SPRAT

THE JOURNAL OF THE G-QRP CLUB
DEVOTED·TO·LOW·POWER·COMMUNICATION
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THE GQ TRANSCEIVER

A HIGH PERFORMANCE CW TRANSCEIVER
AVAILABLE AS A SPECIAL G QRP CLUB KIT

THE GQ TRANSCEIVER - HF POWER ATTENTUATOR
ZL2BMI DSB TRANSCEIVER - SIMPLE KEYER
POLARITY PROTECTION - SIMPLE PRODUCT DETECTOR
EPIPHYTE DIGITAL DISPLAY - BUDGET CW FILTER
G3BMO VALVE TRANSMITTER - A.A.A.
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JOURNAL OF THE G QRP CLUB

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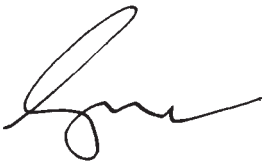
Rev. George Dobbs G3RJV

EDITORIAL :

I look forward to meeting members at many of the summer radio events. This year I will be at several local radio rallies, Friedrichshafen and a new event in Dublin. This new event (see elsewhere in this issue) is a residential QRP Gathering with lectures, practical workshops, active QRP working and social time plus plenty of free time to enjoy Dublin and Ireland. I have just returned from a planning meeting in Dublin and the venue and facilities are excellent. A first of its kind and if it works out well this time, I suspect it may be repeated in future years. This issue also contains information on the Mini-Convention in October.

I must use a little SPRAT space to congratulate Peter, G3PDL, the club treasurer and Diane on their recent wedding. A short report appears in the SSB Column. Peter and I are old radio amateur friends. A friendship which goes back to our late teens when we shared a work place and an interest in making RF come out of valves. I once promised I would not tell anyone he taught me Morse. Peter has worked hard for the club in recent years, putting the accounts into a computer format, preparing the annual Member's Handbook and more recently introducing credit card payments for club membership. He still wields a skilful Morse key on the HF bands.

My Best Wishes for the summer



G3RJV

EDITED BY GEORGE DOBBS G3RJV ARTWORK BY A.W. (MAC) McNEILL G3FCK
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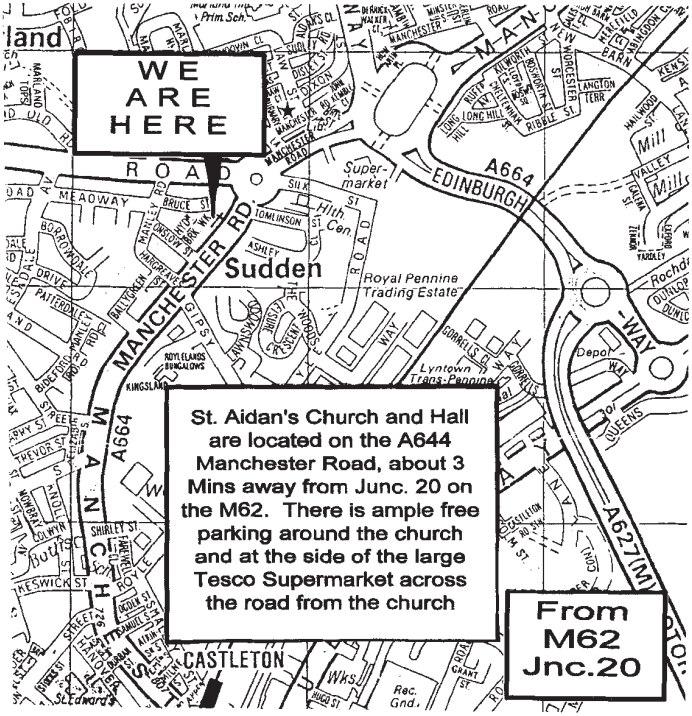
G QRP MINI-CONVENTION
Saturday 14th October 1995

St. Aidan's Church Hall, Sudden, Rochdale
Admission £1 - Doors Open at 10am - Talkin on S22 from 9am
Lectures - Bring & Buy - Surplus/Component/Kit Traders - Large Social Area
Food and Drink available all day - including the famous Pie and Peas Lunch



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HAVE YOU CHANGED YOUR STANDING ORDER ?

FROM THE MEMBERSHIP SECRETARY:

John Leak, G0BXO, Flat 7, 56 Heath Crescent, Halifax HX1 2PW

As most members are aware, the **subscription for UK Members was increased from £5 to £6** a year, from January 1st 1995. Many thanks to those members who promptly paid the extra £1 and particularly those members who sent extra contributions, some quite substantial.

However at the time of writing [end of May], some 140 members who pay by standing order had not increased the amount and had not sent the extra £1.. **Please check your standing order** and if you are one of the members concerned, please remit the extra £1 to me if you wish to continue in membership. Two members sent me £1 each in stamps and one sent a £1 postal order. None of them gave a name, callsign or club membership number, so I have bee unable to update their records.

IT IS VERY IMPORTANT THAT YOUR MEMBERSHIP NUMBER AND CALLSIGN ARE QUOTED IN LETTERS OF CLUB OFFICIALS, PARTICULARLY WHEN RENEWING MEMBERSHIP OR NOTIFYING DETAILS OF CALLSIGN OR ADDRESS CHANGES.

The GQ-40 (GQ-20) CW Transceiver

A High Performance CW Transceiver Available in Club Kit Form

- **Selective Bandpass Input Filters**
- **Passive First Mixer**
- **Six Pole 500Hz IF Filter**
- **Stable, Clean, Class AB1 Power Amplifier**
- **Adjustable to up to 7 watts of RF Output**
- **QSK Operation**

General

The GQ40 is high performance CW transceiver, the receiver is a conventional superhet design at an IF of 4.4Mhz, with a high dynamic range double balanced diode mixer, a 6 pole crystal IF ladder filter and high power audio output stage.

The transmitter is of the mixer type, utilising the receive mixer in a bi-directional mode. The driver and PA are MOSFETs of the inexpensive commercial switching type, adjustable gate bias allows user selection of operating class. The PA is run in push pull to give a low harmonic content and when in AB1 an output of 7 watts is typical. Power output in normal operation is fully variable via a power control [drive] potentiometer.

Full QSK is achieved by electronic time switching of the antenna pin diodes, + ve supply lines and IF gain control. Conventional rectifier diodes 1N4007 are used for the antenna change over system as these are inexpensive and have a similar doping profile to more expensive pin diodes. Insertion loss is less than 0.1dB at 10Mhz with an IP3 of 50dBm when biased at 5mA minimum. Frequency control is by a Colpitts VFO with a high quality variable capacitor, because of the high frequency required for local oscillator on 14Mhz the VFO is pre-mixed with a crystal oscillator. For greater sensitivity an RF amplifier is available. (*See next issue*) In/output pins are provided after the antenna changeover, together with PCB pads, for a piggy-back board above the main board.

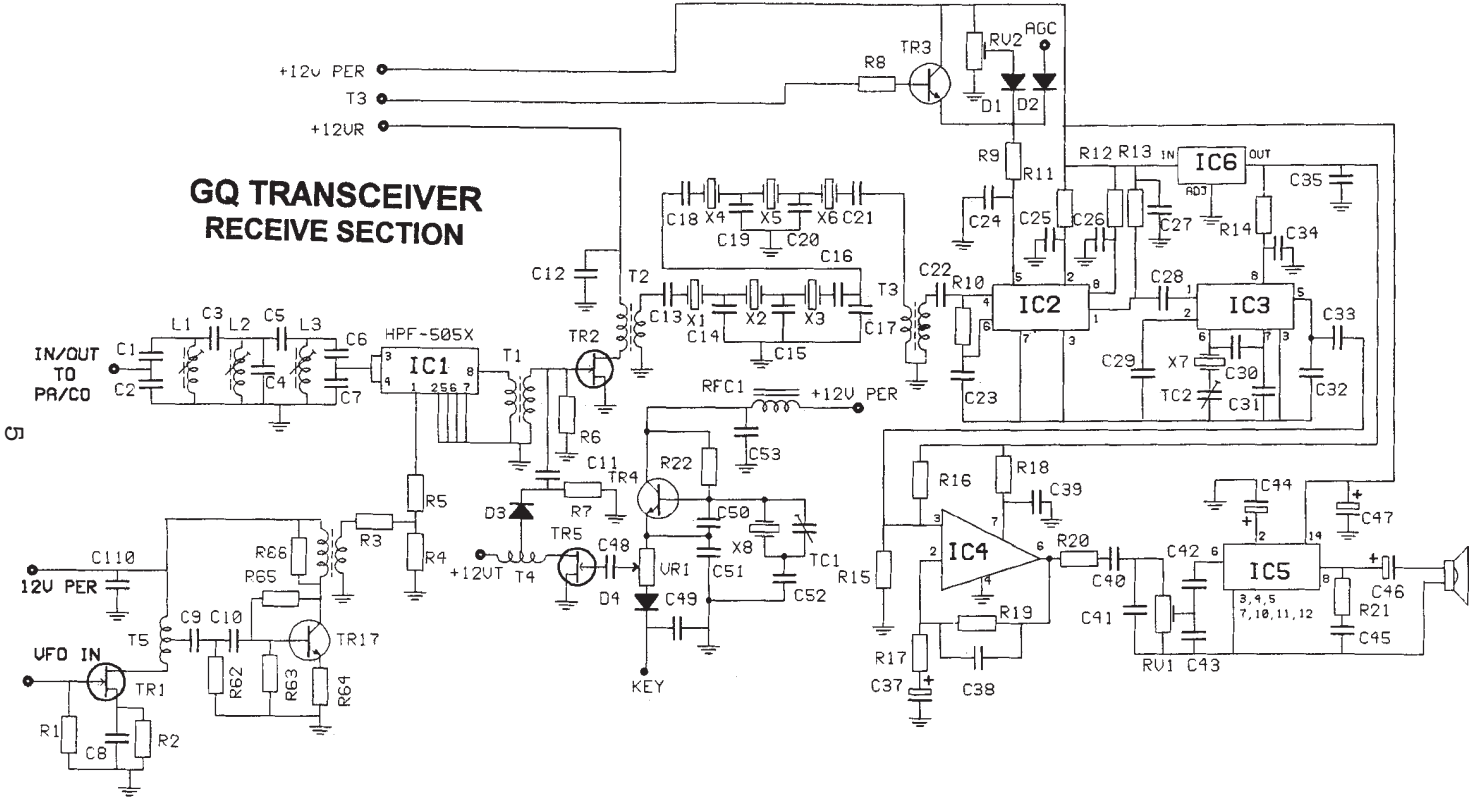
Receiver Front End

Signals from the antenna are routed through the LPF L7-5/C77-74 to the diode change over system. D5/6 are biased on from the permanent 12v line when TR6 is switched on by the receive 12v line. Bias is regulated by R26/25 with RFC2,3,4 and C55,56 keeping RF from entering the DC supply. D7 prevents signal loss during receive through T6. Signals now enter the 3 pole input filter formed by C1-7/L1-3. The input filter is a low loss Butterworth design with a bandwidth of 300khz. Capacitive dividers C1/2 and C6/7 match the characteristic filter impedance to 50R.

The filter output feeds IC1 a double balanced hot carrier mixer type HPF-505x. LO drive for the mixer is provided from a 2N3866 amplifier and to insure a correct termination a 3dB 50R T pad is used at the mixer LO port. The mixer IF port is terminated by a simple active termination which uses a step up transformer to J310 FET amplifier with a gate resistor. Whilst this is not as good as the more common diplexer arrangement, it does not require setting up.

Crystal IF Filter.

The filter is a six pole ladder with a centre frequency of 4.433 MHz. The unit uses high quality, high volume crystals designed for colour burst timing. The filter has a 3dB bandwidth of 500Hz and a Gussian shape by use of Butterworth design constants. T2,3 match the input and output impedance of the IF amplifier and product detector. IF amplifier and product detector. IC2, a MC1350P, provides up to 60dB gain at the IF frequency.


GQ TRANSCEIVER
RECEIVE SECTION
+12v PER
T3
+12VR
IN/OUT TO PA/CO
12V PER
VFO IN
KEY
AGC
IC1
IC2
IC3
IC4
IC5
IC6
HPF-505X
TR1
TR2
TR3
TR4
TR5
TR17
T1
T2
T3
T4
T5
RFC1
+12VT
TC1
TC2
VR1
RV1
RV2
X1
X2
X3
X4
X5
X6
X7
X8
D1
D2
D3
D4
ADJ
IN
OUT
3,4,5
7,10,11,12

During transmit the amplifier is muted by applying bias to the AGC control pin 5, this bias voltage is switched by TR3 controlled from the T3 line. A front panel IF gain control is feed to the AGC control input via D1 and external AGC may also be applied via D2.

The exclusion of an AGC system was a deliberate design policy. Many of the audio derived AGC systems found in current QRP Transceiver designs are far from satisfactory and the inclusion of AGC is often counter-productive to the reception of weak CW signals. *"...as pro-rally drivers require manual transmissions and professional photographers use manual focus cameras, serious radio operators need a manual gain control." Rick Campbell, KK7B, QST August 1992.* If you must add an AGC system - add a good one.

The amplified IF frequency is converted to audio frequency in IC3 an NE602 balanced mixer. LO (BFO) injection for the conversion is provided by an on chip crystal oscillator. The BFO frequency is adjusted by TC2. The NE602 requires a 6vcc line and this is provided from IC6 a three terminal regulator.

AF Pre-Amp and Amp.

A low noise LM358 pre-amplifier IC4, with some frequency tailoring drives a LM380 audio output amplifier. The output is capable of about 1 watt of audio, and has a Zobell network to insure stability.

TX Carrier Osc, Buffer and Mixer

Tr4 is the TX oscillator and is crystal controlled at 4.433 MHz. TC1 allows the frequency to be offset to match the RX BFO audio note. The oscillator is keyed directly at the keying rate via the key line. TR5 is a J310 buffer amplifier, this feeds the mixer via D3 which is biased on during transmit via the 12vt line.

The output is coupled to the mixer transformer T1 via C9 a dc blocking capacitor. The TX signal is mixed in IC1 to the output frequency and routed back through the band pass filter to the pre-driver TR7.

TX Pre-Driver and Driver

When in transmit D8 is biased on by the 12vt line coupling the transmit signal to TR7 by T6. D7 is also biased on to provide an RF ground between D5/6 to improve the input/output receive bypass isolation. C58 provides a DC block to prevent D5/6 being switched on.

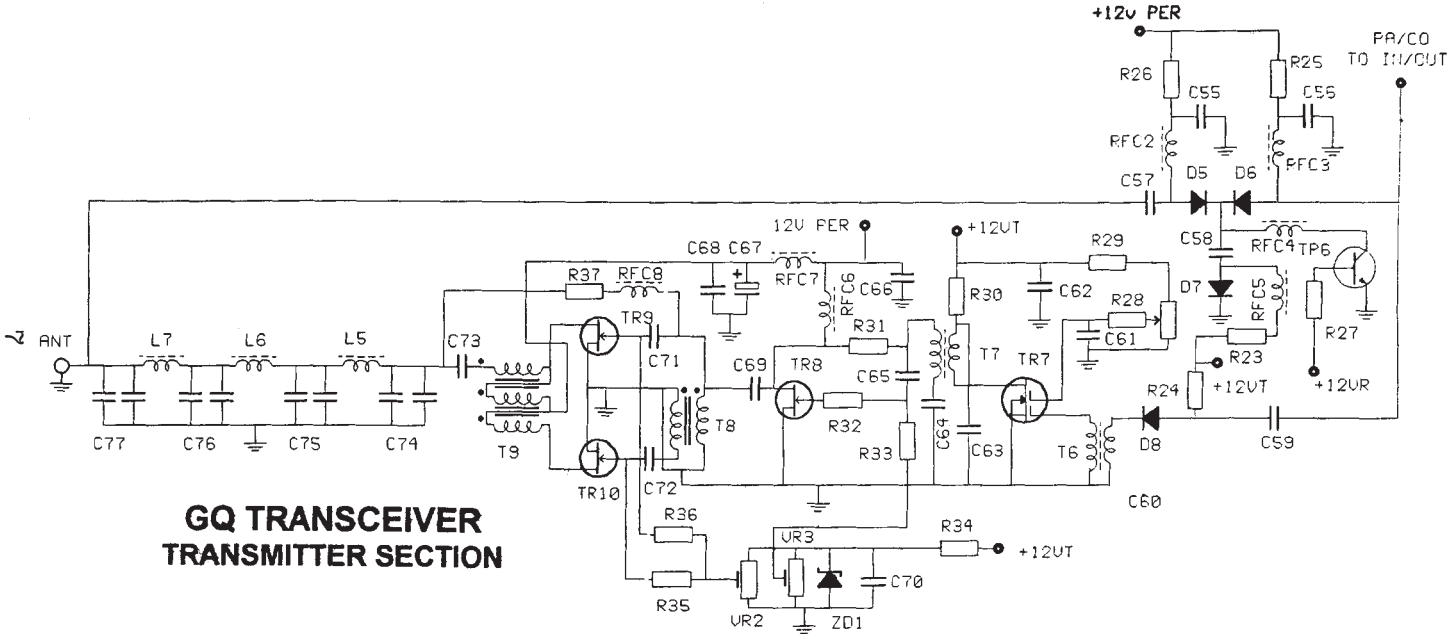
The pre-driver is a dual gate MOSFET, gate 2 is used as a control element by varying its voltage by RV4 a panel mounted potentiometer. The stage is transformer coupled to the next by T7 a broad band matching transformer, C64 on the secondary provides an RF ground but provides dc isolation.

The driver TR8 a VN66 FET, is biased as a class a amplifier. Feed back is applied to the driver to insure stability , this is controlled by R3. Bias adjustment is by VR3, the voltage is stabilised by ZD1 and supplied from the 12vt line. As the amplifier has no bias during the receive period TR8 is connected to the 12v permanent line.

Power Amplifier

TR9/10 are run as a push/pull amplifier, to maintain stability R3/RFC8 provide feedback. Push pull drive for the amplifier is provided from a phase splitter transformer T8. The amplifier is provided with bias to allow the operating class to be varied. The best balance between output power and efficiency will be in class B, VR2 is the bias control potentiometer and is adjusted for the required quiescent current.

T9 a trifilar transformer matches the transistors output impedance to the load presented by the output filter. LPF L5-7 and C74-C77 for a 7 element Chebyshev low pass filter. This has a low SWR at the operating frequency with the cut-off just above the max. bandwidth upper frequency. The filter is used bi-directionally to cascade with the band pass filter when in receive mode.



GQ TRANSCEIVER
TRANSMITTER SECTION

VFO and Pre-Mix

The VFO is a standard Colpitts oscillator. The voltage to the oscillator is stabilised by a three terminal regulator at 5 volts. C93 is the main fixed capacitance, this is made up from 3 values with NP0 dielectric and a small 10pF trimmer for calibration. A J310 amplifier buffers the output to the LO drive amplifier, TR17

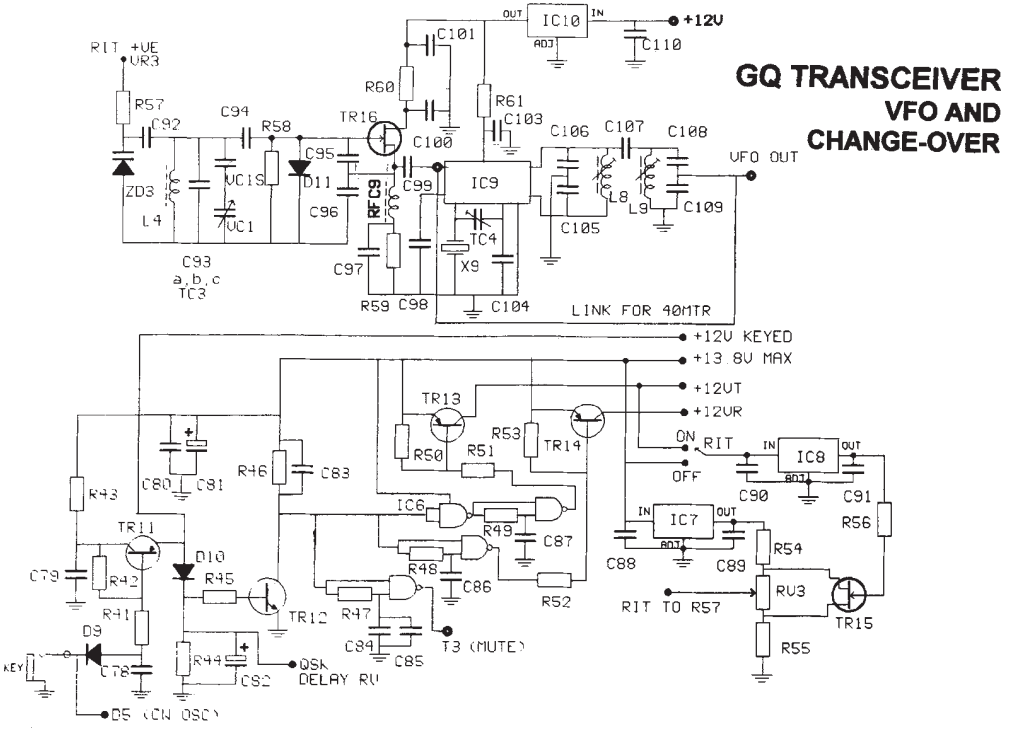
The inductance is wound on type 6 material which is good compromise between thermal stability and the winding size. Receiver incremental tuning is provided by a variable capacitance diode, to maintain a reasonable voltage swing on the diode its effective capacity is reduced by the series capacitor C92.

Output from the oscillator is coupled by C99, either to the pre mixer IC9, or direct to the main mixer LO amplifier TR17. When the transceiver model requires a LO frequency greater than 6MHz IC9 pre-mixer is employed. This is a NE602A used as a Xtal oscillator/mixer. The LO pre-mixer output is filtered by T10 to an 2 pole bandpass filter C105-109/L - L

Voltage and Control Switching.

The 12vt and 12vr power supply lines are switched by PNP power transistors controlled from a time and delay circuit. The timing switch IC6 is a quad nand smitt trigger package, gate timing is adjusted with small ceramic capacitors C84-87. Timing is initiated by TR11 keyer which directly keys the CW oscillator and the delay generator TR12. TR12 will hold on dependant on the charge across C82, the charge is adjustable via RV4 which is mounted on the rear panel.

RIT voltage is supplied through a divider network controlled by RV3 a front panel potentiometer. Voltage to the divider is stabilised by a three terminal regulator IC7 at 8 volts. During transmit or when the RIT is switched off gate voltage is applied to TR15 from IC8. This turns on the FET to short RV3 and centre the voltage equivalent to the mid position of VR3.



Parts List GQ Transceiver All Bands

R1,41	47K
R2,4	180R
R3,5	10R
R6	560R
R7,9,24,51,52,65	4K7
R8,19,27,45,46,50,53,54,55	10K
R11,12,13,14,30,62,66	100R
R15,16	68K
R17,20,23,25,26,28	1K
R18	220
R21	5R6
R22	220K
R29,42,47,48,49,57,58	100K
R31	3K
R32	27R
R33,35,36	22K
R34	2K2
R37, R38	NOT ALLOCATED
R60,61	----------
R62	680R
R64	12R
RFC 2,3,4,5	<N>102
VR1	1K PRE-SET
VR2,3	10K PRE-SET
RV1,2	10K LOG
C14,20,28	100P
C8,12,23,24,25,26,27,29	
33,34,35,40,42,45,55	
56,57,58,59,62,66,68,7980,83,84,86,87,88,	
89, 90, 91,100,101,110	100N
C10,11,43,61,65,71,72	1N
C13,15,16,	
18' 19,21,31	180P
C13A,15A,19A,21A	22P
C14A,20A	4P7
C16A,18A	8P2
C17	fc18P
C22,32,38,39,49,63	
64,69,70,73,78,85	10N
C30,48,93A,93B	47P

C37	10MFD
C41	4N7
C44	47MFD
C46,47,81	100MFD
C50,51	150P
C52	27P
C92	6P8
TC1,2	60P BROWN
TC3	6-10PF BLUE
TR1,2,5,16	J310
TR3,12	2N3904
TR4	2N2222
TR6 TR7	MFE201
TR8	VN66AFD
TR9,10	IRF510
TR11	2N3906
TR13,14	BD140
TR15	BS170
TR17	2N3866
IC1	HPF-505X
IC2	MC1350P
IC3,9	NE602A
IC4	LF351
IC5	LM380
IC6	4093
IC7,8	78L08
IC10	78L05
D1,2,4,9,10 ,11	1N4148
D3,8	BA243
D5,6,7	1N4007
D11	BB105
ZD1	BZY88C 4V7
T1,2,3,6,7	37KX830 [MATT BLACK]
T4,5 ,10	BLN43002402 [2 HOLE BALUN CORE]
T8,9	59-61001101 [MATT BLACK]
X1-8	4.4336MHZ
RFC1	100uH [101J] TOKO 7BS
RFC2,3,4,5	1000uH [102J] TOKO 7BS
RFC6,7	15uH [0082K] TOKO 8RBSH
RFC8	10uH [100J] TOKO 7BS

Parts List GQ Transceiver 40 metres

C1,6 100P
C2,7 1N
C3,5 3P9
C4 100P
C74,77 47P+220P POLY 63V OR >
C75,76 680P POLY
C93 47P+47P+33P
C94 470 POLY
C95,96 1800 POLY
C99 82P
C98-109 NOT FITTED INSTALL BYPASS LINK
TC4 NOT FITTED
R61 NOT FITTED
L1,2,3 KANK 3334 TOKO
L5,7 21T 26SWG T37-6 [YELLOW]
L6 24T S6SWG T37-6 [YELLOW]

Parts List GQ Transceiver 20 metres

C1,6 330P
C2,7 1N [102]
C3 4P7
C5 FIT WIRE LINK
C4 NOT USED
C77,74 180P
C75,76 390P
C93 33P+39P
C94 220P+220P
C95 180P
C96 220P+220P
C98,103 10N
C104 47P
TC4 18P FIXED C105,106 33P
C107 4P7
C108 68P
C109 560P
R61 100R

L1,2 .45uH S18 TOKO
L3 NOT FITTED
L4 T68-6 OR T50-6
L5,7 16T 26SWG T37-6
L6 17T 26SWG T37-6
L8,9 1.2uH KANK 3335 TOKO

THE GQ TRANSCEIVER KIT : MEMBERS OFFER

A Full GQ Kit - Including : Tinned and Component Screened P.C.B. All Components, Punched Case and Hardware with Assembly Manual.

GQ - 40 (40 metre version) : G QRP Club Members Only £70.00

GQ - 20 (20 metre version) : G QRP Club Members Only £75.00

Postage and Packing £2.00 (Registered Postage with Insurance £5.00)

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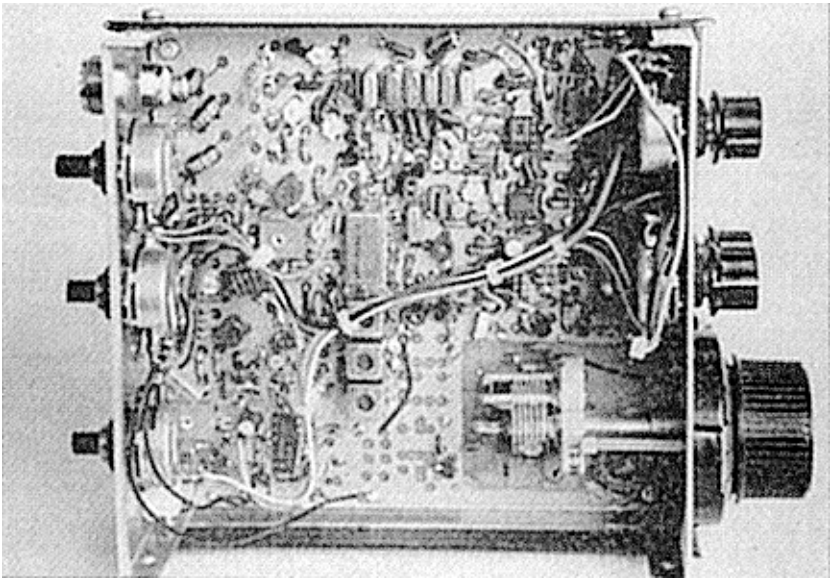
ORDERS TO: IAN WYE GØOKY (see page 21)

GQ - 40 : INSIDE VIEW



A POWER ATTENUATOR FOR HF USE

Dave Penny, G3PEN, 13 Newnham Cl. Braintree, Essex. CM7 2PR

I have trouble setting my HF black box to generate SSB within the QRP level, because the metering is useless at that level. Also, there are problems on CW with obtaining at adequate degree of level stability when drive is reduced to very low levels. I've therefore designed and built an RF attenuator that can reduce the output of my station to QRP level, while running the TX at a power level that allows normal functioning and metering (between 10W and 1000W). Such an attenuator also provides a very useful safety feature when playing with aerial matching. This attenuator does also reduce the RX input, but particularly on the lower frequency bands this may even be a benefit, and most modern rigs can cope on the higher bands by use of an internal pre-amplifier.

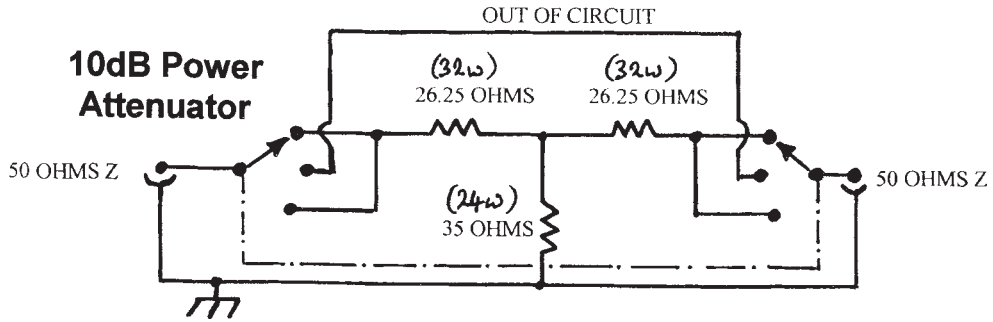
The design is for 50-ohm impedance 10dB attenuator, using a standard 3-way 2-pole ceramic wafer switch to remove or insert the attenuator from its position between the RX/TX and ATU, in the 50-ohm line. The 3-way switch is a safety feature, with the attenuator in circuit at each "stop" position, and "through" in the middle position - making it easier to remember which is which! This protects sensitive RF meters. 10dB loss makes it easy to work out the output level from whatever the TX is set to - divide by 10.

Figure 1 shows the design. It is a T attenuator, with 26.25 ohms in each of the series arms, and 35 ohms in the leg to earth. It uses 420-ohm 2-watt metal-oxide resistors throughout, with 16 in parallel in each series arm, and 12 in parallel in the earthy leg. (I bought a job lot at a rally!) Provided that construction allows good ventilation and heat conduction from the resistors, the power handling is at least 60 watts continuous with a near 50 ohm load, over 50 watts for up to 2:1 SWR, when the rig would see better than 1:1 1 SWR, and about 40 watts for high load VSWRs. The attenuation rises only slightly with small mismatches.

In practice, a 100W output rig on CW or SSB has a less than 50% duty cycle, so this attenuator can cope comfortably with most modern transceivers. For use on lower-power rigs, using 1 watt or 0.5 watt resistors provides a simple alternative design.

The attenuator is symmetrical in wattage ratings, so it can be used either way round. I built mine on a PCB sheet with a front panel but no top (to help ventilation), keeping all the resistors at least an inch away from the PCB, and with separation between in-parallel resistors of about their own diameter. Common tie points, apart from the PCB itself for the earthy resistors, were 1" high ceramic pillars with tags.

Measurements on high-quality test-gear (courtesy of GØDEC) show a through loss of 0.2 to 0.4 dB from below 10 MHz to 30MHz and an added loss of 10.2 to 10.4 dB over the same range, with 0.9dB and 10 .9dB respectively at 50MHz. This meets my requirements - I hope it may be of use to others.



THE ZL2BMI DSB TRANSCEIVER

Rev. Eric Sears ZL2BMI, 31 Ferry Road, Spring Creek, Marlborough, New Zealand. Packet : ZL2BMI@ZL2WA#60.NZL.OC

The ZL2BMI DSB Transceiver has become quite a legend in New Zealand. Eric has produced many versions of this simple transceiver, all using available parts and KISS techniques, and several have been featured in the Break-In magazine. This is a real "see it and do your version" type article.

VFO.

The reason for using UHF dual-gate FETs is simply that they were available cheaply. Other dual-gate FETs should work; J-FETs would also probably work but may require changing the value of the 2.7pF capacitor or the tapping point on the coil.

R1 was originally specified as 100ohms but the altered to 470ohms or even 830 ohms (in one case) to reduce the current drain of the oscillator. Effectively, TR3 operates on about 2 - 3 volts. The capacitor on the drain of TR3 may be a lower value than 0.1uF in some cases. The value of the coupling capacitor to the buffer may also vary.

Capacitor C3, from the output of the VFO to ground, may be included to reduce the VFO drive to the correct level. C3 would be a value up to about 2000pF. it may also have in parallel with it, a resistor of 15 - 50 ohms. The feedthrough for VFO power is 1000pF type. The output feed through is 0pF

Receive Board

The front end tuned circuit is very simple and not particularly selective. A 50 ohm aerial, especially a dipole or balanced type, will not usually cause trouble with BC breakthrough. Some spurious signals from 40m and higher may be hear, but these are not usually troublesome at the time when 80m is best for QRP work. There is plenty of space to experiment with a better front-end if you wish. Alternatively, a simple pi-net filter at the aerial socket would benefit both receive and transmit. (See fig.2).

Note that the VFO port of T1 requires a dc path to earth, which is normally provided through a winding of T2. If T2 is disconnected, it would be necessary to add a small RFC to replace it, in order for the receive mixer to work.

C1 may be raised in value to reduce the audio 'highs' The lower tone may be more pleasant, but will also reduce sensitivity slightly.

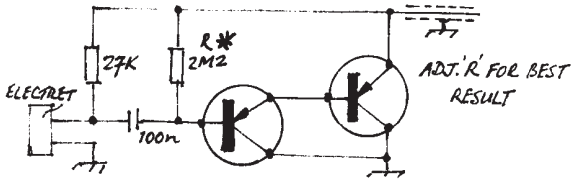
Microphone, Balanced Modulator and RF Amplifier

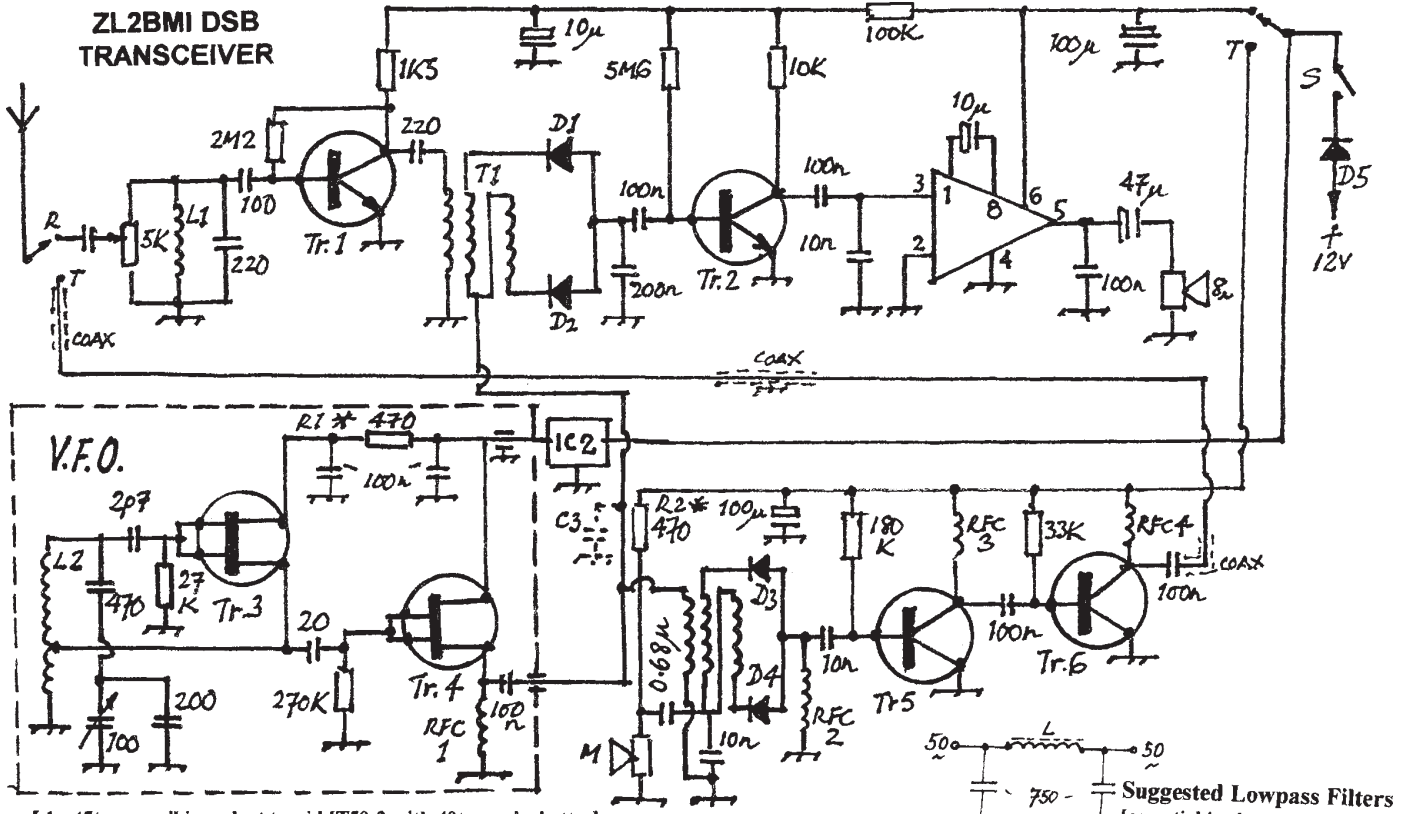
While the carbon mike is simple, it is quite effective. R2 may vary in value, depending on the particular mike. If you wish to experiment, there is a circuit (fig.3), which I have used as a direct replacement (all components in the mike case), for a carbon mike. It still needs some refinement, and it is possible that R2 should be raised to about 10K with a circuit such as this. The 0.68 uF capacitor feeding the bal. mod. may also be altered to increase or decrease the modulation. Note that D1 - D4 could be replaced by 1N914s, (matched pairs), but the carrier null may not be quire so good.

R3 the bias resistor for TR5, can be reduced to 100K. This will give up to 50% extra output; however TR5 will run quite hot in this case (though generally they will stand this OK)

When run on 14 - 15 volts, the transmitter will put out significantly more power than on 12 volts, possibly up to about 3 watts.

Raising the output power with another amplifier is not advisable unless a good deal more filtering is provided.





L1 - 45t on small iron dust toroid [T50-2 with 40t may be better].
L2 - 50t, tapped at 8t, on 5mm slug tuned former
T1/T2 - 7 trifilar windings, aprox 34 swg enam on 6mm, 2.5mm hole [Neosid F7 ferrite]
RFC1/2/3 - 10t through ferrite bead [appox 150uH] RFC3 2½t through 6 hole bead [appox. 15uH]
M - Carbon Mic insert, D1-D4 - BAT81 [H.C.D.], D5 - 1N4001 [polarity protection]
TR1/2/5 - BC338, TR3/4 - BF960 dual gate FET. TR6 - BD139, IC1 - LM386N/3, IC2 - 78LO8.

Other Notes

This transceiver is of very simple design and cannot be expected to perform to the standard of more complex commercial designs. Nevertheless, under reasonable conditions it performs remarkably well, and contacts with VK's are not impossible when conditions are right.

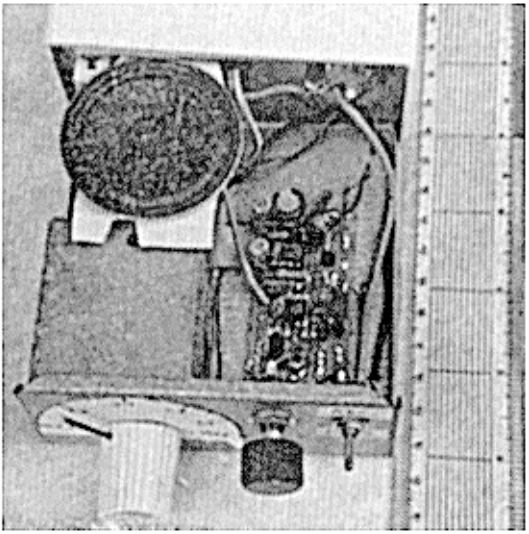
The power supply should be of low impedance, preferably lead - acid or ni-cad cells. Dry cells may require 1000 - 2000uF capacitor across them if there is sign of the receiver becoming unstable. A mains power supply would need to be well filtered.

While tuning is a bit tricky without a reduction drive, it is a 'learned art' which comes with practice. Sometimes it is easier to ask the other operator to tune to you with their main tuning.

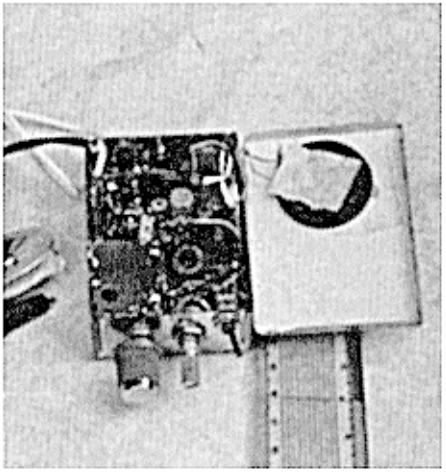
The VFO lid may be removed if necessary by unsoldering the 'solder tracks' on each side. The slug in the VFO is accessible through the hole in the lid to re-calibrate the dial (beware! - the slugs are fragile!) A simpler recalibration is to loosen the grub screw on the tuning knob and re-adjust the knob before re-tightening.

CW may be obtained by applying +12 volts to the audio port of the balanced modulator, through a 1K resistor. However, beware of overheating the BD139 by long key-down periods. A PNP switching transistor could be used, if you require to keyboard to earth. A PTT mic would require replacing the front panel switch with a DPDT relay.

These notes and circuit with layouts were not actually written as a construction article, but were effectively the "manual" accompanying the transceivers which were sold by ZL2BMI. to about four amateurs in New Zealand. (The reproducible design was made to enable a shortening of building time.) Nevertheless, there is probably sufficient detail to enable duplication if you wish..

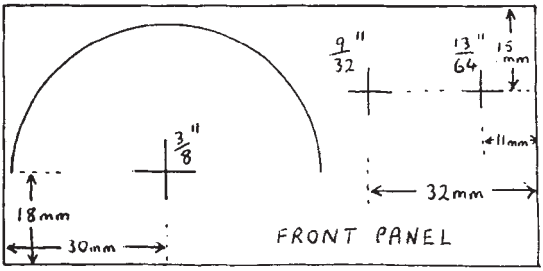


THE TRANSCEIVER AS DESCRIBED

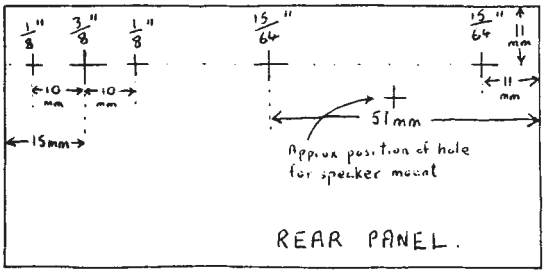


A SMALLER VERSION OF THE TRANSCEIVER

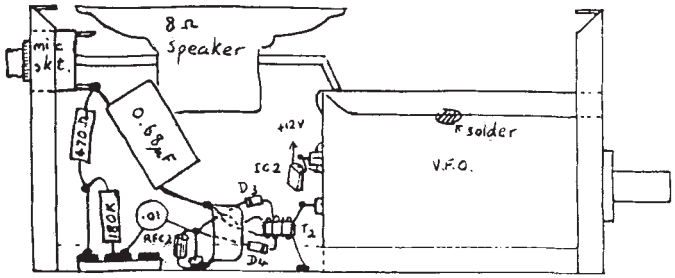
THE ZL2BMI DSB TRANSCEIVER : LAYOUTS

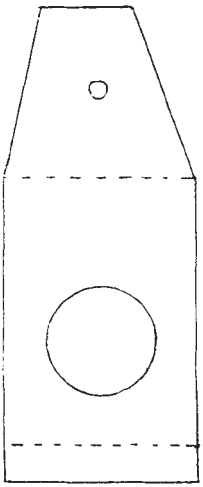


(BOARDS : HALF SIZE)

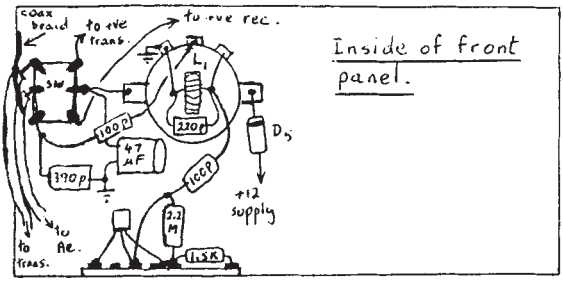


Drilling Layouts (to scale)

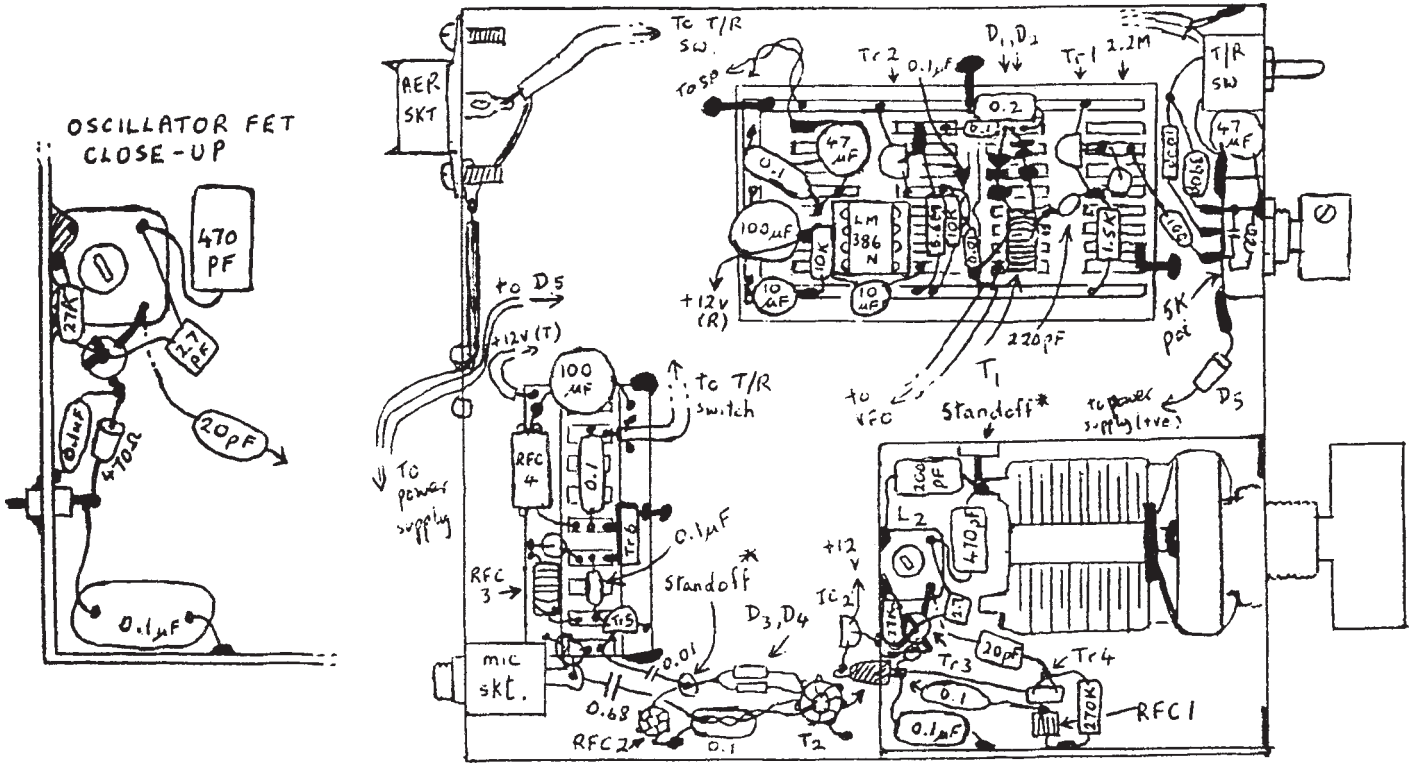




Speaker bracket
(Vinyl floor covering) material



Inside of front panel.



THE ZL2BMI DSB TRANSCEIVER : LAYOUTS

A Simple Keyer - Suitable for the Oner

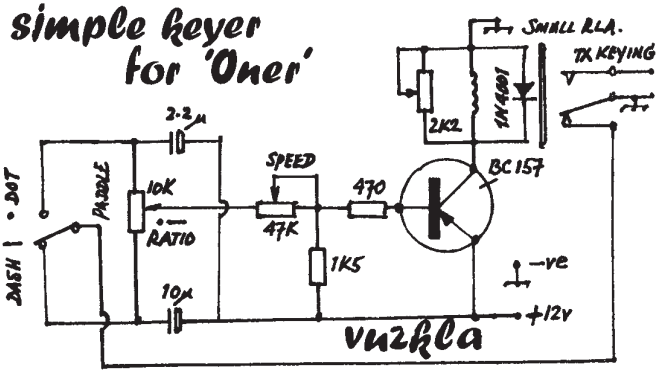
K.P.S. Kang, VU2KLA, P.O.Box 903, COCHIN. 682 006. India

Several design philosophies are around in Amateur literature for keyers but I was trying to evolve a simple small keyer for the "ONER" The keyer presented here is the final design which perfectly follows "ONER" size. Though it is not a $500 keyer but it is a lot of pleasure to play with and a lot easier to use than an ordinary key.

When the paddle is connected to the dash arm the 10uF capacitor charges and its voltage causes the transistor to conduct making the relay operate and the relay grounds the paddle terminal discharging the 10uf. capacitor and removing the bias from the transistor releases the relay. The entire cycle repeats until the paddle is released.

Dots work in similar fashion. The 10K pot sets the dot-dash ratio while the 47K pot sets the speed. The 2K2 pot drops out the relay just before Q1 stops conducting.

I brewed the project on small piece of veroboard and wonder if anyone can come up with a "ONER" size PCB for this keyer!!



SPIRITUS TRANSISTOR BASTA

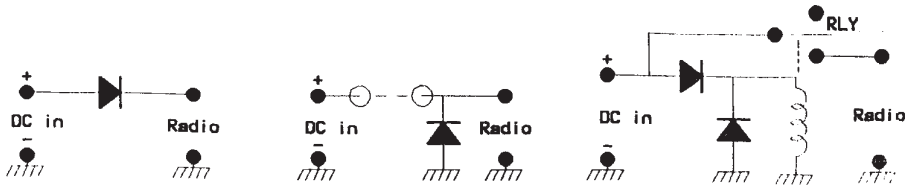
Robert van der Zaal, PA3BHK, Parklaan 89, 2171 Ed Sassenheim. The Netherlands

According to Peter, PE1MHO, this was the diagnosis of classical Roman engineers when checking a transistorised PA that went dead after accidentally reversing the polarity of its supply.

Apart from being annoying this can be an embarrassing experience as well. Especially when you are just about ready to switch your transmitter on from an ever so nice hole as happened to me one day in a 2 metre "foxhunt" DF-game!

The easiest remedy is a simple power diode (fig.1). Although fail safe it introduces a voltage drop of about 0.6 V (Sil-diode) which means loss of power and lower efficiency of the circuit. Much better is the circuit of figure 2. Reversing polarity blows the fuse (which hopefully, is faster than the PA-transistor). But what to do if you forgot to stick a spare fuse in your pocket?

The most elegant solution is shown in figure 3. Reverse polarity - nothing happens. Correct polarity? The relay allows the full supply voltage to feed the circuit. There is one minor disadvantage: most relays take an extra 10 to 20mA. The relay contacts must be capable of switching the desired current.



SIMPLER PRODUCT DETECTOR FOR "THE CONTESTER"
(and other Direct Conversion Receivers).

Roelof Bakker, PAØRDT, Esdoornlaan 11, 4334 CC, Middelburg, The Netherlands.

I received a number of letters from members concerning the toroid transformer used in "THE CONTESTER". (SPRAT nr. 82). They seem very difficult to obtain.

Though I could help a few people with these toroids, (I even shipped a couple of them into the nothern part of India) this is not a proper solution. Neither would I let difficult parts procurement spoil the possibility of building an excellent dc-receiver.
So here is another SL6440 product detector design. 100 mH TOKO coils, series 10 RB, are used as a balanced audio filter and a differential amplifier is added.

The - 3 dB point of the filter is 800 Hz, the - 60 dB point is about 5000 Hz. This filter makes an excellent compromise. Due to the gradual sloping filter, SSB transmissions can also be received very well. For narrowband CW reception I installed a five pole LC filter, also using 100 mH TOKO coils, between the differential amplifier (point X on the circuit diagram of the LF-FILTER) and the volume control. A DPDT switch is used as a selectivity control. *[The LC filter will also appears in this issue of SPRAT.]*

With a MDS of - 131 dBm, a DR of 97 dB, AM detection - 23 dBm, a LO radiation of - 89 dBm and a receiver gain of 98 dB this receiver stands up to its name. There is no sensitivity for mains transformer external fields. Listening on 40 meters at night using a 150 feet long doublet aerial showed not a trace of crossmodulation or intermodulation products and AM breakthrough has not been observed.

This receiver can handle signals up to - 33 dBm (S9 + 40 dB). Above this level the output of the differential amplifier gets distorted. Should this be a problem, which is quite unlikely when listening to QRP stations only, the gain of the differential amplifier can be decreased by lowering the value of the 56K feedback resistors. The total receiver gain will also be decreased though.
I have not encountered this problem yet and I prefer the higher receiver gain.

TWO QUICK TIPS Frank Greenough G4EHY

Simple Mods for the Kanga Frequency Counter

Fit all 8 of the 7 segment LEDs and switch pin 14 on the 7216D counter chip to either D1, D2 or D3 (pins 5, 4 & 6). This will give the original 0.1s count plus 1s and 10s. You can also fit a reset switch to s/c pin 12 to ground and a hold switch can be connected from pin 27 to +5v. I also put 6AA Nicads in a small box with an LM317 for charging. This will power the counter for about 2 hours.

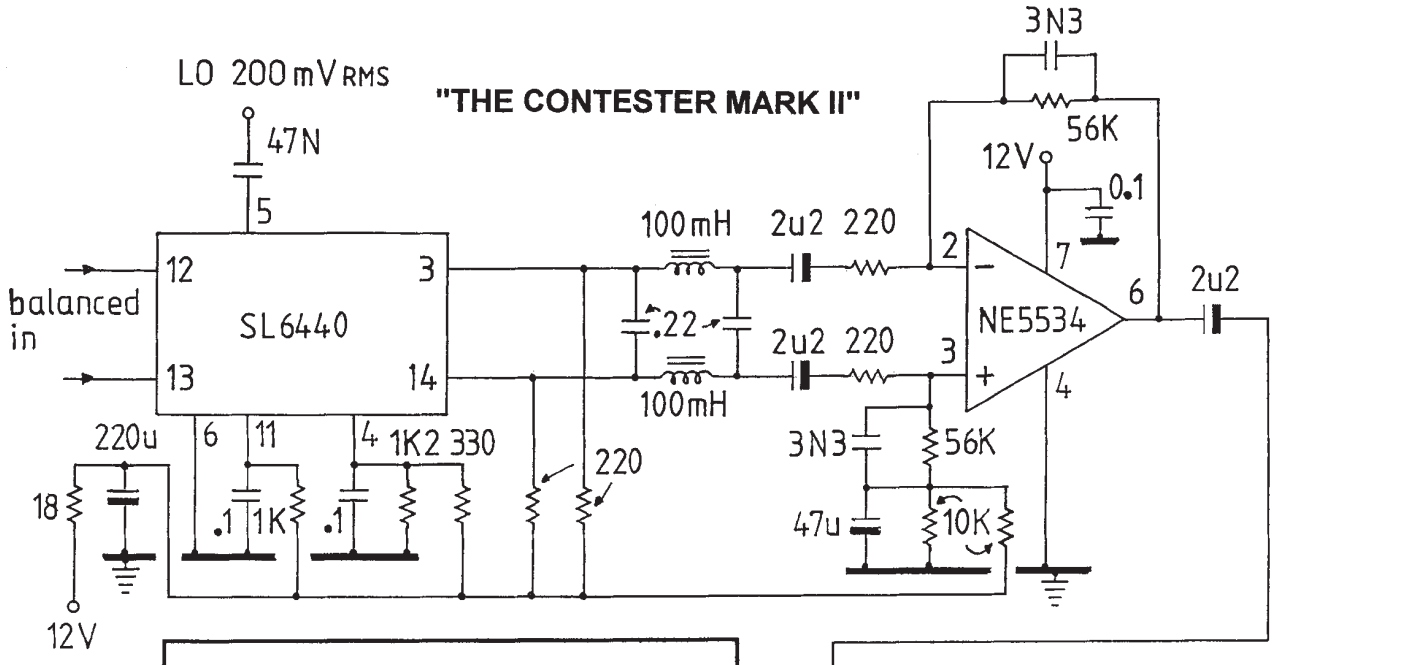
Lake AF2 Audio Filter

After building the kit, I had strong AM breakthough on the phones. A 0.1uF capacitor across the phone gave a complete cure.

A QUICK TIP C.W. Harlow (4024)

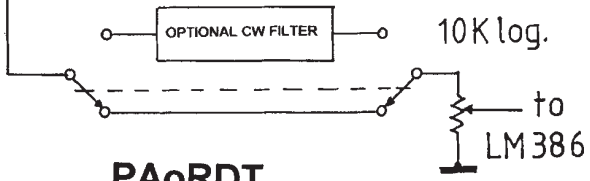
Toroids for the GM4JJG RF Sniffer [SPRAT 71]

GWM Radio of 40/42 Portalnd Road, Worthing, Sussex, BN11 1QN, Tel: 01903-234897, have ferrite rings (22mm outer dia, 13mm inner, 6.5mm thick) which can be very easily cut with a fine metal saw and filed as required. These are 75p each including postage.



Specifications:

MDS (3 dB S+N/N) = - 131 dBm
Sensitivity for 10 dB S+N/N = -124 dBm
DR = 131 - 34 = 97 dB
IP3 = + 14.5 dBm
AM detection (3 dB S+N/N) = - 23 dBm
LO radiation = - 89 dBm
Receiver gain = 98 dB
Bandwidth low pass filter:
- 3 dB 800 Hz
- 6 dB 1000 Hz
- 12 dB 1200 Hz
- 20 dB 1700 Hz
- 40 dB 3000 Hz
- 60 dB 5000 Hz



PAoRDT
G-QRP # 6019

A LOW-BUDGET HIGH PERFORMANCE CW AUDIO FILTER

Roelof Bakker, PAØRDT, Esdoornlaan 11, 4334 CC, Middelburg, The Netherlands.

When reading an anouncement in the 1995 spring issue of SPRAT, offering stacks of five 88 mH toroids, I realised that this is the right thing to build a very good audio filter for cw.

The filter consists of L1 to L5 and C1 to C9. R1 and R2 are the terminating resistors. Tests have shown that for C6 to C9 tantalium capacitors can be used, without effecting the filter response to at least 60 dB down. These capacitors have to be polarised, hence R3 to R6, connected to + 6V. One can use normal capacitors though and R3 to R6 should be omitted then. (I had no normal capacitors of the right value at hand so I used tantalium capacitors, which have also the benefit of being quite small).
U1 is used to match the filter input to the foregoing circuitry and U2 is an amplifier that corrects filter losses, utilizing unity gain for the filter in use.

The best place for this filter is after the product detector at a point where the level of audio noise is low. Excessive noise "triggers" the filter and is responsable for ringing. The bandwidth between the 3 dB points is 80 Hz, still allowing one to change the pitch of the incoming CW signal. At the high side the attenuating is 44 dB/100 Hz, at the low side 42 dB/100 Hz, making this filter competitive with current DSP filters. (Yes analogue techniques can also produce nice filters!).

At the present time two of these filters are in use here. One in a home made 9-band cw-transceiver using 9 MHz crystal filters and one in a 9-band dc-receiver. They are very effective in beating the SSB QRM around 3560 KHz.

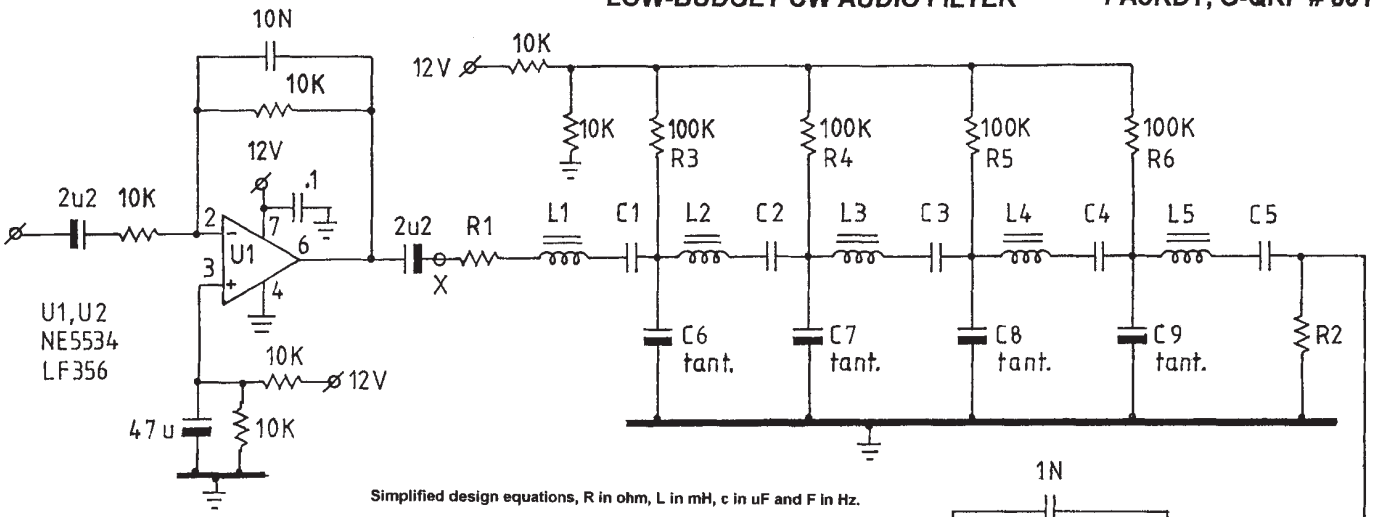
One final warning. When I started listening with this filter I was quite disappointed. I found the ringing rather anoying. But after a couple of hours my ear-brain system had itself adjusted to this filter and now I will not do without it!

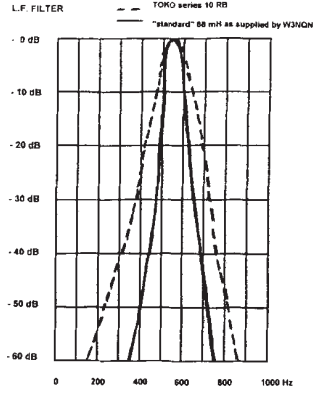
When 88mH toroids are not available, 82 mH Toko coils, series10RB, can be used as a direct replacement and the values of the filter capacitors need not to be changed. These coils exhibit more losses then the 88 mH toroids, giving a Gaussion passband rather then a Butterworth response. The effect is less steep filter slopes. The insertion loss is prohibitive: some 40 dB! But the following amplifier takes care of that.

I used 100 mH TOKO coils myself and the component values are shown in the circuit diagram. This filter is in use in a modified "CONTESTER" and it sounds very pleasant with no ringing, though the bandwidth is about 100 Hz.
I have presented a fine cw filter which uses readily available parts. I hope some of you will make good use of it.

LOW-BUDGET CW AUDIO FILTER

PAoRDT, G-QRP # 6019





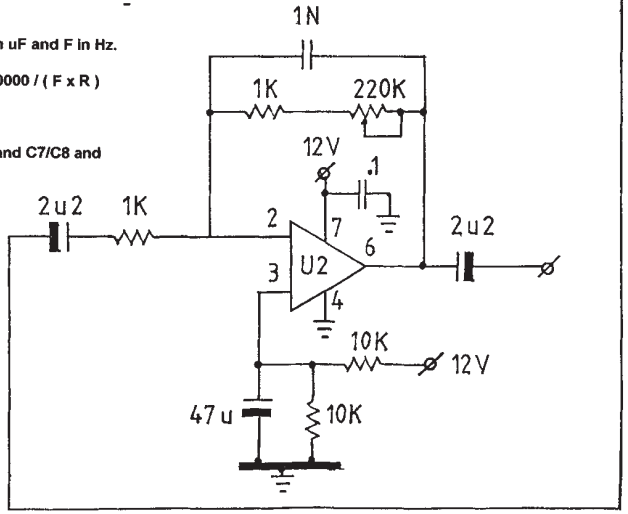
Simplified design equations, R in ohm, L in mH, c in uF and F in Hz.

R = L x F / 640, C1 = 45000 / (F x R), C6 = C9 = 190000 / (F x R)

C7 = C8 = 1.5 x C6.

Pick a available value for L, calculate R, C1, C6/C9 and C7/C8 and round to the nearest standerd component value.

LF-FILTERS COMPONENT VALUES		
R1, R2	68 ohm	82 ohm
L1 - L5	82/88 mH	100 mH
C1 - C5	1.2 uF	1 uF
C6, C9	6.8 uF	4.7 uF
C7, C8	10 uF	6.8 uF



A DIGITAL DISPLAY FOR THE EPIPHYTE

Derry Spittle, VE7QK, 1241 Mt. Crown Rd, N. Vancouver, BC Canada V7R 1R9

The following has been adapted from an article in QRPp

SPRAT readers will be familiar with the **BASIC COUNTER** circuit (Fig. 1) which uses CD4026BE decade counter/7-segment decoders and requires no display latches or extra logic to generate the count-reset pulse. It has been around for a long time and in recent years John Hey, G3TDZ, had adapted it for use in his widely acclaimed phasing transceivers. The design I offer here operates from a five volt supply thereby eliminating the necessity for a current limiting resistor in each display segment. It also includes some simple logic to digitally effect a 453KHz offset. Although the counter has a LSD of 100Hz I have chosen to "prescale" the input signal with a high speed decade-divider so that the 4-digit display has a resolution of 1KHz. Here is a brief description for those who may be unfamiliar with its operation:-

The **50Hz CLOCK** (Fig.2) generates complementary (180 degrees out of phase) square waves from a 3.2768MHz crystal oscillator and divider with a modulus of 2^{16}. Circuit (a) uses a M706BI 50Hz timebase manufactured by SGS-Thomson. As this is now difficult to find, circuit (b) is an alternative employing readily semiductors.

TIMING (Fig.3). At 50Hz one complete "cycle" takes place in 20ms. Pulses are counted during the first 10ms. At the end of the "display period", the system is "reset" and cycle repeats. Positive reset pulses are generated very 20ms by differentiating the complementary output with C-1/R-1. D-1 "clamps" the negative pulses.

The **OFFSET LOGIC** assumes the VFO to be 453KHz higher than the signal frequency. The VFO frequency, reduced by a factor of 10, is fed to both U2a (NOR gate) and U3c (AND gate). If the number of pulses passing through U3c during each "count period" is reduced by 453 (453,000Hz x 0.1 x 0.01s) it will force the display to register the signal frequency. At the commencement of each cycle the out output of U-3b (pin 9) is LOW. U3c is closed and U-2a is open. Once the 4040 binary counter has received 453 pulses pin 9 of U-3b goes HIGH, U-2a closes (stopping further pulses reaching the 4040) and U-3c opens to pass to the 4026 display counters for the balance of the "count period").

This digital display has been in use for several years and some of you may have seen it at the 1992 QRP Mini-Convention in an earlier transceiver. It has now been installed, along with the Epiphyte, in a Ten-Tec 5" x 4" x 2" case. The 2" x 3.25" counter board is mounted in the top half of the enclosure along with the 4-digit display on brackets to place it behind the front panel. No PCBs are available at this time but something will be produced if there is sufficient interest. This unit is much quieter than programmable counters with multiplexed displays. Even without screening any hum from 50Hz leakage is well below band noise on 80M. ***Please let me know if anyone finds a source of M706BIs!***

FIG. 1 - THE COUNTER

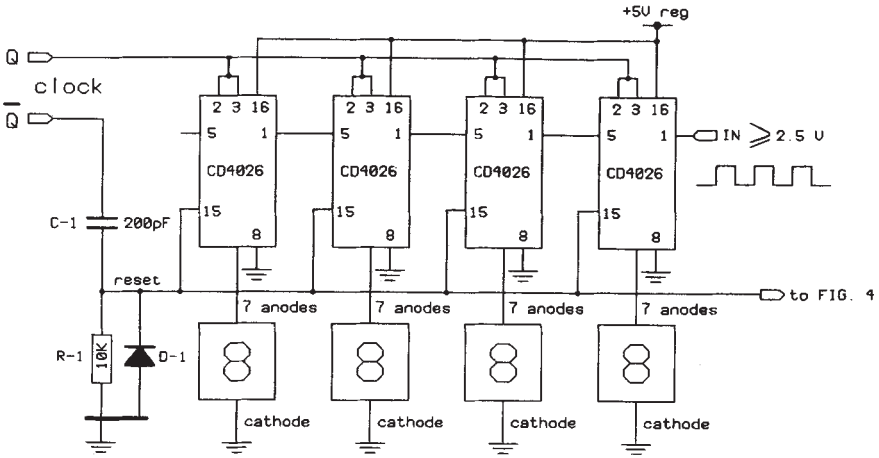
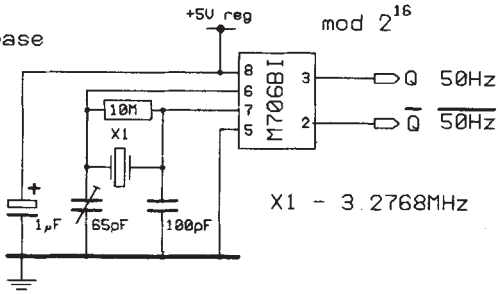


FIG. 2 - THE CLOCK

(a) M706BI 50Hz timebase



(b) alternative circuit

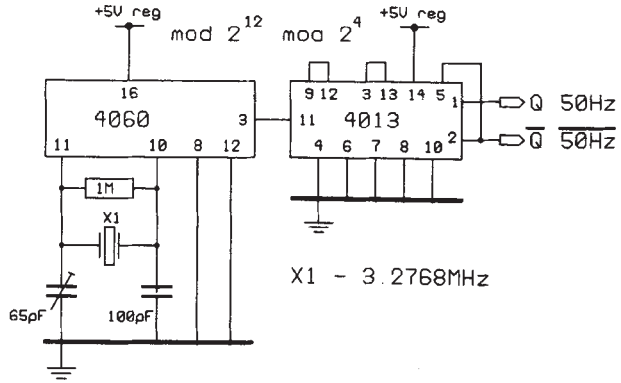


FIG 3 - TIMING

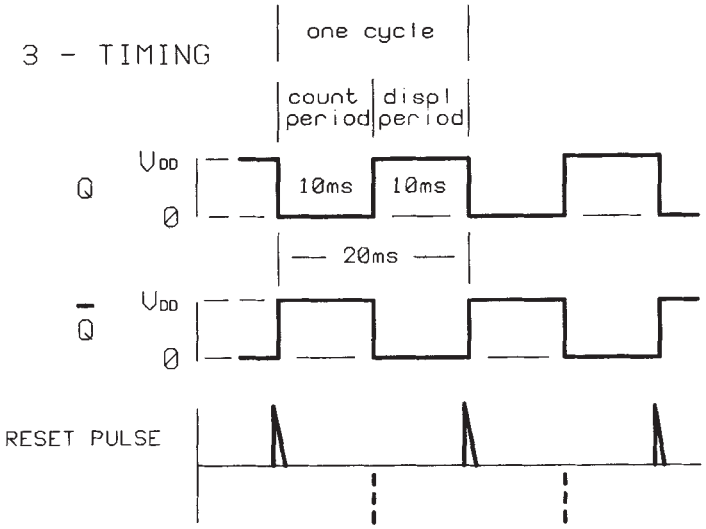
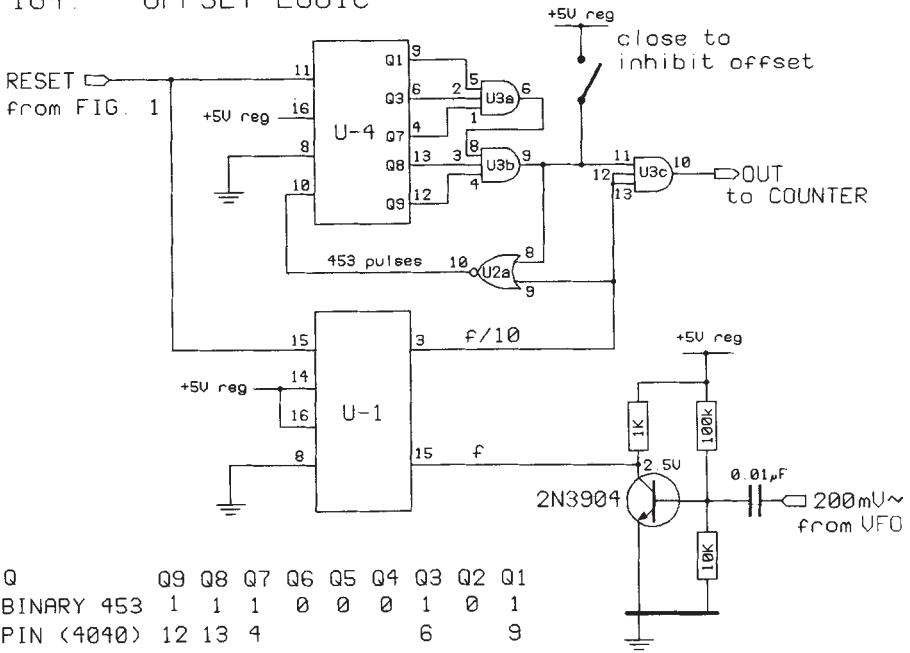
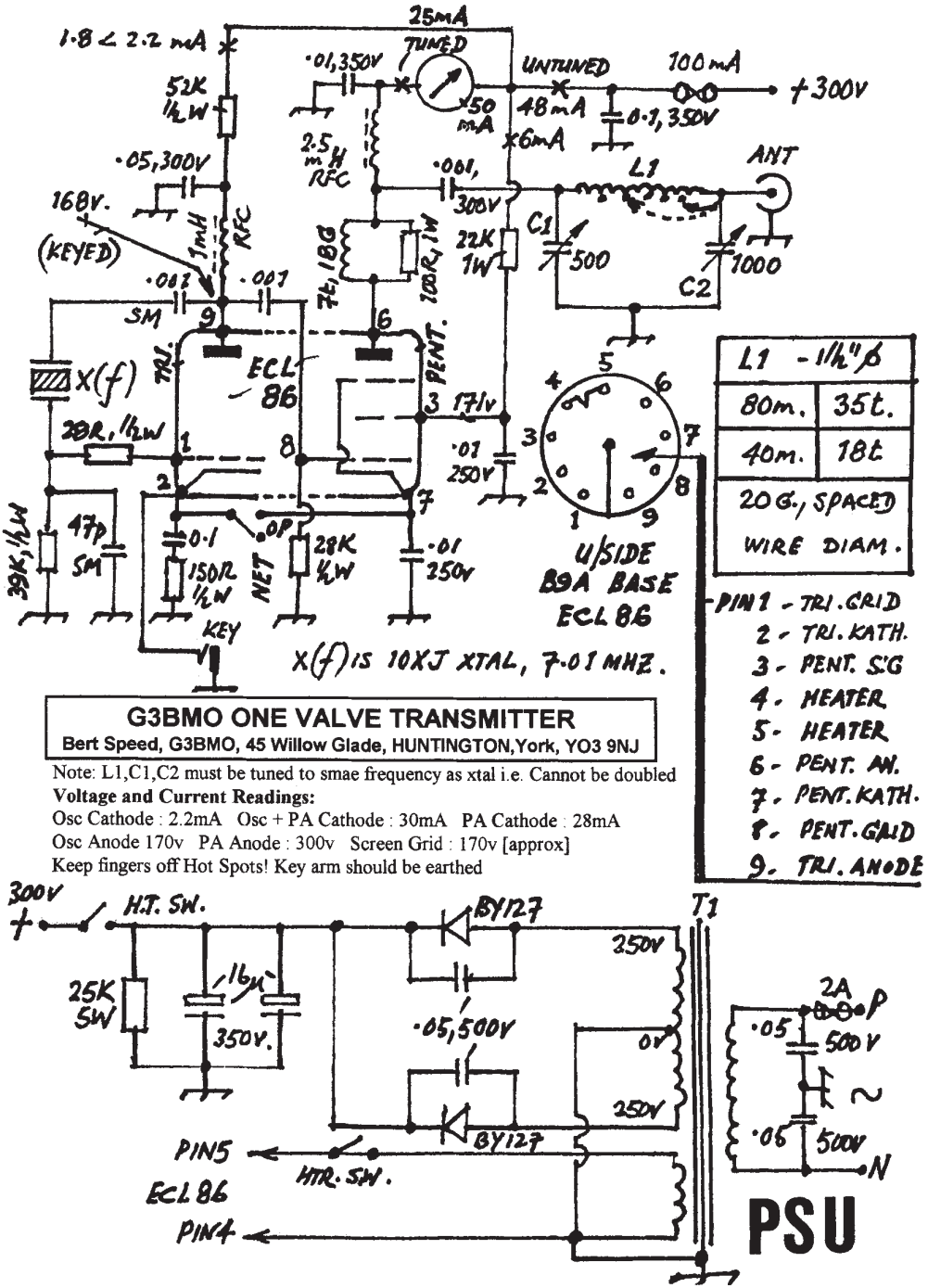


FIG4 - OFFSET LOGIC



Q	Q9	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1
BINARY 453	1	1	1	0	0	0	1	0	1
PIN (4040)	12	13	4				6		9

U-1 74HC4017E DECADE COUNTER/DIVIDER
U-2 4001BPC quad 2-input NOR gate (3 sections unused)
U-3 4073BPC triple 3-input AND gate
U-4 4040BPC 12-bit BINARY COUNTER



L1 - 1¼" ϕ	
80m.	35t.
40m.	18t.
20G, SPACED WIRE DIAM.	

G3BMO ONE VALVE TRANSMITTER

Bert Speed, G3BMO, 45 Willow Glade, HUNTINGTON, York, YO3 9NJ

Note: L1,C1,C2 must be tuned to smae frequency as xtal i.e. Cannot be doubled

Voltage and Current Readings:

Osc Cathode : 2.2mA Osc + PA Cathode : 30mA PA Cathode : 28mA

Osc Anode 170v PA Anode : 300v Screen Grid : 170v [approx]

Keep fingers off Hot Spots! Key arm should be earthed

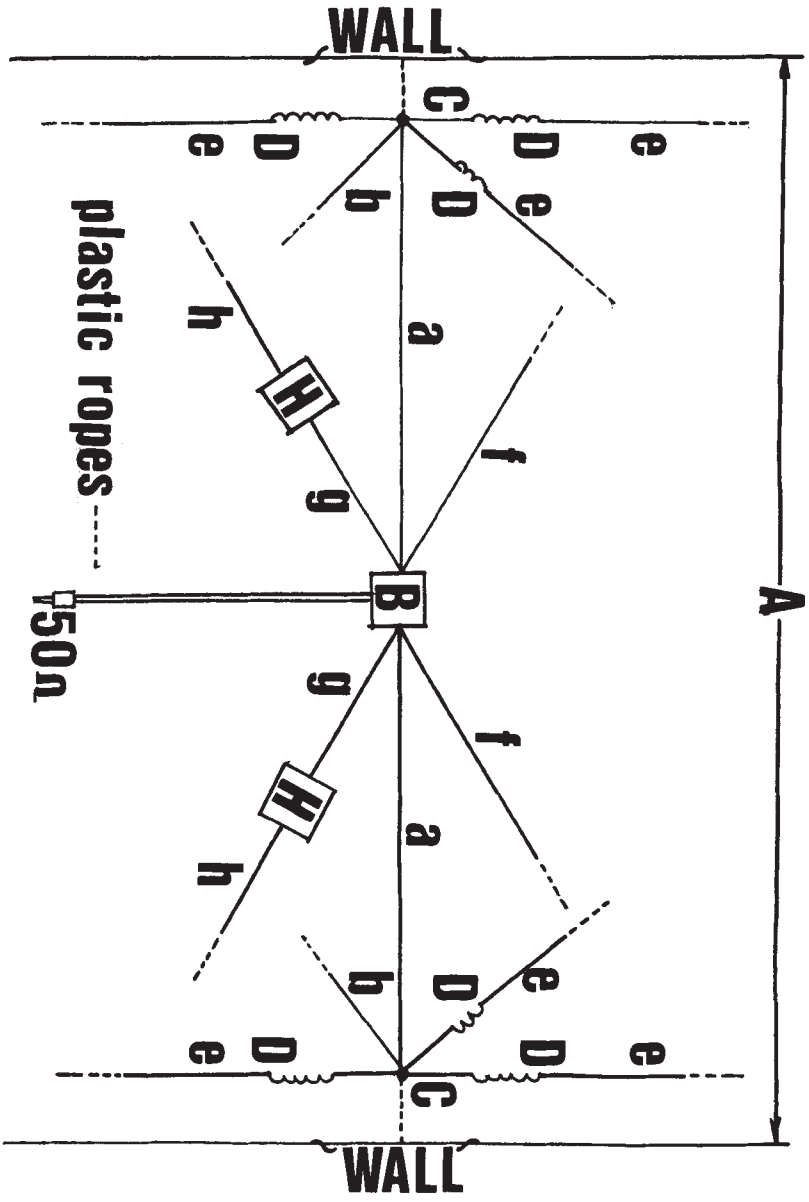


FIGURE 1. THE MAY SPECIAL ANTENNA.

THE MAY SPECIAL

A Restricted Space Multiband Dipole combining several principles

Ha-Jo Brandt DJ1ZB, EICHENWEG 7, 84160, FRONTENHAUSEN, Germany

The first May Special was designed for DL1MAY who had been allowed a space of 16 metres (distance A) in the attic of a five storey block to set up her antenna. For this type of multi-band antenna no fixed lengths can be given. The principles explained here must be adapted to the desired bands and the available space, as shown in Figure 1. The antenna is fed via 50 ohm co-ax, and lends itself particularly for attic mounting.

The May Special consists of a basic dipole a-a which uses most of the available space A , with a spacing of 6 to 10 inches from the walls and roof (If the available space A is very small, [for example only 6 metres in a version for DJoCD] the shape of the dipole can be an inverted U, thus using all available space). At point C , end wires , and coils combined with end wires,are connected to the basic dipole to establish resonance for several bands. For these bands the basic dipole will carry the highest antenna current and provide most of the radiation. The basic dipole is fed via balun B at its centre, this converting 50 ohms balanced to 50 ohms unbalanced.

The end wires b are needed to lower the resonance of the basic dipole to the next lower amateur band with the least length of wire necessary. For example, with a length a up to 5 metres, the end wires b are used to tune the basic dipole down to 14 MHz. If the length a is 7 metres the end wires "b" will tune it down to 10.1 MHz, and with a length a up to 10 metres it can be tuned down to 7 MHz. Additional lower band resonances can be obtained by employing coils D combined with end wires e . Depending upon the length of the basic dipole a-a in relation to the wavelength, the efficiency on the lowest band may be low, but still worth trying.

The coils D act as chokes at the higher resonances and do not greatly influence their tuning. However, care must be taken to ensure that a parasitic resonance of these coils does not coincide with the resonance of the basic dipole tuned down to an amateur band by end wires b . The 1.8 MHz coils are especially critical in this respective. Suitable inductances for coils D are 360 uH for 1.8 MHz, 100-110 uH for 3.5 MHz, and 25-30 uH for 7 MHz. According to available formers, the number of turns can be found by formula. For low loss operation a wire diameter of 1mm is recommended, especially if QRO is also to be used.

The lengths of the end wires e should be 2 to 2.5 m before pruning. Some interaction has been observed between the resonances of the coil and end wire combinations for 1.8 and 3.5 MHz when measured unconnected and when measured connected to the antenna. When unconnected the resonance of the 1.8 MHz coil/end wire was found to be lower than when it was connected to the antenna, indicating that 3.5 MHz coil/end wire in parallel may be causing a "shunt effect" which increases the resonant frequency at 1.8 MHz. This effect does not cause any problems when tuning the antenna.

Additional dipoles

Additional dipoles for the higher bands, which require less length, can be connected to the balun in parallel with the basic dipole a-a ; they are designated f in Figure 1. They should initally be made slightly long, so that they can be pruned to resonance. On the models of this antenna so far constructed trying to use the 7 MHz dipole on 21 MHz produced a high swr, although

in a version produced for DJ9EO every other band between 3.5 and 28 MHz performed satisfactorily there were still problems with 21 MHz so there seems to be a practical limit to the number of dipoles that can be connected together at the balun in parallel.(In this instance it was all bands 10.1 to 28 Mhz. The 21 MHz dipole could not be resonated properly, whereas the other five could be.).

Use of two-band trap dipoles

Although it has not yet been possible to carry out practical tests, it may be possible to reduce the number of higher band dipoles required by using two-band trap dipoles, such dipoles employing coils H (Figure 1) to provide operation over two bands. To allow for pruning to resonance wires g and h in such dipoles should be cut a little long intially. For QRP operation it might be possible to use co-axial cable traps on two or three bands.

Erecting the antenna.

For indoor érection plastic cord can be usedto secure the elements to suitable hooks. Try and keep the ends of the various antennas as far apart as space limitations allow. Where several elements meet, such as at point C in Figure 1, suitably connected tag strips aid construction.

Tuning the antennas

This will normally require two people, both familiar with antenna resonting techniques, use of instruments etc. They will usually require a radio or line intercom.
It is first necessary to measure all initial resonances using an antenna tester (such as the MFJ), a noise bridge in conjunction with a general coverage receiver, or signal generator and swr meter. The resonances of the various antenna sections should be below the amateur bands which it is desired to tune them to. The coil resonances may be much lower than the desired band and very sharp, making it difficult to detect them with the noise bridge.

If it is not clear which part of the system is causing a particular resonance, touching one end of the antennas should identify it. The touching process is also useful in ensuring one does not cut the wrong wire !
The tuning process starts with the highest band additional dipole f, and works down in frequency until all these dipoles have been resonated. The end wires b of the basic dipole are then pruned to resonance. Approximate lengths of wire to produce shifts of 100 kHz are 1 cm at 28 MHz, 4 cm at 14 MHz, 7 cm at 10 MHz, and 15 cm at 7 MHz. If trap dipoles are fitted the inner wires g should be resonated first. After this the outer wires h should be pruned (but note that the lengths quoted above do not apply in this instance). If noise bridge or other low power measurements are not very accurate, use these instruments only to find the lower edge of the band, then use a good swr meter and power from the transmitter to establish the final desired frequency of resonance.
Finally the end wires e are tuned. They act like pure capacitances and may be shortened according to the rule "frequency change is equal to the square of the capacitance change". If, for example the resonance of this antenna section was measured as 2.4 MHz and it needs to be tuned to 3.5 MHz, the end wire must be shortened by a factor of:-

$$\left(\frac{2.4}{3.5}\right)^2 = 0.47$$

In practice the shortening effect is rather less , because the self-capacitance of coil D is unchanged.

Operational bandwidth

The May Specials so far erected show an swr of less than 2:1 on all bands from 7 MHz upwards ,except the very wide 28 MHz band. On 3.5 MHz the equivalent figure is 50 to 60kHz. On 1.8 MHz even the minimum vswr may be as high as 3:1, depending upon the length of the basic dipole, because such a short dipole must show a low feedpoint resistance even when resonated. A good atu such as a T-section (two variable capacitors 300 pf minimum and an inductor of 20-25 uH max.) should be employed at the shack end on this band,together with low loss co-axial cable, to allow full use to be made of the multi-band capability of the antenna.

IMPORTANT NOTE. Send technical queries on the above to DJ1ZB, not G8PG please.

POINTS OF VIEW.... "Once I got my CW DXCC Award I scrapped my QRO TX and went 100% QRP. And what is funny is I cannot see any difference !".... "However we could only run half a kilowatt from each PA (that is enough power say the QRPers and so it proved to be"); well known GM writing about a DX-pedition in one of our contemporaries ! The QRP quote is from Andy,SP9NLI. No further comment !

HIS WORLD-WIDE CIRCLE OF FRIENDS will be interested to hear that George, GM3OXX and his XYL have moved to 6, Glenside Court, Armadale, Bathgate, EH49 3RX. Apart from antenna space there is room for a dedicated workshop, so look out for some new designs from the man who gave us the OXO and the ONER.

ARE YOU ENCOURAGING BEGINNERS in your area to go for the EUCW CW Novice Award ? The detail appear on page 25 of your Members Handbooks. Many find this to be the first of their operating awards.

AWARD NEWS

Congratulations to the following.

QRP Countries. 25 DF1NH, SP9NLI.

WORKED G QRP Club. 1100 G4JFN (Does he ever sleep ?);840 G3XJS, 700 G8PG; 300 GoKCA ; 260 GoTDK ; 140 GoKZO; 100 G4EIB; 60; GoSWU ; 40 SP9NLI ; 20 DF1NH, G4UDG,HA5CIU, G3YHF.

TWO-WAY QRP. 80 G3XJS (Outstanding !);20 GW3TKZ,10 SP9NLI, 9A3FO, G3YHF.

REMEMBER THAT " BAD CONDITIONS " is often simply lack of activity. Despite current low sunspot numbers it is amazing what can be worked both in the way of two-way QRP and of DX. So give the bands a try regularly, including the "dead" ones such as 21 MHz. You may get some pleasant surprises.

WATCH OUT FOR RARE QRP DX !

Special Station EI3RJV From Dublin : August 28th - September 2nd

COMMUNICATIONS AND CONTESTS

Gerald Stancey G3MCK 14 Cherry Orchard, STAINES, Middsx. TW18 2DF

1995 CZEBRIS QRP Report

From the logs received a good time was had by all. Conditions were quite reasonable and activity high. 33 logs were received, similar to last year, and 30 different countries and 4 continents were worked. The winner was again Bob, G4JFN, with a score of 262 points, followed by Stan, G4MQC with 185 points and Peter, G3XJS, and Vasek OK1FHL, tying for third place with 174 points.

A comment from many UK logs was lack of activity from OK/OM. Examination of the logs shows that only one station, OM3TUM, was active from Slovakia and this is very disappointing.

Highlight QSOs were FY/DJOPJ who was worked by G3XJS on 15m and 20m, and G3ESP on 15m - the first time he has ever heard FY!! G3XJS also worked FM5CW.

I am conscious that due to space restrictions it is not possible to give more than a brief overview of a contest. However through the good offices of Bob, G4JFN, all UK stations who submitted a log and keep envelopes at our QSL bureau will receive a more detailed analysis with their next batch of cards. Anyone else who wants a copy of this analysis please send me a SAE. I am learning and would appreciate feed back on this but please remember I can only précis that which I receive in the first place.

CHELMSLEY TROPHY

Very few entries this year but an outstanding win by Mike, GØIFK, with 787 QSOs in 97 countries. A very worthy score from Piva, IK3XJP, with 594 QSOs and 70 countries who receives a certificate and in third place Henry, DL6ZLG.

160M

Derek, G3HKD, has reminded me that in the 1950's the Short Wave Magazine carried the 160m Worked All British Counties table. With the lower sunspots 160m is a good band and I propose, if there is support, to resurrect this in SPRAT. The rules are very simple, let me know how many of the new UK counties and regions you have worked since 1 January 1995 on two way QRP. This is a fun table, QSL's are not required but your entry should list the counties/regions worked and the call-sign worked. The other station does not have to be a club member.

CEPT and Portugal

Brian, G3KJX, tells me that this has now been implemented with effect 17 January 1995. He is quite often QRV from CT1 on QRP and also hopes to get on 50 MHz.

CIS QSL Bureaux

Own, G4VPF, has kindly supplied the following information.

PO Box 56, Kiev 1, 252001 Ukraine
PO Box 469, Minsk, 220050 White Russia
PO Box 74 Tashgkent, 700100 Uzbek
PO Box 112 Karaganda, 47055 Kazakh
PO Box 125, Tallinn, EE0090 Estonia
PO Box 1000, Vilnius, 2001 Lithuania
PO Box 164 Riga, 2260898 Latvia
PO Box 48 P..Filipovic, 11001 Belgrade (for YU, YN, Z3)

Please note that the situation in the CIS is very fluid.

TF/MM/QRP
David, GØNEZ, has sent me details from Villi, TF3DX, of a voyage made from Iceland to the UK by TF3YS and TE3XS. At the last minute their "proper transceiver" went u/s and they used 2w on 7030 KHz to keep safety reporting skeds. This apparently amazed some QRO types, however we know better don't we! Well done Villi, Gunnar and Amanda.

IARU position on Morse
Readers of Morsum Magnificat will have read Tony Smith's G4FAI article. Those who haven't may I suggest you get a copy of MM38. The article is too long to précis and do it justice. However the important part is that the IARU position is "Consistent with the views of the member societies as expressed through regional organisations the IARU will neither propose nor support a change in the requirement at this time."
The rest of the article gives their reasons.

Incidentally John, GW3COI, writing in the June issue of Practical Wireless suggests that after a CW QSO you really have the intellectual pleasure of feeling that you have a achieved something. He also points out that you can still operate if you have bad cold, a sentiment with which I unfortunately can fully concur.

SWL
May I remind our SWL members that I am only too pleased to receive logs from them for any of our contests. If sufficient SWLs show an interest I will see what can be done to produce a suitable award.

IARU Region QRP Contest
Don't forget this is 17 June and logs to me by 17 July.

AWARDS
Please may I remind you again that all claims etc. go to Gus note me. Yes, I know this is not what the Handbook says so please amend your Handbook NOW!!

ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADA-ADS-ADS-ADS-ADS-ADS-ADS-ADS
FOR SALE: Chatterbox Transmitters (Top Band AM). Two for sale. Fully boxed, complete with mikes. £40 each ono. Maplin Top Band RX (superhet). Complete in cabinet £50 ono. Fred Sammon GI0PCY, Tel: 01365 - 324993.

FOR SALE: FT277ZD (FT101ZD look-a-like), with CW Filter and Hand Mic. Ideal 2nd rig. Offers near £250. Bill, G4LQO (Poole) 01202 - 631603

FOR SALE: Ten Tec Argonaut 515, mint condition, on board TT 500Hz filter, outboard TT audio filter, calibrator and PSU, all handbooks. £300. Colin Waters, G3TSS 1 Chantry Estate, Corbridge, Northumberland, NE45 5JH.

FOR SALE: Lake DTR7, Hardly used kit. Was purchased as a project to fill in QRT time during QTH move. £60. Lionel, G3OSJ (Glastonbury) 01458 - 833205

QRP ON THE INTERNET : LISTS CHANGE ADDRESSES

Both the QRP-L List in the USA and the GQRP-L List in the UK have changed Addresses

THE GQRP LIST:

To Join : Send mail to Majordomo@blacksheep.org and include the words "subscribe GQRP-L" in the body of the message, leave the subject line blank. Your first mailing will be an introduction to the list.

THE QRP-L LIST:

To Join : Send mail to listserv@Lehigh.edu and include the words "subscribe QRP-L *name & callsign*" in the body of the message, leave the subject line blank. Your first mailing will be an introduction to the list.

WHO IS ON THE INTERNET?

I have picked up addresses for most members with Internet facilities, but it would be helpful to keep a club list of email address, especially traders. Please send details to g3rjv@gqrp.demon.co.uk

Correction

SPRAT 82: Epiphyte VFO on page 21. C11 is the main tuning capacitor. There is a line from the junction of C11 and C3 which goes to the output of the voltage regulator, as well as C6, C8 and the FET. That line should not be there, and the top of C11 should go only to C3. **Thanks to Mike WA8MCQ**

AMATEUR RADIO TABLE TOP SALE

St. Mary's Church Hall, Reddish, Stockport Saturday 23rd September, 10am-4pm. Table £7 in advance, £8 on the day (if available) Half tables pro rata Refresments - Talk-in on S22 - Parking. Details Ring John, G4ILA, 0161-477-6702

The NorCal-40A Transceiver - Commercial Kits now available

A kit of parts to build the NorCal-40A is now available from **Wilderness Radio, P.O. Box 734, Los Altos, CA 94023-0734**. Tel: [Int+] 415-494-3806, for $129 plus shipping $10 in US Funds. A copy of a leafter may be had from G3RJV for a SASAE marked Norcal-40A. The Sierra will be available shortly.

SOMETHING USEFUL .... and inexpensive

At the London Radio Show I obtained a useful printed circuit board from Keysolar based upon the L200 regulator. By simply adding an 18volt DC supply - the output from a typical "12v" transformer and rectifier - a variable voltage and current source is available for charging sealed lead-aicd batteries. All the hard work of a charger, on one board for £2! **G3RJV**

SEALED LEAD-ACID BATTERY CHARGER BOARD

Complete Printed Circuit Board with L200 I.C. Variable Voltage and Current and Crowbar Protection 18v DC input and 13 - 15v output, 200mA - 1.5A. **Available for £2.00 + 50p Postage from KEYSOLAR SYSTEMS, 4 GLANMOR CRESCENT, NEWPORT, GWENT, NP9 8AX TEL/FAX 01633-280958**

N.B.T.V.A.

The Narrow Bandwidth TV Association (founded 1975) is dedicated to low-definition and mechanical forms of ATV and introduces radio amateurs to TV at an inexpensive level, based on home-brew constructions.

NBTV should not be confused with Slow Scan which produces only still pictures at a much higher definition. As TV base bandwidth is only about 7KHz, recording of signals on audio cassette is easily achieved.

A quarterly 12-page newsletter is produced and an annual exhibition is held April/May in the East Midlands.

If you would like to join, send a crossed cheque/psotal order for £4 (or £3 plus the wrapper from a recent SPRAT) to Dave Gentle G4RVL, 1 Sunny Hill, Milford, Derbys, DE56 0QR, payable to "NBTVA"

NOVICE NEWS

Steve Ortmayer G4RAW
14 The Crescent, Hipperholme, Halifax. HX3 8NQ. Tel: 0422-203062

Not much news from Novice Members this time. I wonder what you are all up to? Perhaps most have gone onto a full licence please let me know. A check in my log reveals recent QSOs with 2EØAJN, 2EØAJS and 2MØAIX all on 80m so would Novice Members welcome an activity evening on 80? Please let me know. Sam VU2USA writes to say he has used a similar transmitter to the "Ten Minute TX" and has worked some good DX with it. Sam is on the lookout for an HW7, HW8 or MFJ Transceiver so if anyone can help let me know and I will pass on details. You don't have to spend a fortune on a Morse key. I note from a QSL card received from Jim GØNTR that he was using a key made from scrap plastic similar to the PW Speedbrush.

Make someone happy....American native legend says that the keeper of the gate to heaven has only one question to ask those who seek to enter "Have you made someone happy during your life?" I went with other members of the Halifax Club to a local school where we put on a Special Event Station for the day. A total of 48 pupils passed messages and we all had a very happy time. I would recommend this type of activity to members as the most rewarding side of Amateur Radio.

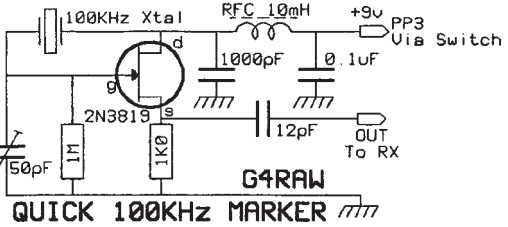
Handy Hints for a Happy Shack...

Raymond W3GY sends details of how to put those 35mm film canisters to good use. Raymond hopes to build a Blinking Noise Limiter in one and he has used one to house a CW filter made with a Tandy isolation transformer tuned to 800Hz with capacitors. The transformer is located in the canister with cotton wool balls. Canisters have also been used to house stereo jacks to make an adapter for an iambic keyer.

Quick 100kHz Marker

John Birkett still has some cheap 100kHz crystals and with one FET they can make a useful 100kHz marker to check your receiver. The output can be fed into a frequency counter and the trimmer used to set 100kHz.

That's all for now please sent me your news and handy hints.



ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADA-ADS-ADS-ADS-ADS-ADS-ADS-ADS

FOR SALE: Cheriton 80/20 dual band receiver kit, as supplied plus most bits required to complete. Further details / Offers G1EPS Tel: 01704 - 20356

FOR SALE: Shimizu Denshi SS-1055 ssb/cw QRP Transceiver in pristine condition. Up to 15w, fitted with noise blanker board and cw filter. Crystalled for 80/40/20/15/10 metre bands. £230. Harry, G4FEQ, Tel: 01977 - 552862.

FOR SALE: Heath HW9 Transceiver 60 to 10 incl. WARC bands, CW, good working order. £230 incl. Carriage. Tony, G3KCJ, Tel: 01582 - 454778 after 6pm.

SWAP OR SALE: Howes Rig : DCRX80, CTX80, CVF80, ST2, 20dBW atten. Build as separates in one box, hard switching, Ok not not very neat. I would like a DTR7. Jim Harrison, 43 Churchfield Court, Walton, Peterborough, PE4 6GB.

FOR SALE: Various PCBs with goodies inc 2 radios £2 the lot, Walkman headphones 65p, 12v - 1a transformer £1.50, All together for £3 ono. Answercall Ranger 2000 cordless phone good order but needs new antenna £5. Answercall Elite large answering machine [may or may not work] so £2.50, 100mA battery eliminator upgraded with brifge rectifier £2.50, Infra Red stereo remote RX/TX for listening to TV or HiFi - TX needs 18v PSU £7.50 ono. Finally large selection of records of Classical music, Sinatra & Galway for about £2 a record [less for boxed sets]. Call David on 0181-317-2223 eves and weekends.

SSB COLUMN : Dick Pascoe GØBPS

Seaview House, Crete Road East, Folkestone. CT18 7EG. Tel: 01303 891106

I have at last got back on the air with my 10 watts of SSB using a TS50 mobile. Ian G3ROO and I took to the roads and we worked down into the Med. to a /MM station. Many other contacts into the USSR and Europe were fun over the next few days. I am trying out of the **Texas Bugcatcher** aerials which seems to work very well.

A great letter arrived from Rune, SMØGKF, who cannot work CW because of a car accident some years ago. He is an avid QRP Sideband operator and has several awards to his merit. Using a simple vertical antenna for the 10, 15 and 20m bands he has gained 255 countries with his "squirt" of RF. He tells me that his 254th was 9M2DJ in Malaysia with a 5/2 given and his latest being XX9X (Macao) who offered a better 5/3. His best DX is VK5FOX who he has worked several times. His historic roll includes: 5 watt WAZ in 1984 (first SM), QRP WAC in 1978, 2000m QRP Award 1980 (1st in SM). G QRP 100 countries in 1980.

Rune likes to sit around the usual SSB QRP Frequencies and may be found on 14.285 and 21.285.
He also asked for a sked and suggested a time and date. Typically I was busy that day and time - driving north to a wedding in Lincolnshire.

Peter, G3PDL, (our club treasurer) and his YL Diane decide to tie the knot and we were invited along with many other members of the G QRP Club. A high time was had on the previous evening with many a story being told. The day itself was a superb event. We knew the tone of the service when the vicar (GØTWE) made his opening statement, "we are gathered here today to join in matrimony G3PDL and his XYL". Two vicars (GØTWE and G3RJV) took the service. At the end of the service I noted that even the photographer wore an RSGB badge! He then asked for all the radio amateurs to step forward for a picture and almost 50% of the congregation walked forward to gather around the happy couple.

The reception afterwards was even better than the previous evening with a few sore heads appearing the next day. I am sure that all members will join me in wishing both Peter and Diane a long and happy future together.

Back from Dayton, another trip to remember! Just George and I represented the club this year and the weather was good to us, Lots of new members joined and even more renewals made the event worthwhile. We renewed acquaintances with old friends and made more new friends. It was great to meet several of the QRP-L Internet gang too. That's it this time, keep the news coming. TTFN de Dick.

VHF MANAGER'S REPORT

John Beech, G8SEQ
124 Belgrave Road, Wyken Coventry CV2 5BH Tel. or Fax 0203 617367.

Firstly this quarter, I will review the magazine "VHF COMMUNICATIONS", published by KM Publications, 5 Ware Orchard, Barby, Rugby. CV23 8UF, UK. The magazine contains a wealth of articles from 28 MHz to 24 GHz. Most are practical constructional articles, ranging from complete rigs to how to modify commercially available equipment. Some are articles on instruments and measuring techniques. There are also articles on FAX, GPS Wx Sats. & Antennas. The annual sub. is £15 or equivalent and individual copies can be bought for £4.00. It is well worth buying the "Complete Index, Vols 1970 to 1994", just to see what you've missed! But in reality, anything after 1980 and some of the previous material is still available from KM.

As I write I am debating where to go to operate in the "Backpackers" contest. As it is also my son's 10th Birthday on that Sunday, I won't be putting on a seriously competitive station, but hope to get on for an hour or two to give some points away. I've been checking my equipment out and found a few faults, but still managed to work DF & ON the other weekend with just 1 W of SSB. Hopefully the Wx will be kind and the Dx will be exciting.

I work people from time to time and talk to them at rallies and am amazed at how many people read this page. How about writing to me telling me of your personal "bests" or favorite little rig or unusual happenings? I have had very little from the membership lately. For those of you not on packet, a new beacon on 50.070, SK3SIX was activated on 06/05/95, but I've not heard it yet.

In the short time I was on in the "Backpackers", I worked five countries, just using 1 W to 5 el Yagi. GI & GD were conspicuous by their absence & I didn't hear much from the East & South-East.
Not one of the stations was a G-QRP club memeber, so was I the only club member on the air? I would have thought that this was an ideal contest for QRP-ers. The next 2m one is 18th June, but there is a 50 MHz on 3rd June and 9th July. There are two other 2m events on 2 July (coincides with VHF NFD) and 3rd September. For full rules see April RadCom p.83 or send SASE to me. That's it for this quarter, 73

ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADA-ADS-ADS-ADS-ADS-ADS-ADS-ADS

FOR SALE : Heath HW8 with Power Supply in immaculate condition with Handbook. £90.00
John, G4OJS, 0121 - 445 - 53207.

WANTED: Two VN66 power mosfets without protective zener or info on source. Joe, G3DII, QTHR or ring 01526 - 353362.

AN FT7 QUESTION ? I would like to modify my FT7 in such a way that the result is an automatic reduction in mode "cw" on QRP level. How can this be done on key-down using the ALC. Heinz Hierholzer, Weiermattstr. 3, CH4653, Obergoesgen Switzerland.

WANTED: KW2000 plus PSU. John, G3ZKZ, QTHR, Tel: 01284 - 810620.

WANTED FOR SRI LANKA: An old but workable transceiver, gift if possible, for 4S5SD to get him on the air. Stephen Wyesekara, 515 Millawatta, Batapola, Sri Lanka.

General Purpose High Current PNP Small Signal Transistors E-LINE Case
IC-2amps, Po[Max] 1w, Vce[Max] -100v. Vcb Max -120v, Hfe 100-300 @ Ic 0.5A, Vce -2v, Ft 140MHz Available at 50p inc post , plus address label, for 10 transistors. 25p is for return postage and the other 25p for Novice Classes thus encouraging future radio amateurs.
Robert Snary, G4OBE, 12 Borden Avenue. Enfield, Middx. EN1 2BZ.

MEMBERS' NEWS

by Chris Page G4BUE

"Alamosa", The Paddocks, Upper Beeding,
Steyning, West Sussex BN44 3JW.
Tel: 01903 879750
Fax: 01903 814594
Internet: g4bue@pavilion.co.uk
Packet: GB7DXS on UK DX PacketCluster

Those of you who subscribe to the RSGB's DX News Sheet (DXNS) will know that I have recently taken over as the editor, following the resignation of G4DYO. I have just completed editing my second DXNS and am finding it very interesting.. I have made contact with the editors of other DX bulletins and news sheets throughout the world and this should help me become aware of items of interest to QRPers.

I have used this new position to justify getting on to the Internet, hence the addition to my contact addresses at the top of the column. Those of you who have access to the Internet, please use it to send me information about your QRP activities for this column. Please also note the change of my telephone number. I have made my old number a dedicated fax line to ensure I receive faxes.

G4GIY has built the Oak Hills Research Spirit transceiver for 30 metres. It has a superhet receiver which Robins likes as he previously built the Lake DTR 80m transceiver but found the DC receiver rather difficult to use.

Robin bought the Spirit from The QRP Component Company (**G3TUX**) and commends Chris for his fast back-up service. To his astonishment he found that everything worked first time and with a delta loop he has used it to work nine European countries and has heard stations in the USA, JA, VK and ZL.

GM3OXX has moved QTH to Bathgate in West Lothian, 20 miles west of Edinburgh and had withdrawal symptons as he took down his old zepp! George is now building a new shack, which will include a work bench of course.

DL2RM has also moved QTH and has put up a low homemade windom (FD3 type) antenna with a 1:4 balun. Rudi was astonished to find the antenna is more than good enough for European QSOs and has worked many DX stations. The antenna works on all bands, including WARC, with an ATU. He is using an FT757 for QRO and an HW9 for QRP and would like to her from other members using windom (FD3 or FD4 type) antennas. He says it is a very popular antenna in Germany and wonders how many UK members use it.

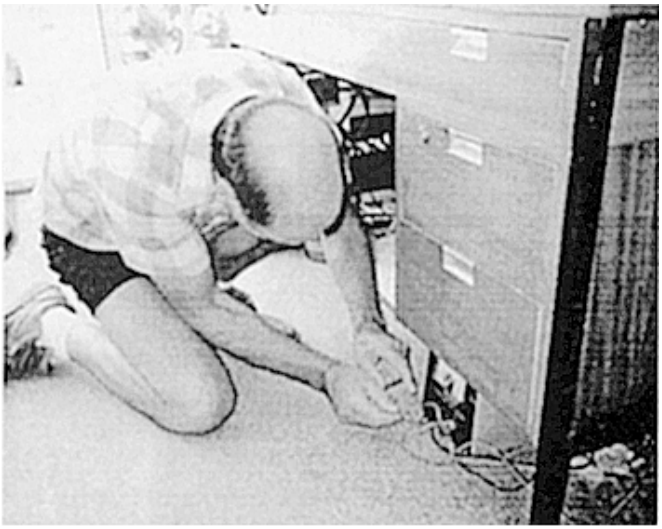
DJ4SB was planning to give a talk on 'milliwatting' at the annual meeting of the DL-Group of the G-QRP-Club at the end of May.

During the CZEBRIS event at the end of February, **G3ESP** used his 5W and doublet to make QSOs with stations in USA and Canada and with **FY/DJØPJ** on a 'dead' 15m band. Walter wonders how it will be when the sun-spot cycle peaks if he can do that now. **G3XJS** also worked **FY/DJØPJ**

Can anyone guess what Dick, GØBPS is looking at in this photograph taken at the Summer QRP Party last year? See the next page for a clue!

in the CZEBRIS event on 20 and 15 metres, plus FM5CW on 20m but missed HP1AC who, Peter says, was very weak on 15 metres. He is building the Malta 40 but for 20 metres.

If you worked one of the ID9 stations at the beginning of June, you may have been lucky and worked club members **IT9NGN** or **IT9TZZ**. Tino and Giovanni were part of a DXpedition to Panarea Island in the Eolian Archipelegao (IOTA EU-017) and were planning to operate QRP with homebrew transceivers. QSL all QSOs is via IT9HLN.



This is who Dick was looking at! Can anyone suggest a humourous caption for Dick or this photograph of me getting down to my PSU. ***(Thanks PA3BHK for photographs.)***

Bruce, now TA2ZO, backpacking at Yedi Göller in northwest Turkey. A 2 metre 'handitalkie' is hidden in one of his shoulder pockets.

VE7HR is now based in Turkey as TA2ZO and is QRV with QRP from his apartment using random wire and half square antennas. Bruce has an Omni VI transceiver but has some concerns about the noise blanker on it. He finds the noise blanker in his Scout more effective on the large lorries that trundle past his flat.

GWØNSR is very impressed with the W3NQN filter which he uses with his FT101ZD and 120 feet wire at 40 feet. Tony lives in a steep sided little valley which is 200 yards wide and 50 feet deep! Despite this he is still able to work DX as his confirmation with VKØLL on Heard Island whilst using 3 watts on 80 metres proves. Between 26 August and 9 September

DK7VW will be QRV from Lake Balaton in Hungary as HA/DK7VW with his HW9 and wire antennas at the end of August and beginning of September. Joe says that despite previous holidays as DK7VW/5B4 and HI8/DK7VW his wife, Sabine, has allowed him to take his QRP rig to Hungary!

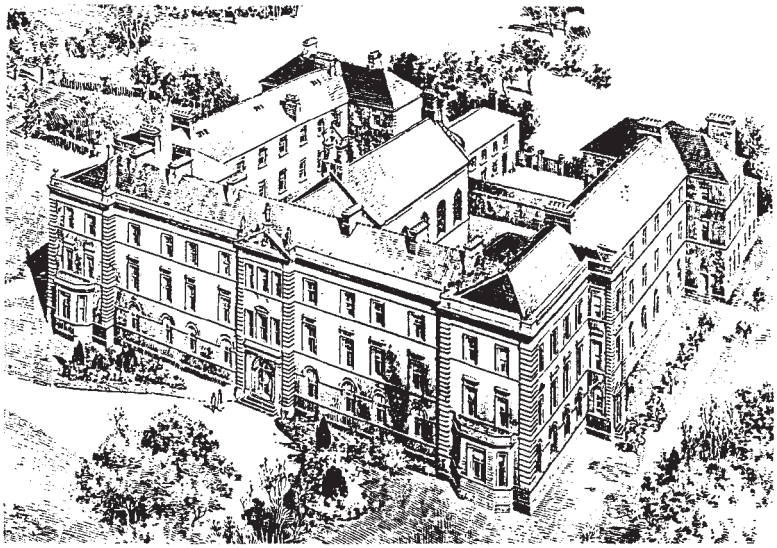
Just space to wish you a good summer. Let me know hopw it goes, by the 25th August, please. *73, Chris*

Enjoy Ireland - Dublin .... and QRP International QRP Week

Marino Institute of Education, Dublin

Monday 28th August to Saturday 2nd September

Two Major Presentations by G3RJV [repeated beginning & end of week]
Practical Electronics and Engineering Laboratory Workshops
Fully Operational QRP Station [EI3RJV] Social and Hospitality Evenings



The Marino Institute is set in peaceful Parkland close to Dublin Airport and the City Centre. It provides very comfortable single and twin accommodation and full catering. The Courtyard Gardens and Extensive Grounds offer rest and recreation. Major Tourist and Scenic Attractions are within easy reach. The programme includes ample Free Time for exploring the local area or even for travelling further afield

Cost:

Bed, Breakfast, 4 Course Lunch, Coffee/Tea Breaks Plus All Activities
£28 per day per person
The Whole Week : Monday Morning to Saturday Lunchtime (5 Nights)
£125 per person. (additional Sunday night (27th) : £10 per person)

Further Details and Application Form:

Gerardine Quinn, Marino Institute of Education,
Griffith Avenue, Dublin 9.
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NEW! DTR7 – 40m CW TX·RX

The DTR7 is building on the success of its companion, the 80m DTR3. Featuring module construction, with no less than five PCB's, the rig incorporates all the essential features of a transceiver without indulging in expensive gimmicks.

Covering the entire 40 metre band – 7.0/7.1 MHz – the Transmitter produces a clean 2 watts of CW. It requires only about 350mA at 13.8V (key down), which, combined with its compact size and light weight makes it ideal for portable operation.

The Receiver section (Direct Conversion), can resolve signals of less than 1uV. Selectivity is around 250Hz @ 6dB.
AF output, up to 1/2 watt, is for 8 ohm 'phones or speaker.
Sidetone and RIT (plus and minus 4kHz shift!) are built in.

ALL COMPONENTS AND HARDWARE INCLUDED

£87.50 (Kit) **£140 (Ready Built)**

NEW! PM20 POWER METER for QRP

The PM20 is a combined 50 ohm Dummy Load and direct-reading milliwatt meter. Designed specifically for the QRP enthusiast, it accepts any frequency from 10kHz to 150MHZ. VSWR is less than 1.5:1 at 150MHz, about 1.1:1 at HF.
A dual range instrument – 20 watts or 1000 milliwatts FSD – it permits readings down to 25mW to be made easily.

ALL parts (Yes! Case AND meter!) are included.

£19.50 (Kit) £28.75 (Ready Built)

For full details of our kits, send SAE to

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KANGA PRODUCTS

Providing great QRP kits for over 7 years
Our kits are sold around the world in over 25 countries

NEW KIT

An RF Milliwatt meter that can read accurately power levels down to the 1 Milliwatt by using a digital Multimeter, Easy to build with no setting up procedure, Club price is just £5.00

Our ***IAMBIC KEYER*** is so small it fits in the palm of your hand. With on board speed control. at £15.25 The ***KIRSTA Keyer*** is even smaller. Ideal to build inside that QRP rig too. £17.50

Our QRP A.T.U. is a must too. Just 7" x 2" x 6" (approx.) it will handle up to 25 watts in a doublet or a long wire. £39.95

The latest kit from George RJV is the RF activated changeover, a nice unit on a tiny board. It operates at just 100mW on 160m and 500mW on 10m. Easily handling full QRP power levels. The G3RJV RF QSK kit is just £9.00

The Stockton Power Meter / Wattmeter is a firm favourite around the world. With two meters it indicates accurately the power up and back down the line. No setting up including meters is £29.95

CRYSTALS

We have a stock of the "standard" QRP crystals and a few others.....
3.560, 7.030, 10.106, 14.060, 21.060 at £4.00 each to members, Sockets for these are just 50p each.
Other crystals available are....
8998.5 & 9001.5 at £4.00 each.
4MHz & 12 MHz at 50p each

We still have all those old favourites too, the ***SUDDEN*** Receiver, (£15.25) the ***LCK Superhet Receiver,*** (£29.95) the Kanga ***Crystal Set,*** *(£3.50) and* of course the ***ONER Rx*** *(£9.00).* Altold a choice of 4 different Receivers.

The transmitters in our range vary enormously from the superb ***LCK*** *(£39.95)* to the huge amount of fun provided by the ***ONER,*** *(£32.95)* The ***OXO*** *(7.25),* both the single and the multi-band versions (£8.25) can provide hours of enjoyment.

Lots of others kits are available, including test equipment and other items. Don't delay, send today.....

(Don't forget the Postage & Packing @ £1 per order)

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NB: We are closed on Wednesdays.
At a rally most weekends!