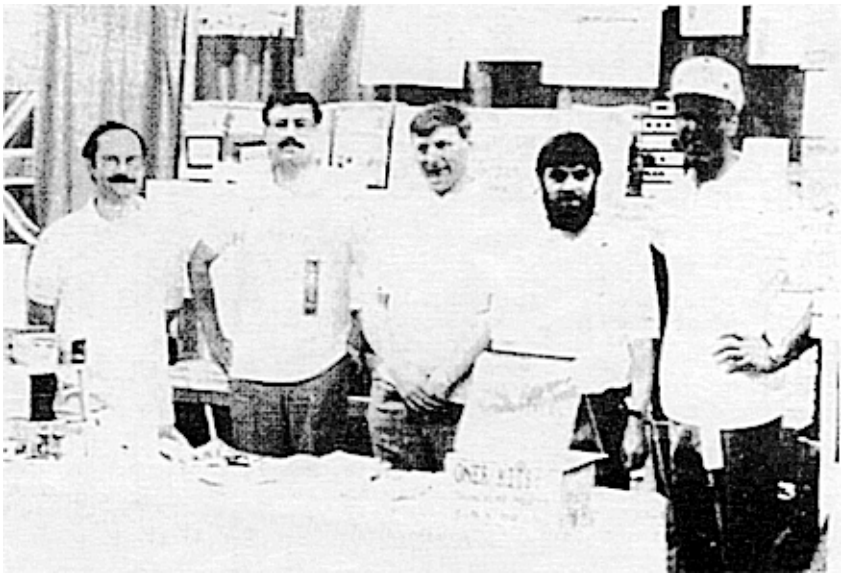
SPRAT

THE JOURNAL OF THE G-QRP CLUB

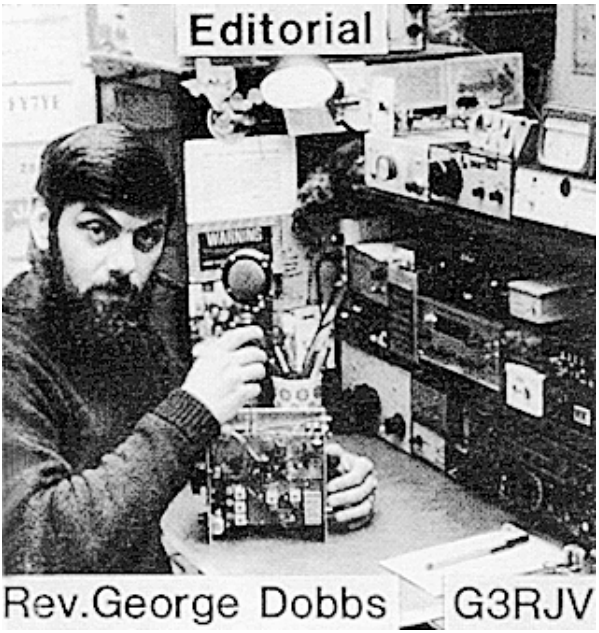
DEVOTED·TO·LOW·POWER·COMMUNICATION

ISSUE NR. 51 | © G-QRP CLUB | SUMMER



PICTURED ON THE G QRP CLUB STAND AT DAYTON
G4LQF, G3VTT, G3PDL, G3RJV, AND G3BUE

MLX APPLICATIONS - BREAKIN & SIDETONE - RF SNIFFER - USING A 4066
TTL TRANSMITTERS - SMALL TRANSISTORS IN PA CIRCUITS - THE QRP 80
ROOFRACK MOBILE ANTENNA - G QRP CLUB IN DAYTON - SPECIAL CLUB OFFERS
AWARDS NEWS, VHF NEWS, MEMBERS NEWS, OPERATING AND CONTEST NEWS.....



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OL11 3HE.
Rochdale [0706] 31812

One of the best things about radio conventions and rallies is meeting other amateurs and certainly those of us who went to Dayton enjoyed meeting the QRPers in the U.S.A. (See the report in the centre pages). May I thank them here for their hospitality and help, with a special word of thanks to Bill, N8ET, and his family.

I, and I understand G8PG, had the pleasure of a visit from Rai, VK7VV, a few weeks ago. Rai is the editor of LO-KEY, the Australian QRP Journal and I can recommend the VK CW Operators QRP Club and Lo-Key as a good a growing club.

R.S.G.B. HF CONVENTION 1987 : September 26th, Belfry Hotel, Nr. Oxford
Yet another good chance to meet members and the G QRP CLUB will be there. We do require help with the club stand. If you intend to go and can help, please contact G3VTT : Colin Turner, Hurley, Weavering St. Maidstone, Kent.

Check out the CLUB OFFERS page, we brought you some good things from Dayton, pity space did not allows us more.
Hope to see on the the bands 73

G QRP CLUB CARDS

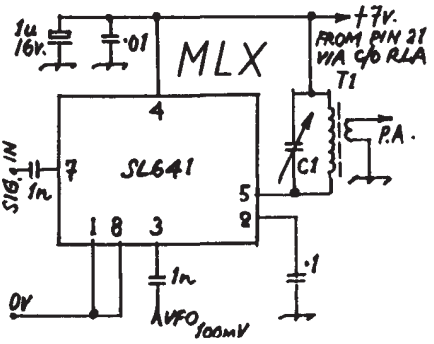
All members of the club will have received in SPRAT 50 an order form for the new club QSL Cards. Please note the following:
1) Make out all cheques to: G QRP CLUB
2) The price stated is for 5"x3" Black ink on standard colour, with printing on one side only. Other colour inks or double sided costs extra. The standard card colours are: Yellow, White, Pink, Gold, Grey, Cream, Marine Blue, and Buff.
3) Special Artwork, Printing on rear etc, can be quoted on receipt of an sae. Special badges can be added at no extra cost if a clear black on white copy of the badge is enclosed. This can be any size and is copied photographically.
All enquires and orders to: Dave Aizlewood, G4WZV, 36 King St, Winterton, Scunthore, South Humberside. DN15 STP

APPLICATION NOTES FOR THE MLX SSB BOARD

Mike Hanley G4JXX

Alternative circuits for use with the Dentron MLX 9MHz SSB Transceiver board (SG9 Board). Circuit modifications refer to the Short Wave Magazine articles by G3RJV.

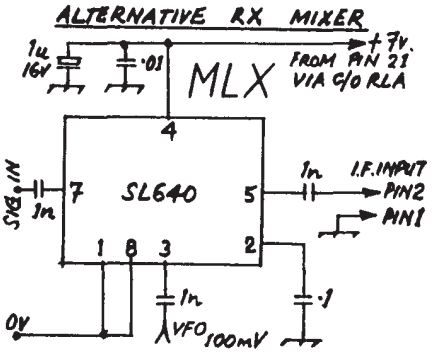
ALTERNATIVE XMIT. MIXER



80 metres

C1.160
T1.52T 30swg
T50-2 pri
7T 20swg
sec.

ALTERNATIVE RX MIXER



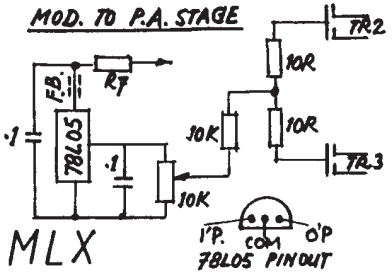
Note 1. Reduce VFO output to 100mV.

2. In SW Mag article, RX input pins SHOWN REVERSED. (P1 and P2).

3. Also volume control wiring wrong P3 is wiper of pot. not ground.

4. No matching required into MLX from 640 O/P.

MOD. TO P.A. STAGE



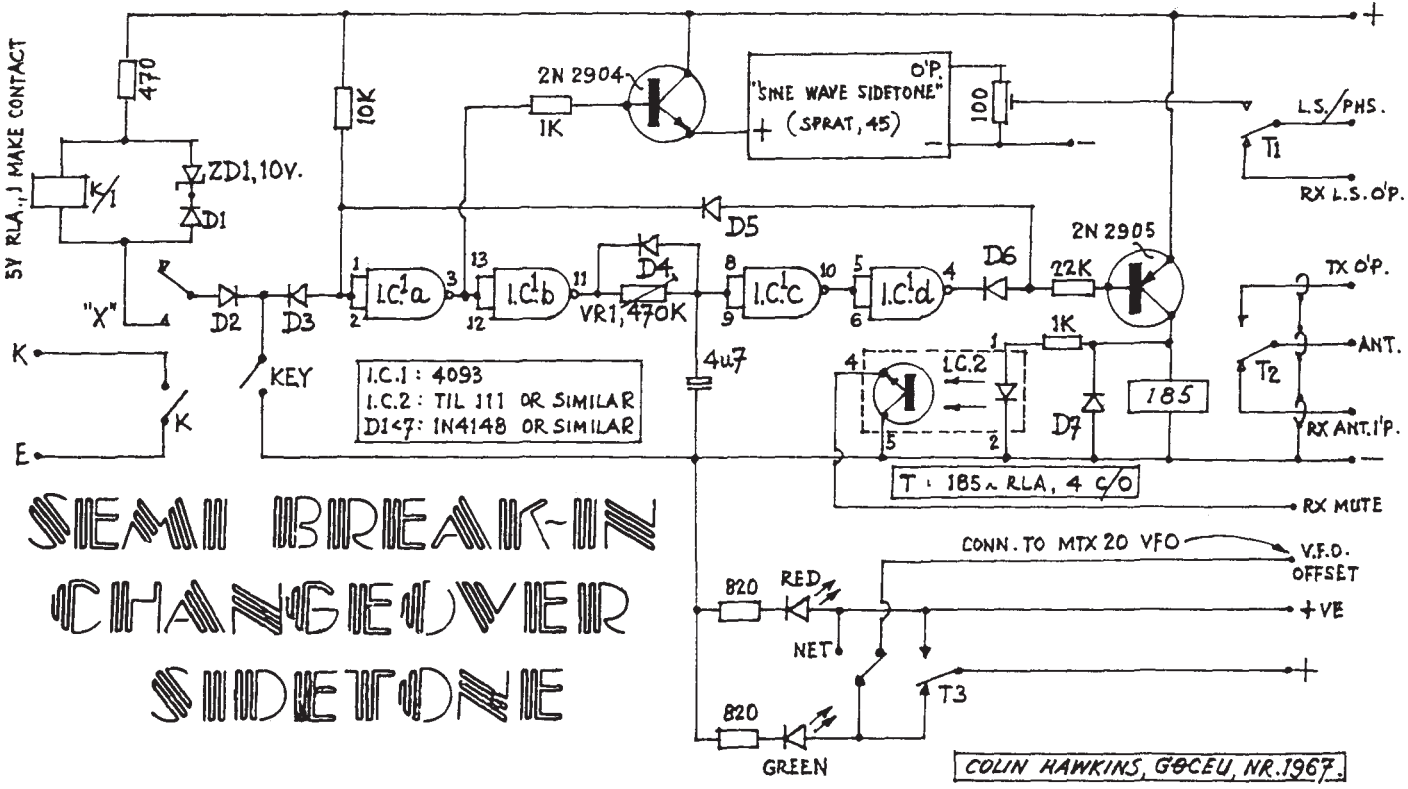
Note 1. Power Amp requires about 1.5V Pk-Pk input for 4 watts O/P on 80 metres.

2. Reduce VFO output to 100mV Pk-Pk

Change ZO1 from zener to 5V 100mA regulator this improves stability. But be careful to decouple as close to regulator as possible.

SUMMER RAMBLE 1987
June 13th to 21st, all hf band QRP frequencies. Please try to be active on Wednesday, 17th June, which is International QRP Day. The station submitting the best log of QRP activity on that day is eligible for the Suffolk Trophy; see SPRAT No.45, page 25 for full rules). Basically, work as many Region 1 IARU countries on as many bands as possible and add them all together for your final score. Maximum power you con use 3W rf or 10w pep. See you on the 17th.

ROD YOUNG G4MQH
We regret to announce the untimely death of Rod, member 2076. Rod was a keen constructor and contributed to SPRAT issue 44. Rod leaves a wife Carol who is to continue receiving SPRAT and hopes to re-activate Rod's class B call in the future.


SEMI BREAK-IN
CHANGEOVER
SIDETONE
5V RLA.; 1 MAKE CONTACT
470
10K
ZD1, 10V.
K/1
D1
"X"
D2
D3
KEY
K
E
2N 2904
1K
O/P. "SINE WAVE SIDETONE" (SPRAT, 45)
100
L.S./PHS.
T1
RX L.S. O/P.
D5
D4
VR1, 470K
4u7
I.C.1 : 4093
I.C.2 : TIL 111 OR SIMILAR
D1<7: IN4148 OR SIMILAR
I.C.1a
I.C.1b
I.C.1c
I.C.1d
D6
22K
2N 2905
TX O/P.
ANT.
T2
RX ANT. I/P.
1K
I.C.2
D7
185
T: 185 ~ RLA, 4 C/O
RX MUTE
CONN. TO MTX 20 VFO
V.F.O. OFFSET
820
RED
+VE
NET
T3
820
GREEN
COLIN HAWKINS, G8CEU, NR. 1967.

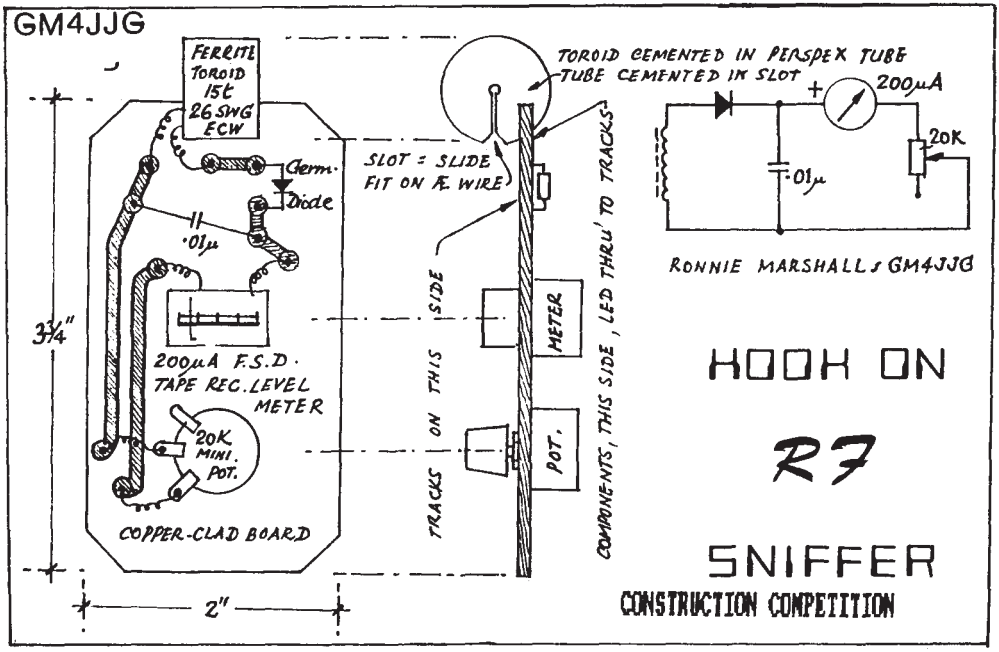
SEMI BREAK-IN CHANGOVER AND SIDETONE CIRCUIT
By Colin Hawkins G0CEU

This circuit was constructed for use with a Howes MTX20 board and an R1000 receiver. VR1, sets the hang time and VR2 the sidetone level. The sine wave sidetone was described by G40QQ in Sprat, number 45, Page 20, and is ideal for this application because it will feed a low impedance loudspeaker or headphones directly.

To get the last ounce out of the MTX20 board a "metal" connection from the keying point to 0V is required, hence the use of relay K may be omitted and the keying point on the MTX board connecter to point X. In this case D2 should not be omitted as it prevents the base - emitter junction of TR2 (on the MTX) being reverse biased during key up periods. A contact of relay T is included in the keying circuit as the Howes board did not always fire if the keying point was earthed before the positive supply was connected to the oscillator.
An opto-isolator was used for RX muting as it was available and it saved a relay contact.

A net button and a vfo offset facility is shown. If a V.F.O. is used it would be left running during receive periods and the +ve point on the MTX board could then be directly connected to the positive supply and contact T4 could then be omitted from the keying circuit (the writer has not as yet used a VFO)
Although the MTX 20 was used by the writer any similar transmitter could be used with this circuit. The prototype (apart from relays and front panel mounted items) was built on a piece of veroboard 4" X 2" and fitted in the transmitter case. The circuit could however be built as a separate unit and connected to whatever transmitter was in use.

The connections to the output of the opto-isolator are currect as shown for the R1000 RX which has negative muting. They may have to be reversed for other receivers. An opto-isolator would probably not be suitable for muting valved receivers and an additional relay contact would be required.



IS THERE A 4066 IN YOUR RIG?

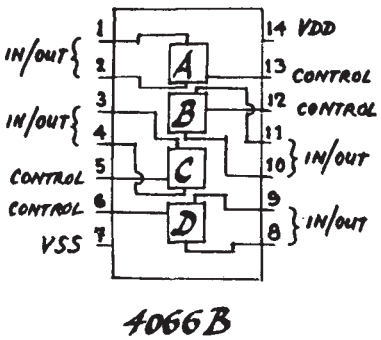
By Peter Linsey G3PDL

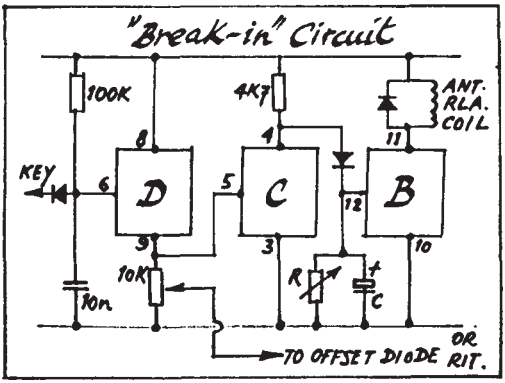
Credit is due to Matt Volkert, DK4SQ, for the use of a 4066 as an RIT switch in Sprat 38, Page 12. I wanted to provide a variable offset during receive in a transceiver using a DC rx and the 4066 did the job beautifully. Since we first met, the 4066 and I have become firm friends.

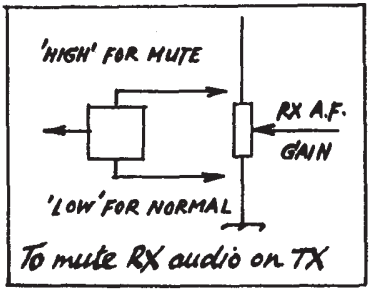
It occurred to me that I was only using a quarter of the chip and started looking for things to do with the rest. So what is a 4066? My chip book said it was a quad analogue switch. A bit more poking about and I began to see how useful it really is. Basically it is just four CMOS switches that can be turned on or off by putting a voltage on a control line. With 0 volts on this line the switch is open (well, 10000000000000 ohms anyway,) and with more than half the supply voltage on this line the switch is closed (80 to 270 ohms.) It can pass DC for switching RIT / relays etc, passes audio with low distortion, and handles RF up to 40 MHz. It switches on and off at up to 10 MHz and is certainly a QRP device with a supply current of 0.5 microamps. The peak voltage to be switched should be no greater than the supply voltage so don't try it on the mains! It looked like the answer to a lot of problems so I started looking for problems to solve.
The spare switches made LEDs blink on TX/RX. This identified a limitation. If you want to pass more than 5 or 6 mA through it, make pins 2,3,9,10 the negative connections to the four switches. The spare sections were tnen used to make a semi break-in system. When the key is down pin 4 goes high and charges C. The diode ensures that it discharges only through R. 2.2 uF and a 1 Mohm variable gave a recovery time of up to 2 seconds. If space is tight a 470K fixed resistor should do nicely. Relays with coils less than 300 ohms tended to make the switch latch on but not suffer damage so play with what you have in the junk box. Miniature reed relays work well and it is easy to switch one off as another comes on if you don't have changeover types for switching antennas from RX to TX. This worked very well with a ONER and a spare 'switch' was used to further isolate the RX. I don't don't know how it would work connected directly to the antenna as a solid state switch.

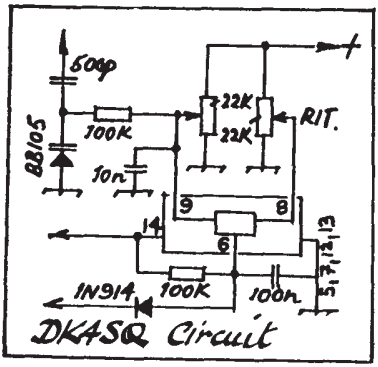
It works nicely as a multivibrator for sidetone, using the switches as transistors - not a waste if you have two spare sections. I played with it in the station big rig and it mutes IF and audio for full break-in without clicks if a 10nF capacitor is connected from the control pin to ground. When I find time I must try it to time AGC hang, as a noise blanker, as a remote AG filter switch.....

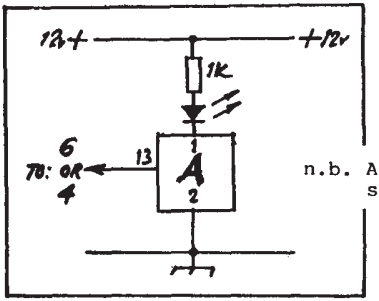
Incidently, 4066s are easily damaged by static unless buffered so use 4066Bs if possible. Having said that, my 4066s have all come from old computer boards, are not buffered, were unsoldered with a gas blowlamp (despite the awful smell,) and they all work fine so don't be put off experimenting.





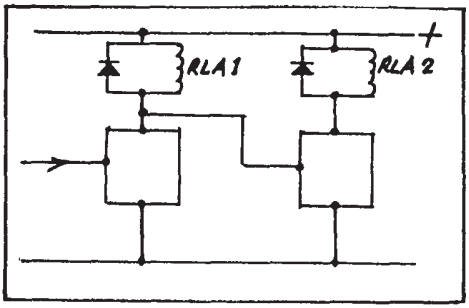




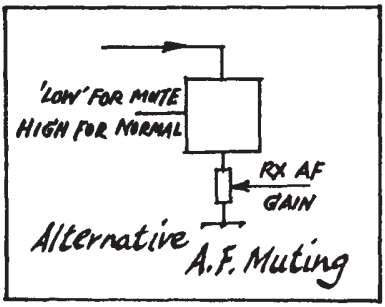


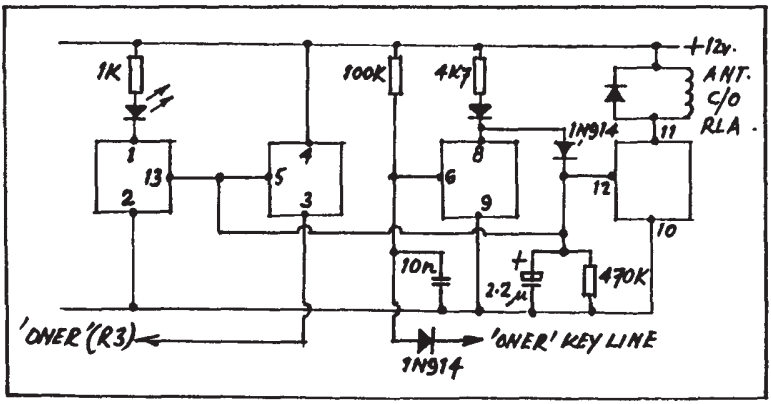
n.b. Always earth 7 and put + supply on pin 14

Connect 13 to 16 for LED ON - Rx
Connrct 13 to 14 for LED ON - Tx



RLA1 on when RLA2 off and Vice-versa. Allows change over with simple reeds





QRP TTL TRANSMITTERS

BY DL1ZB

Last year a 40 metre QSO with DL1KS initiated me to experiment with TTL transmitters myself. His transmitter was similar to that shown in the Winter 1982/3 edition of SPRAT, using a 7400 as an oscillator and a 7438 as a PA delivering about 500mW output. However, DL1KS had stated that he was not too lucky with the 5 volt supply, and that the harmonic suppression of the pi output filter was just 10dB.

I decided to look for open collector drivers which could be operated at 12 volts and to employ 78L05 for the TTL 5 volt supply. The first IC I tried was the 7407, which I found more suitable than its logic counterpart the 7406 due to simpler internal circuitry, and hence less current consumption. Driven by a 7400 oscillator and all buffers paralleled the 7407 delivered 2 watts, but was easily destroyed by mismatch conditions. To provide some means of current limiting and equal current sharing I inserted a 47 ohm resistor into each collector output lead. This made the output drop to about 1.2 watts, but the circuit was stable and safe, and the resulting power still sufficient for QRP work. Fig. 1 and Fig. 2 show the complete circuit.

7400 Oscillator - The gates following the oscillator section must be connected in such a way that with the key open all 7407 inputs and outputs are high (no output current). Note that one gate input of the oscillator input section is pulled high by a 1K resistor to 5 volts, (as recommended by TI). This is to reduce the oscillator input current and thus the crystal current and dissipation.

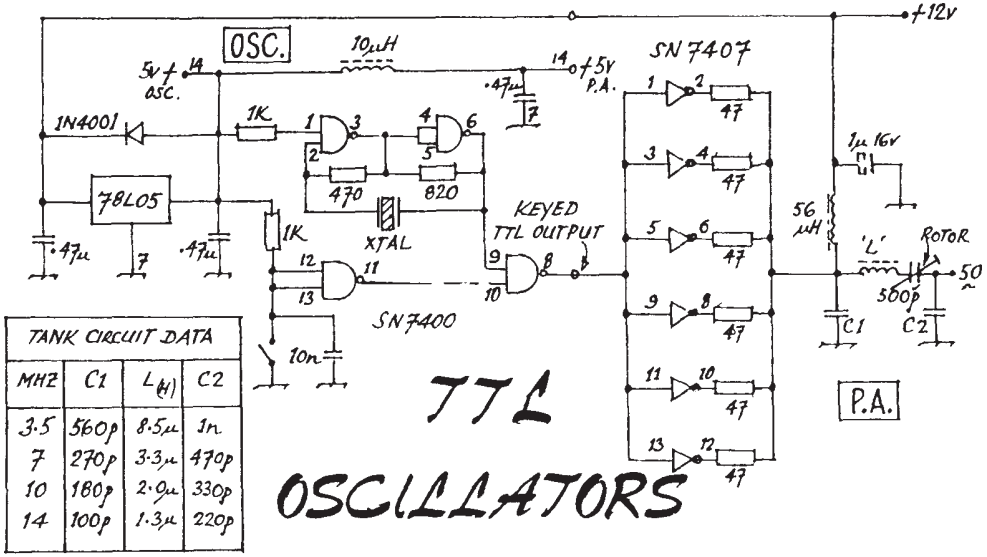
Output Tank - The harmonic suppression of the output tank could be improved to over 30dB by replacing the small pi coil by an LC series circuit, making a much higher coil possible without changing power match. At this power level, the correct match between the IC output and the 50 ohm load is mainly determined by the output capacitor C2. The input capacitor value is a compromise between high efficiency (C1 low) and low peak collector voltage (C1 high).

The additional circuitry in Fig. 4 in parallel to the PA collector choke, (diode, load capacitor and zener diode), may also be added to this tank circuit to limit high RF voltage peaks during tuning, (and to roughly measure the peak collector voltage to ground with the zener diode removed).

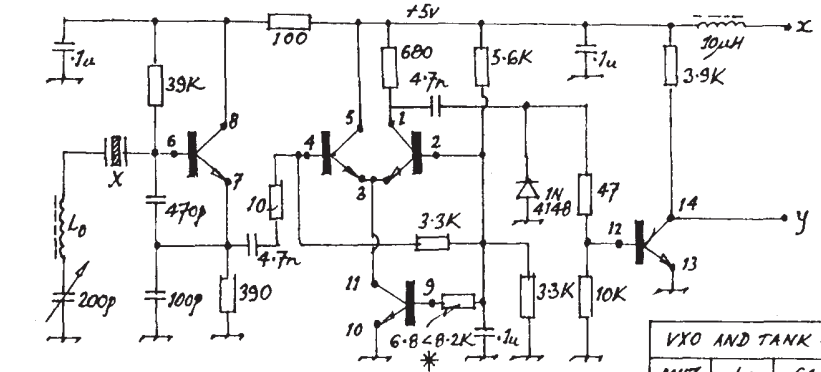
Compared to a simple two stage transmitter with discrete transistors, there is no need for interstage tuning or matching, and there is no sign of crystal pulling when the PA is tuned because the TTL circuit offers the advantage of a multistage transmitter. However, a slight frequency shift may be introduced via the 5 volt supply depending on the key open or closed, especially noticeable at 14MHz. To avoid this, each TTL circuit should have its own blocking capacitor of the 5 volt supply, and the 5 volt supply of both ICs must be separated by an RF choke.

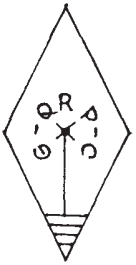
SN75453 - Another IC suitable for QRP PA purposes is the lesser known 75453 from the TTL line of peripheral drivers. Due to the cooling conditions it will deliver about the same power as the 7407, but it has several advantages. It has two outputs rated at 30 volts and 300mA, an OR gate input and less driving requirements for the same output current. The optimum collector series resistor seems to be 18 ohms. Keying may be transferred from the oscillator circuit to the PA, and up to four 75453 may be driven by a single 7400 oscillator to achive the 5 watts output level of the US QRPers. As the 75453 is housed in a 8 hole dual in line case, two of them may be plugged into a 16 hole dual in line socket and cooled by a common cooler. Fig. 4 shows a PA circuit with two 75453 delivering an output in excess if 2 watts.

Cooling - Cooling the PA ICs is a question of the duty cycle in practical CW operation. There are IC coolers on the market for 14 and 16 pole ICs which may be glued or clamped onto the 7407 or two 75453 or a common socket.



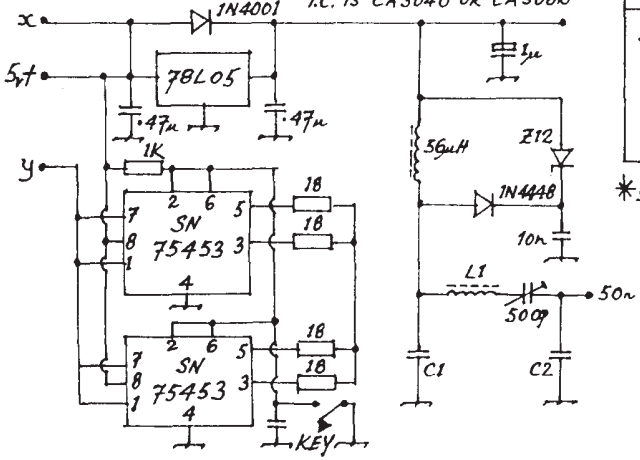
TANK CIRCUIT DATA			
MHZ	C1	L (µ)	C2
3·5	560p	8·5µ	1n
7	270p	3·3µ	470p
10	180p	2·0µ	330p
14	100p	1·3µ	220p





VXO AND TANK CIRCUIT DATA				
MHZ	$L_{0\,\mu H}$	C1	$L1_{\mu H}$	C2
3·5	60/120	1n	8·5	1·5n
7	25	470p	3·5	680p
10	22	270p	2	470p
14	8	150p	1·3	330p

*OPTIMISE, FOR 14 MHZ OPERATION IN VXO CIRCUIT.



2 watts

qrp tx

Frequency Limitation - Both the 7407 and the 75453 will work with almost equal power output from 1.8MHz to 14MHz. There seems to be a little hope, however, that the development of faster logic families like HCMOS will provide suitable PA ICs for up to 30MHz, because until now no open collector versions for higher voltages and currents have been announced.

VXO Circuit with CA3046 or CA3086 - In one respect however, work on TTL oscillators was very disappointing. I was unable to find a way to achieve the same pulling range on the TTL circuits, (which use the crystal series resonance, which I had realised with discrete transistor VXOs, (which use the parallel resonance of the crystal). To get a VXO with the same visual appearance as the PA circuits, I designed one around a CA3046 (or CA3086) transistor array, see Fig. 3.

The first transistor is operated in the same way as in the Lagos QRPeter and similar circuits, (SPRAT Summer 1980, Summer 1982 and Winter 1982/3). The next three form a symmetrical limiter with constant emitter current, delivering a 1:1 rectangular wave form to the final transistor which can supply up to 10mA of single ended TTL output. For optimum pulse to pause ratio at 14MHz the resistors designated "X" must be optimised according to the load presented by the driven circuit.

Molded RF chokes may be used for the VXO coils. For band switching these coils, care must be exercised to use wiring and switches with a stray capacitance as low as possible, otherwise the achievable pulling range may be limited. I used separate miniature switches (SPDT) for each band.

As the VXO operates on the transmitter output frequency, it must be well screened to avoid instabilities and frequency pulling.

I have built a transmitter from the combination of Fig. 3 and Fig. 4 with good results on all bands between 3.5MHz and 14MHz. If the PA collector choke is doubled in value, the circuit may also be extended down to the 1.8MHz band.

TTL Frequency Generation - Finally I would like to mention the contribution of Gig Dragulescu, YO6HQ, in the Autumn 1982 edition of SPRAT, page 7. In his transceiver ideas he presented an exciter which may replace the crystal oscillators of Fig. 1 or Fig 3 to form a 4 band VFO controlled TTL QRP transmitter.

Tank Circuit Data

MHz	C1	L	C2
3.5	560pF	8.5u	1000pF
7	270pF	3.3u	470pF
10	180pF	2.0u	330pF
14	100pF	1.3u	220pF

VXO and Tank Circuit Data

MHz	Lo	C1	L1	C2
3.5	60-120u	1000pF	8.5u	1500pF
7	25u	470pF	3.5u	680pF
10	22u	270pF	2.0u	470pF
14	8u	150pF	1.3u	330pF

THE "BUE" MEMBERSHIP LIST

Second Edition

The second edition of the Membership List is now available. As a result of your suggestions it has bigger print, a nice cover, spaces for new members and contains some general QRP information. The format is the same with callsign, membership number, christian name and space to record QSO and QSL. The list is available at £1.50 (cheques to C. Page) or $3, including postage (airmail), from Chris Page, G4BUE, "Alamosa", The Paddocks, Upper Beeding, Steyning, West Sussex, BN4 3JW.

PARALLELING SMALL TRANSISTORS FOR QRP RF POWER

Doug DeMaw (W1FB/8), Luther, Michigan

A number of RF power transistors are sold as "ballasted" de-vices. Ballasting means that the composite transistor has built-in protection against SWR conditions that can cause excessive current in the transistor junction.

Practically, these ballasted devices consist of numerous small transistors that are formed on a common silicon ship or substrate. The bases are in parallel, and so are the collectors. But, each emitter contains small resistance of identical value to the other resistors. The ends of these many ballasting resistors, opposite the emitters, are connected in parallel within the transistor. This is shown in Figure 1. What do these individual emitter resistors do?. They prevent what the industry refers to as "hot spotting." In more ordinary language, the resistors prevent any single transistor on the chip from hogging current during mismatch events. On other words, the resistors tend to equalize the current flow among the family of small transistors, thereby preventing one or more of them from hogging current and burning out a section of the overall power transistor.

For many years I have used this principle to make QRP amplifiers from such devices as the popular 2N2222, 2N3904 and similar high fT devices. The advantage is that these transistors are low cost and readily available. Four 2N2222As, for example, can provide 1 watt of output power up to 30 MHz, with very low driving power (approximately 100-150 mW). Figure 2 shows a typical circuit in which four 2N2222As are used. Higher output power may be obtained by using six or eight transistors in parallel. Additional driving power is required if this scheme is adopted. Also, larger RF transistors, such as the 2N3866, may be paralleled and ballasted to provide 2 watts output (two transistors) or 4 watts output (four transistors).

I recommend that you attempt to match the transistors before placing them in parallel. Insert an mA meter in the collector supply, apply 9 or 12 volts, with a 1-ohm resistor in the emmitter leas to ground. Use 1 volt of forward bias to the base. Select transistors that yield equal or nearly equal (5% matching) current under these conditions. I have also done transistor matching with an 18-MHz crystal oscillator. I use an 1N34A rectifier diode at the oscillator output to read the DC current produced by the oscillator (100-uA meter). Select transistors that produce equal output readings. I have never found it necessary to use heat sinks on the four 2N2222As in parallel at 1 watt output. They do run a bit warm, but never become too hot under 50% CW duty cycle. Heat sinks can be made from thin copper and press-fit on each device. These sinks need be only 3/4" long. When selecting small signal RF transistors for parallel use, make sure the safe Vce (collector-to emmitter voltage) in at least 36V, and that the devices are of identical manufacture. Also, choose devices that have an fT of at least five times the highest proposed operating frequency. The collector voltage under CW conditions will rise to twice the supply voltage. Under conditions of SWR or self-oscillation the effective Vce may rise as high as four times the supply voltage. Allow plenty of leeway when choosing a Vce maximum rating. The collector load impedance is determined the same way it is when using a single RF power transistor. It may be found from $Z(\text{collector}) = Vce^2/2Po$, where Z is in ohms and Po is the anticipated output power of the stage. Thus, for a 1-watt amplifier (four 2N2222As) the collector impedance is 144/2 = 72 ohms. This is for a 12 volt Vce. I have never had a device failure when using parallel small-signal transistors within their safe dissipation ratings. It is important, however, to keep all transistor leads short. Also, the ballast resistors should be returned to a common PC-board bus, and their pigtails must be a short as practicable. The resistors must be mounted as close to the emitter leads as possible in order to prevent unwanted lead inductance, which causes a gain loss by way of degenerative feedback. Some degenerative feedback will be present by virtue of the unbypassed 1-ohm resistors. It represents a performance tradeoff in favour of the ballasting feature.

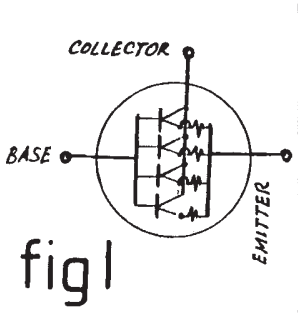
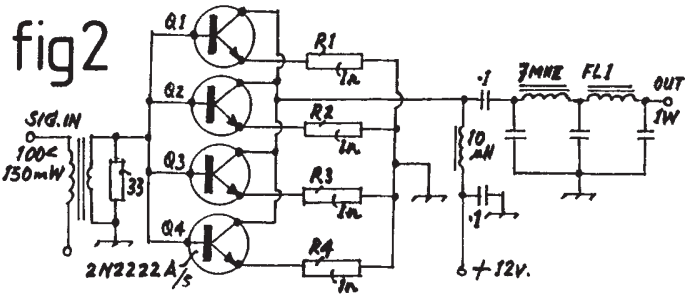


fig1

fig2



KIT REVIEW - THE KANGA VFO KIT.

When talking to constructors who visit the club stand at NEC the most frequently mentioned problems seem to be in connection with VFOs. Typical questios cover topics like:-

Which is the best circuit?
How do you stop drift?
Why does it chirp when I key?
Is a 1N914 as good as a BA102 for RIT or offset?

Kanga Products seem to have come to the rescue with a kit designed by Ian Keyser, G3ROO, which should cover most needs. The VFO works up to 10mHz or so and includes RIT/offset, FM faciities, and variable output level. The output is sufficient to drive a diode mixer on its own. The package is complete except for tuning capacitor and coil since these will need to be chosen to suit your own particular application. Included is a very good quality diecast aluminium box with almost vertical sides - aren't those sloping ones annoying? - measuring 120 X 65 X 40mm. The pre-tinned and drilled glass fibre circuit board covers about half of the area of this box leaving plenty of space for a tuning capacitor and coil. All components are supplied; I even had an extra 100k resistor.

The instruction sheets cover six pages and are very comprehensive. The circuit is described in detail, together with some of the design philosophy. The thermal compensation, frquency range, and mechanical construction are also considered. Coil and capacitor data for four useful ranges are provided along with a component list. The circuit diagram, board layout, and performance graphs complete the paperwork. These sheets are worth reading in their own right.

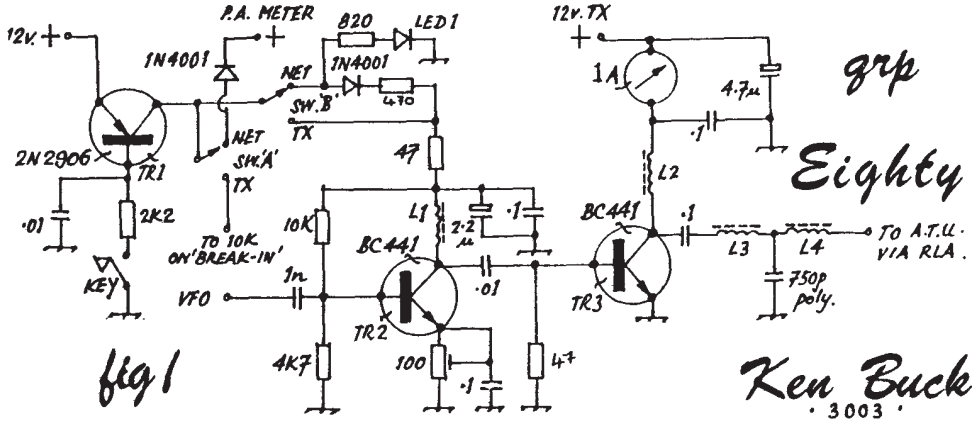
Construction was quite straight forward though there were a couple of errors in the blurb and the holes had to be enlarged to accept two preset potentiometers. These problems should be sorted out in later kits.

My kit was tested from 1 to 10MHz with various coils and proved to be very stable. My frequency counter only reads to 100Hz and the VFO can be left for hours on 5MHz without the last digit changing. The RIT was easy to set up and worked very well. I have not yet tried the FM facility. David Aizlewood, G4WZV, has built a kit to use with his MLX board with similar results.

The kit is available from Kanga Products, 3 Limes Road, Folkestone CT19 4AU and costs £9-45 including post, packing, and VAT.

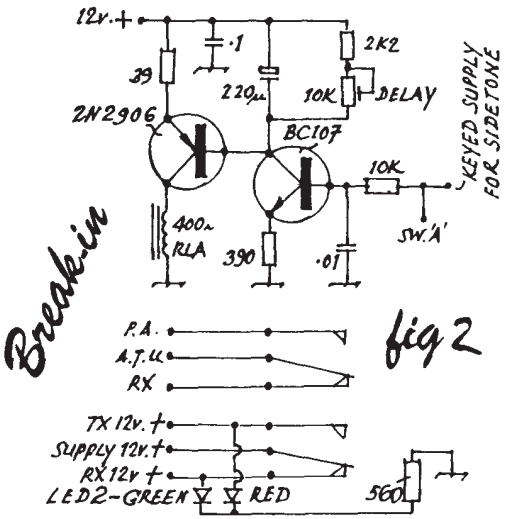
THE QRP 80 - A 3.5MHz 2.5 watts CW TX

The circuit is not entirely originql. The driver is based on Peter Brent's JU6 mod. with a change of transistor. The VFO used is as shown on page 18 of the G-QRP-Club Circuit Handbook, but I had to play around with the tuned circuit to cover 3.5 - 3.6MHz.



L1 53t 36 SWG on 1W carbon resistor
L2 10t 24 SWG on 7mm ferrite ring, (rally surplus)
L3 16t 24 SWG on T50-2
L4 23t 24 SWG on T50-2
All resistors, including the presets, are 0.5 watt carbon.
Fixed resistors are 5% tolerance
SW A/B is a SPDT toggle
LED 1 is Maplin Catalogue part no. QY96E
100 ohm driver preset is Maplin part no. WR38R

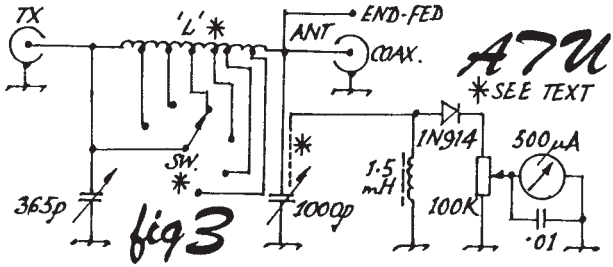
CONSTRUCTION COMPETITION

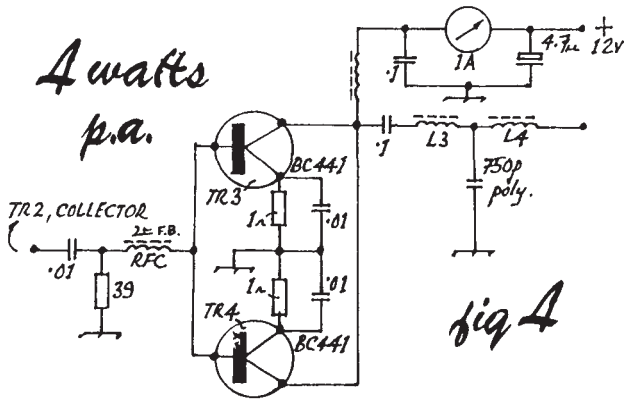


The 220mF capacitor on break-in will hold in the relay for most keying speeds but can be increased to 330mF. Change-over is swift with no relay clatter.

Extensive use of screened leads reduced unwanted radiation on receive. The driver collector choke L1 is wound on a 1K 1W carbon resistor, the older 10% type is best for this. A heatsink is not required as the transistor runs cold on 2.5 watts PA input. The preset can be replaced with fixed resistors to reduce the drive level as a front panel control. Before testing the transmitter, this preset should be set to 82 ohms and then re-adjusted after switch on. The net switch can be a 3 pole 2 way to short the key on "NET", but the contacts must be break before make. The 390 ohm resistor gives just sufficient drive to switch on the PA for a net signal, but can be adjusted. A BC441 is used for the PA and is rated at 2 watts. It must be fitted with a finned clip on heatsink and will run quite happily at 2.5 watts in Class C. The experienced builder can increase the input to 3 watts, but avoid long periods of key down and don't attempt to increase the heatsink area to squeeze out more power. The easiest way to destroy a PA transistor is to overdrive or run it into a poor mismatch.

If you are a newcomer to QRP construction, it would be wise to use a 50 ohm resistive bridge as the output is always correctly loaded, (see page 63 of G-QRP-Club Circuit Handbook, or G3RJV's PW DART TX). Sufficient drive is available for a parallel 4 watt PA stage involving a few component changes. With care, this stage is capable of a lot more than 4 watts, but beginners should keep to the 4 watts.

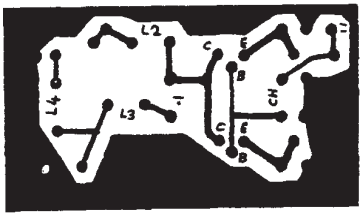




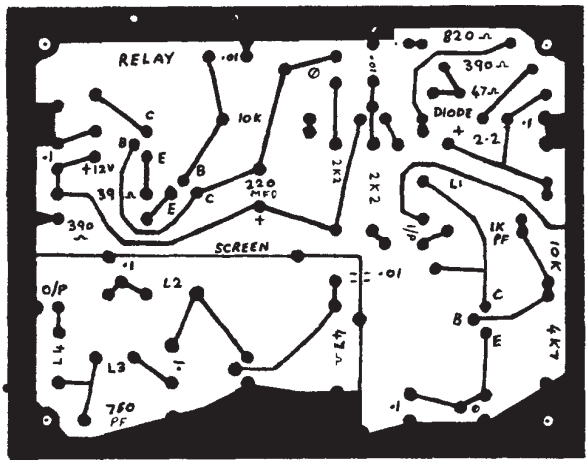
A sidetone circuit is not given as there are plenty in the magazines. The one on page 17 of the G-QRP-Club Circuit Handbook will fit on the PCB near the driver transistor. The only difference is the +12v supply, and this should be taken from the keying transistor and not the PA. The pi-network inductor has 30 spaced turns on a 1.25 inch diameter former. Bifilar wind the 18 SWG tinned copper wire with 16 SWG on a coat of varnish, then remove the unwanted winding when the varnish is almost dry. Mask off a narrow strip across the coil length for the tapping points and re-varnish. The ATU will load short wire lengths and is ideal for restricted space antennas.

QRP 80 FOIL PATTERN

(FOIL SIDE)



QRP 80 4W PA (FOIL SIDE)



"QRP BY THE SEASIDE"

Great Yarmouth QRP DAY, Saturday September 12th 0930hrs to 1700hrs York Road Drill Hall.

ADMISSION FREE

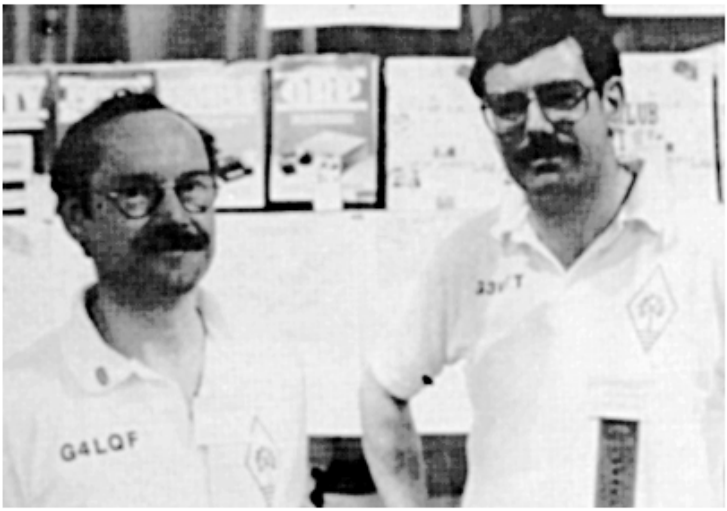
TEA & COFFEE ON SITE - PLENTY OF EATING PLACES OF EVERY TYPE & PRICE WITHIN WALKING DISTANCE.

HOME BUILT GEAR - VACUUM TRANSISTORS - ANTENNAS- PORTABLE WORKING - ETC,,

PLENTY FOR ALL THE FAMILY AT THE SEASIDE WHILE YOU ENJOY MEETING OTHER MEMBERS.

Further detail from DAVID G30EP,
33 Addison Road, Gorleston, Yarmouth NR31 0PA.
Telephone Yarmouth 662323.

G-QRP Club In DAYTON
Sprat Photo Report



The successful G QRP CLUB Stand at the HAMVENTION in Dayton, Ohio. Top Left are G4LQF and G3VTT with Bottom Right: G3RJV and G4BUE. Peter, G3PDL made up the fifth member of the club party which took the G QRP CLUB to the largest Amateur Radio event in the World. Each member of the party paid half of the expenses, plus all their personal expenses to mount the venture. The club also provided a HOME CONSTRUCTION FORUM, hosted by G3RJV with G3PDL and G3VTT as the team of speakers.

The Club Stand was placed next the the American QRP ARCI Stand in one of the main exhibition halls.

The Club Stand bedecked by Union Flags showed a fine display of member's home built equipment. The stand stocked a large range of books which included the Circuit Handbook and the PW Book "Introducting QRP", ONER Kits, Kits from Howes, Amateur Band Crystals, Back Issues of SPRAT, Club Badges, Carstickers, Keyfobs, Rubber Stamps and accepted applications for membership.

The club also mounted a HOME CONSTRUCTION FORUM hosted by G3RJV with G3PDL and G3VTT as speakers. The Forum was well attended and the feedback was surprising with people who had heard the lectures turning up at the stand to buy publications and kits and to talk about Home Construction. One local amateur turned up at the stand every day to show G3RJV the component bargains he had bought to build our projects from the Handbook.

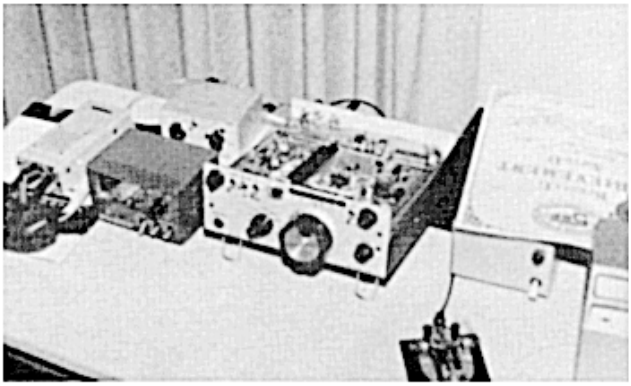
With so much to see and so much interest in the stand a rota was maintained to keep at least three staff on duty at all times. Even with that staffing level, the going was heavy most of the time.

Leaving the hotel at 5am and returning at 6.30pm and then going on to social events in the evening.....
It was hard work!

The club members stayed in the Dayton Belton Inn on a floor completely booked for QRP Amateurs. The QRP ARCI made the booking, provided a QRP Hospitality Suite and organised social events.

The link between the G QRP Club and the QRP ARCI was strengthened and ideas, frustrations, plans and a lot of humour were shared.

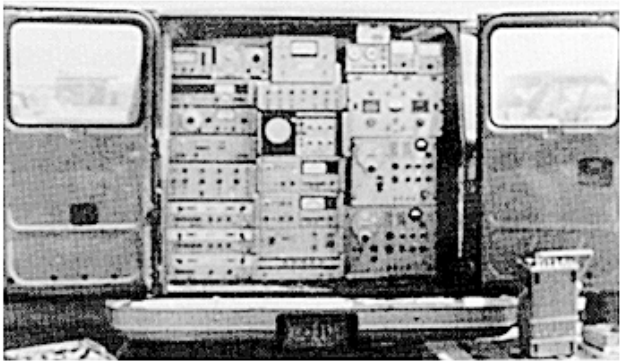
On Thursday evening a QRP Banquet in a local night club helped the Trans Atlantic link....



Above, Mike, W3TS, the Author of several fine items in SPRAT.

On the right some of the Home Built Equipment on show at the Belton Inn. The centre piece is a fine all band rig from Mike, W3TS.

Two photographs to give an impression of the mammothe Flea Market (over 1,500 stalls) at Dayton.



The Club Stand was a success. In the three days of the event we took over $5,000 on the stand and the interest was very high in who we were and what we did.

Peter, G3PDL, has the difficult task of doing the full accounts for the venture.

The final statement has not been prepared at the time of writing this item. We came back with stocks, see elsewhere in this issue for details. These were bought as sales items for members. Also there are a few minor bills still to come in and Peter has to work out a payment for the complex Ohio State Sales Tax.

A project estimate shows that the club has made a profit on the venture. The exact amount is yet to be calculated and will be published in SPRAT.

It would appear that the profit made on the sales items has been enough to pay the club's contribution to the trip. The only slightly disappointing feature was that 70 new members were enrolled and we did expect far more enrolments. Although on later reflection, the stand did seem to emphesize home construction which resulted in excellent sales of books and kits.

The group that made the trip certainly enjoyed themselves, certainly worked very hard and hopefully did a good job in promoting the ideals of the club.

Right: G3PDL and G3VTT look with horror on what has to fit into the hire car, plus 5 club members for the return journey from Dayton to Detroit Airport

....You should have seen the stuff we took in !

CLUB OFFERS

When the club offered the "MLX SSB BOARDS" (a 9MHz transceive SSB board) last year the response was overwhelming. We could have sold twice as many as we managed to obatin from the USA. At the Dayton Hamvention, G3RJV in rest periods from the Club Stand duty "pounded the beat" of the miles of small traders in the mammoth flea market, looking and asking for further supplies. One small supply was located....so

MLX 9MHz SSB BOARDS: (10 only) at the old price of £25.40 inc. postage on first come first served basis. Fully circuitry provided of the original MLX Transceiver plus notes. A full reprint of the G3RJV Short Wave Mag. articles on putting the boards onto 80/160m for £1.25

OTHER DENTRON BOARDS:
In addition to the MLX Mobile Transceiver, Dentron also produced a 5 Band Transceiver, the HF200A, which also used the same board (which should be called the SG9 Board). Also located at Dayton, again in small numbers on a first come first served basis, we can offer....

L.O. PREMIX/PRE AMP BOARD: To mix with a 5.0-5.5MHz VFO to give LO injection for 5 bands (all on the high side of 9MHz) complete with crystals, 1496 mixer and switcg wafers for £10 + 60p postage BUILD A FIVE BAND TRANSCEIVER!

LOW PASS FILTER BOARDS: 5 Element, 50 ohm in/output filters for 80-10m will handle 200W, on two small,back to back, PCBs at £5 + 40p postage

RIT,AGC,CW BOARDS FOR HF200: The CW Control Board from the HF200A for use with the SG9 Board on one PCB for £5 + 40p postage.

All of the above are supplied with the circuit of the individual board plus the complete interconnection block diagram for all the HF200 Boards. Full Circuit Manual for complete HF200 Transceiver for £1.00

**********SPECIAL OFFER ON CRYSTAL FILTERS**********
9MHz SSB CRYSTAL FILTERS: Brand new 9MHz, 2.2KHz bandwidth, 6 pole filters, 500 ohm in/out, standard mounting as used on the SG9 Boards.
Ideal for any SSB receiver/transceiver circuits
ONLY £8.00 + 40p postage

BFO CRYSTALS FOR THE ABOVE FILTERS: 8998.5/9001.5KHz in HC18 housing to complete the set with the Filter ONLY £3.00 A PAIR + 40p postage

ALL OF THE ABOVE ITEMS ARE FROM G3RJV (Cheques to G QRP CLUB)

**********STOP PRESS NEWS**********

HIGH GRADE SUPERHET RECEIVER FOR 80/20 METRES
Soon to appear in a magazine article by G3ROO and G3RJV but in advance for Club members:
Semi-Kit for receiver now available for £29.95 from KANGA (see back pages)
Kit also requires 9MHz Filter and BFO Xtals (see offer above), 100pF variable, SL610 & 640 (Birkett's Cheapies), SL6440 (Bonex or Cirkit).
Using 5-5.5MHz VFO to 9MHz IF this receiver offer image rejection of 75db.

CALLING ALL HW 8 OWNERS:

Also at Dayton we bought a UK stock of the HOT WATER HANDBOOK.
The definitive book on HW8 modifications. Over 30 circuits for this popular QRP rig. at £3.00 plus 40p postage FROM:
Dave Aizlwood, G4WZV, 36 King Street, Winterton, Scunthorpe, South Humberside DN15 9TP (Cheques to "G QRP CLUB")

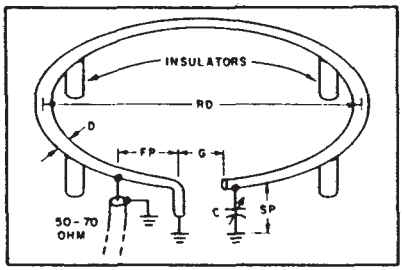
AND.....THE ONER IS BACK.....Kits for the ONER mini Transmitter are also available from G4WZV, as above, at £4.00 plus 40p postage.

14 MHz MOBILE ROOFRACK ANTENNA

By Peter Dodd G3LDO

I was very interested to hear of John McDonnell's (G3DOP) experiments with the Hula Hoop antenna. I have been using a similar antenna for mobile use for the last ten months and the following is a description of its construction and results.

My antenna is based on the DDRR antenna described in the ARRL antenna handbook. The design data is reproduced below.



RD = 0.078 λ (28°)
SP = 0.11D (2.5°)
FP = 0.25 h (See Note 1)
C = (See Note 2)
D = (See Note 3)
G = (See Table 4)

Feet X 0.3048 = m.
Inches X 25.4 = mm.

Notes: (1) Actual dimension must be found experimentally. (2) Value to resonate the antenna to the operating freq. (3) d ranges upward from 1/2" (13 mm). The larger "d" is the higher efficiency is. Use largest practical size, e.g., 1/2" (13 mm) for 10 meters, 5" (127 mm) or 6" (152 mm) for 80 or 160 meters.

Band (Meters)	*160*	*80*	*40*	*20*	*15*	*10*	*6*	*2*
Feed Point (FP)*	12"	6"	6"	2"	1.5"	3"	1"	1/2"
Gap (G)	16"	7"	5"	3"	2.5"	2"	1.5"	1"
Capacitor, pF (C)	150	100	70	35	15	15	10	5
Spacing (Height) (SP)	48"	24"	11"	6"	4 3/4"	3"	1 1/2"	1"
Tubing Diameter (D)	5"	4"	2"	1"	3/4"	3/4"	1/2"	1/4"
Ring Diameter (RD)	36'	18'	9'	4.5'	3'4"	2'4"	16 1/4"	6"

Figure 1 DDRR Antenna (from ARRL Antenna Handbook)

My version of the DDRR antenna was constructed out of copper tubing because of the availablity of plumbing material. The antenna was given a square configuration because I didnt have tube bending equipment necessary to make the circular configuration called for in the design. I also reasoned a square would look like a roof rack and be less obtrusive, although I did'nt know if it would work. The design used 90 degree joints, used in plumbing, for the corners.

I made two variants; the first was made as close to the original DDRR design as possible because I did'nt know how it worked. The rather imposing title of Directional Discontinuity Ring Radiator made me think it was some sort of slot antenna.

The average height of the element was 6 inches above ground (in this case the roof of the car) although the overall element length was more because of the problem of the capacitor. A conventional tuning capacitor was not used because it was not available; making a capacity tuning unit that would be weatherproof at 70MPH was a bit beyond my constructional capabilities. A capacitor was constructed by fixing a plastic block near to the 'top' end of the element, which held the element a fixed distance away from the roof of the car. By moving the block along the element against the curved surface of the roof enabled the roof/element distance, and the capacitance, to be varied.

This antenna appeared to perform well using 10 watts output but only two transatlantic QSOs were made during three months of intermittent use. I decided to modify the design after reading a mathematical analysis of this antenna by Robert Dome, W2WAM (QST July 1972). This analysis gave the original QST DDRR antenna an efficency of 2.75%, mainly because the low radiation resistance caused the conductor ohmic losses to consume much of the avaiable power. He suggested that by increasing the height to 20 inches (for 20 metres) and using good coductivity materials the efficency could be raised to 25.8%, an increase of 9.8db signal strength.

I regarded a roofrack 20 inches above the roof of the car a bit obtrusive so the design in Figure 2 represents a compromise, with an average height of 10 inches above the roof of the car. It is fixed to the car by genuine bar roof rack, the sort used to transport ladders etc. The bars are set about 12 inches apart and a sheet of aluminium attached to the bars. When this is done the clamp nearest where the vertical section of the element is to go is removed.

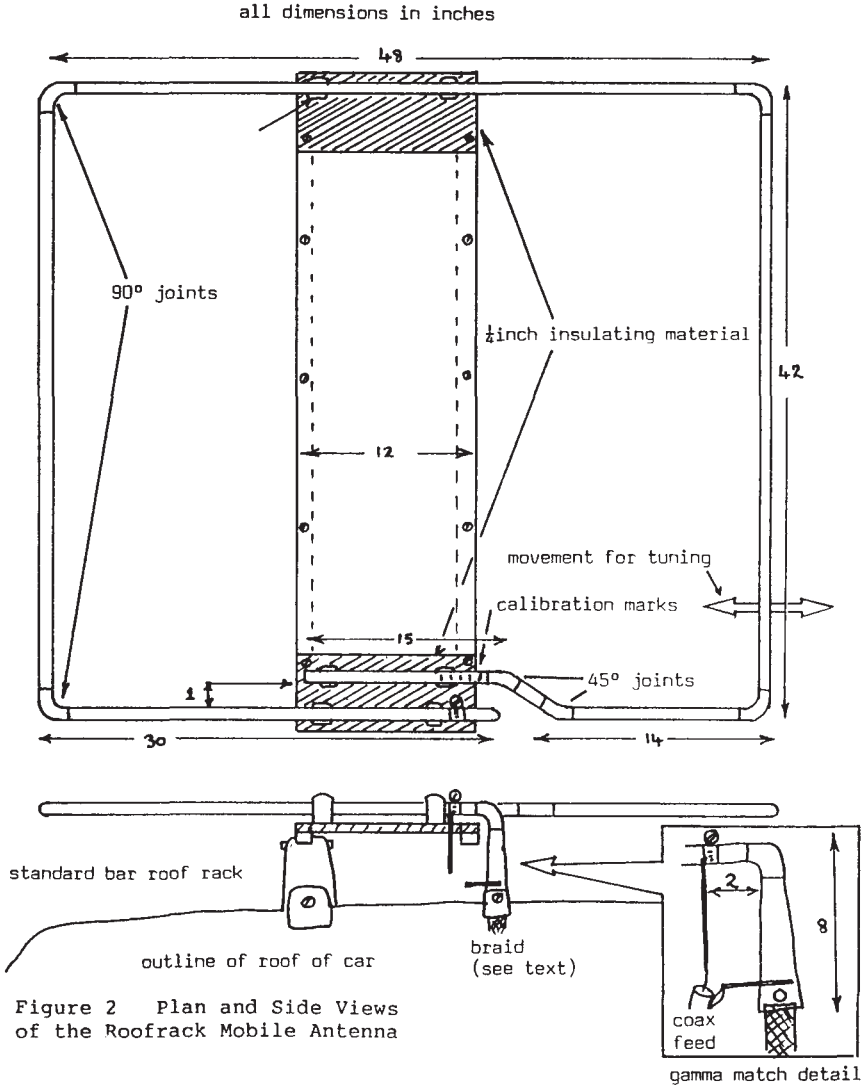


Figure 2 Plan and Side Views of the Roofrack Mobile Antenna

This rack also provides facilities to mount more conventional antennas for comparative tests.
Two pieces of bakerlite or paxolin are fitted to the ends of the rack for mounting the element. The element is made of 22mm copper tubing, similar to the Mk1, and fixed to the insulating sections with plastic 22mm tube to wall fixings, providing double insulation.

It is tuned by the capacitance of the overlapping element end along the base of the element. This overlap, and hence the capacitance, is varied by moving the front part of the element as shown by the arrows; the top of the element slides in the plastic tube clamps.
The base of the element is flattened so that it will sit in the roof gutter and is attached like a roof rack using part of the removed vertical clamp. Additional electrical contact is provided by braiding, soldered to the base of the element, and attached to the door post with self tapping screws; this is done at a point covered when the door is closed.
A thick piece of wire is also soldered to the base of the element so that the braid of the coax can be soldered to it when the antenna is installed. The centre of the coax feed is fixed to the element by a jubilee clip so that it can be adjusted for the correct feedpoint.
The antenna can be matched using the lowest SWR although it is better first to resonate the element using a GDO. I measured the actual impedance as described in SPRAT 50 and this is shown in Figure 3.

The transatlantic QSO count, using 10 watts, has now gone up dramatically to about two QSOs per week operating half an hour in the middle of the day during week days. The antenna does produce a bit of wind noise at 70MPH but on the other hand its unobtrusive disguise as a roof rack does have some advantages.

	Input Parameters				RESULTS		+/- Errors	
Freq	A	C	D	E	Res	jX	Res	jX
14.11	158	136	70	75	50.7	-52.3	12.8	12.4
14.12	150	125	70	67	50.3	-42.2	6.8	7.2
14.13	143	114	71	61	52.7	-29.1	3.2	3.3
14.14	135	101	70	59	56.9	-12.9	1.7	1.8
14.15	131	92	70	63	62.6	+2.8	0.6	0.8
14.16	131	87	71	75	71.4	+21.6	0.5	1
14.17	131	84	70	89	77.7	+39.4	1.6	5.1
14.18	141	92	71	113	90.7	+60.4	1.5	12.1
14.19	159	110	72	141	107.7	+93	0.9	5.3

Figure 3 Impedance Plot (via 0.15 wavelengths of coax)

SWL NEWS

Philip Le-Brun G0HHN

Welcome to the new SWL QRP column aimed at encouraging the participation of shortwave listeners in the C-QRP-C. So please send any QRP DX heard, tips, queries and other relevant items to me to make this column worthwhile.

Starting in the next issue will be a "QRP Heard Table" running for all bands (HF,VHF,UHF and even SHF). For each band multiply the number of DXCC countries heard. All stations must be running QRP (3W rf output or 10W PEP) but can be in QSO with a non-QRP station. This table will be for all time scores so get listening!
The 80m CW QRP frequency is certainly worth listening to, as it is often busy with a wide range of British and European stations, but is spoilt with RTTY transmissions at night. The 40m and 20m frequencies tend to be used frequently too, but activity on 15m and 10m seems very low even though the former band offers very good DX and propagation, as well as being less crowded than twenty.

A useful organisation for any SWL listener to join is the international listeners association. Although it has only been running just over a year, it already has a following of about two hundred, in the capable hands of Trevor GW40XB (QRP 1454)
For a subscription of one pound, you receive an information, quarterly newsletter, always containing something of interest for everyone. The ILA's QRP award is certainly a challenge confirmed reception of 250 QRP stations, or what about the prefix awards endorsed for QRP. Contact Trevor (with an SAE) for more information.

THE CHELMSLEY TROPHY 1987

Duration: From 1st January to 31st December each year.

Bands: Contacts may be made on all authorised bands between 1.8 and 28MHz.

Modes: CW and/or SSB

Power: CW - not exceeding 3.3 watts RF output (5 watts DC input).
SSB - not exceeding 10 watts PEP output.

Antenna:
(a) No antenna used shall exceed 35 feet (10 metres) in height above ground.
(b) No antenna shall exceed 132 feet in length.
(c) Entrants may change the antennas in use during the year, but at any given time not more than one horizontal and one vertical antenna shall be used.
(d) All antenna used shall consist of only a radiatior element without reflectors or director.

Logs: For each band used the log submitted will consist of:-
(a) A list of all DXCC countries contacted in alphabetical order of prefixes with below it figures showing the total number of DXCC countries contacted.
(b) A similar and separate list of all countries worked using two-way QRP.
(c) A note drawing attention to any contacts which, by virtue of very low power used, rarity or other reason, the entrant considers to be outstanding.

In addition a separate sheet shall be provided giving details of the transmitting, receiving and antenna equipment used during the year. Should any entrant consider that during the year he has done work of importance in the field of simple antenna design or propogation studies, a note briefly outlining such work should be included.

Submission of Entries: Entries must reach the Communications Manager by 15th February of the year after the contest year. Entries received after that date will be disqualified.

Awards: At the discretion of the Club Committee, the entrant submitting the most outstanding log will be awarded The Chelmsley Trophy for one year. The two runners-up will receive certificates of merit.

Disputes: In the event of any dispute regarding these rules, the decision of the Club Committee will be final.

Proof of Contact: If they wish, the Club Committee may ask for written proof of any contact.

NOTES ON CENTURY 22 SET UP FOR SPRAT

By Colin Turner G3VTT

Many of our members will no doubt have invested in the Ten Tec Century 22 transceiver and found the lack of a complete service manual to be a failing. Despite rumours to the contary it seems Ten Tec will not be producing a manual, such as they have always produced, merely an operators guide.
What is required is a description of a method for setting up the PA driver and the output stage quiescent currents and ALC levels.
Ten Tec inform me that the current settings are 30mA for the driver and 140mA for the PA. These currents are set up with the "driver bias" and "final bias" potentiometers respectively, with the drive at minimum. The "ALC" pot should be be adjusted to give a maximum output of 20 watts with drive control set at maximum.
I have also learned that, because of failures of the MRP475s, these devices have now been replaced with 2SC1969s.

VHF News

G8SEQ 14 Hollow Crescent, Radford, Coventry, CV6 1NT. Tel: 0203-598186

Looking back over the time since George, G3RJV first asked me to write for the VHF column, there have been two principle events which have encouraged me to continue with VHF QRP activities. One is the addition of the 50MHz VHF band with its promise of real DX in the summer months and at the sunspot peak; things should really hot up in this band.

The major factor is of course the letter of variation allowing Class B licencees to use Morse code on the higher VHF/UHF bands; simple CW TXS and RXS are now viable. Hence myself and others have been experimenting with direct conversion receivers for 2 metres (and 50MHz). With suitable antennas and pre-amplifiers, these can be made to perform really well.

My predecessor reputedly gave up the VHF Column due to lack of interest amongst the membership. A survey of my incoming mail concerning amateur radio suggests that the interest is there, but some interesting facts arise. Half my mail concerns the DC series of HF kits I supply, the remaining half consists of general support for VHF, requests for information and constructional material in about equal proportions. The strangest part is that most of the costructional items come from overseas readers who probably represent less than a tenth of the G QRP club membership.

Maybe it is true what other magazines say that home construction is a dying art. A used to be a problem constructing at VHF because newer licencees who were class Bs needed relatively complex receivers for FM or SSB to get on the air and had not sufficient constructional ability to produce anything worthwhile.

However the DC RX can be very good for CW and is hardly worse than a superhet for SSB on the uncrowded VHF bands. The OE6HS DCRx (Sprat 43) couldn't be simpler for anyone who wanted to have a go and there is plenty of room for development of this circuit (RF pre-amp AF amp etc).

As for as transmitters go a VXO type can cover large and useful portions of the band because of the multiplication factors involved (C.F. 200KHz per X total coverage for IC202). Such tramsmitters, though containing more stages than simple HF TXS like the OXO, are not difficult to construct and set up. If you want more than 100mW of RF, VHF RF P.A.s must be some of the simplest circuits going, though I suspect some HF enthusiasts are put off when they find a bent hairpin for the output tank inductor!

What is in the future I wonder? Lets hear from you concerning any novel ideas for VHF, unusual propagation modes or special achievments

Good DX and 73 for now
John Beech G88EQ

50 MHz DC TRANSCEIVER KITS

Direct Conversion Transceiver - CW (with FM option on transmit)
Complete Kits of Parts for £50.00 (Multimode Superhet Kit soon)
John Beech, G8SEQ, 14 Hollow Cres. Radford, Coventry. CV6 1NT.

Award News

ACTIVITY AND AWARD NEWS
Gus Taylor, G8PG, 37, Pickerill Road,
Greasby, Upton, Merseyside L49 3ND.

AWARD NEWS

Congratulations to the following on the Awards indicated.

QRP Countries 50, FD6HSI

Worked G QRP Club 540 (!) GM3OXX; 380, G3XJS; 200, G3DNF, GM3RKO; 140, G3BFR; 120, GM4YLN,GM3KPD, G4HZV; 100, GM4JJG, ON4KAR, G4GLC, G4TDU, GM4XQJ, GM4oss, G4SXE; 80, G4PUU, G4XVE; 60 GM4UYE, G3YFU; 20 G4EDD, G3DAN, G0FKX. (Note that 1 in 3 of the above are Scottish stations. Wake up south of the Tweed !)

Two-way QRP

GM3OXX MAKES THE FIRST HALF CENTURY, AND ALL CW. Congrats George. G4ASL 20.

PARTRIDGE TROPHY

The award goes this year to John, G3DOP, for his article "I have to mow the grass to find my antenna" in SPRAT No.50. That article required much patient development and testing on the part of John, who reports that he is now getting good results on both 7 and 10MHz with the version described in SPRAT. Congratulations to John on both his technical work and his operating. Will members please note that the next award of the Partridge will be for the antenna article published in SPRAT between now and the end of 1987 which they consider to be the most outstanding. No applocation for the award is required - just submit an outstanding antenna idea.

CHELMSLEY TROPHY 1986

The winner is Pete Haskins, G8JR, for his outstanding performance on all the hf bands, using a much bent 136 foot wire, only about 20ft of which is outdoors. When we say "all" hf bands we mean just that. 18MHz and 9 countries on 24MHz. This is the first time any member has been awarded a trophy for using 8hf bands; congratulations Peter.

WINTER SPORT 1987 - FURTHER REPORT - AWARDS.

Bad conditions on the hf bands? Who says so? The final total from logs received indicates two-way QRP contacts with 22 countries in four continents, once again highlighting the fact that good QRP operators are not detered by a lack of sunspots. WS 1986 was a very successful event that gave a great deal of pleasure to a lot of QRP operators. As yet the Club does not have a Sportsman of The Year Award, but if we did it would go to George, GM3OXX/A. Using his massive antenna he piled up over 100 two-way QRP contacts, including several trans-Atlantic QSOs, but being the sportsman he is said "please treat this as a check log". Thanks, Geo ge, from all those who have to operate from small back gardens! Turning to the actual awards, that for the best G log goes to Bob, G3JFN, who made 123 two-way QRP contacts with 14 countries. The runner-up award goes to Peter, G3XJS for his high percentage (almost 33%) of contacts with European QRP stations. Overseas logs were somewhat sparse this year, but the winner in this section is Pavel, OK2BMA. Although no log has been received from him, Dave, CT4RL/P gave tremendous support to the event, so he has been awarded a special merit certificate. Finally, let us not forget those who did not get into the frame. Despite a burst water main in the complex of buildings for which he is responsible putting him off for two days, Sandy, G3ZPN, got back on for the end of the event and submitted a log. Charles, G3SB operates from a location so badly screened that even 100W usually brings 339 reports. But he still put 18 hours of operating into the event - for a total of 13 contacts! That is real QRP perseverance.

REMOTE LOCATIONS WEEK 4 - 11 OCTOBER, 1987

NEW PROCEDURES TO HELP REMOTE STATIONS - PLEASE READ THEM!

During Remote Locations Week, 1987, we ask all stations outside the areas designated for each day to move their normal operation into the 3570-3575 KHz area and only to use the area around 3560 when actually calling or working remote stations. We also designate specific days for remote areas as follows:
4th Oct; All of Ireland (EI/GI).
5th Oct; All of Scotland NORTH OF ABERDEEN.
6th Oct; All of Wales.
7th Oct All of Ireland, plus GD/GJ/GU.
8th Oct; All of Scotland north of Aberdeen.
9th Oct; All of Wales.
10th Oct; All of Ireland plus GD/GJ/GU.
11th Oct; All of Scotland north of Aberdeen.
It is now up to you lads in the remote areas to make the event a success. Any QRP DX-peditions to GJ GU would be very welcome. Remote stations should use plenty of "CQ QRP" calls around 3560 KHz. We think conditions will be such that 3.5 MHz will be the main traffic frequency, but also suggest that during the period 1130 - 1230 GMT daily calls around 7030 KHz, and on 10MHz by remote stations could be useful. The rest will monitor at these times.

OK/G QRP TESTS 31 JANUARY/ 1st FEBRUARY 1987

This, the second series of Tests, was an outstanding success. The contacts and participation doubled compared with 1986. Some 20 OK QRP stations were active, of whom more than half made contact with the UK. Over 40 UK station made it to Czechoslovakia. As expected, 21MHz produced no contacts, and it will be dropped for the 1988 event. 14MHz was excellent for OK2 and OK3. 10MHz was terrific during the day, nearly 50 two-way QRP contacts being made. 7MHz was tough, though some made it. 3.5MHz produced over 30 contacts, but was much plagued by TV time base QRM in the UK. 1.8MHz also produced no contacts this year. For the 1988 event there will be a drastic change in the times of the 3.5 and 1.8MHz periods in the hope of catching maximum propagation and minimum QRM. Watch SPRAT for further info.
Certificates for the best Czech performances have gone to OK1AIJ, OK2BMA, OK3CPY and OK3CUG. Czech souvenir awards go to the best UK performers, namely G4JFN, G3VTT, G3BFR and GM4XQJ. (Yes, the GMs did make it this year!). A thoroughly enjoyable event, and many thanks to our OK friends for making it possible. QRP is going big over there now. There was a recent very succesful QRP Rally, a QRP circuit book is being prepared, and there should soon be a regular QRP column in the national radio magazine.

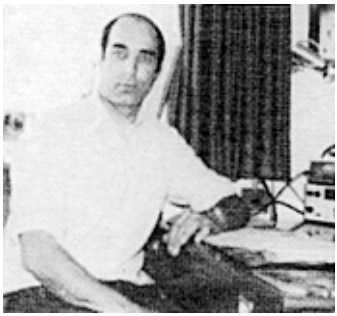
MILLIWATTING (AND MICROWATTING) ON 2304MHz

By Terry Young K4KJP

The first known QSO in the playground area of 2304MHz took place on 26 July 1986 when W4ODW and K4KJP gave the 13cms band a try with some linear transverters constructed by W4ODW. SSB, CW and NBFM modes were all worked successfully over the 12.6 mile path between Niceville and Ft. Walton Beach, Florida, USA. K4KJP was 5x9 plus 10dB at the 600mW output level and S7 at the 20dB down level of 6mw. At 0.6mW output he was 3x2 on SSB and RST 339 on CW while using a non resonant antenna, the 432MHz beam.

These power levels were very accurately measured with a Hewlett-Packard HP-435A power meter. 10dB attenuators, good from DC to 4GHz, were used to accurately reduce power to these milliwatt levels. W4ODW was using a dish antenna with a 2304MHz feed and homebrew 3 watt amplifier. With a resonant 20dB gain antenna at my end, I am certain that we could have easily gone down 10 more dB in power level to 60 microwatts output and maintained a QSO. This QSO represents a 21,000 miles per watt achievement and both W4ODW and K4KJP have earned the first Killo-mile per watt awards from ARCI ever issued for the 13cms band.

Member's News



Chris Page G4BUE

"Alamosa", The Paddocks, Upper Beeding,
Steyning, West Sussex, BN4 3JW

The last couple of months have been very hectic on the social scene with NEC, Dayton and the Yeovil QRP Convention. I have lost count of the number of members I have met, many for the first time, and it has helped to make up for my absence from the QRP frequencies this year. Those of you waiting for a QSO with G4BUE will, I am afraid, have to wait a little longer as things are getting more hectic than ever. I shall be working away from home during the Summer and my week-ends will mostly be taken up with Club administration and gardening chores. Talking of the social scene and summer, don't forget the Summer QRP Party on the 15 August, details are elsewhere in SPRAT. Now to get on with your news, and first let us congratulate Norman, G4IQF who, I believe, is the first UK member to pass the USA exams to qualify for his Extra Class licence. Norman sat the first exams at NEC and completed them at Dayton during the Convention. Great going Norm.

Congratulations also to the Yeovil ARC for making the 1987 QRP Convention such a success. This was my first time there and the Club stand seemed to be constantly surrounded by members. My thanks to Bob, G4JFN for devoting his afternoon to the stand while I did a talk on getting started in QRP construction. My thanks also to Eric G3GC and his charming wife Katharine for giving me the use of their guest room. There were approximately 100 amateurs there of whom well over half were Club members. This was the first time of the new May date, it has previously been held in October, and it was disappointing that the attendance was down on previous conventions. Whether it was the Shropshire Rally on the same day or the change of date to May that kept people away the Yeovil Club are not sure, but what is certain is that those who stayed away missed a terrific day. The Yeovil Club are now considering whether to keep to May or revert to October. Let G3GC know what you think at 60 Chiltern Grove, Yeovil, Somerset, BA21 4AW, but whenever it is held in 1988 I urge you to go. There is excellent facilities for putting rigs on the air, talks, stands and displays, good (cheap) food and lots and lots of enthusiasm for QRP. My own choice? What could be better than Somerset in May?

Thanks for all your comments regarding SPRAT 50, I wish we could produce a magazine like that every time. We need more members and more articles before we can do that, as more members mean more copies of SPRAT and more copies mean a cheaper SPRAT. The membership is growing, I have just enrolled number 4246, but the articles - well that is down to you!

Seems as though we have some candidates for the worst QRP garden. G0EBQ has 15 feet at the back of his house and has managed to get a half size G5RV in by fixing it to the top of a 10ft wall and up a drainpipe. Nigel has worked UA3 with 600mW on 20m with it. VK4BRF lives in a high-rise apartment where antennas are forbidden and G0FIU describes his QTH as a postage stamp, the garden being 12ft square and next to a railway line. A Jaybeam VR3 has given way to a half size G5RV which then came down in the wind.

G0DJA is very active on 2m CW from his Birmingham QTH using 2.5w from an FT290. Dave is also active on 50MHz with 300mW, but hopes to do better when he ups the power to 3w. G3ICH is another member on 50MHz with an IC505, and Pete finds the band considerably better than 10m for local and GDX conditions, although he is only using an indoor dipole. First outside job of the year is to erect a 3 or 4 element beam. G8HJS asks for designs for simple VHF/UHF rigs like the G8AEV 1w TX of years ago. John suggests a design contest, say a simple TX with 6 channels. If anyone would like to organise it get in touch with John, G8SEQ our VHF Manager. G1SVC uses a FT290R and 4 el quad on 2m. Pete would be interested to know if there is a QRP calling frequency or any QRP nets, etc. Over to you VHFers, let me or G8SEQ know what you come up with and we will publicise it in SPRAT.

G3XJS has acquired a DX32 and spent the days just prior to Christmas putting it up - remember that awful cold weather just then! Pete says it was well worth it as he has found DX in the shape of CP, 8P, OD5, ZF, VP2M, PY, ZS and TA on 15 and 20m. A later letter tells us about his red letter day at the end of March when he worked his fist VK to complete WAC. Pete was

also active in the April ARCI QRP Contest and was pleased to make 15 QSOs into the USA, including 6 with members. The ARCI have another contest on 17/18 October which is very popular with USA QRPers. They are always pleased to work European QRP stations and the Contest is an excellent opportunity to make your first two-way QRP QSO across the Atlantic. Thinking of DX do you want to work Andorra on two-way QRP? If so look for C30LDF between 22 August and 5 September as one of the operators will be G4WKJ. Trevor will be using a Century TCVR for the first 7/10 days on the CW QRP frequencies as much as possible. He says the path to the UK is excellent all day on 20m and on 80m from late evenings, and he will be monitoring the QRP frequencies on each hour. How about a write-up for SPRAT Trevor? Another member off to a DX location is G3CBF who should be in Libya by the time you read this. Gerrard intends applying for a licence and having just built the Howes 40m RX, which he decribes as amazing, only needs a small TX to be QRV from 5A on QRP. Still on DX a letter from an excited G8JR tells me he worked 5N2KRC on 15m two-way QRP. Pete says he was rather chuffed about it and then worked 5A0A for number 91 for his DXCC.

G4JFN is continuing his quest for Mw DXCC inbetween working the occasional new member. The pressure is on when you are out in front Bob! Bob is now up to 82/78 including S79, HZ, TA, YC, ZS, 3B8 and 5T5. Highlight of February for G3IQF was working his first USA station on 30m with his 2w homebrew TX. Congratulations to Ron and Jean, G0AQX and G0AQY who are the first husband and wife team to complete the Novice Award (both A and B sections). G6EPT is shortly to become G0HTR as he has achieved one of his greatest personal radio goals - passing the morse test. Laurence says that most advice to him so far is to now chuck the keyer up the garden and forget the whole thing. After the effort of passing he says that would be a waste and someone, somewhere is going to have a lot of patience with his slow, slow morse. Patience is one thing QRPers have a lot of and I'm sure you will receive a big welcome on 3560.

Now a plea from G3YFU and G3FCK whose copy of SPRAT 49 went missing in the post. I was able to replace it for them but not the QSL cards which were in the envelope. So if you worked Tom and Mac prior to Christmas 1986 please send them another QSL card. Mac is well known to you as the man behind all the drawings and schematics in SPRAT. A similar plea for replacement QSL cards for G4VPV whose copy of SPRAT 50 was received minus QSL cards. So if you worked Dave prior to March 1987 please send him another card. Whilst on QSL cards, G4WZV asks me to mention the new Club QSL cards which he has kindly offered to be responsible for. A sample was sent out with SPRAT 50, one side of which is an order form. Dave says that orders should be completed within 10/14 days.

WA1MAC is working on an IC receiver using the CA3046 array and G4UYB has converted a CB for 10m using a WPO mini synth. Jon has worked USSR with it on a 5/8 vertical. HB9ABD recently tried the Hula-Hoop antenna from SPRAT 50 and worked several Scandinavian stations. The same article reminded DD5LC of an article in CQ-DL, "Rahmen und Ringantennen", 5/84 which describes a number of magnetic antennas and their characteristics. Dave says the article contains a description of three antennas and is well worth a read if you understand German. OK1DKW and OK2BMA both attended the QRP Rally at Chrudim along with 60 others, including 17 members of The OK QRP Group. Petr will have a regular QRP column in the Czech radio bulletin and to encourage 10MHz activity, (Petr himself worked ZL with 3w), they have announced a competition for the design of a 10MHz rig called 10x10 involving a maximum size of 10cms cubed! In reply to the request from G4XOM in the last Members News Petr gives the DIG Secretary as E. Warnecke DJ8OT of Postfach 10 12 44, D-5620 Velbert 1, FRG. SP6GVU reports the formation of a QRP Group in Wroclaw who all read SPRAT with interest. Members include SP6GB, SP6FVF, SP6GYS and SP6RT. Anoly says they have a QRP contest at the end of April each year on 80m, so make a note in your 1988 calender.

Not so much construction news this month, but G4KKI has just finished a new rig for 80m CW which is to replace the DSB80. The specification sounds great and perhaps Bill will let us have more details for SPRAT. On the air UA9 was worked for his first Asia contact, just leaving S.America for WAC. K4JSI worked KH6 and 5T5 on 40m in the ARRL Contest using 5w and G0CWW has worked all over Eastern Europe /M with an FT290, Howes TVTR and a G Whip. Roy also worked 2 USA stations on 10w SSB. ZL1ABS and G3ROO continue their skeds at 0830z Tuesdays on 14118 and AI2H tells me he is now 7J7AAF 400 miles north of Tokyo. Barry runs an Argonaut and checks the QRP frequencies regularly for members. N8CQA is building the "Two-fer" kit, a club project by the ARCI gang. The ARCI magazine "The Quarterly" has now become a first class QRP magazine and like SPRAT is published quarterly. Membership of the ARCI is open to all QRPers at $13 for DX amateurs. Details from the Membership Chairman, K4AHK, 10923 Carters Oak Way, Burke, VA 22015, USA.

Several of you have asked me whether we lost many members due to the new subs system. I don't think we lost any because of the change although I have deleted quite a few from the SPRAT mailing list this time, on checking the old records I see they have not paid subs for a long time. Now that all members are due to renew in January it makes life a lot easier all round. Remember though that you can always pay two or three years in advance if you want to. Starting with the next edition of SPRAT I am hoping to include the last two figures of the year you are paid up to on your address label, (87 for 1987, 88 for 1988 etc), so you will know when you have to renew.

GM3KPD is one of my fellow members of FOC and the Club has its annual "Marathon" contest over the first week-end of February. This year Alf decided to use QRP at 2w and made 118 QSOs including VP2M, 4X4, OY and numerous Ws, including W1 on 80 and W3 on 40. Afterwards Alf put a 10106 crystal in his Oner and tried a tentative CQ which resulted in a 559 from a DL. The antenna was a long wire, most of which is in the attic! FD1JDG is QRV on 40m with a G4VAM TX from SPRAT 43 which he uses for milliwatting. Andre was the winner of the QRP Gold Cup in the 1985 and 1986 REF Contests. He is in favour of the 1843KHz frequency for 160m.

G0GSZ is QRV on 160m with a G3WPO DSB/160 kit, and on 80m with a Howes. G4NFR has been working members on 80m with 3w from a KW2000. Reg has almost completed a PW7, despite some problems with the BF256 FET in the VFO. He recommends the W1FB QRP Notebook and W0RSP Joy of QRP to fellow club members. G0FKX is using a dipole for 160m fed with 600 ohm feeder and a homebrew ATU for the other bands. David says it works well with QRO, but neither his Howes or DSB2 like it, even though the SWR is 1:1, unusual one there Dave! GM3MXN and G0FTO are pleased with their new Argonauts, G3YCC has swopped his TS430S for an Argosy, and G3MBN has got a Century 22. ON4KAR apologises for being late in QSLing. Rene has had health problems, but I'm pleased to report he is now better. A friend gave him a TH3 beam which is going up this summer and he mentions that ON stations are now allowed to work 1.8, 10, 18 and 24MHz but not 50MHz. WF6U has put up a 48ft aluminium flagpole to hold one end of his 40m dipole. He is looking forward to working the UK on QRP soon.

A request from G4KCB who wants to get on 10MHz with his KW Vanguard and Geloso VFO, but is having problems adapting the VFO to give 10MHz. George wonders if an outboard VFO would be the answer and would welcome suggestions. K6DFP recently tried out his 1949 one valve 1w TX and found it worked fine. Chester intends using it for milliwatting. KA7KXA, despite being confined to a wheelchair with multiple schlerosis, is very interested in antennas. Lewis would like to hear from any other members in the same position as himself.

The different print style used in the last Members Column was received without one vote against, so I have retained it. Judging by the amount I have written so far it is just as well. George allows me two pages, but (again), sorry George, I guess I shall be over by about half a page. Don't let that stop you telling me your news though! Finally I must thank all those members who responded to the "Adopt a Member" scheme mentioned in the last SPRAT. Within a few days all 17 East European members had been sponsored by having their subs paid. Your terrific response and generosity shows the true spirit of amateur radio and in particular QRP. I know it's an old cliche but it's still very true that if more of our world leaders had the same spirit of goodwill as radio amateurs, then the world would be a much better place. On behalf of our East European members - thanks a million.

Let me know how your Summer goes, by 20 August please, and perhaps see you at Alamosa on 15 August?

73 Chris

1987 SUMMER QRP PARTY

As mentioned in the last SPRAT Pam and Chris extend an invitation to all members to attend their fourth Summer QRP Party at the G4BUE QTH on Saturday 15 August from 2pm. This is your opportunity to meet other members and swap ideas etc. Don't forget to bring your home brew rigs with you, either to hook up to Chris's beam, or to get some help to get it going if it won't work! Pam and Chris ask that you let them know you intend going, either to the address shown in Members News or on 0903 814594. A bottle of something would be appreciated to assist with the catering. Last year over 50 members attended and so far this year members from the USA and Holland will be there.

CAVEAT EMPTOR

FOR SALE: Century 22 Model 579 CW Transceiver, 0-20W Output, 80 to 10M, including 30M. Complete with internal Ten Tec Electronic Keyer and calibrator.
As new, mint condition, £300. Colin G3VTT, 0622,39936.

FOR SALE: Trio TS130S, £395, or with YK-88C CW Filter, £425. BNOS 12/25 25 amp power supply, £125. Digital Multimeter HC7030, LCD, 10A, 1000V, 20Mohms, overload protection, £25. Tel 045,36,3994.

FOR SALE: Howes Modules, TX and VFO for 14MHz, Built and Tested £20 plus postage. G3YCC QTHR TEL: 0482.650410.

FOR SALE: Marconim TF801D 10-470MHz Sig, Gen, £20. 2N3055's at 5 for £1. Equipment Carrying Cases: 7x11x13 at £7, 10x7x7 at £3. Mechanical back run timers (60min) £3. 4 digit, 12V, Impulse Counters: £2 Paul G4BXT, QTHR TEL: 0322.77401.

FOR SALE: ICOM ICR7000 Receiver with Remote Control and AH7000 Discone Antenna: £850 plus carriage. WELZ AC38 A.T.U. Mint, Boxed: £70. Trio DM81 Grid Dip: £90. Sony TV121EP B/W Portable TV, Mint: £50. John Allsopp, G4YDM, 30 Manor Park, Concord Village, District 11, Washington, Tyne and Wear, NE37 2BT. TEL: 091.4162606.

FOR SALE: KW704 Transmitter 160 to 10 metres. Complete with manual. £95 plus carriage.
Peter Dodd G3LDO QTHR Tel 0903 770804

WANTED Any info about mods for Trx Ten-Tec 540. Did this model have a name? Also wanted a noise blanker, Ten-Tec model 249 and CW filter model 245. Your price paid. Will be visiting Summer QRP Party at G4BUE QTH. Peter Halpin PD0MAM, S.Vestdijkstr. 21, 7552 Nr. Hengelo, The Netherlands.

WANTED Other members who have a Yaesu FT301S to swa ideas on mods, possible faults etc. Malcolm Horton, G4DMH, 79 Swinnow Gdns, Bramley, Leeds, LS13 4PH. Tel: 0532 554703.

FOR SALE Set of SPRAT issues 20 to 50 complete and in good condition, £5 plus postage. Solid State Design for the Radio Amateur by ARRL, in good condition, £5 plus postage. John Finby, G4PQF, 25 Bodleian Court, Gorleston, Gt. Yarmouth, Norfolk, NR31 7HB.

WANTED Handbook for a BC221 frequency meter. Willing to pay postage and photocopying costs or buy. Bill Rennison, G3BOK, 18 Bucklesham Rd, Kirton, Nr. Ipswich, Suffolk, IP10 0PA.

WANTED Used postage stamps, GB and foreign, to finance medical equipment. John Allsopp, G4YDM, 30 Manor Prk, Concord Village, District 11, Washington, Tyne & Wear, NE37 2BT.

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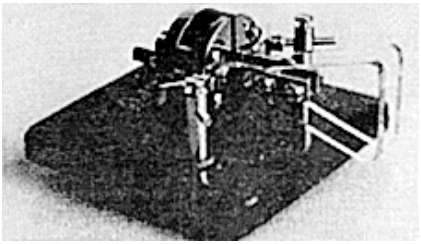

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