detailed information may be found at my Web Page
http://mjrainey.googlepages.com/dasderelicht



Q1, Q2: BUL128; no heatsink or collector over-voltage protection required
T1: 9 turn secondary wound on 1mH radial leaded RFC
T2: rewound ferrite toroid; 6 turn primary (~25uH), 3 turn secondary
PA efficiency ~ 50%
All harmonics at least -40dBc
* Only X1, L3, L4, C8 and C9 were not found on the compact fluorescent lamp

Das DereLicht

An 80m CW QRP Transmitter

de AA1TJ

Valves at low B+ voltages

Duncan Telfer G8ATH [dtelf.98ath@virgin.net]

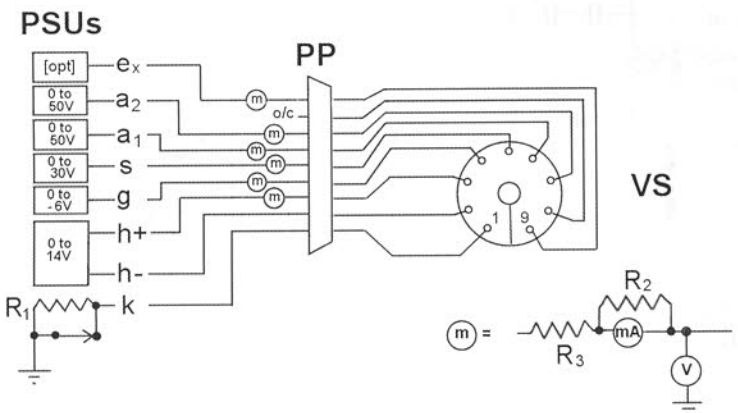
Have you ever wondered what you might do with that odd (and probably quite old) shiny glass thing that just rolled onto the floor and you nearly trod on? The following might be of interest to valve (tube) aficionados and particularly those with an eye for QRP and low voltage experiments, a number of which have already been reported in past issues of this magazine.

A Valve Tester

As most published valve data and characteristics are for 'normal' (higher B+) operation, much less information is available for lower operating voltages (<50V). So I built a valve tester to find out more.

(a)

Schematic of low B+ valve tester



(b)

Example personality plug (PP) internal connections

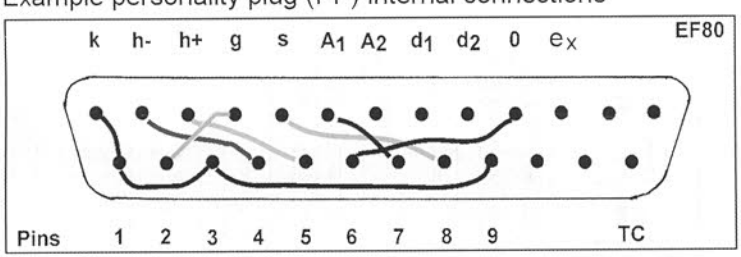


FIG 1a. Schematic: Low voltage valve testing arrangement of G8ATH. The PSUs were surplus items, except the DC heater supply. R1=1kΩ, R2=10Ω, R3=100Ω except for h+ where R2=1Ω, R3=1Ω. R1 is for optional auto bias.

FIG. 1b. Schematic: 'Personality plugs' for valve pin-outs were constructed with D25 connectors. For convenience, connector ordering was derived from that of the AVO Mk4 roller switch.

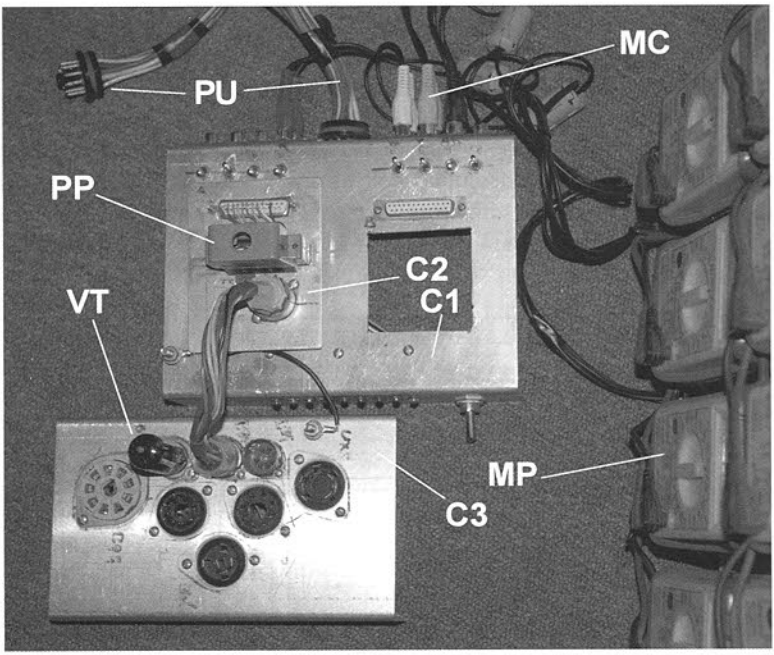
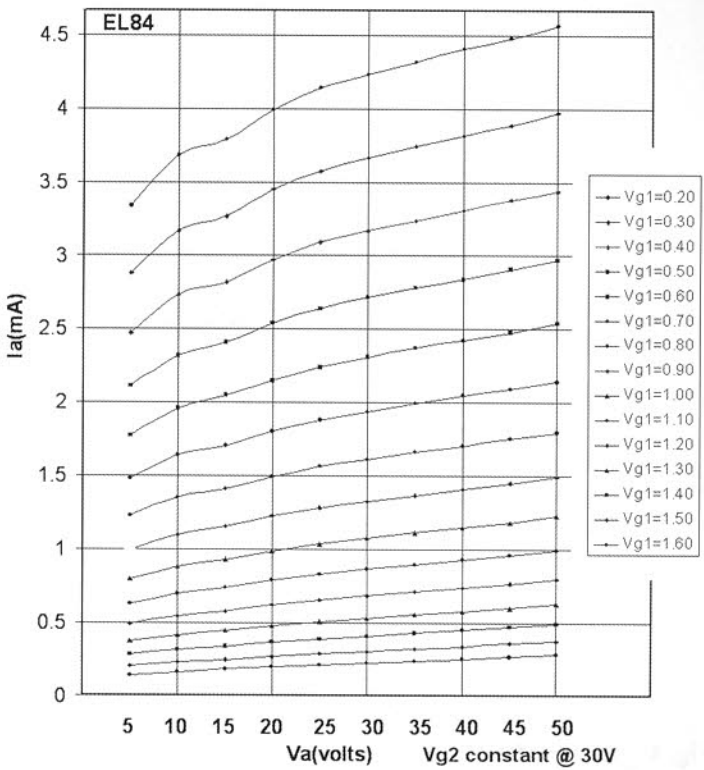


PHOTO 1. The valve tester implementation. **PU** power umbilical (PSUs not shown), **MC** meter connectors, **PP** personality plug for valve being tested, **VT** valve under test, **C1** main chassis, **C2** plug-in tester module sub-chassis, **C3** valve socket expansion panel, **M** meter panel. Meter ranges are pre-adjusted to match voltage and current requirements at the electrodes. Although PP is chosen for the valve pin-out, it follows that a given PP may be used to match a number of different valves. This requires care to check the documentation.

In a previous issue of Sprat, I read with great interest the contribution by Ernst Olivier F5LVG , 'Low voltage 3 Tube Shortwave Regenerative Receiver' [1], especially as the EL84 happens to be one of the valves (tubes) that I've measured using a purpose built low voltage valve tester (**Fig. 1**). The scheme for this is straightforward and involved using a number of regulated PSUs and several DVM meters, one dedicated to each current and voltage channel (**Photo 1**). These meters, low cost devices (Mastech M830-B) were obtained from Maplin and checked against a Precision Gold WG-020 DVM and each other for consistency. Measurement accuracy was estimated to be better than +/- 5%, well within the production spread of the characteristics of most valves, even those of similar brand, and certainly second-hand ones. And just for good measure (!) the valve samples were selected after checking each for good (>80%) emission and performance, using a Mk4 AVO Valve tester and its valve data book [2]. That instrument has low end (<100V) anode and screen voltages in steps of 10V (with lowest B+ at 12.8V) and incorporates ingenious AC circuitry to obtain the valve characteristics. In contrast, B+ with my home-made setup is continuously variable from zero to 50V and is entirely DC. The valve heater supply is also DC, the unit being an Aiwa PS-120M intended for the range 0-14V.

Some Tests on Valves.

All measurements were taken after at least 10 minutes to allow warm-up drift to settle. Data runs were recorded manually and plotted with Microsoft Excel (TM). The examples shown below include two pentodes EL84 (**Fig. 2**) and EF80 (**Fig. 3**), and a double-triode ECC82 (**Fig. 4**). These results are not averaged between samples, and are deemed 'typical' for instances of old valves in reasonable condition, rather than definitive. They are certainly not meant to serve as a substitute for any manufacturer's original data, but to promote your interest and give some idea of what to expect when trying out valves for low voltage (and current) applications.



Although having less cathode area, the EF80 (**Fig. 3**) and ECC82 (**Fig. 4**) are not too far behind (c.f., [3]) and their lower heater current may attract those interested in solar powered projects – bearing in mind that heater voltages should be held constant at their recommended values. And regulated DC eliminates risk of hum.

FIG. 2a. EL84: Ia vs Va characteristics at a constant screen voltage of 30V. The Vg1 values are negative and the lowest curve corresponds to Vg1= -0.6V

In Fig. 2a the Ia/Va characteristics of an EL84 are shown at constant screen voltage Vs=30V. This valve is quite lively down to Va=5V. This is also evident from Fig. 2b which shows the set of variations of anode current with control grid voltage at different Va steps. A reasonable slope (transconductance gm = Ia/Vg1) is maintained down to Va=5V.

In **Fig. 2c** gm is plotted at a fixed Vg1 over the range of Va steps. These results support Ernst's practical findings that the EL84 is well suited to low voltage experimentation.

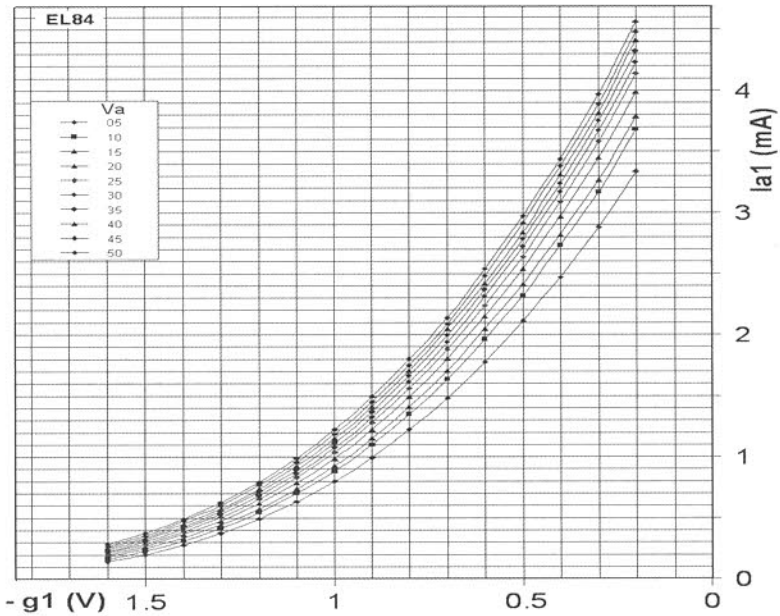


FIG. 2b. EL84: Ia vs Vg1 for stepped anode voltages Va, with Vs=30V. The lowest curve, for Va=5V, still has an appreciable slope (gm, mA/V, see below).

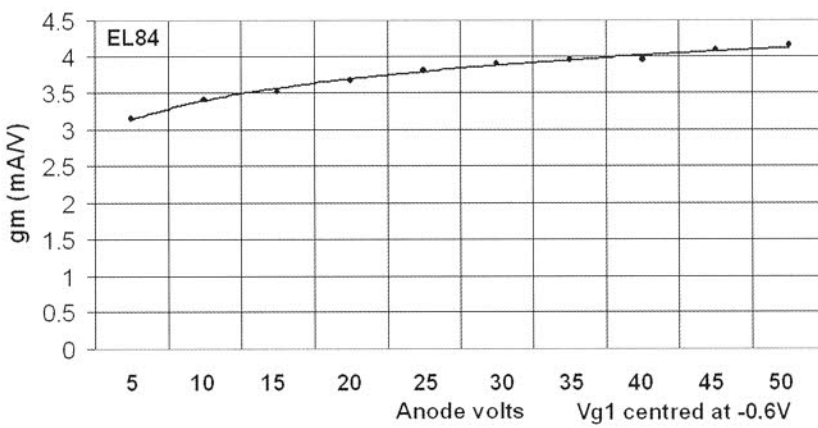


FIG. 2c EL84: gm (mA per Volt) for range 5 to 50V (Vs=30V, Vg1=-0.6V). Note that the EL84 entry in Table 1 below is for Vg1= -1.0V

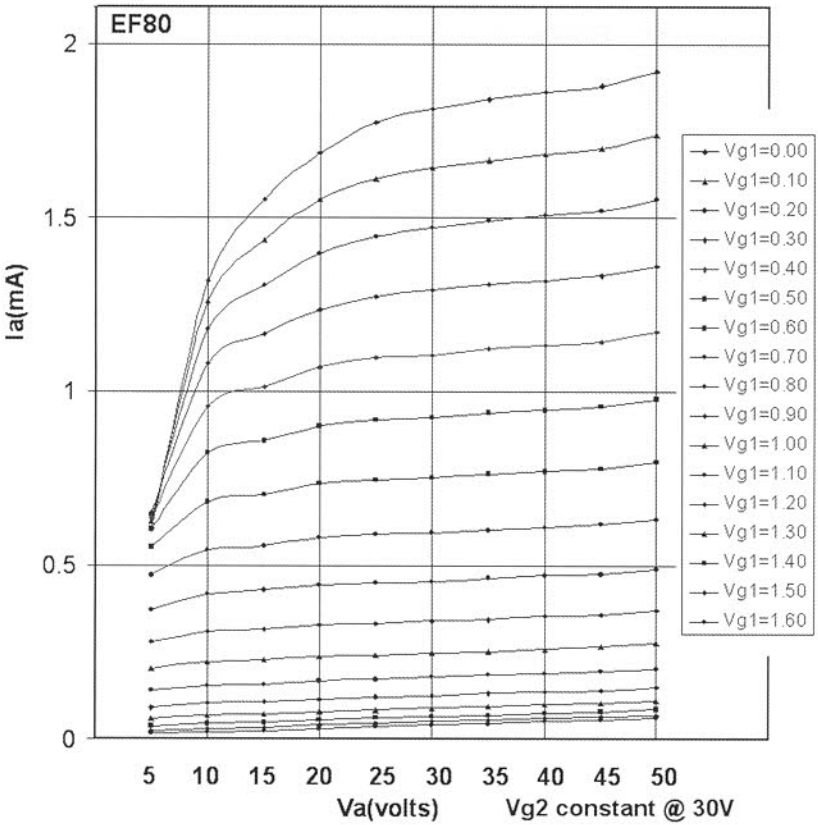


FIG. 3. EF80: Ia vs Va at constant Vs=30V.

TABLE 1		Anode Voltage Va (screen voltages or beam plates held at 30V; Vg1 bias for each valve as shown).									
Valve	Vg1	5	10	15	20	25	30	35	40	45	50
ECC81	-0.5	0.06	0.16	0.31	0.54	0.8	1.09	1.4	1.7	2	2.3
ECC82	-0.6	0.08	0.33	0.7	1.04	1.37	1.67	1.9	2.1	2.3	2.5
ECC83	-0.6	0.02	0.04	0.07	0.12	0.18	0.26	0.35	0.45	0.57	0.69
ECC84	-0.7	0.42	1.13	1.89	2.56	3.22	3.65	4.15	4.5	4.95	5.3
ECC85	-0.6	0.15	0.33	0.59	0.94	1.3	1.7	2.1	2.51	2.93	3.34
ECC91	-0.7	0.26	0.64	1.12	1.65	2.19	2.66	3.15	3.47	3.75	4
ECC189	-0.8	0.09	0.38	0.93	1.77	2.96	4.43	6.15	7.75	9.6	11.25
EF80	-0.6	0.68	1.39	1.51	1.61	1.64	1.66	1.69	1.69	1.7	1.74
EF86	-0.6	0.91	1.09	1.13	1.17	1.18	1.19	1.19	1.2	1.2	1.2
EF91	-0.6	0.98	1.14	1.19	1.23	1.25	1.28	1.28	1.3	1.3	1.31
6AK5	-0.6	0.99	1.19	1.23	1.28	1.3	1.33	1.34	1.36	1.35	1.36
EL84	-1	1.83	2.01	2.08	2.19	2.26	2.32	2.37	2.42	2.46	2.51
EL91	-1	0.99	1.13	1.18	1.21	1.25	1.25	1.29	1.3	1.32	1.32
6V6GT	-1	1.95	2.15	2.05	2.1	2.15	2.2	2.25	2.25	2.25	2.25

Low B+ voltage transconductances (gm) for some other valves are summarised in **Table 1.** These figures are limited to spot values for single chosen examples, but suggest that useable gain could be obtained in low 'HT' voltage circuits for these and many other valves 'out there'.

References:
[1] Ernst Olivier F5LVG, 'Low voltage 3 Tube Shortwave Regenerative Receiver' Sprat #136, Autumn 2008, pp6.7
[2] AI Williams, CE Hull. The AVO Valve Data Manual, 16th Edn. (1964) AVO Ltd.
[3] R.Gomez, http://diyaudioprojects.com/Solid/Tube-Mosfet-Hybrid-Headphone-Amp/

Yaesu Manual Offer

Dom Baines M1KTA, 34 Bury Rd. Stapleford, Cambridge. CB2 5BP

I have a selection of Yaesu Manuals in PDF format. If club members would like a particular manual, please send a blank CDR and SAE, clearly stating which manual you require.

(On behalf of the club, may I thank Dom for this kind offer - G3RJV)

YAESU FT1 BASE TRANSCEIVER OPERATING - YAESU FT1000 BASE TRANSCEIVER SERVICE YAESU FT101,B,E,EE,EX BASE TRANSCEIVER SERVICE - YAESU FT101Z BASE TRANSCEIVER SERVICE - YAESU FT101ZD BASE TRANSCEIVER SERVICE - YAESU FT200 BASE TRANSCEIVER INSTRUCTION - YAESU FT220 BASE TRANSCEIVER INSTRUCTION - YAESU FT221 SERIES BASE TRANSCEIVER SERVICE - YAESU FT227 SAME AS FT101 BASE TRANSCEIVER SERVICE - YAESU FT230R BASE TRANSCEIVER OPERATING - YAESU FT250 BASE TRANSCEIVER INSTRUCTION YAESU FT301 BASE TRANSCEIVER INSTRUCTION - YAESU FT707 BASE TRANSCEIVER SERVICE YAESU FT747GX BASE TRANSCEIVER SERVICE - YAESU FT757 MK I BASE TRANSCEIVER SERVICE - YAESU FT757GX BASE TRANSCEIVER SERVICE - YAESU FT767DX SAME AS FT707 BASE TRANSCEIVER SERVICE - YAESU FT77 BASE TRANSCEIVER INSTRUCTION - YAESU FT80C BASE TRANSCEIVER SERVICE - YAESU FT901DM BASE TRANSCEIVER SERVICE - YAESU FT902DM BASE TRANSCEIVER SERVICE - YAESU FT980 BASE TRANSCEIVER SERVICE - YAESU FT990 BASE TRANSCEIVER SERVICE - YAESU FTDX100 BASE TRANSCEIVER INSTRUCTION - YAESU FTDX150 BASE TRANSCEIVER INSTRUCTION - YAESU FTDX400 BASE TRANSCEIVER SERVICE - YAESU FTDX401 BASE TRANSCEIVER INSTRUCTION - YAESU FTDX500 BASE TRANSCEIVER SERVICE - YAESU FTV707 BASE TRANSCEIVER INSTRUCTION - YAESU FT767GX SERVICE

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

WANTED: A microphone to fit my IC4E transceiver. It is a dual plug one which also fits the IC2E. Adrian G4GDR. Tel: 01793 762970.

WANTED: MIZUHO portable QRP series MX7 or/and MX14, Heathkit HW8 or 9. Contact ik0vsv@libero.it - Marco.

FOR SALE: MOONRAKER FA5000 professional CB Mobile, 80 channel receiver, as new in original box. £50. (inc post and packing). BEARCAT UBC785 Scanner Receiver. 1000 channels, as new in original box. £100 (inc post and packing).
John Noble, 35 The Queen Mother Court, Borstal Rd. Rochester, Kent. ME1 3JF.

The Gnat 1: A One-Transistor CW Transceiver for HF Frequencies

Chris Trask, N7ZWY, Sonoran Radio Research, P.O. Box 25240, Tempe, AZ
Email: christrask@earthlink.net

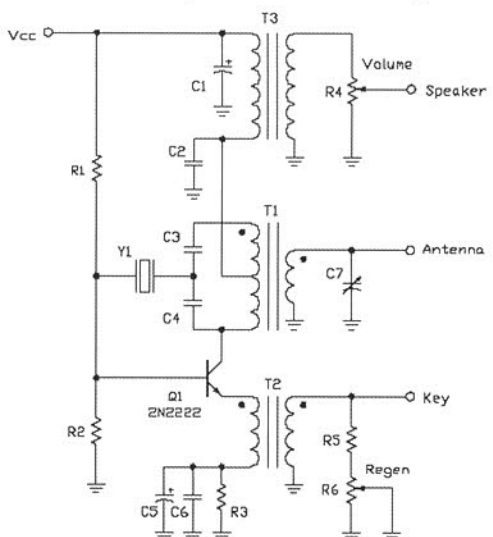
Introduction

Among the diverse areas of interest in amateur radio, the design, construction, and operation of transmitters, receivers, and transceivers that encompass a minimum of components has become increasingly popular amongst those in the QRP community. Lacking the more sophisticated features of commercially available rigs and kits, these simple projects offer the user an opportunity to better understand the electronics associated with radio and at the same time develop operating skills, abilities which will remain with the user and form a good basis for furthering their understanding.

Transmitters and receivers making use of a single transistor are fairly common, the transmitter being a power oscillator and the receiver being a regenerative detector. A transceiver using a single transistor is an interesting challenge from a design standpoint. A few designs exist that make use of a multiple-pole switch or relay to switch the transistor from one circuit to another, but a switchless circuit that makes use of the key alone to switch from receive to transmit môde is not at all common.

The Gnat 1 Transceiver

A transceiver encompassing a single transistor was designed and a couple of prototypes were built for evaluation. Named herein as the "Gnat 1", the schematic and parts list appears in Fig. 1. Parts values for the resonant tank circuit (C3, C4, Y1, and T1) are chosen for the frequency of operation and are listed for various HF bands in Table 1. The construction of transformers T1 and T2 will be discussed later, as will the altering of the component values for other frequencies. In this circuit, the key together with transformer T2 provides the necessary switching from transmitting to receiving mode.



C1, C5 - 47uF 16WVDC Aluminum Electrolytic
C2, C6 - 0.1uF C7 - 25pF Variable
C3, C4 - See Table 1
Q1 - 2N2222 or 2N4401 (see text)
R1 - 33K
R2 - 15K
R3 - 33 ohms
R4 - 5K Variable
R5 - TBD (short)
R6 - 500 ohm Variable
T1 - 2CT:1 Transformer (see text)
T2 - 1:1 Transformer
(see text and Table 1)
T3 - 8 ohm to 1K audio transformer
(Xicon 42TL013-RC, available from Mouser, or Radio Shack 273-1380)
Y1 - See Table 1

Transmitter Theory

When the key is closed the circuit becomes a transmitter. The secondary side of transformer T2 is shorted and the emitter of the transistor is conducted to ground. At the same time, capacitor C2 couples the centre tap of transformer T1 to ground and the circuit takes on the form of a simple oscillator, as shown in the functional schematic of Fig. 2. Using a centre tap on the primary side of T1 provides the needed 180° phase shift needed for the oscillator and avoids having to add a third winding. With a 2CT:1 winding ratio and a 12V supply, the oscillator can develop 0.5W peak, and with a 2CT:2 ratio it can develop 2W peak.

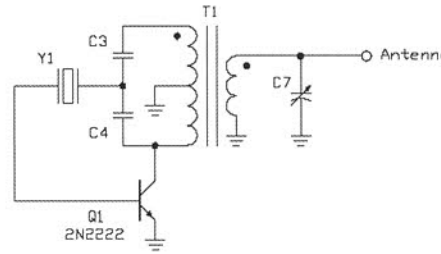


Figure 2 - Gnat Transmitter RF

Receiver RF Theory

When the key is open, the circuit becomes both a regenerative detector and an audio amplifier. With regard to the RF operation of the receiver, everything is essentially the same as for the transmitter except that the transistor emitter now sees the resistors R5 and R6, which together provide the negative feedback needed to control the onset of oscillation, all of which is shown in the functional schematic of Fig. 3. Keeping in mind that a regenerative detector is basically an oscillator that isn't, potentiometer R6 is adjusted to a point just below which the circuit oscillates. By keeping the positive feedback gain of the oscillator low by way of the ratio of C3 and C4, there is very little hysteresis in the detector, which means that if the circuit breaks into oscillation little adjustment of R6 is required to return the circuit to a regenerative detector.

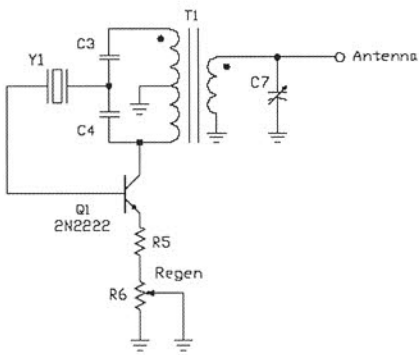


Figure 3 - Gnat Receiver RF

Receiver Audio Theory

The regenerative detector develops an audio signal across the base-emitter junction of the transistor, and for discussion purposes we'll simply say that it appears at the base terminal. As shown in the functional schematic of Fig. 4, at audio frequencies transformer T2 does not couple to the secondary side, and the inductance of the primary is so small that is appears as a short circuit, and

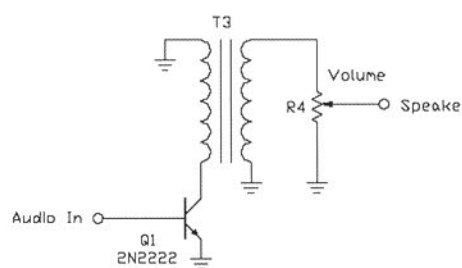


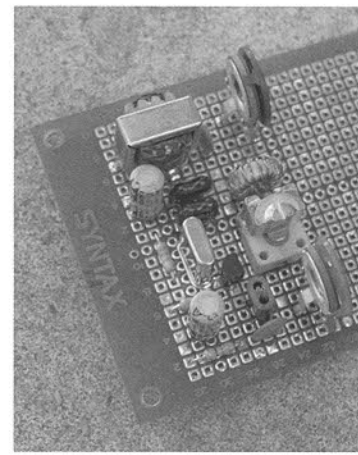
Figure 4 - Gnat Receiver Audio

capacitor C5 of Fig. 1 couples the transistor emitter to ground.

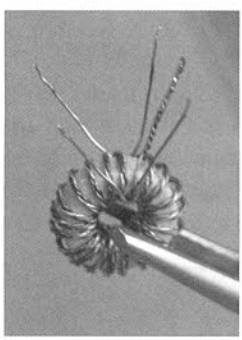
At the same time, transformer T1 becomes equally transparent and capacitor C2 becomes a de-emphasis filter. The resulting audio signal appears across the primary winding of transformer T3 and is coupled to the secondary side to volume control R4 and then to the speaker, which would most suitably be a high impedance earplug.

Prototype Construction

A couple of prototypes were constructed and tested, the more presentable of which is shown in Fig. 5. Constructed on a commercial perf board with plated-through holes spaced 0.1" apart, the circuit takes up about two square inches. Regeneration control R6 is at the lower end of the photo and volume control R4 is at the top.

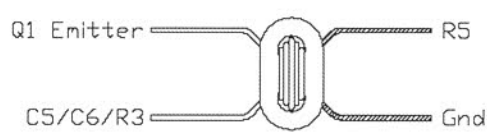


For the 40m band, capacitors C3 and C4 are 120pF and 82pF, respectively. Table 1 lists values of these components for other bands For additional operating bands, the values for C3 and C4 can be simply scaled by way of the ratio of the desired operating frequency, as can be the number of turns used on transformer T1, or a different core can be used.



For the 40m band, transformer T1 is constructed with 15 turns of #30 trifilar wire on a Micrometals T37-6 toroid core, and Table 1 lists the number of turns required for other bands. A photograph of T1 as built for the 80m band is shown in Fig. 6. After winding the required number of turns on the toroid core, both ends of one strand of the trifilar bundle are separated to the left for the secondary winding. An opposite pair of ends of the remaining two strands are twisted together to form the primary winding centre tap, and the remaining two leads are separated out to form the primary winding end terminals. The wires are then tinned prior to installation.

T2 is a simple 1:1 transformer made with 4 turns of #30 bifilar wire wound on a Fair-Rite 2843002402 binocular core, and is illustrated in Fig. 7. These turns should be wound fairly tightly and the leads should be kept short as excessive stray inductance will cause a shift in frequency between the receive and transmit môdes.



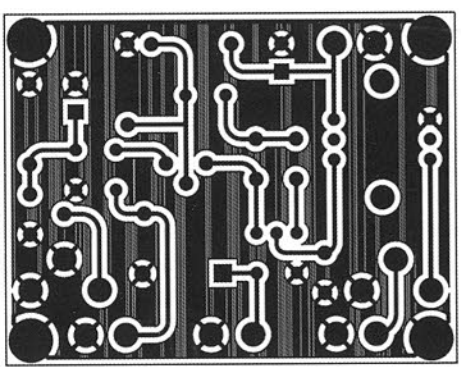
Transformer T3 is connected with the 8-ohm side used as the primary (left) and the 1K side used as the secondary (right) so as to provide additional voltage gain as well as reduce the DC resistance in the path between the supply voltage and the collector of Q1.

Regardless of the style of construction, some adjustment may be required as the tank circuit should resonate fairly close to the crystal frequency so as to operate properly. This adjustment is easily accomplished by first setting the trimmer capacitor C7 to its mid-range position and shorting the leads of the crystal. Connect a load to the antenna terminal and apply the supply voltage. Using a frequency counter or an oscilloscope measure the frequency of the circuit while in the transmit môde (key closed). If the frequency cannot be adjusted to the crystal frequency by way of trimmer capacitor C7, add or subtract a turn at a time from transformer T1 (coarse adjustment) or adjust the values of capacitors C3 and C4 (fine adjustment). If the frequency is slightly high, it may be even more convenient to simply add a small fixed capacitor across C7. This may take some degree of effort and patience but is necessary due to all sorts of variables, especially if a different sort of transistor is used for Q1.

Frequency	3.5MHz	7.0MHz	10.0MHz
C3	270pF	120pF	82pF
C4	180pF	82pF	56pF
T1	20 turns #30 trifilar wire on T37-6 core	15 turns #30 trifilar wire on T37-6 core	12 turns #30 trifilar wire on T37-6 core
Y1	3.598MHz	7.030MHz	10.130MHz

Table 1 - Values for Frequency-Dependent Components

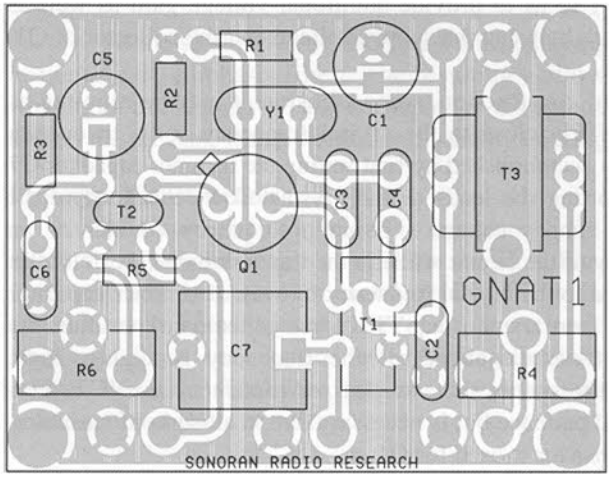
Printed Circuit Board



The small number of components used in the Gnat makes construction on a small piece of perf board fairly easy, but for those who have a desire for a more formal and robust method of construction, a printed circuit board (PCB) layout is provided in Fig. 8, and the parts placement is shown in a larger form in Fig. 9.

PCB Layout

Parts Placement



The potentiometers used for R4 and R6 in the PCB layout are CTS series 201, which are inexpensive, very rugged, and are available from Digi-Key. The variable capacitor C7 is a Sprague series GAE, and similar parts are made by Johnson and Erie. These are also very rugged and can be found from distributors such as Surplus Sales of Nebraska and Dan's Small Parts. Most builders will undoubtedly prefer to use panel-mounted variable components, which will require the addition of wires between the PCB and the control variables.

The pads for transistor Q1 are for the TO-5/TO-39 package so that devices such as the 2N3866 may be used. These pads will also accommodate smaller packages such as the TO-18 and TO-92.

The pads for transformer T3 are for the Xicon 42TL series of ultraminiature audio transformers that appears in the parts list of Fig. 1, which are available from Mouser. These PCB mounted transformers have a very small footprint and are ideally suited for applications such as this.

The space provided for transformer T1 is intended to accommodate toroid cores up to 1/2" diameter, which will be required for those wishing to increase the power level up to 2W or for lower frequencies that will require more than the 20 turns that the T37 size core can accommodate.

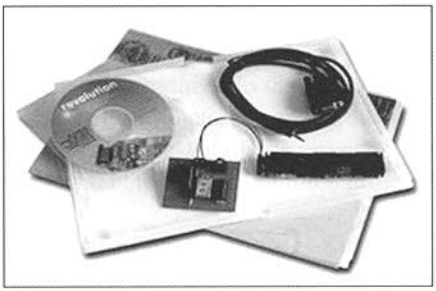
Pads for attaching power leads are provided in the upper right-hand corner, and pads for the key, antenna, and speaker are arranged from left to right in that order along the bottom edge together with accompanying ground pads.

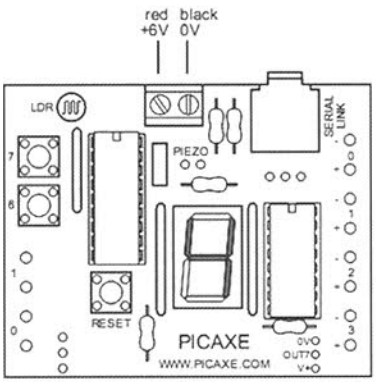
Synopsis

Designing the Gnat 1 transceiver continues to be a fun project, and refinements continue as time allows. Simple multi-function circuits such as this are very often compromises in performance, and the builder should anticipate that some degree of variation will occur as building practices and components (especially transistors) will cause variations in performance. Despite this, having a one-transistor transceiver that does not incorporate a multi-pole switch or relay is quite a lot of fun.

Starting with PIC

Paul Debono 9H1FQ, 65 Triq Il-Hafur, ATTARD BZN 03. MALTA





More and more amateur radio construction projects are being based on Peripheral Interrupt Controller, or better known as PIC. These miniature computers can be programmed to perform a thousand and one functions. Revolution Education ltd has come up with the idea of producing starter kits for the complete beginner. You will not only learn elementary applications of PIC's, but also the BASIC programming language, in the same process.

We are going to have a look at the complete beginner kit named PICAXE-18 Tutorial Pack, code AXE050, and how we can program it to act as an electronic keyer. The kit comes complete with PIC type PICAXE 18 (16f627A) , ULN 2003 driver chip, to drive a motor, numerical display, light dependent resistor, input switches, battery holder, download serial port cable, a comprehensive cd containing step by step beginners tutorials, required software editor, and more manuals for further study. The kit may be seen here http://www.rev-ed.co.uk/picaxe costs £15.28p in the UK. Delivery is quick and efficient.

First, download the editor, as shown on the cd. Next connect the cable supplied, with the PC serial port and the pcb. Put three AA batteries in the battery compartment. The board may already have been preprogrammed as a counter. On the editor, click on VIEW, options, and select 18, then select serial port, COM 1 or COM 2, and close. Now we need to reset the chip and erase any program present. Select PICAXE and select CLEAR HARDWARE MEMORY.

Now we are ready to start. Solder an LED at between output 7 and -ve. The texts are not case sensitive, but note the spacings between numbers and text. Type the following program: (comments enclosed within the apostrophe is a description of each line and are not read by the editor).

main: *'this is the label of our program. The colon indicates it is a new command'*

high 7 *'make output 7 high, on'*

low 7 *'make output 7 low, off'*

pause 1000 *'delay by 1000 milliseconds'*

goto main *'jump to the start label main'*

Select PICAXE from the menu and click on RUN- You have just programmed the LED to flash on and off. Select PICAXE and select CLEAR HARDWARE MEMORY, to erase the program.

The PIC has a built in audio oscillator. Solder a Piezo sounder, or buzzer at output marked 6. We can activate like this:

main: *'label of our program'*

sound 6, (100, 30) *'acivate sound on output 6 100 hertz length 30 milliseconds'*

goto main *'jump to the start label main'*

Select PICAXE from the menu and click on RUN !

Select PICAXE and select CLEAR HARDWARE MEMORY, to erase program.

Now we can program it as an electronic key:

main: 'program label'

if input6 is on then dots *'switch at input 6'*

if input7 is on then dashes *'switch at input 7'*

goto main *' go back loop'*

dots: *'define dots'*

sound 6, (100, 10) *'a dot of 100 hz, 10 milliseconds long, at output 6'*

pause 010 *'delay of 10 milliseconds'*

low 6 *'output 6 off'*

pause 010 *'delay Of 10 milliseconds'*

goto main: *'jump to the start label main'*

dashes: *'define dashes'*

sound 6, (100, 30) *'a dash of 100 hertz, 30 milliseconds at output 6'*

pause 010 *'delay of 10 milliseconds'*

low 6 *'output 6 off'*

pause 010 *'delay of 10 milliseconds'*

goto main *'jump to the start label main'*

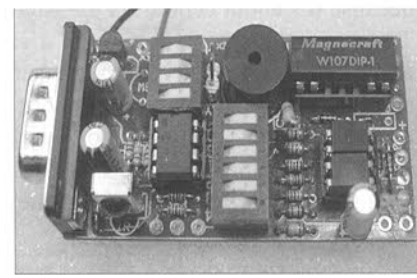
Click on RUN, pressing the built in switch 6 will sound a series of dots, pressing switch 7 will sound a series of dashes.

These are just a very few elementary examples of how a PIC can be configured to.
Your imagination is the limits. The manuals, supplied with the kit, offers excellent easy to understand tutorials, from the very basic till advanced stages.

There are other kits on the market, worth reviewing. Rex Harper, W1REX, of www.qrpme.com, came up with the idea of designing, constructing and selling his own original Picaxe microcontroller kits. He is expected to be a speaker at the next GQRP convention. He has three excellent kits, all based on the Picaxe 08-M PIC microcontroller. They come complete with a beginners tutorial, with practical examples which gradually build up to projects aimed especially for the radio amateur. You are gradually introduced to the Picaxe 08-M controller, which although small, can perform a vast range of functions and circuit conditions. Commands are explained with examples which can be tested on the project boards.
As I said before there are three project boards.

The Maine Lobstercon Bugs Kit
The Maine Lobstercon Bugs Kit has few parts, easy to build in an hour, but has limited expansion capabilities. Yet it can be programmed to do various functions. It comes complete with a temperature sensor, LEDs, and piezo buzzer.

The Picaxe Hatchet Kit
The Picaxe Hatchet Kit is ideal as a basic learning project board. It comes complete with temperature sensor, IR decoder, input switch, relay, opto isolator and piezo sounder. It comes with starter programs which turn it into a T/R Switch, Beacon Keyer, Audio monitor, Infrared controller, Timer, or Temperature Controller.



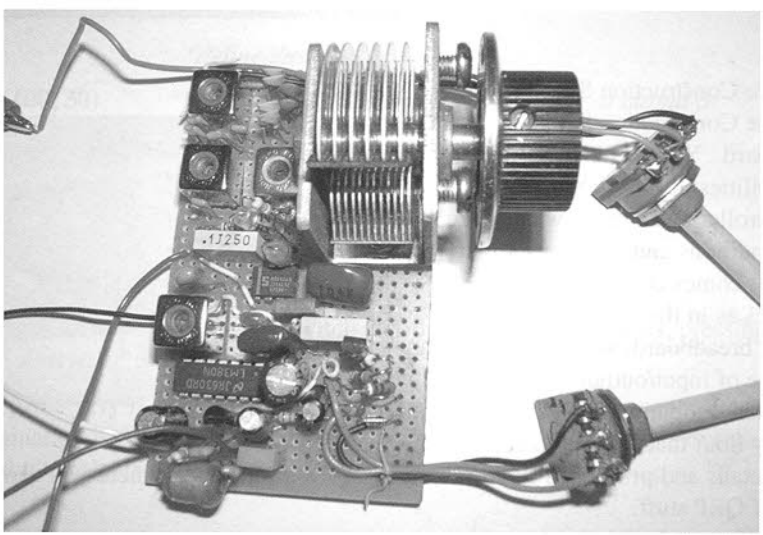
The Picaxe Construction Set
The Picaxe Construction Set is the ultimate project board . You will be able to test the full capabilities of the Picaxe 08-M microcontroller and see the wide range of circuit conditions and functions it can perform. It comes complete with the accessories as in the Hatchet, plus a solderless breadboard, which allows for a wide range of input/output devices. Once you have mastered the tutorials, your imagination is the only limit that this board can do!

For full details and prices, visit the website on www.qrpme.com, where you can also find a haven of QRP stuff.

Simple 160m Superhet

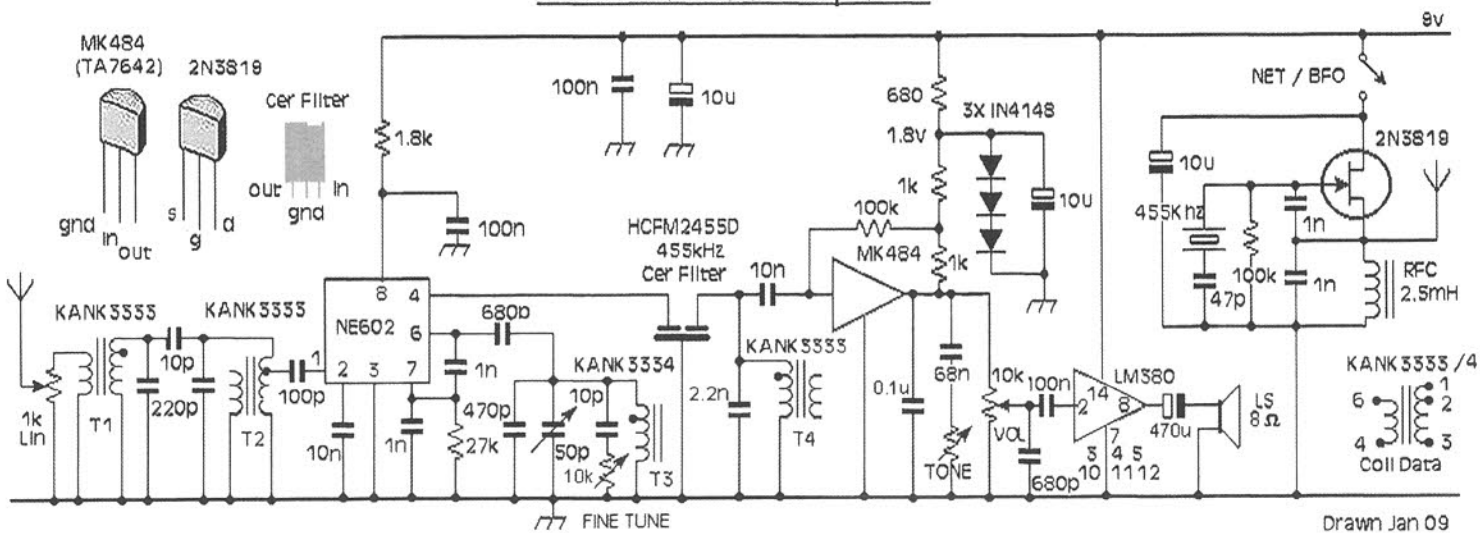
Peter Howard G4UMB 63 West Bradford Rd Waddington Clitheroe BB7 3JD

The Super Simple Superhet was made as a companion for the Small Talk Transmitter (See Sprat 133) Intended for AM reception on 160M. It incorporates several circuits which I have read in various publications. The front end up to the mixer oscillator IC is identical to the Sudden Direct Conversion Receiver. I changed the capacitor values of the oscillator to make it work at 455kHz above the received frequency and then followed the output with a 455kHz ceramic filter and tuned circuit T4 at the same frequency. The signal then passes into a MK484 which is an AM receiver in its own right (see Sprat 128) used here as an IF amplifier, then after that into the LM380 audio amplifier. The BFO circuit is optional; however it is worthwhile adding it to act as a means of netting and also to receive SSB and CW signals. Unfortunately having an IF frequency of 455kHz means that an unwanted heterodyne occurs at 1820kHz. The coils and the Ceramic filter are available from Jabdog as are probably everything else. All other parts should be easily got from most suppliers. The 455kHz BFO is made with a Ceramic Resonator which I got from Maplins. I have been informed that the MK484 is no longer made but an alternative identical IC is the TA7642 which I got from Sycom. Improvements could be made adding band spread or a reduction drive for more manageable tuning. Alignment is straightforward even without test equipment by adjusting the slugs of the coils for maximum signal at 1940Khz, chosen because it's about central on the band for phone reception. The setting up of the oscillator T3 can be done by listening on a calibrated receiver for the output between 2255kHz and 2455kHz. Selectivity and Sensitivity are reasonably good. The receiver was built on stripboard proving that layout is not critical but it would obviously be better on a PCB. The tuning capacitor I used was too high in value so in true amateur fashion I carefully removed some of the vanes to make it suitable. Although I simplified the circuit without using a dual gang variable capacitor to tune the front end it is still sensitive enough throughout the whole band.



A SUPER SIMPLE SUPERHET FOR 160M

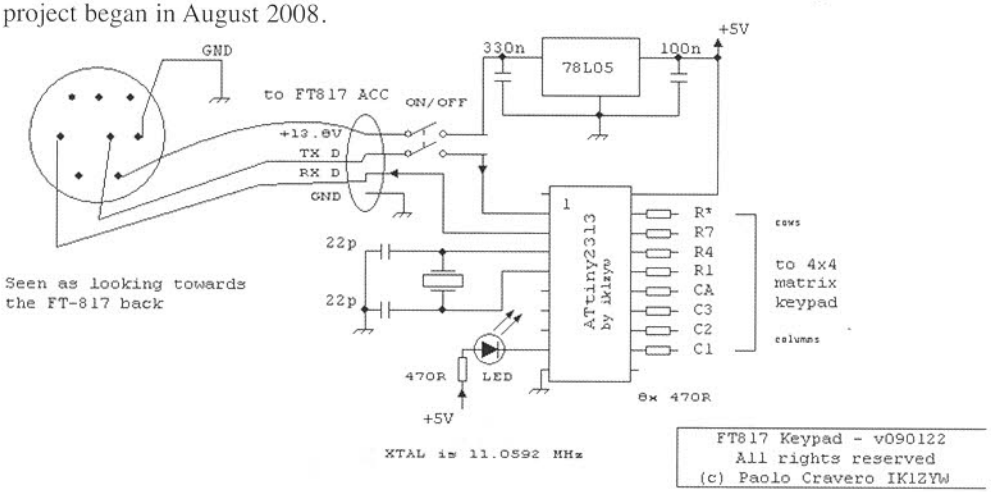
The Small Talk Companion



External Keypad for FT-817(ND)

Paolo Cravero IK1ZYW, via Terni 40, 10149 Torino, Italy

Yeasu's FT-817(ND) is a popular quadriband transceiver amongst QRP enthusiasts (and not only), but as soon as you start using it for some serious activity you probably spend a lot of time hunting for something through the nested menu system. During a VHF contest session I wanted to change Power level, Meter mode and VOX on/off very often, and they sit in different menu "pages". What a nightmare. So I came up with the idea of an external keypad to control those functions. Out of four existing products advertised on Internet, no one carried them. With respect to the cheapest commercial solution I could setup a home development station, save money and have some fun: a three-month-long after-dinner project began in August 2008.



The hardware : The FT-817 can be controlled via the CAT interface on the ACC rear socket, through a 0/5V serial "8N2" protocol. The User's Manual lists few commands, but KA7OEI has documented an exhaustive list of advanced features that give access to many useful settings.

Fortunately there still exist microcontroller chips in humanly manageable package ("DIP"), with a lot of built-in functions and programmable in a high-level language. Atmel's ATtiny2313 is one of them. With a handful of components a new, extensible, 817 keypad was born.

The circuit is very simple. Power supply is taken either from the ACC socket or a separate 9V battery. Clocking at 11.0592 MHz is a good compromise for serial communication reliability and harmonic-free HAM bands. Series resistors to the matrix keypad limit the current flow. Provision has been made to add a LED that blinks at powerup and once a key press has been acquired as a raw form of feedback. A DPST on/off switch can help reduce the overall current consumption when the keypad is not in use.

The software

While a standard firmware version is freely available on the keypad webpage, a special version has been developed for GQRP members.

Like other keypads, this one allows **direct frequency dial**. All digits from hundreds of MHz to kHz have to be typed down, including leading zeroes. A non-numeric key lets you send the frequency value without typing trailing 0's: "007000" and "007A" both QSY to 7.000 MHz, as well as "1455B" means 145.500 MHz.
"**A**" key toggles between VFO A and B. "**B**" key cycles the Meter mode (SWR, ALC, MOD, PWR). "**C**" key cycles the output power level downwards.
"**D**" key provides a shortcut to [F] menu pages. Press "D" and then 0-9/A/B to jump to a specific page: D 6 on the keypad loads the [IPO ATT NAR] page (further details are in the user's manual).
"**#**" key gives access to 15 user defined onboard non-volatile memories. The sequence "**#**", "*****", "*any key*" stores the current VFO frequency and mode at "*key*" location. Recall it with "**#**" "*key*".
Last but not least a single press of "*****" keys your FT-817 for 5 seconds at the current frequency and power level, useful for operating antenna tuners.

These functions fill the microcontroller memory and should satisfy most operators. Other controls can be implemented as long as they are supported by the undocumented Yaesu CAT protocol extensions and fit the chip memory, such as: DCS/CTCSS, Lock, RIT on/off and amount, NB, AGC, DW, PRI, Scan, BK, KYR, VOX, VLT, DSP, CHG, CW keyer speed, PBT, FaST tuning, mode change.
Direct frequency dial, onboard memories, VFO toggle and Quick Tune should work on other Yaesu devices with CAT support, like FT-857 and FT-897.

Some quirks of the FT-817 (all detailed in the Keypad User's Manual). The Vcc line on ACC socket is not protected with a fuse and voltage is present even if the radio is off (mind the internal batteries!). All 817 settings are stored in EEPROM cells, whose life is limited to some 10-100'000 write cycles, so don't forget your cup of tea on the keypad. Communication errors to the radio may result in a factory reset, so take note of the 76 calibration settings of your specific radio (this warning also applies to CAT control software users, like the popular HRD!).

A detailed User's Manual of the keypad (26 pages at the time being), as well as firmware updates, are available through my website **http://www.paolocravero.tk**. The manual explains both keypad functions and assembly instructions. The firmware bytecode as described above will be sent to GQRP members able to program the Atmel uC. Pre-programmed chips and other components may be available to help builders: please check my website for availability and instructions. I try to keep a small stock of chips/XTAL pairs. It is also possible to customize the firmware up to the extent of available microcontroller program memory. If you have no Internet access, please ask a friend/relative/nephew for assistance. Don't forget to mention your call and GQRP number when requesting the firmware or a pre-programmed chip.

WIFB MEMORIAL ENTRY

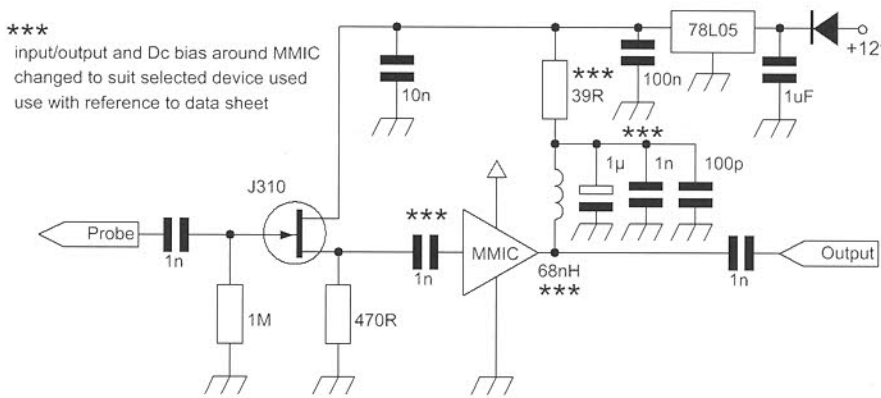
An High Impedance Amplified RF probe

Paul Newman, VK4APN
13 Hudson St. Whitfield. Cairns. Queensland. Australia

Very cheap and easy to make, it is ***not*** a precision instrument. However, it is extremely useful for relative measurements & imposes little loading to the circuit under test.

This project started out as an article torn out of an early "73" magazine and filed away for future reference. The original article was by W6WTU and described a probe based on a FET high impedance buffer stage, followed by a wideband MMIC. The object was to rev up and possibly extend the usefulness of test gear on hand i.e. freq counter; CRO, RF sniffer etc - use your imagination!

Firstly, I do not have an electronics background and do not claim that this is the best implementation of such a circuit; I am merely a relatively keen amateur. I am sure those technicians amongst us could tweak and improve both the design and my first ever attempt at designing a PCB to go with it. What I can say is that the probe works well and has proven to be very useful, especially for those of us with lightweight test equipment. It won't impress the Agilent/HP brigade though!!



The schematic is very easy to follow and is simply a FET buffer – J310 feeding into an MMIC – SNA386 and a 5V regulator together with a handful of 0805 smd resistors, capacitors & inductor. My choice of devices was based on what was on hand and no doubt could be played with a little! The J310 has interchangeable source and drain so beware with this substitution if choosing another device; also various MMIC's require slightly different components and methods of applying DC. It is possible to "peak" the frequency response of MMIC's via component selections if required. Reference should be made to appropriate datasheets and changes made accordingly. The PCB as it is - will allow MAR devices and the SNA386 simply by inserting/altering/deleting components.

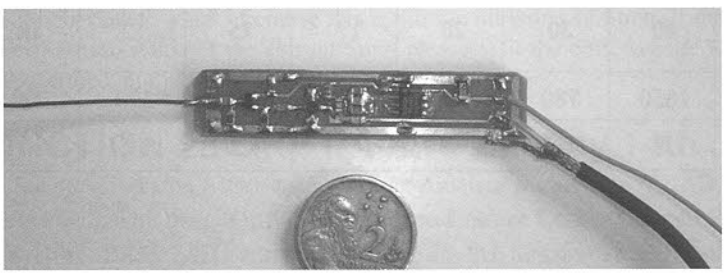
3 probes have been built as shown; all worked off the bat and are in current use. They all provide useful output to at least 1296 MHz. The PCB is double sided; however, the bottom is left intact as a continuous ground plane. There are a number of vias to be installed before other components are added. The circuit is simple enough that a pcb could be fashioned using blank double sided pcb and a dremel tool. Originally it was envisaged that the probe would be built into a metal tube, however at the first and only try it made a wonderful oscillator!! – hence the clear plastic tube finish. The plastic finished probe doesn't appear to be a problem though.

I bought the SNA-386 off eBay for about a $1 each, the J310 (smd) were cheap as chips and all other parts are common types. A regular 5v regulator could be used in place of the soic – just watch the pinout.

The original article mentioned the used of a T piece at the test instrument – with a 50 ohm load on one side, the probe on the other with the remaining connected to the instrument. In practice it didn't seem to make much difference.

It seems to be a perfect add on for my homebrew RF milli-wattmeter (OZ2CPU) used in relative mode.

Pictures of original prototype by Paul VK4APN & packaged probe by Keith VK4BKS



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

FOR SALE: Heath IM17 Utility Voltmeter FREE , Heath HD10 keyer (early, 115V AC input - collector to test, no liability accepted) FREE. (free items can be collected or carriage paid). TR7200G 2M trx, some crystals fitted £20, ANB-H-1 fitted headset, USAAF?, no plug, short cord £10, C-LR earpiece fitted headset, no info £10,
5805 99 580 8558 Nato key, c/w plug, gwo clean, £55,
HK 707 key, cracked retainer on top, keys fine. £20, Crystals, 10X (I think!) black cases, £2 each, SASE for marked frequencies. All oscillate. All plus post or carriage.
WANTED: G4LEG's 90 special, six stage TRF, Denco coils, removable top sold G0OKY about ten years ago. Panel is like a CR45. G4LEG QTHR. Tel: 01293 437814 Crawley

Phi-C Matching Network

Jesper Fogh Bang OZ1XB, Elmevej 10, DK-3500 Vaerloese, Denmark
[foghbang@mail.dk]

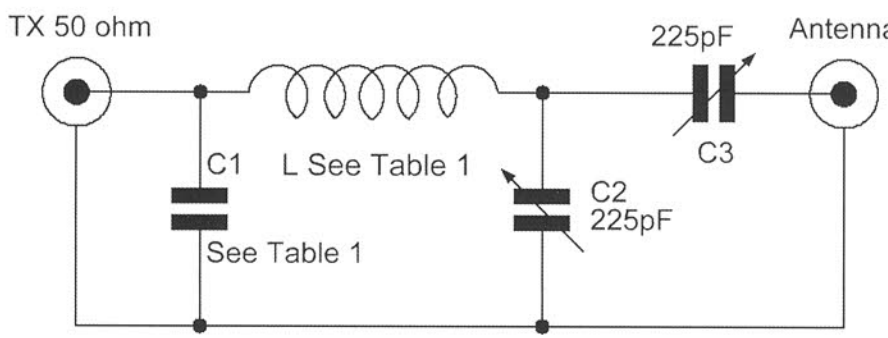
The circuit is basically a copy of the old and famous Drake MN-4 Matching Network design. The system is easy to tune and has very good harmonic rejection. It was known to have a very low insertion loss (maximum 0.5 dB). The disadvantage is a restricted tuning range of 5:1 (or better). On the other hand, if your feed point impedance is way out at the station end, it may be better to modify or redesign the antenna/feeder system.

The old MN-4 design used a band switched set of components for C1 and L. Values for C1 are easy to find on the Internet. See table 1. Values in bold are either from the original Drake design or found elsewhere. Other values are either interpolated or found by experiment. Capacitors C2 and C3 are 225 pF maximum. Lower values can be used at the higher bands. On 10m it is essential to have the minimum capacitance as low as possible.

I have built two separate single band units, one for 80m and one for 10m. Both units tune my antenna systems like a dream. In the 80m unit I have used a 1500pf capacitor bank instead of the suggested 1810pF without any problems.

Band [m]	**80**	**40**	**30**	**20**	17	**15**	12	**10**
C1 [pF]	**1810**	**1050**	**780**	**620**	470	**400**	330	**300**
L [μH]	**8.5**	**3**	**1.7**	1.5	1.2	1.0	0.8	0.7

Table 1



Addition support material on this article with calculations and spreadsheet can be found on the club website under the "Sprat" menu option.

Membership News

Tony G4WIF, PO Box 298, Dartford Kent. DA1 9DQ

Please rescue the Sprat wrapper from the bin and check the "expiry end of" date. If it says "2008" then this is your last Sprat and we have not received a renewal from you. Please contact me or your local representative right away to renew for 2009.

It is quite possible if you are a UK member paying by standing order that your payment will not be credited. Of the bank statements received at the time of writing, 53 members have not corrected, (as we have requested) the information that their banks provide to the club that enables us to identify them. We have no idea who has paid when this happens, no membership number has been quoted for these 53 payments and you will not have your membership renewed. Once again, you will know this because your Sprat label expiry date will not be incremented. If you are one of these, please send a new standing order form to your bank for next year (there was one in the centre pages of your Winter Sprat) and please contact G4WIF.

The Winter Sprat was delayed this year. We do not actually have publication dates – we have targets as befits a volunteer organisation. Most often, Winter Sprat arrives just after Christmas or the first week of the New Year. Both Sprat and the mailing database were supplied on schedule, but events at our printers, and then our distributors conspired to hold things up a little. What followed though was an avalanche of emails and phone calls to club officers asking where Sprat was - and you can imagine how tiresome that was after a very short while.

So for the record, the Winter Sprat might be delayed a little but unless it arrived in the Spring it could not be late – and of course this applies to all issues of Sprat. If members wish to check on news of the status of the current Sprat please visit the club website where you are always kept informed, but please don't call or email.

JUNCTION 28 QRP RALLY - Sunday 14th June 2009

The South Normanton Alfreton and District Amateur Radio Club (SNADARC) in association with the G-QRP Club. **Alfreton Leisure Centre Church Street, Alfreton, Derbyshire. DE55 7AH.** Just 10 Minutes from M1 Junction 28 and the A38
Open to the Public from 10.00 am. Admission £2.50
PLEASE NOTE NEW LARGER FULLY ACCESSIBLE VENUE WITH PARKING
Amateur Radio, Electronics and Related Items, Bring and Buy, and Special Interest Group Stalls, Refreshments. For further details please contact Russell Bradley (G0OKD) on 01773-783658 russell.bradleyG0OKD@ntlworld.com

Let Google Work It Out ... A Note from Ken Mayne GI4FLG

If you find it hard doing radio calculations by hand and can't find your scientific calculator and just can't be doing with the silly one provided as an accessory program in Windows, do not despair, Google has quite a sophisticated calculator built in.

Suppose you want to know the reactance of a 1uH inductor at 7MHz using the formula $2\pi\lambda\phi$. Using scientific notation, just type 2*pi*7E6*1E-6 into the Google search box, and bingo - not only does the answer 43.9822972 appear, but you get the results of an internet search on the calculation into the bargain.

Winter Sports at Coombe Beach

Colin Turner G3VTT, 30, Marsh Cres. High Halstow, Rochester. ME3 8TJ

Winter Sports for me this year was conducted mainly on one band only, that of 80m. If you were to ask me which two bands I had to choose for all of my amateur operating they would be 30m and 80m which, strangely, are the two bands I have fitted permanently to my K1. As it happened for the WS this year I used my Corsair Two cranked down to 3 watts output and a home-made 'Paraset' also with 3 watts measured on a Racal-Dana 9100 absorption wattmeter, and the station bent long wire 100 feet long. I lengthened it from my usual 85 feet to hopefully improve 160m. In the event I worked one DL4 and G4BUE on 1836 Khz.

From home I worked 53 stations including G, GM, PA, S52, OK, W3KL, OZ, IK1, I, DL, HA, F, ON, and HB9 although the contacts with G and ON were made using my version of the Paraset which was modified for full QSK and a pi network output although it retained the normal circuit architecture. The transmitter was a 6V6 crystal oscillator and the receiver used two 6SJ7's in a detector and AF output configuration, O-V-1, with the regular shack high voltage power supply being adjusted at 280 volts to give me 3 watts output. British Army DLR headphones gave a good trade off in sensitivity and selectivity which you need with a TRF receiver.

The highlight of the WS was visiting Coombe Beach on December 30th situated on the Kentish shore opposite Canvey Island along with Geoff G3YVF where we were later joined by Brian GOLJD and his cutting edge technology FT817 used on SSB, (nuffink to do with me!). Portable rigs we used were my Paraset, Geoff's 'transistorised' Paraset and his single valve 6V6 rig, now featured in the Winter Sprat with which I later worked Ian G3ROO and Brian's PAPA80 transceiver. High voltage power was derived from 17AH batteries and an inverter unit.

above: G3VTT Paraset

The antenna was an 80m dipole at 25 feet fed with ribbon line and an Elecraft T1 tuner through a 2:1 balun which was about the easiest way we could get a match. Yes it was cold, very cold, with temperatures ranging from between 3 degrees C and .5 degrees C on the beach. Even the remnants of the receding tide were frozen on the beach and if you did not move around you froze. This meant Geoff had to get a fire going, keep it going and cook throughout the day and ply us with hot real coffee. We have never drunk that awful

instant stuff out portable. He managed, as camping services manager, to make sausage baguettes, banana baguettes and this was supplemented with spicy vegetable soup made by my wife.

I as operator sat at the table and soon found myself freezing despite dressing in a tee shirt, long sleeved shirt, jumper, sleeveless Barbour jacket (known as a 'Dobbs jacket' in our house), a full sleeved waxed Barbour jacket complete with trousers over my jeans and a Russian fur hat. The dress was finally topped off by a genuine Peruvian angora scarf and clogs.

above: G3VTT & G3YVF with Paraset, Inverter,SWR Meter and Soup

above: G0LJD and his 'PAPA 80'

The operations lasted from 1030z until our last contact at 1329z although time on site assembling and dismantling was about an hour for each. The contact rate was low with only 7 stations worked with the Parasets, the one valver and Brian's 'PAPA 80' transceiver at the end of the day. Was it worth it - yes. The best DX was Ray GI3PDN on my Paraset during which I used the regeneration control to alter tuning and beat note level as the QRM faded and rose in strength. An added bonus was working G4BUE again.

The traditional techniques of operating a TRF receiver have to be relearnt with this simple equipment as do those of designing a suitable piece of equipment using valves to be run from a 12 volts supply in the first place. Power supplies have to be carefully considered. Where do you get your 250 volts from on a beach and not drain the batteries with excessive filament current? Also I learnt that flesh sticks to an ice cold morse key, that you have to have a warm drink every 30 minutes or so, you must try and move around if possible which is difficult for the operator and...it is quite possible to die in the English winter if you are not careful.

This was by far the best portable operation we have ever had. Our intention is to run a 'Vacuum Day' for portable valve rigs during 2009. Watch out for details in the next AAA! 72 Colin, Geoff and Brian.

Antennas Anecdotes Awards

Colin Turner G3VTT
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G3vtt@aol.com

Straight into the mail bag this time with comments on the 'no counterpoise antennas' from the last Sprat Number 137. Peter M3KXZ who has been in touch with some of the big names in Amateur antenna designs.

I have just received the latest edition of Sprat, and note the "no counterpoise antenna in your column. I carried out an analysis of this antenna a couple of years ago, and have been using a 25ft vertical one extensively ever since. I have also been experimenting with a phased array of two of them. You can read more on my web sites at:

http://www.outsideshack.com/no_cpoise_v_10m_comparison.pdf

http://www.outsideshack.com/no_counterpoise_phased_array.pdf

I have also spoken at length with Jeff Imel (K9ESE) who came up with the idea for this simple antenna and who sells them on EBay. Dear L B Cebik (W4RNL, SK) has written about my phased array of these antennas, and his notes are available on the Antennex website at. http://www.kandka.com/mirrors/www.cebik.com/wire/m3kxz.html.

I have also had lengthy discussion with Tom Rausch W8JI on the QRZ.COM forums, and many others on the FT817 Yahoo groups over the past two years or so. These discussions have generally centred on the belief that this antenna cannot work without a separate counterpoise. The way I see it though is as an off-centre fed dipole with the short leg folded against the long leg. It is no more, or no less, balanced than any off-centre fed dipole, and provided a good current balun is used at the antenna feedpoint, then feedline RF should not be an issue. I've certainly not had a problem.

One thing that needs to be borne in mind though, is that the 25ft antenna (for 20m and up) is actually pretty short on 20m, and so its efficiency cannot be expected to be as good as a full size 20m half wave dipole on that band. There are also potential issues concerning the use of PVC insulated speaker/zip wire, in that the dielectric loss on the twin section are likely to be high as the SWR on this section is high and the dielectric constant of PVC is also high. A better option would be to use some form of PTFE/Teflon insulated cable, or better still, bare wires as would be used for ladder line. This is something I am experimenting with at the moment.

Thank you for your observations Peter. Another comment was from Steve M0ETY who writes

'I read with interest your 'Antenna I ' in 'Antennas Anecdotes Awards' last time and thought my experience with the antenna would be of us. I obtained the antenna from the Immel Corporation some three years ago and it is resident in our summer home in central France. Contacts have been enjoyed all over Europe including my home QTH (Burnley) and as far south as Armenia, mainly using 5 watts C.W. but I did have a QSO with H.M.S. BELFAST on the River Thames using 1 watt. The antenna is indoors in the attic and I have found that using two random length radials from the 817 around the floor increases the R.F. current in the antenna feeder section. On my next visit to France I will experiment with the radials of this 'no counterpoise system' and send you my thoughts on the results.'

Another email was from Bob MM0RKT gave some practical details of his installation of the two wire vertical shown in the Autumn 2008 Sprat Number 136.

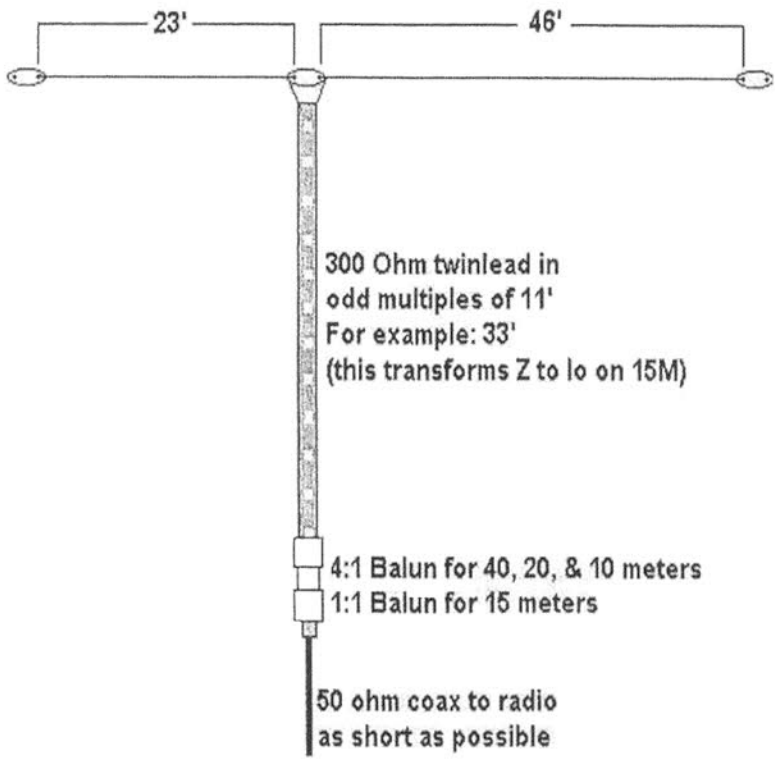
'I saw your article (Antenna Anecdotes Awards) in the Autumn 2008 copy of SPRAT about this type of antenna. After I had read Peter G3LDO's column in Radcom, I lashed up the 25' version around a 5 metre roach pole and mounted it on a 6' fence post in my garden. I put a 4:1 current balun (all I had!) at the bottom and fed it into the shack via 50 ohm coax. Performance was OK on 20m but not, as you would expect, as good as from my 132' Windom so I eventually took it down. It's effectively a Zepp half-wave antenna and normally mono-band. I may revisit the design. My shack is in the loft and I have at least a 66' run to the bottom of the garden, so I could run a 66' no counterpoise antenna from the ridge of the house to the bottom of the garden on a slope (XYL doesn't approve of poles!). The feeder would be at the shack end and all of 10' in length. It would work on 40m quite well.'

Bill G4KKI who has been on QRP ever since I was a lad sent me a word of warning about the cheap loudspeaker cable available from 'Poundland' which was discussed on the GQRP reflector.

'Regarding the speaker wire from Poundland featured on the Reflector, I have used it and have a couple of the reels still here. What I would point out is the twin wires are not both copper. One is copper and takes solder without problem the other is silver coloured and it will not scrape bare. Neither will it take solder. I found this out when I made an antenna using the twin wire and needed to ground one of the wires!'

Thanks Bill for the warning and nice to hear from you again.

Windom Antenna from the US – Michigan QRP Club



George G3RJV sent me a couple of copies of the Michigan QRP Club publication 'The 5 Watter' which is a well known quarterly magazine in the U.S. An article on page 10 of the Spring 2007 issue by Rick McKee KC8AON discussed the FD3 antenna which is a variant of the old Windom antenna.

The arrangement allows a low SWR on 40, 20, 15 and 10 metres using a 4:1 or 1:1 balun and a 50 ohm feed line. The dimensions are obvious from the drawing and Rick suggests using a 4:1 balun on 40, 20 and 10m and a 1:1 balun on 15m. The antenna will also work on 30, 17 and 12 metres if a tuner is used.

This seems like a fairly simple multiband antenna that could go up from your front garden to the roof of your home and down into the back garden. There is the added bonus of the enjoyable challenge of making a pair of baluns, (watch out for the diagram of a switched balun in the future), and making an antenna from wire scraps for a few £'s that would cost you around £100 new in a plastic bag here in the U.K.!

Awards - G3MCK WABC

Apart from the initial flurry of activity, (mostly on the QRP reflector!), there have been two entries for the G3MCK WABC activity event during 2008. The first was G3JSR who has received his certificate and recently I have received a letter from Eric G0OTE who has submitted a list of 29 QSO's with 27 different counties. What is so special about Eric's entry is that he describes the equipment he used which consists of variety of transceiver and transmitters connected to his 130 foot long doublet.

Eric describes how he used a 'Taunton' from the Walford range, an Alinco DX70 which had problems staying down at the 2 watt level despite using a negative voltage into the ALC input, an FT101 with a steady 2 watts output and finally a 'Drayton' transmitter again from the Walford range along with a Howes direct conversion receiver. The direct conversion receiver lacked filtering but no doubt Eric has developed a good pair of ears to filter out the weak ones. Eric may not know but the Alinco can be switched internally from 100 watts output to 50 watts which makes it more stable at lower power settings.

Well Eric may not have the highest score but at least he was there and operated with a variety of interesting rigs – real experimental stuff. He receives a well deserved certificate.

Kevin G4CMZ has asked *'could you please confirm if the WABC award will be available in 2009? I've been working towards it since the 1st of January. I think this could be an interesting award worth going for and it could be expanded in many ways such as activating some of the more obscure areas. I'm going for 1 watt of RF and my total so far is 16 counties'.*

I see no reason why this award should not be run into 2009 and look forward to receiving more entrants this year. Finally – don't forget there is the *prize* of a CT Paddle from G3RJV for the best antenna article sent to me during 2009. I already have one article from US7IJW which will appear soon – any more? Spring is coming so a happy cat this time for you all. 72 and Good Luck with QRP as the year unfolds G3VTT

An Easy to Build LC Meter

I would like to draw readers attention to " A Surprisingly Accurate Digital LC Meter" to be found by putting that into an internet search engine or going to
<http://ironbark.bendigo.latrobe.edu.au/~rice/lc/>
I made one from the information on the site, my version uses a PIC 16F628, is built on Veroboard, uses a Maplin LCD display (N24AZ), I fitted it in a small plastic box, and it is powered by a PP9 battery.You will need a programmer for PIC microcomputers, and the ability to assemble the code found on the web site. Operation is simplicity, switch on, zero the unit, attach the component, and read the value directly from the display.
Mike G3XTQ

COMMUNICATIONS AND CONTESTS

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WINTER SPORTS 2008/2009

Whether we are yet climbing out of the sunspot minimum in any meaningful fashion remains to be seen, but whatever slight improvement there may have been in HF band conditions has been marginal. This is reflected in the comments made by many who participated and/or submitted logs. It remains true to say, however, that contacts can still be made, with plenty of enjoyment to be had. It may seem a challenge at times, but isn't that half the fun? We wouldn't want it to be too easy!

Support for the event remains at a good level with a selection of regular callsigns, and some very welcome newcomers. One callsign conspicuous by his absence was **GM3OXX**, George Burt, who was unfortunately not able to take part this year. His usual outstanding 1watt Winter Sports presence on the bands was missed, and commented on by quite a few.

My thanks to the following members who have taken the trouble to send their logs (via email or snail mail) and I congratulate them all on their efforts: **G0FUW**, **G0KQK**, **G0KRT**, **G0OTE**, **G0VGS**, **G3ICO**, **G3ILO**, **G3JFS**, **G3MCK**, **G3NUA**, **G3ROO**, **G3VTT**, **G3YPZ**, **G4FAD**, **G4GIY**, **GI4CBG**, **GM0NTR**, **GM4XQJ**, **GW0VSW**, **AB8FJ**, **DK5RY**, **IK1RDN**, **IK5XCT**, **PA3CRC**, **PA9RZ** and **RW3AI**. That's about the average number of logs received during the poor conditions but fewer, of course, than when the bands are/were really buzzing.

Snippets from some of the logs: **G0FUW** Steve used his homebrew BITX 20m SSB rig and a Cobweb. **G0KQK** Snip comments that he enjoys the event as it has such a friendly and relaxed atmosphere (at least, once the O QRP Contest is over!) that may encourage others to try QRP. **G0VGS** Ian has not been QRV with CW since his test in 1995 and found WS an ideal gentle re-introduction to the mode, making 26 contacts with his K3 and 5W into a W3DZZ. **G3ICO** George used his Elecraft KX1, K1 and K2 rigs during WS. **G3ILO** Steve was operating from his narrow boat, using 5W from his K2 into a 100ft end-fed supported by a roach pole. Thanks for the photos Steve. **G3MCK** Gerald makes the very valid point that "you don't need much gear to get on with QRP." I might add that it needn't cost very much, either! **G3ROO** Ian says that 160m opened the best it's been in ten years and sent a log crammed full of exotic 160m Dx, including North Carolina. Mind you, he does have the sort of antenna installation that most of us can only dream about! **G3YPZ** John made several QSO's using 4W of 80m AM from his Elecraft K3. **G4GIY** Robin has not entered a WS log before, but did so this year having had some fun with his KX1. **GM4XQJ** Brian didn't have as many entries in his log as he often does, but was delighted to have worked into VK6 on 20m and VE7 on 40m. I was one of the stations to have worked **GW0VSW** Carl on 80m CW while he was using a mobile whip mounted on a baking tray parked outside his shack door on the landing floor. Carl used the same set-up to work into OZ8. Once again, there was an impressive list of rigs used by **AB8FJ** Ted during his Get The Rigs On (GTRO) WS: Tuna Tin II, xtal controlled Howes AT-160 with Ten Tec 1253 regen Rx, Norcal 38 Special (300mW), DSW-II 20, Universal Tx (20m vxo), Argonaut II, and an Argonaut V with which he made 4 AM contacts. The best 20m DX for

IK5XCT Stefano, using 5W from his K2 and a Butternut HF9V, was A45XR. Another 'first time log' came from **PA3CRC** Gert who kindly sent me a photograph of his homebrew valve station, and hand key. He was pleased to work into C31 on 80m despite the pile-up. **PA9RZ** Robert decided to follow George Burt's fine example from previous years and turned the wick down to 1 watt on all bands. **RW3AI** Valery clearly likes contesting as he sent a huge log of QRP contacts, all made during different contests that took place during the same period.

Based purely on the quality and quantity of Dx worked, one can easily argue that G3ROO's log is top of the pile but the most unusual log, and you could say the most in the true spirit of QRP, undoubtedly came from Colin, **G3VTT**. He has kindly provided a write-up of his activities, including some photographs that paint a very vivid picture of the portable operation he (along with **G3YVF** and **G0LJD**) undertook from Coombe Beach. I'm sure you'll enjoy reading Colin's report, which is printed elsewhere in this magazine, and join me in offering congratulations to the **'Invicta QRP Club'** on winning the G4DQP Trophy.

QRP CALENDAR CORRECTION (HTC QRP SPRINT)
HB9BQB advises me that the HTC QRP Sprint is always held on the 2nd Saturday of September, and that the 2009 event will therefore take place on the 12th. Guido suggests visiting www.htc.ch for further details.

INTERNATIONAL QRP DAY 2008
It had escaped my attention that I'd received no entries for last year's June 17th event, but I discovered recently that, uniquely, Bob **2E0ATZ** had indeed submitted a log. Mysteriously, it did not arrive. I always acknowledge receipt of any logs submitted by email, but not when they are submitted by snail mail, and obviously have no way of knowing whether any go astray.

By his own admission Bob's log is a modest one, due mainly to band conditions being less than helpful, but does include a 2-way QRP CW QSO across the pond. Whilst the QSO was with a station outside of Region 1 (see rules page in Members Handbook) it does demonstrate that Bob was active on the bands and successfully looking for QRP contacts, which (I see from my log) is more than I managed that day! He used a Ten Tec Argosy, MFJ tuner and G5RV antenna. Bob has shown that it is always worth taking the trouble to submit a log as you might just win, and he has won! As soon as we can organise it, the International QRP Day Plaque will be on its way to you Bob – many thanks and congratulations.

CHELMSLEY TROPHY 2008
At the moment, I have received three logs. I don't have the space to include details this month but will do so in the next issue. This gives you all one last chance! Have a look at the list of requirements (in the Members Handbook) and put an entry in the post (or email) to me – but please be quick.

That's all we have room for this month. If you have anything for inclusion in the next issue, the deadline for this column is the beginning of May. In the meantime, enjoy your radio and have plenty of QRP FUN.

72 de QRPeter

MEMBERS' NEWS

by Chris Page, G4BUE

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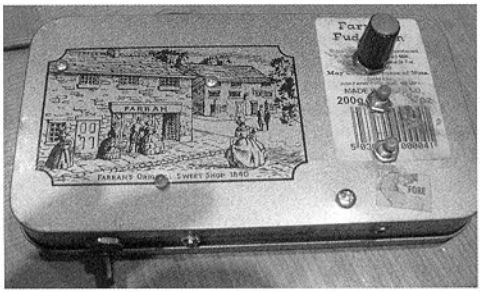
It is always worth checking 10m, even in these generally poor HF conditions. On 29 November, **G3XBM** was, "Lucky enough to work **3X5A** on 10m CW with 5W and the Homebase-10 halo antenna. Conditions on 10m were not at all good although **D4C** popped up out of the noise from time to time as well as the odd European. This time next year things should get a whole lot easier". Let's hope Roger is right about later this year. **G4ICP** also worked **3X5A** on 10m on the same day, plus some Europeans. Richard also used a Homebase 10 antenna, mounted in his loft, with 5W from the FT101Z and says, "The antenna is proving to be very good and is not upset by clutter in the loft, proximity to the roof etc, which now includes my capacitor loaded loft doublet which I use on 80m.

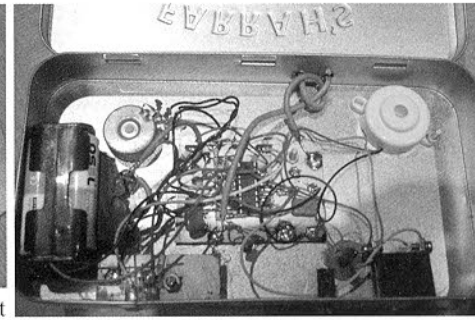
WB3AAL has been hiking on the Appalachian Trail in Pennsylvania every month since March 2000 with his QRP HF radio. The first time, Ron made eight QSOs from the trail (four with USA and four with Europe) and has now logged a total of 1024 QSOs, 1000 on CW. He always has fun talking to the other hikers and explaining what he is doing with his radio and wires. When a hiker is watching Ron write down on paper where the station is located and the operators name, there is a look of amazement from the hiker. Ron can't wait for the propagation to pick up so he can make a couple more QSOs into Europe. The picture on the left shows him operating on the Trail on 23 January 2009.

DL2BQD reports that **NT7S** has opened *QRPedia* at <http://www.qrpedia.com/node> which could become an interesting meeting place. There are some good notes on the Pixie and Flea and its modifications, there. Dieter is seeking informationfor his *Workbench Hints* at <http://www.qrpedia.com/book/200812/workbench-hints-and-more-hints>. **G3CWI** used the ARRL DX CW Contest to experiment with some audio filtering on a simple 40m DC transceiver and wondered how a single stage LC lowpass filter might sound. A faulty switched mode PSU provided Richard with a 17mH choke and the addition of a 1uF capacitor gave him the filter. He says, "I was pleasantly surprised by the improvement even this simple circuit made. Well worth the five minutes that I invested in the design and implementation(!) It's not a 'brick-wall' filter of course, but it makes listening much more pleasant". See <http://www-users.cs.york.ac.uk/~fisher/lcfilter/>.

G3UGF says photographs from the new QRP Convention venue at Rishworth have been uploaded to the files section of the GQRP Yahoo Group. **G3XIZ** is looking for 500kHz and 80m cross-band QSOs. Chris says, "I am surprised at the low take-up of G-QRP operators using this MF band as it is ideal for the those who build their own equipment and like to use CW". **KDØFNR** has created *The New QSLMapper* to find out how far QRP calls with his Rockmite are going. Hamilton's Mapper shows the path between any two stations, their QSL address, the distance between them and the miles/kms per watt, see <http://copaseticflow.blogspot.com/2008/12/new-qsl-mapper.html>.

G3YMC entered 20m in the QRP Section of the 2008 CQWW CW Contest with 5W from his K2 into his low 65 feet long-wire. Dave made 340 QSOs and 73 multipliers for a claimed score of 47k points and says, "Certainly hard going on QRP but enjoyable". **G3LHJ** entered all bands with his K2 and made 627 QSOs for a claimed score of 265k points. Derrick only made one local G QSO on 10m, 20 QSOs on 15m and none on 160m as he does not have an antenna at present. **AC8W** and **K8DD** were QRV as **YN2DD** in the 2009 ARRL DX CW Contest and were QRV QRP on the Thursday before on 40m. **G4ICP** worked 11 of the 12 Dutch provinces on 80m in the recent PACC Contest with 5W to his indoor doublet.



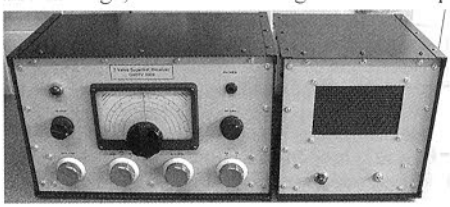


GØBAK has been using a FT-817 for the past year, and with 5W to only 25 feet of end-fed wire, it has brought him great pleasure on 80m. Bill is amazed what can be done with such a short length of wire at only a low height. He writes, "I am usually on 80m 0630-0700z and have found little activity around the QRP calling frequency in winter, however quite a few contacts have been made in the summer. I have built the Willow 40m transceiver, (see the PDARS web-site <http://www.pdars.com/pages/construction/index.php>) and have modified the original VFO and put in a DDS VFO. I built the DDS and the PIC control circuit dead bug style, so there is hope for those of us who cannot solder. I also built a sweep generator the same way; this is an excellent project and connects to the PC to produce bandwidth graphs etc. This circuit etc is by **OM3CPH** and his son **OM2PH**, and I would really recommend it. My latest project is a PIC keyer by **DL4YHF**, see <http://freenet-homepage.de/dl4yhf/pic_key.html>. The case is an old fudge container left over from Christmas!" (see the two photographs above).

G3YMC used the 2009 ARRL DX CW Contest for an interesting experiment on 20m spurred on by a chap on the CDXC reflector bragging that he had worked **K3LR** with 100mW. Dave says, "Knowing that working the USA is easy with 5W, I decided to repeat his experiment. First off I turned the K2 power down to an indicated 1W and had easy QSOs with **W3LPL** and **K3WW**. So down it went some more. On the 0.1W position there is absolutely no indication that I am radiating as no LEDs light, and so I am not sure whether it is remotely close to 100mW actual power (I have no other means of measuring it). Anyway after a few abortive calls I managed to QSO **W1WEF** - it took a number of repeats so obviously the signal from my longwire was pretty marginal, but I completed the QSO and chose to send my power as 1W rather than complicate matters with a decimal point. Then I found **K3LR**, the station of the original CDXC experiment. I called him at 0.5W and it still took a few goes as he had several people calling him, but I managed another good QSO, just a slight request for repeat that I had sent '599 1W' which he duly repeated back to me. Conditions to the USA were ok but nothing out of the ordinary, so in good conditions, when the sunspots are back, it will probably be very easy. But at the moment with wire antennas anything less than 1W is a bit marginal".

G3VTT comments on Dave's experiment, "I've checked my K2 against my Racal Dana 9100 absorbtion wattmeter and at zero RF (ie no LEDs alight and 0.1W on the dial), you get 50mW out. At the 1W level you get.....one watt. Somebody did their sums right...it appears Dave might have had less power than he thought". **GØUCP** also used the ARRL DX CW Contest for some QRP tests. John writes, "Like Dave I did some tests, though not at such low power. With 4.5 Watts I had three QSOs with the USA, two with PEI, Canada and one with VO. The antenna was a horizontal dipole, under 10 feet long and 6½ feet above the floor at a downstairs window. I have contacted the USA with 2W with this antenna but there is a limit to how much you want to try the good nature of a man in a hurry with a kW to a five element beam! Details of this small inductively tuned dipole, provisionally called the *Vista* are with *RadCom*, but if rejected by the Technical Committee, I will offer it to SPRAT".

The photograph below shows **G4DFV**'s winter project, the resurrection of a design for a seven valve receiver featured in the 1949 *ARRL Handbook*. It was originally designed to have a regenerative first IF stage, but after suffering considerable problems trying to 'tame the beast', Duncan decided to settle for a standard IF amplifier instead. Using all-metal valves, the line up is 6SG7 RF, 6K8 mixer/osc, 6K7 1st IF, 6K7 2nd IF, 6SQ7 Det, AGC and 1st AF, 6F6 audio output and a 6J5 as BFO. He says, "It tunes 80m and has a 470kHz IF and performance is quite good comparable to an AR88. It is powered from a matching mains PSU/speaker unit. To complete the line-up, future plans are to build a matching 80m SSB/CW QRP transmitter (with valves, naturally!)".



F5VLM says the <http://www.askjanfirst.com/dindex.htm?/loet stelle-e.htm> web-site has a range of kits that are a little different to the usual QRP kits, using valves etc. John says that although the web-site is in German, there are some explanations in English. **VU3SUA** reports the Bitx Version 3 complete kit is available on his web-site at <http://www.cqbitx.blogspot.com>, together with some other exciting projects. **G3ROO** reminds us that *Google* has a translate feature: go to the *more* at the top of the Google search page, then to *even more*, then the second column *translate* and copy/paste <http://www.askjanfirst.com/dindex.htm?/loetstelle-e.htm> and select *German >> English* from the list. Ian says it is not a perfect translation, but is more than good enough to see what all the sections of the above web-site are about.

G4KKI was pleased with how well his new Rock Loop worked, and after thinking about using it on the LF bands, he made another one and pinned it to the shack wall. The biggest loop Bill could put up was six feet square; he used a T68-2 toroid with 40 turns of 28 SWG to link to the coax feed to the transmitter and left the five turn link on the main loop the same. He then used a dual 365pf capacitor to give 730pf, and found it tuned on 160 and 80m. Not expecting much from it, Bill called several stations in the CQWW Contest and worked stations in the UK and PA. He then changed the thin wire to some two inch wide copper foil and after QSOing **OK1CZ**, hot glued it to the wall where it is doing better than all expectations.

The 'Congratulations' paragraph this time includes **F5NZY** for his first ever FK (New Caledonia) QSO in December with 5W. The QSO was long-path at a distance of 14,462 miles from Steph's QTH. **G3JFS** for a QSO with **K5D** (Desecho) on 80m with 5W using his bent 120 feet end-fed wire and Smart Tuner. Peter actually QSO'd **K5D** twice, ten minutes apart, as they copied his call as **G3JFI** the first time! **GM3OXX** for a two-way QRP QSO with **XW1B** on 1 February after **GM4YLN** telephoned to alert George that **XW1B** was QRV with QRP. Chris also worked **XW1B** a few minutes later. And finally **G4KKI** who received his A-1 Operator Club certificate from the ARRL.

The photograph on the right shows **GU3TUX**'s recently completed Oak Hills Research 500 QRP transceiver. Nothing unusual in that, you may think, but Chris started it in May 2003! He put it aside when he made the decision to retire and emigrate to Sark and only got round to picking it up again at the beginning of February. He says, "It is a 100 per cent analogue radio and works very well. The kit is hard work as there are plenty of toroids to wind and many, many wires to interconnect the three PCBs. It worked first time, although some of the variable pots/trimmers needed cleaning after years of storage".

GØEBQ was pleased to receive a quick QSL for a 17m SSB QSO with **TO5X** using his BITX. Welcome to new member **MØRNA** who is mostly QRV on 80m CW with a FT-817 and a long wire (130 feet about 26 feet high). Steve says, "As a fairly recent convert to QRP, I am wondering why I ever bothered with higher power levels (and higher electricity bills). I am finding that most of the time, if I can hear them, I can work them". **G4KKI** has been out portable in the Pennines on many occasions using his MFJ-9040 or SW20+ with a 66 feet end fed wire held aloft with a big eight cell para foil kite. The first time he took the MFJ out, he thought it was dead because the noise level away from habitation was so low!

ON6WJ and **F6EJU** have built a replica Paraset (WW2 spy transceiver) and Jos QSO'd **G3VTT** with it to make a two-way Paraset QSO, as Colin was also using his Paraset. Jos has made pictures of his available at <http://www.flickr.com/photos/28834875@N02/>. **GWØVSW** is now QRV again using a QRP Plus, 5W to an indoor 'Crown' wire loop (about 106 feet wire) fed through a 4-1 balun and tuned with a LDG Z11 auto tuner. Carl sends an impressive list of stations worked 40-15m in all continents. **G3JNB** embarked on a personal '10W DXCC' project for 2009 and although he holds a 'real' QRP DXCC, he thought that the continuing poor conditions, plus a reduced antenna size, merited a spot of QRO. Victor managed to work 51 prefixes in January, including ZD8, VE7, UA9, 4Z4, TS7, OX3, KP2 and CU5; business slowed in February and he found **K5D** somewhat diverting!

G4EFE planned to be QRV from Malaga, Spain at the end of February with his FT-817. The battery pack died a long time ago and Martin, "Bought some 2900mAH AA cells and put them in the battery holder; done the so-called green wire mod, which will enable charging to the battery holder, and done a small mod (added a resistor) to increase the charge rate so now I can fully charge these cells in eight hours - still a long time, but better". **ON4NIC (MØNJP)** is QRV on 80 and 40m in Brussels with an inverted vee, "Sandwiched between our houses and flats". Nick has made friends with **ON4UAP**, also from the UK, and is currently trying to decipher PSK using his Mac iBook with MultiMode and fldigi software. **G3XIZ** has been working plenty of stations (including **G3XBM**) on his version of Roger's 15mW QRPp 80m micro-transceiver (the FETer).

A tip for visitors to ZL from G3XBM, who is currently touring New Zealand, is to take a small UHF handheld and program in the channels for the NZ Amateur Radio National System. Channels are linked (5MHz repeater offset) so that it covers the whole country as one linked system. Channels are all below 440MHz, unlike on 2m where they are above 146MHz, so no rig mods are needed. Using his little QRP VX2 handheld, Roger has had several QSOs from hotel and B&B rooms up and down New Zealand. As one station said, "They know you're coming", as stations down south can listen in to the QSOs further up the country. No tone access seems to be needed.

The photograph on the right shows Roger trying to operate on 25 January, before he left for New Zealand, but hindered not only by being QRP, but also because of his little grandson sitting on his knee. It's also a good view of Roger's 'all QRP' shack showing the various rigs in current use. These include the Elecraft K1, Elecraft T1 ATU, the FT-817, IC-703 and an MFJ Cub. Out of view are the ultra-simple homebrew rigs.

M1MRB writes, " My son Colin and I have decided to record a fortnightly amateur radio podcast called *ICQ Podcast*. The aim is to help new entrants to the hobby, like Colin, to learn and understand the technical detail to attain their licence, while providing experienced operators a combination of news, options, upcoming events features and reports. The podcast is recorded for amateurs and including amateurs. Previous episodes have covered topics including operating on holiday in Cyprus, an introduction to building an 80m SSB kit and other technical topics. We are looking for other contributors to become involved with views and radio topics. If you are interested, please e-mail me at <info@icqpodcast.com>. Please visit our website at <http://www.icqpodcast.com> or search iTunes for *icqpodcast* and download an episode or two. For those of you who need help downloading episodes, I am willing to talk you through downloading these podcasts. For those who don't know, a Podcast is an audio file which has been compressed into MP3 digital format, and can then be played on a MP3 Player, a computer, or some CD players that can read this format direct from a disc.

Our condolences to the family of **DJ7ST** who became a Silent Key on 9 January. Hal was a very early member of G-QRP Club (110) and the organiser of the very popular AGCW-DL QRP contests for many years. Our condolences also to the family of **W9PNE** who became a Silent Key at the beginning of February. Brice was one of those amateurs I describe as a 'wireless pioneer'. He was known around the world as 'Mr Milliwatt' for his QRPp work and was a big inspiration to me when I started 'milliwatting' in the late 1970s. He also set several VLF distance records and had been a radio amateur for 77 years. Both Hal and Brice will be sadly missed by the QRP world.

M1KTA has built two **G3XBM** FET transceivers, one for 80m and one for 10m. Dominic has reworked the design of his **VU2HMY** transceiver and posted the details at <http://shipwreck.yi.org/documents/projects/homebrew/vu2hmy_HMY2K8_All_Band_SSB-CW_XCVR.pdf>. The QRP2004 project group that he started in December now has potentially 75 members with 15 kits shipped (11 to DX) and components sent to six others. Dominic has also put a MkVII 'Wadden' spy set together, after buying the pieces at a rally, and will use it /P on 80m this summer in Normandy, France. **G3TLH** is enjoying his new K3, but will keep the K2 that he built as he regards it as a personal achievement, "I don't really like soldering and am not very good at it (even though I've been doing it for 40+ years)".

G4GXO has tried developing a 'digital' alternative to a multi-turn pot for tuning varicap VFOs. The approach uses a low cost encoder, an eight pin 12F683, 5V regulator and a few resistors and capacitors to generate a pulse width modulation (PWM) signal at a few kHz, which is then low pass filtered by a resistor and a capacitor to produce a DC voltage. Ron writes, "Turning the encoder changes the PWM duty cycle and hence the filtered DC output level. Tests using a 7MHz VCO have been very rewarding with no detectable sidebands from the PWM fundamental and over 80kHz of coverage with the 5V tuning range. The design offers dual rate tuning and programmable tuning direction - set on power on. There is plenty of scope for further development in this area and I hope to be able to present the design in a future SPRAT".

My thanks to everyone who contributed to this larger edition and to George, G3RJV, for letting me stretch to four pages this time. Don't forget to let me know how your spring goes, by 20 May, please.

QSL Cards from Nasko - LZ1 YE

LZ1YE has sent me details of some attractive QSL cards including the Club Log.
Members can make their orders by sending samples, explaining what they want to print, and sending the materials: photos, files...etc via e-mail: qsl@qslprint.com or qsl@kz.orbitel.bg or if no internet access via the postal address: Atanas Kolev, P.O.Box 49, 6100 Kazanlak, Bulgaria. Examples of cards and prices can be seen at **www.qslprint.com**
For people need QSL cards urgently LZ1YE dispatches three days after the payment is made. UK Members can pay via a UK address: Please send your cheque / cash via recorded delivery to: LZ1YE QSP Print service, c/o Melanie Rowe, St. Leonards House, 35 St. Leonards Road, Exeter, EX2 – 4LR, Devon. e-mail: m0mja@aol.com (make cheques payable to : Melanie Rowe)

GQRP Club Sales

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

Antenna Handbook – 2nd edition – members £6.00, non-members £10.00 plus post } £1.00 (UK); £2.30 EU
Radio Projects volume 3 – Drew Diamond – members £5, non-members £10 plus post } DX - £3.90 per book
6 pole 9MHz SSB crystal filter 2.2kHz @ 6 dB, 500ohm in/out **£12 plus post** }
Pair LSB/USB carrier crystals HC18U wires - [9MHz ± 1.5kHz] **£6 pair** } All components
MAR-4 RF amplifier - £1.50 } plus **postage**
HC49U (wire) crystals for all **CW** calling freqs – 1.836, 3,560, 7.028, 7,030, } **(ANY quantity)**
7.040, 10.106, 10.116, 14,060, 18,096, 21.060, 24,906, & 28,060 - **£2.00** each } 60p (UK),
HC49U (wire) crystals for DSB on 40m – 7.159MHz - **£2.00 each** } £1.20p EU,
HC49U (wire) crystals – 10.111MHz – 50p each } £1.70p (DX)
HC49U (wire) crystals – 3.5795MHz, 3.6864MHz, 4.1943MHz, 10.0MHz, } If
13.50MHz, 32MHz – 30p each } ordered
Miniature crystals (watch crystal size – very low power) – 7.030, 10.106, } with
18.096, 21.060, 24.906 & 28.060 – limited quantities - **£2.00 each** } heavier
Ceramic resonators – 455kHz, 2.0MHz, 3.58MHz, 3.68MHz & 14.30MHz – **50p each** } items
Polyvaricon capacitors – 2 gang (A = 8 to 140pF, O = 6 to 60pF) c/w shaft ext & mtg screws - £1.20 each } use that
Schottky signal diode – 1N5711 low fwd volts for up to vhf/uhf **20p each** } max of 5 } postage.
Varicap diodes – **MVAM109** – 40pF @ 9v, 500pF @ 1v. **75p each** } max of 2 }
– **MV209** – 5pF @ 12V, 40pF @ 1v **35p each** } per member } plus
SA602AN - £1.75 }
MC1350 - £2.00 } 10%
LM386N-1 - 4 to 15v, 300mW, 8pin DIL - **£0.40** }
CA741 op-amps 8pin DIL – **5 for £1** } of this
2SC536 transistors (npn) fT - 100MHz, hFE-320, VCBO+40V - **5 for 50p** }
MPSA92 transistors (pnp) fT - 50MHz, hFE-40, VCBO-300V - **5 for 50p** } postage
IRF510 FETs - £1.25 }

Toroid cores – **Priced per pack of 5 – max of 2 packs of each per member**
T37-2 – 75p; T37-6 – 75p; T50-1 – £1.00; T50-2 – 90p; T50-6 – £1.10; T50-7 - £1.20; T50-10 – £1.20;
T68-2 - £1.80; T68-6 - £2.20
FT37-43 – 80p; FT50-43 - £1.20; FT37-61 - £1.00; FT50-61 - £1.20;
BN43-2402 - £1.00; BN43-202 - £2.00; BN43-302 - £2.00; BN61-202 - £2.00
Ferrite beads – FB-73-101 (3.5mm dia x 3.2mm long, 1.2mm dia hole) – **40p for 5**
All toroids are plus postage – up to 5 packs = 60p (UK), £1.20p (EU), £1.70 (DX); Each additional 5 packs please add 50% of the same postage etc.
(please note – if you order 2 packs – you will probably get all 10 in one pack)

Binders for Sprat - the original 'nylon string' binding type back in stock again! Black with club logo on spine **£3.75 each plus postage** (one: UK – £1.00, EU – £1.80, DX - £2.40. More – add 80p, £1, £1.20 each)

Back issues of SPRAT are still available at 50p each. I have most issues from 78 plus a few earlier ones. UK Postage is 1st magazine – 50p, each additional magazine add 40p.

Sprat-on-CD V3 – 1 to 132 (see Sprat 132) – members price - £5 plus post UK - £1.00, Eu - £1.20, DX - £1.70
I have sold out of the large toroids, and the 9MHz CW filter - no more are expected.

Please note - I only have stock of the above items – I do not sell anything else. Anything in previous advertisements not shown above is out of stock – if it becomes available again – it will be in the next magazine.

To keep within second class postage limits, orders may be sent in more than one package!

Cheques (UK) and payable to G-QRP Club. Sorry, but cheques in other currencies are uneconomical to us due to bank exchange charges!

Visa/Mastercard. - Due to insurmountable problems, we have now ceased to accept credit card payments – sorry to anyone this affects – if it really stops you buying from the club, or paying your subscription - please contact me and we will sort something out.

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

MINIMUM ORDER for cheque or PayPal payments is £5

For orders less than £5 – please use postage stamps (any denomination £1 or less please), or cash. We can accept cash in GBPound, or US$, or uros – but please send securely!
You can order via e-mail to g3mfj@gqrp.co.uk Pay by PayPal please.

PayPal is very successful – if you can use it, please do – it is easy! Send the order to Paypal using g3mfj@gqrp.co.uk - show clearly what you want with the payment – pay in GBPounds please - and include your membership number!