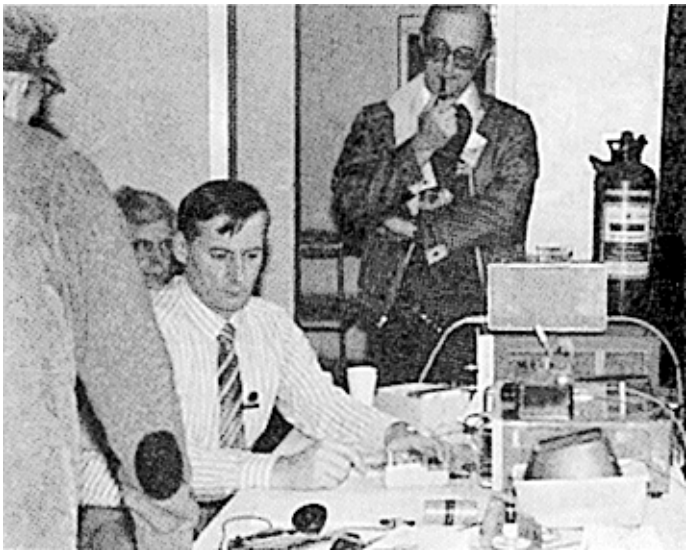
SPRAT

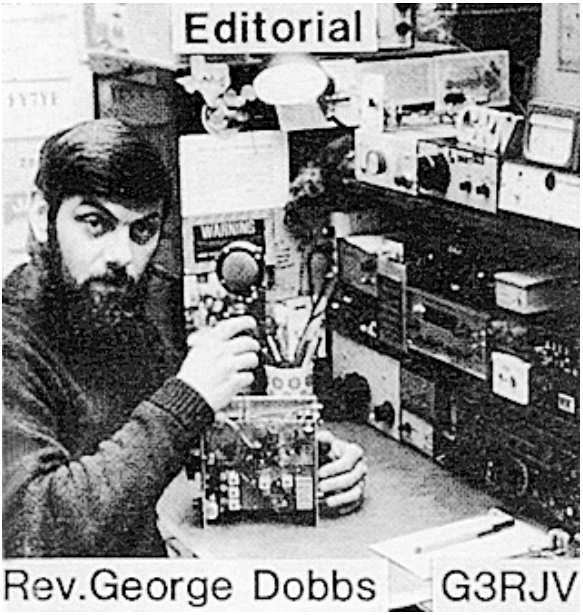
THE JOURNAL OF THE G-QRP CLUB

DEVOTED·TO·LOW·POWER·COMMUNICATION

ISSUE NR. 61 | © G-QRP CLUB | WINTER 1989/90



G3PDL Operates the HF Station
at the Rochdale Mini-Convention
using the G3ROO All Band All Mode Rig



St. Aidan's Vicarage,
498 Manchester Rd
ROCHDALE,
Lancs,
OL11 3HE.
Rochdale [0706] 31812

Dear Member,

The winter often means construction time and in this issue we offer a whole range of exciting projects. I am grateful to John Hey, G3TDZ, for permission to reproduce his WHITE ROSE RECEIVER and for the supply of PCBs to back up this project. Another very exciting project is the BI-DIRECTIONAL IN-LINE WATT METER from David Stockton. I must be one of the many who have wished to own a BIRD Wattmeter. Our initial tests of David's design suggests that it is better than the Bird! I think this circuit will become an amateur radio standard.

May I thank all the members who attended to Rochdale Mini-Convention and special thanks to those who wrote with their thanks an suggestions. Please accept this as a general thankyou because I had so many letter after the event.

In 1990, the club will be present at the LONDON AMATEUR RADIO SHOW, March 9th and 10th and the RSGB NATIONAL CONVENTION, April 21st and 22nd (although at this point I have not received any information from the RSGB). Please come and see us at the club stand and, if possible, lend us a hand.

Every Blessing and Enjoyable Amateur Radio for 1990

George G3RJV

THE WHITE ROSE RECEIVER JOHN HEY G3TDZ

The White Rose Receiver is half of an all band transceiver and is complete as a stand alone receiver.
The circuit was designed as a club construction project to allow those with minimum experience to get on the air or onto the new bands without breaking the bank or supporting the Japanese economy. Certain Class B members saw no point in struggling with the morse test only to be faced with a financial brickwall. Here then is presented a circuit which can be put together for about £25 excluding chassis and case, needs no sophisticated alignment equipment, and yet performs well.

The Circuit

A direct conversion receiver overcomes the necessity of expensive filters and difficult alignment: its shortcoming are mainly overcome by choice of design yet inexpensively contrived.
It was difficult to imagine inexperienced constructors tackling huge coil packs, plus the fact the whole range from 160m to 2m was envisaged. The tunable IF approach was adopted, tuning 6 - 6.5MHz with plug in converters for the various bands. Most operators have favourite bands; other bands may therefore be added a a later date where desired as finances permit.
The choice of 6MHz allows good image rejection, but more interestingly the crystals except for 2m and 4m are all off the shelf values from normal electronics suppliers, used mainly for computers - and cheap.
The main receiver starts with a casode RF amplifier employing the ubiquitous 2N3819; fairly bomb proof and always stable; an Rf gain control connects to the tail end. There are two tuned circuits at signal frequency: capacitive taps are favoured instead of tapped coils; always to be avoided where possible.
The mixer is the old clunker 1496 which provides useful conversion gain, and a balance pot overcomes the Radio Moscow effect. The injection oscillator uses a simple bipolar transistor with an optional buffer follower for feeding an eventual transmitter.
One of the deficiencies of very simple DC receivers is inadequate filtering. In this circuit a third order Butterworth stage is followed by a second order Chebychey to produce the SSB selection; a further bandpass filter at about 700Hz is selected for CW reception. These occupy three sections of a quad op-amp LM348N, a with the fourth acting as centre line biasing supply for the others.
The ssb/cw selector switch feeds an SL6270 vogad chip which performs audio gain and AGC functions. This is followed by the volume control and the AF output which uses the well known LM380N.
A three gang tuner is necessary of about 20-25pF per section. Other values can be used with a series capacitor; provision for these has been allowed on the PCB. The prototype used a 360pF broadcast type with 47pF in series.
Initial drift was found not to be due to the bipolar, for an FET was tried; nor was it the tuned circuits, but was in fact the three in tapping and coupling capacitors C36, C37 and C39. The med.k ceramics were found to be hopeless and when changed to multilater cog types (expensive) all was well.
For the only reason that it makes the front panel look good, an S meter drive circuit is included on the board. Where not wanted U5, R51, VR4, D2 and C60 may be omitted. A 100uA movement is recommended.
The audio power stage is supplied from the 15v input; a 78L12 stabilized then feeds all the other stages.

THE CONVERTERS

The signal path is similar in all converters from 8Ø to 2m: an FET cascode RF stage is triple tuned, its tail or source resistor being routed to the RF gain control along with the other RF amplifier in the main receiver board. The mixer is a low noise dual gate BF981. It is possible to use a similar device on 2m and 4m converters.

Various bands demand differing oscillator chains; a simple fundamental crystal on most low bands; and overtone on 4m, 6m and 1Øm; fundamental plus doubler as an option for 1Øm; with overtone plus doubler for 4m and 2m. All these different configurations are possible on the one board layout by wiring what is needed; a coupling capacitor acts as link to a common bus which feeds gate two of the mixer. See sheets 3 and 4. The mixer output is wideband coupled into the short 5Ø ohm link to the main board where L6 selects the wanted frequency. The low impedance link plus nice short connections at the socket ensure no pick-up of the noisy 6MHz broadcast band.

Converters have DIN41617 plugs (25p at rallies) with a common socket in the receiver chassis.

Gain is such as to allow good reception on all bands with just a short whip aerial, hence the RF gain control for use when a tuned aerial is connected. Easily copiable signals have been measured down to Ø.Ø6uV.

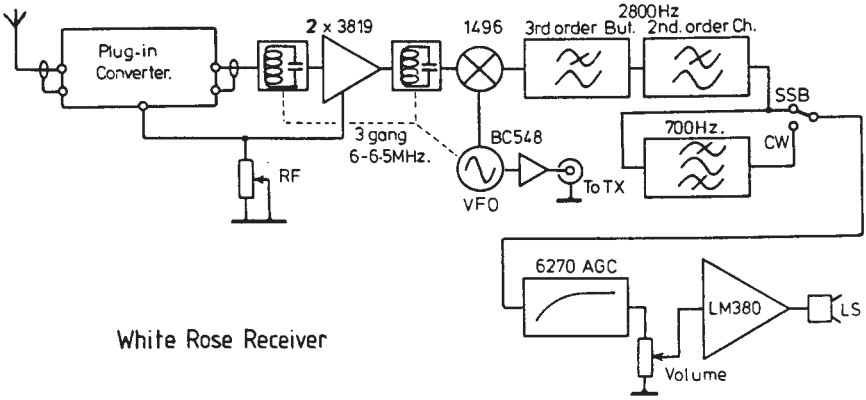
EXTRA NOTES:

R26 (1K) is made up from two 47Ø ohm in series to improve layout.

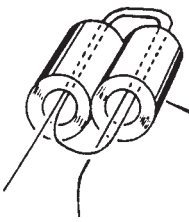
22MHz crystals are available from Quartslab at £3 for 1Øm & 6m converters. For 1Øm, follow instructions on sheet 3. For 6m, use 2m and 4m circuit on sheet 4 with values for appropriate bands.

16Øm: as 4.5MHz crystals are sometimes difficult to obtain, if you don't mind reverse tuning, use 8MHz crystal; L1, L2, L3 2ØuH (67t 42 swg, C1, C6, C7 39ØpF, C2 33ØØpF, C12 12Ø pF, C13 18ØpF.

Ferrite Transformer: 2x FX1115; wind 1Øt 32-36 swg primary, and 2t 28 - 26 swg secondary, wind tightly.



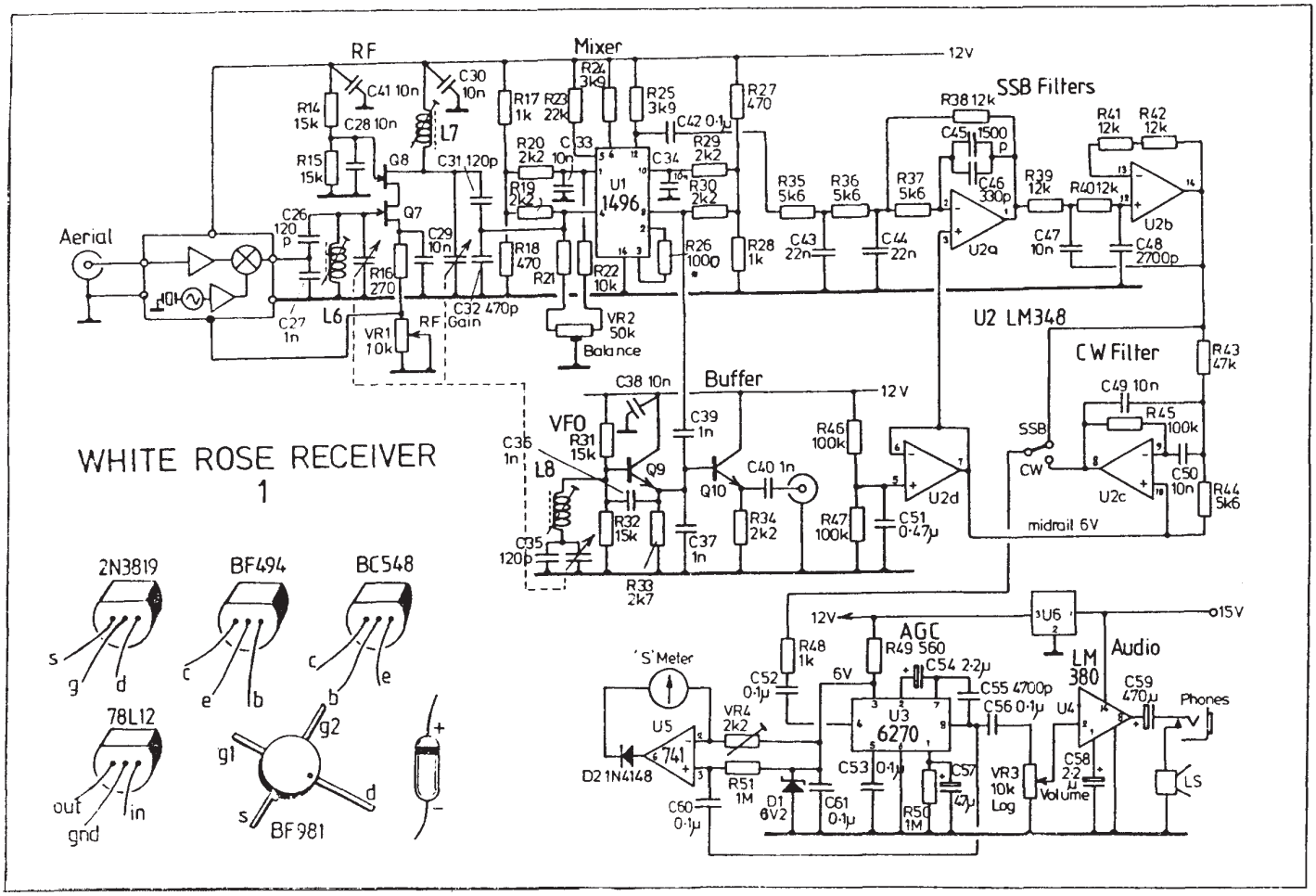
White Rose Receiver

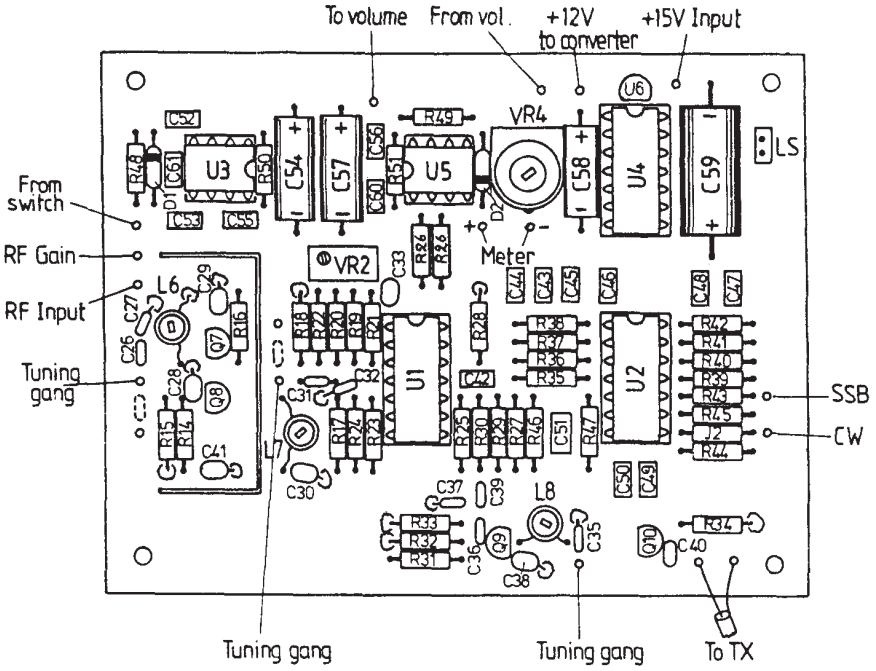


Ferrite transformer

Sketch shows two turns. Wind 10 turns of 32-36 SWG on primary; 2 turns on secondary 28 SWG. Keep windings tight.

2 x FX1115


WHITE ROSE RECEIVER
1
RF
Mixer
SSB Filters
Aerial
VFO
Buffer
U2 LM348
CW Filter
AGC
'S' Meter
Audio
LM 380
Balance
Gain
midrail 6V
12V
15V
2N3819
BF494
BC548
78L12
BF981
out
in
gnd
g1
g2
s
d
g
c
e
b

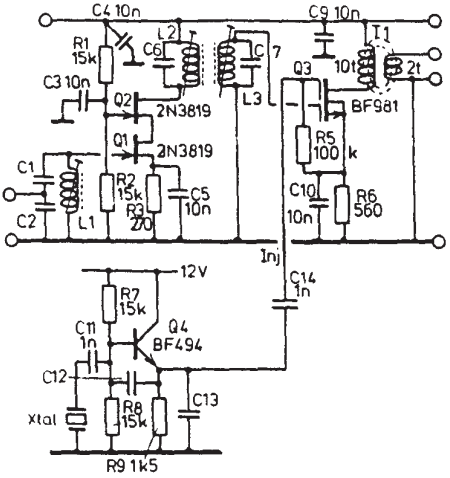


PARTS LIST

R1, R2, R7	15k		C1, C2, C6, C7, C12, C13, C14, C15, C16, C20, C21		See sheet 3 and 4
R3, R16			C3, C4, C5, C8, C9, C10, C18, C19, C23,		
R4			C28, C29, C30, C33, C34, C38, C41		10n hi K Disc
R5, R45, R46, R47	100k		C11, C14, C17, C27, C39, C36, C37, C40		1n med K ceramic *
R6, R49, R11	560		C26, C31, C35		120p Lo K ceramic
R9	1k5		C32		470p med K ceramic
R10, R19, R20, R29, R30, R34	2k2		C42, C52, C53, C56, C60, C61		0·1µ polyester
R12			C43, C44		22n "
R13			C45		1n5 "
R17, R28, R48	1k		C46		330p "
R18, R27	470		C47, C49, C50		10n "
R21, R22	10k		C48		2n7 ceramic
R23	22k		C51		0·47µ polyester
R24 R25	3k9		C54, C58		2µ2 16V elect.
R26	1K	2×470Ω	C57		47µ 16V "
R33	2k7		C59		470µ 16V "
R35, R36, R37, R44	5k6		C55		4n7 polyester
R38, R39, R40, R41, R42	12k				
R43	47k		SEMICONDUCTORS		
R50, R51	1M		U1	MC1496N	Q1, Q2,
	* 39k		U2	LM348N	Q7, Q8 2N3819
VR1	20k lin		U3	SL6270C	Q3 BF981
VR2	50k 10 turn		U4	LM380N	Q4, Q5 BF494
VR3	10k log		U5	LM741CN8	Q9, Q10 BC548
VR4	2k2 skel.		U6	LM78L12ACZ	
			D1	BZX79C6V2	
J2	270		D2	1N4148	

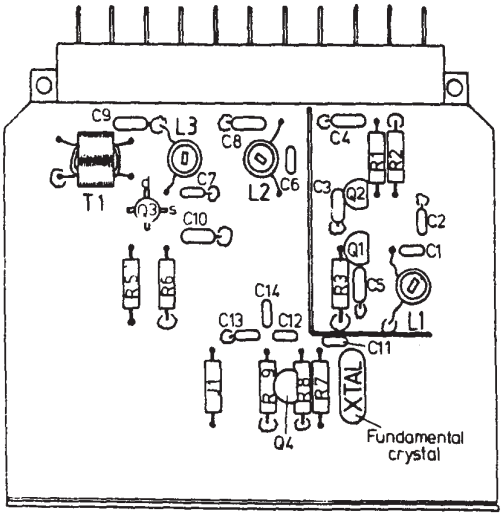
* C36, C37, C39 1n C0G Multilayer

WHITE ROSE RECEIVER 3



Converters using fundamental mode crystals

	80	40	30	20	15
Xtal	2·5MHz	1MHz	4MHz	8MHz	15MHz.
C1	220p	120p	68p	56p	39p
C2	1800p	1000p	560p	470p	330p
C6,C7	220p	120p	68p	56p	39p
C12	390p	470p	220p	120p	82p
C13	560p	680p	330p	180p	120p
L1,2,3	44t	31t	28t	22t	14t

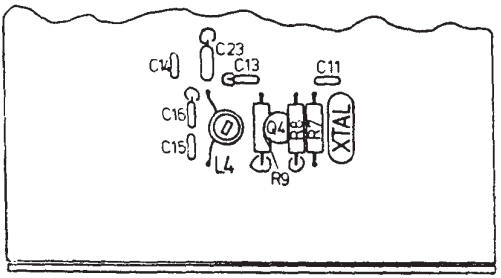


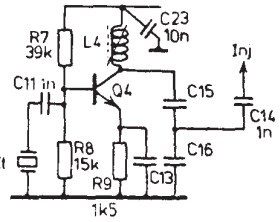
(J1 = zero ohm resistor)

J1 zero ohm resistor

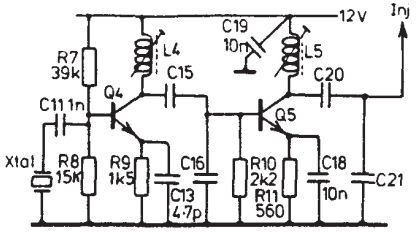
Converters using single stage overtone oscillator

	10	6	4
Xtal	22MHz	44MHz	64MHz.
C1	27p	15p	10p
C2	270p	120p	82p
C6,C7	27p	15p	10p
C13	5·6p	4·7p	4·7p
C15	39p	18p	12p
C16	150p	68p	47p
L1,2,3	12t	9t	8t
L4	19t	13t	9t





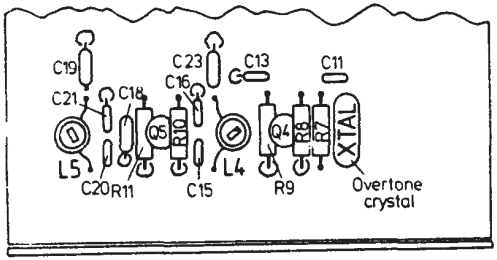
WHITE ROSE RECEIVER 4



Osc chain for 4m and 2m converters: overtone oscillator and multiplier.

	4m	2m
Xtal	32MHz.	46MHz.
Mult	x2	x3
C15	22p	18p
C16	100p	68p
C20	12p	5·6p
C21	47p	22p
L4	16t	12t
L5	9t	5t

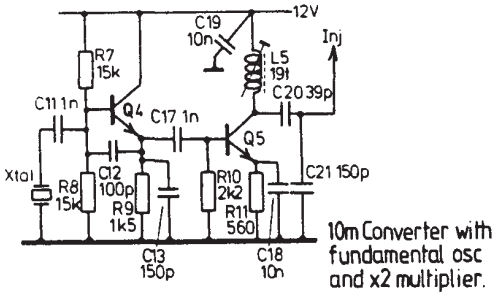
Q1,Q2 replaced by single BF981 in 2m board.



COIL TABLE

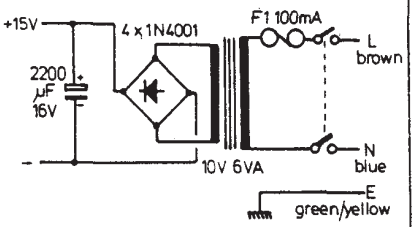
All coils are close wound on 3/16" formers.

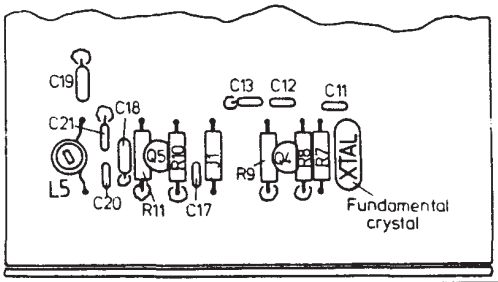
	L1 L2 L3			
3·5MHz.	8·64µH	44t	3layers	32-36swg
7MHz.	4·3µH	31t	2layers	32-36swg
10MHz.	3·72µH	28t	2layers	30swg
14MHz.	2·3µH	22t	single	30swg
21MHz.	1·47µH	14t	"	28swg
28MHz.	1·2µH	12t	"	26swg
50MHz.	0·675uH	9t	"	26swg
70MHz.	0·5µH	8t	"	25swg
144MHz.	0·22µH	4t	"	24swg
	L4 overtone			
28MHz.	(22MHz)	19t	single	30swg
50MHz.	(44MHz)	13t	"	26swg
70MHz.	(64MHz)	9t	"	26swg
70MHz.	(32MHz)	16t	"	28swg
144MHz.	(46MHz)	12t	"	26swg
	L5 multiplier			
28MHz.	(22MHz)	19t	"	30swg
70MHz.	(64MHz)	9t	"	26swg
144MHz.	(138MHz)	5t	"	24swg
	L6,L7,L8			
6MHz.	5·2µH	36t	3layers	32-36swg

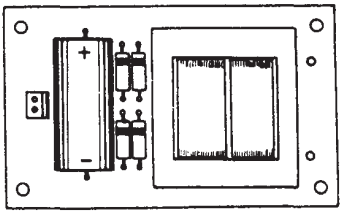


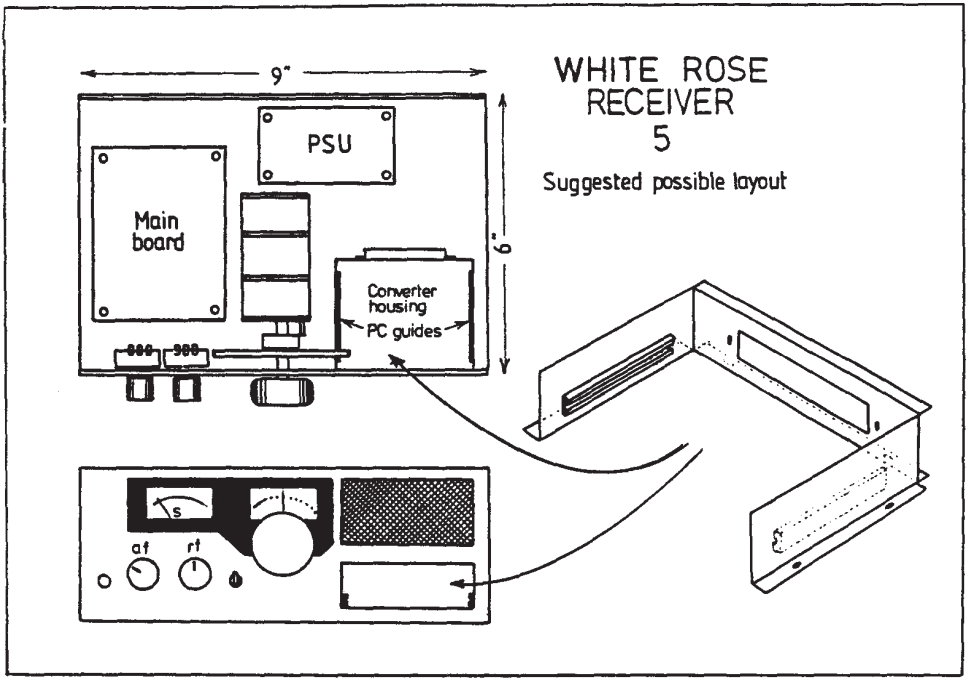
10m Converter with fundamental osc and x2 multiplier.

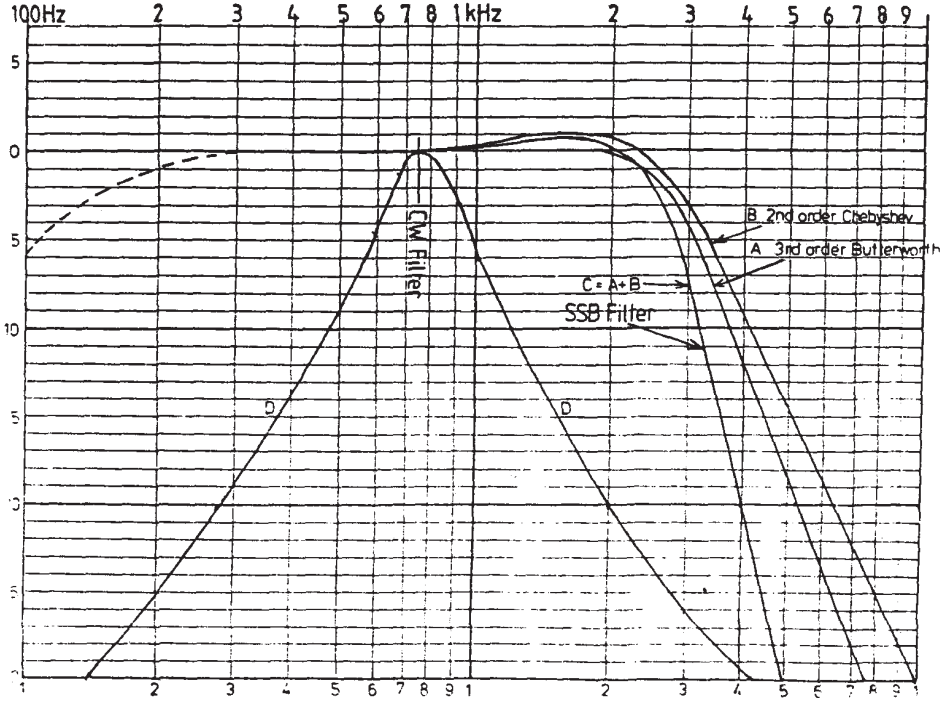
POWER SUPPLY



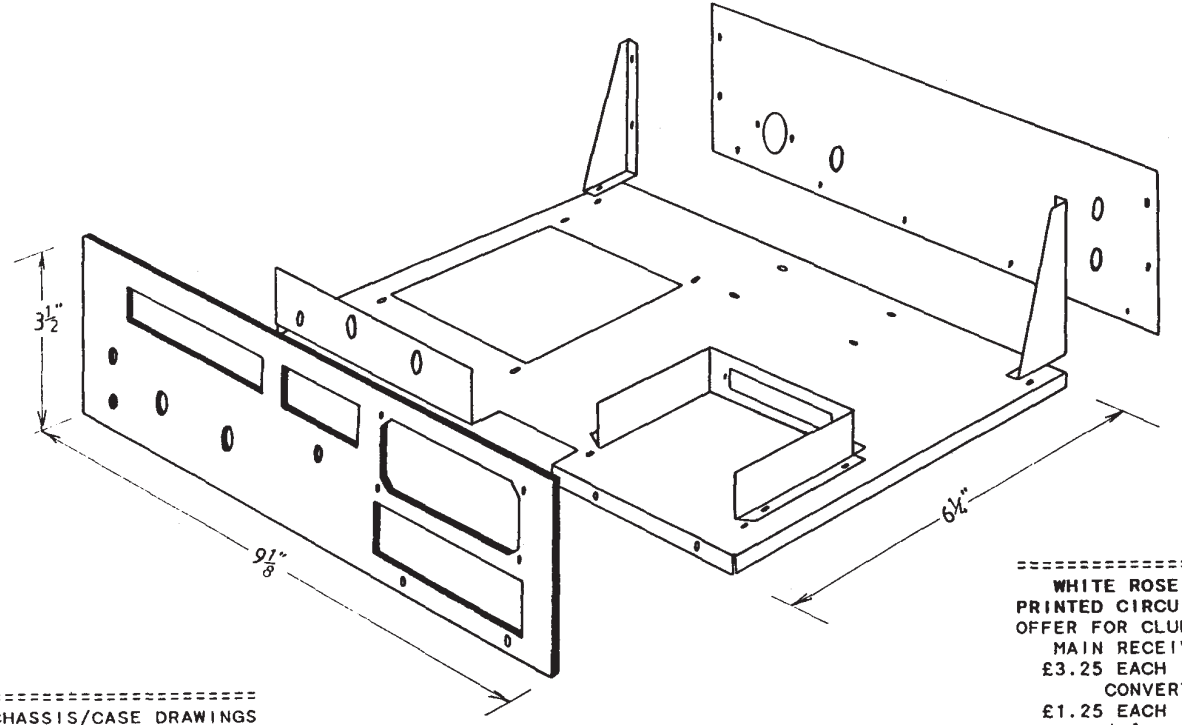





WHITE ROSE
RECEIVER
5
Suggested possible layout
9"
6"
PSU
Main board
Converter housing
PC guides
af
rf


100Hz
1kHz
CW Filter
B 2nd order Chebyshev
A 3rd order Butterworth
C = A+B
SSB Filter

White Rose Construction Project
Receiver Chassis



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FULL CHASSIS/CASE DRAWINGS
WITH ALL THE REQUIRED DIMENSIONS
Available from G3RJV for an SAE.
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WHITE ROSE RECEIVER
PRINTED CIRCUIT BOARDS
OFFER FOR CLUB MEMBERS
MAIN RECEIVER BOARD
£3.25 EACH [P&P 2Øp]
CONVERTER BOARD
£1.25 EACH [P&P 2Øp]
From Dave Aizlewood G4WZV,
36 King Street,Winterton,Scunthorpe,
South Humberside, DN15 9TP.(Cheques "G QRP CLUB")
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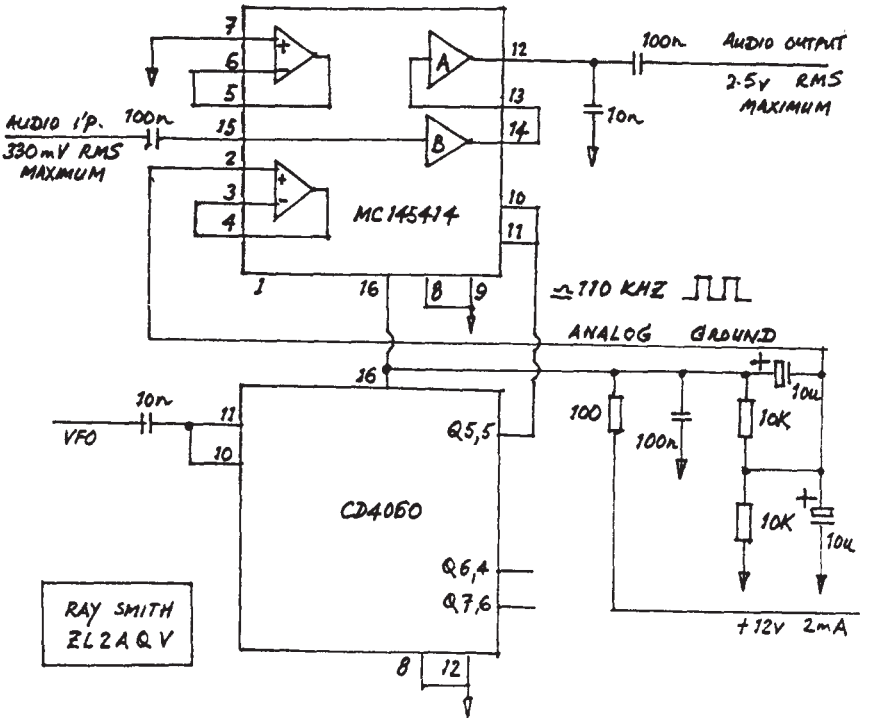
DIRECT CONVERSION RECEIVER SELECTIVITY ZL2AQV

Direct Conversion receivers usually suffer from poor selectivity. Essentially all selectivity is determined by the characteristics of the high frequency response of the audio amplifier. Often a low pass filter is used, but the selectivity is at best mediocre.

A dramatic improvement can be effected by using a switched capacitor filter IC. This will produce a low-pass filter with almost perfect characteristics - flat response in the passband and very rapid attenuation above it. The Motorola MC145414 is a dual filter device with a response drop of 40 dB per section in under 100 Hz. Using both sections produces a filter with 18 dB gain and 70 dB attenuation in about 40 Hz at 3 kHz. It requires to be driven by a square wave 36 times the cut-off frequency. This can be conveniently obtained by dividing down the VFO with a CMOS divider CD4060. Dividing a 3.5 to 3.9 MHz VFO by 32 times produces a cut-off frequency variation of 3038 Hz to 3385 Hz, an insignificant disadvantage. By switching the clock from pin 5 to pin 4 (divide by 64) the cut-off can be reduced to 1.5 kHz to produce an excellent response for cw reception. Even narrower slectivity (750 Hz) is available by using pin 6 (divide by 128). Maximum audio input is 350 mV RMS, so the filter should be inserted in the early stages of the audio amplifier.
The MC 145414 has two spare op-amps which could be used to produce the desired clock frequency.



A BI-DIRECTIONAL INLINE WATTMETER

DAVID STOCKTON G4ZNQ

GOOD ACCURACY FREQUENCY INDEPENDANT NO ADJUSTMENTS
LOW INSERTION LOSS WIDE POWER RANGE SIMPLE TO BUILD

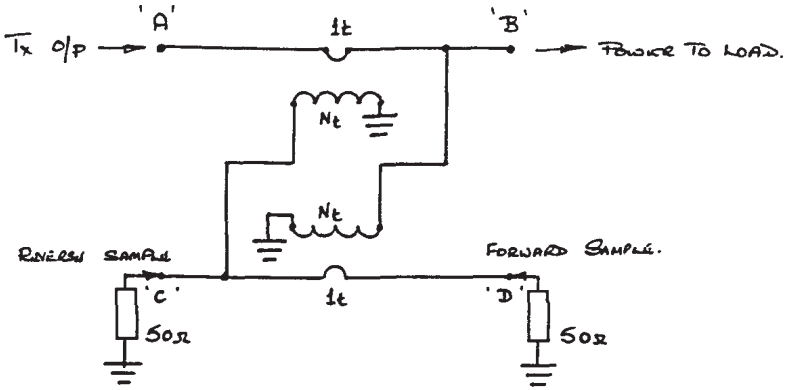
Asked to build a "transmitter VSWR meter", my fancy was taken by two variants of the Bruene circuit and I built one of each. The first uses a resistive potentiometer to sense the line voltage - found in the RSGB Manual. The second uses an autotransformer to sense the line voltage - found in an article by Ulrich Rohde in the US HAM RADIO magazine. Both proved to be less sensitive to stray than their ancestor, but I felt it might be possible to do better. The cause of their sensitivity to stray capacitance is the high impedance which the detectors present. Some calculations also showed that this high impedance was also limiting performance at the lower end of the range.

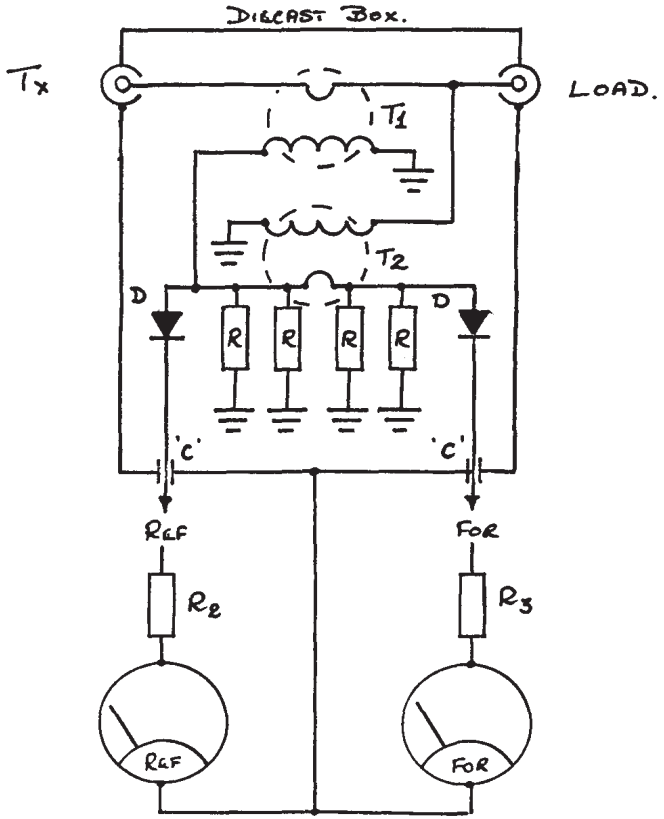
I started thinking of low impedance alternatives and suddenly remembered some professional work I had done on return loss bridges some 10 years ago. It happens that as circuit impedances are lowered, the bandwidth over which a transformer is usable increases, and I had designed a transformer based bridge which was usable from 10KHz to 40MHz with laboratory instrument class accuracy. This made me suspect that choosing a circuit with controlled, low impedances would be beneficial all round.

To experiment with transformer design I built a true 4-port Hybrid intended for 50 ohm use. A hybrid is a very simple circuit - just 2 transformers and 4 connectors - with some amazing properties. The connectors or ports are best thought of as two pairs. If a signal is passed in one connector and out of the other of a pair, into some unknown impedance load (say an antenna) then, if both of the other connectors are terminated in the intended system impedance (say 50 ohms) then the hybrid feeds a fraction of the power passing forwards through the first pair of connectors into one of the terminations. It feeds an equal fraction of the reverse power passing forwards through the first pair of connectors into one of the terminations. It feeds an equal fraction of the reverse power flow into the other termination. Hybrids can be designed to have different sampling fractions, usually quoted in dB, so a 20dB Hybrid diverts 1% of the flowing power to the appropriate terminated port. The really wild properties are that the circuit is symmetrical and the 2 pairs of ports can be reversed with no effect on function or performance, the signal can be fed through in the opposite direction in wbich case the forwards and reverse samples to the terminations are interchanged. Finally the hybrid itself contains nothing to set its operating impedance - the terminations on the sample ports do this. To convert a 50 ohm transformer hybrid into a 75 ohm one, just change from 50 to 75 ohm sample port terminations. If a large change of operating impedance is wanted, a transformer re-design may be needed to avoid some loss of bandwidth.

This circuit very nicely illustrates one of my favourite points. There is not necessarily any relation between number of components and "complexity". The operation of this circuit is extremely difficult understand, yet it only uses two components. Fortunately it is easy to build and easy to use.

Look at the symmetry of the circuit - due to a balancing effect of the transformers we can turn the circuit upside down, sway left for right, (or both) and it would still work the same.
Let us arbitrarity choose to feed our power into connector 'A' so our power passes through the transformers and 99% of it comes out of 'B' and goes to our load (the antenna) 1% comes out of connector 'D' and into its 50 ohm resistor.





METERS MAPLIN 50uA - 2 Needed
(not supplied in Kanga Kit)
R= 100 ohms R2 = R3 (22K for 5W FSD. 56K for 20w FSD)

If the antenna does not present a perfect 50 ohm impedance, some power will be reflected and will pass backwards through the hybrid from B to A only 99% of the reflected power reaches 'A'.
1% is diverted to connector C and is dissipated in its 50 ohm resistor. In order to work, it is essential that C and D are terminated with good 50 resistors. The hybrid relies heavily on the match of ports 'C' and 'D'>

A prototype was built. The transformers were made with toroid cores of type Si ferrite made by SEI (Salford Electrical instruments, Heywood, Lancs.) (Colour code: YELLOW) This ferrite is quoted for use to 2 MHz. Such statements usually refer to the range over which high - Q inductors can be made. Transformers are much less demanding and the usable frequency range is extended. The controlled impedance levels of the two transformers is very favourable and operation is good to about 50 MHz.

The prototype transformers had a single "primary" (with faraday screen) and a 12 t "Secondary".

With 12t, the coupling factor is - 21.584 dB. The prototype was measured at -21.59 ± 0.01 dB over 1.5 to 50 MHz. This flatness is excellent and the proximity to the calculated value for the first hybrid made (no adjustment or selection was done) shows the degree of confidence which can be placed in this type or circuit.

Plots of through path attenuation (<0.1dB 1.5 - 30 MHz) Coupling factor (21.59 ± 0.01 dB 1.5 - 30 MHz).

Directionality is the measurement of how well the hybrid can separate forwards and reverse samples. >23 dB directional power meter, we need only to add two termination resistors (50 ohms) and two diode detectors.

With a 21.6 dB (12:1 turns ratio) coupling factor the forwards termination dissipates 0.69% of the forwards power so two 100 ohm 1/2W resistors in parallel would be ideal for use with up to 150w continues carrier transmitters (580w PEP, unprocessed).

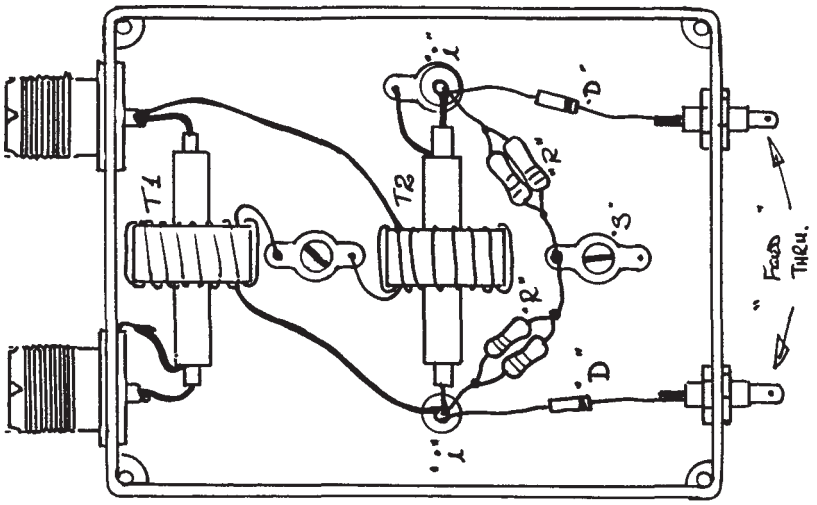
A good match gives zero reflected power. Interchanging the RF ports just causes the function of the two meters to be interchanged.

Two meters are really essential in this circuit, switching one meter merely detracts from the usefulness of the principle. Note that the principle of individual forwards and reflected power meters which do not have a VSWR scale not do Bird Thruline meters, not in one needed. If you know Forwards and Reflected power, you can esily convert to Return Loss (or VSWR) if you really wish.

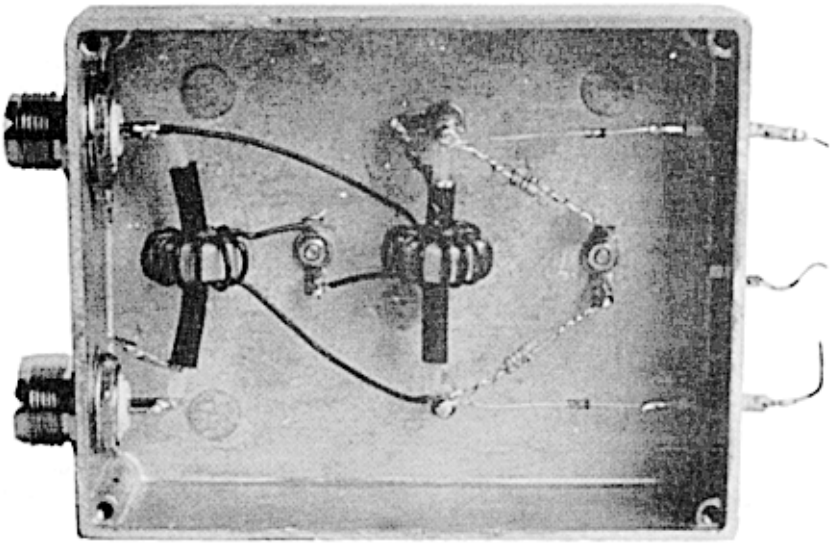
$$\text{Return Loss} = 10 \log \left(\frac{\text{Reflected Power}}{\text{Forward Power}} \right)$$

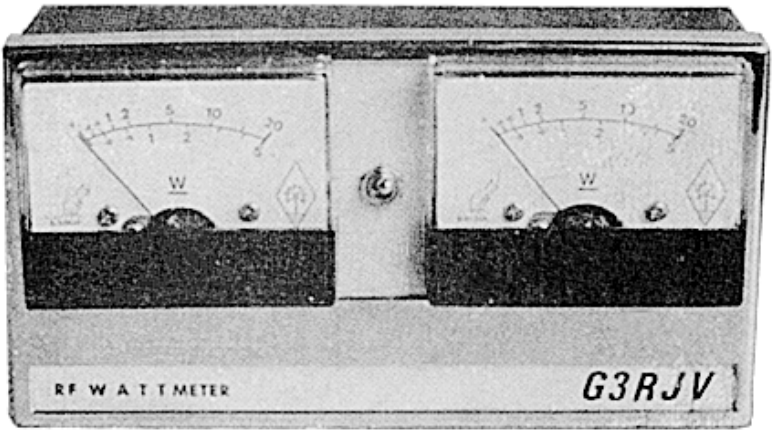
KANGA KIT VERSION
The protographs and diagrams refer to the Kanga Kit version of the Power Meter. This kit includes all that is shown in the "head" of the meter including the case, the special cores for T1/2 and all components. Two self adhesive scales are provided for the kit with two ranges: 5 watts and 20 watts FSD. This scale is designed for use with the MAPLIN 50uA Meter type FM98G. This meter is amongst the cheapest quality meters available. Several prototypes built with these meters showed excellent accuracy.

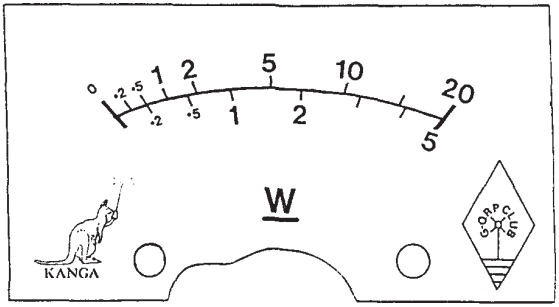
KIT PRICE TO CLUB MEMBERS (exc meters) £13.95 (post £1) from Kanga.



i = Standoff Insulators
T1/T2 = 12t. PVC covered wire - see text
Fit a tag on outside of case at S for Meter Negat
R = 100 ohm Low Inductive Resistors
D = Schottky Diodes
Feed Thru Capacitors - any value 1000 - 20,000pF







WATTMETER SCALES (5w & 2Øw FSD) Stick-on Scales 2 supplied with kit These are for use with the stated values of R2 and R3 in the article. Alternative higher (up to about 2ØØw) or lower full scale deflections can be had by changing R2 and R3.

U.QRP CLUB

EK3QRP on the EU/AS Border (Mt. Volchikha)

Left to Right:
RA9CCE - Sergej
RV9CIA - Boris
UWØLCN - Victor (seated)
RV3GM - Oleg (On Top)
UZ3GXX - Olga (xyl RV3GM)

The U QRP Club expedition in July 1989. 159Ø QSOs in 1Ø days, all under 5w. 65 DXCC, All Continents, 135 Oblasts and many G QRP Club members inc. G8PG, G3YCC, OH9VL, I7CCF Most interesting QSO was WF9Y running 8ØmW on 2Øm. EK3QRP used a Homemade Transceiver with simple wire antennas on all bands.

Report by Oleg RV3GM

VANDAL'S VALVE TX GM4BQA

A simple and effective one-valve QRP TX can be made from an old valve broadcast RX. The RX I used was a KB ER1Ø : a 4 valve plus rectifier, 3 waveband superhet for AC mains, made in 1949. Normally I would agree that to break up a valve RX for its parts would be vandalism, but in this instance the wooden cabinet was much rotted through standing in puddles - the set had been stored injudiciously next to the pen of an incontinent dairy goat. Also the IF transformers were missing and the set's cabinet was anyway ugly and impractical design; furthermore the shortwave band attempted to cover 5.9 MHz to 18.4 MHz with just 18Ø rotation of the tuning capacitor, so selectivity would have been very poor.

By modifying the power amplifier of the RX to become a crystal oscillator, and by retaining the original PSU, I ended up with a TX using Golledge's crystals to produce about one watt output on 3.56Ø MHz, 7.Ø3Ø MHz and 1Ø.1Ø6 MHz. The circuit can be quickly altered to lower the output in steps.

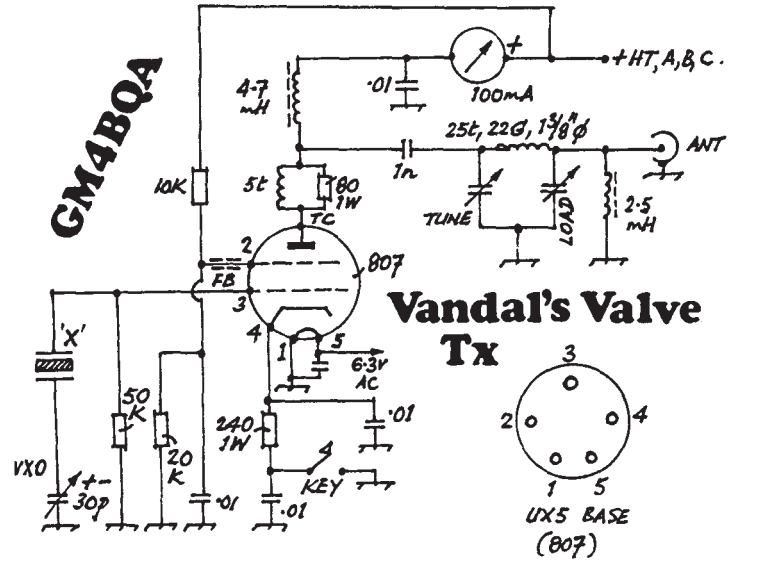
The original PSU was improved by adding a fuse in the HT line, a ceramic Ø.Ø1 uF across the first electrolytic (to keep any wandering rf from the mains transformer), and a smoothing choke from the junkbox (this last item not being necessary really, just part of a "belt and braces" approach to keeping all mains hum from the output). A chain of 1Ø watt wirewound resistors were wired across the HT to provide a constant minimum current through the smoothing choke, and to provide tapping points (A,B and C) for varying the power output of the TX.

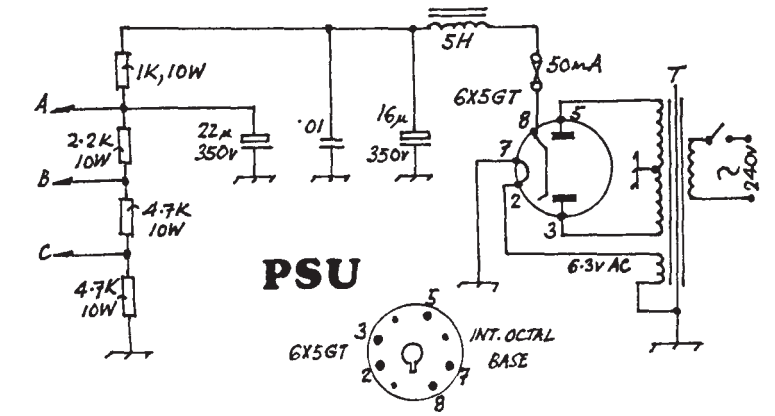
The orginal output valve was a 6V6GT which would have made a good TX valve, but I chose to replace it by an 8Ø7 because I had one available and the 8Ø7 has a top cap anode enabling one to put all anode circuit components above the chassis and all grid circuit components below it : hence no instability. Also the 8Ø7 is a fine thing to look at, whilst the 6V6gt is small, dumpy and dull. The ordinary Golledge QRP club crystals work well in this circuit and do not heat up. The 8Ø7 incidentally is rated at 75Ø volts on the anode and 5Ø watts output, and it ill survive even more, so in this circuit it does not even notice t is doing any work. To avoid parasitics a ferrite bead was threaded onto the lead to the screen as close as possible to the valveholder tag; and close to the anode top cap is a parasitic choke of 5 turns wire would outside and in parallel with an 8Ø ohm resistor. The 'Tune' capacitor is of maximum 15Ø pF from the junkbox : had high voltages been used one would need widely spaced capacitor plates but using only 15Ø volts this is less important. The 'load' capacitor is the tuning capacitor from the RX.

This circuit seems pretty safe: the HT is fused, there is an rf choke across the aerial lest the coupling capacitor of 1,ØØØ pF to the pi tank should ever go short circuit, there is cathode bias from the 24Ø ohms resistor, the HT is low and the components are conservatively rated (eg all the Ø.Ø1 and the 1,ØØØ pF capacitors are 1,ØØØ volt HT types). Two safety weaknesses remain: first, cathode keying is used (though I do use a well shielded and insulated keying lead, and the key is connected so that all the exposed brasswork thereof is earthed) and second, the chassis is operated unshielded and uncased with the chassis resting on the table, so it would be possible inadvertently to touch HT live point.

With the TX getting its HT from point A of the PSU, the 8Ø7's anode gets 15Ø volts and the meter reads 2Ø mA. This is 3 watts input, and an output meter records one watt rf output. The TX is free of key clicks, chirp, drift, parasitics, TVI and other vices. After the output has been through the atu on its way to the dipole the harmonics are all down 5Ø dB or better. On the first day of use I worked club members Reg (614) and Paul (2451) on 4Ø and 8Ø metres respectively and the reports were 459 and 569.

I feel rather pleased with myself over the vandal's TX because my level of technical knowledge is just that of the RAE (from the days when the syllabus gave due and proper attentionto valves) plus erratic reading of the RSGB Handbook, yet I know the purpose of each component, I can confidently service and modify the TX and it should last forever. Having read wartime stories of POWs and civilians in accupied Europe who managed to construct a TX by rebuilding a broadcast Rx, it is gratifying to know one can do the same. In case any others wish to try something similar, Maplin (Ø7Ø2-552911) sell ceramic capacitors at up to 1,ØØØ volts DC rating and electrolytics at up to 45Ø volts DC. For axial rf chokes Cirkit (Ø7Ø5-669Ø21) have a better range at up to 4.7 mH. These seem to be the only valve-related components which might be awkward to find : resistors, fuses and so on are available from all the suppliers, though they should be in any well stocked junkbox.
Long may your valves glow!

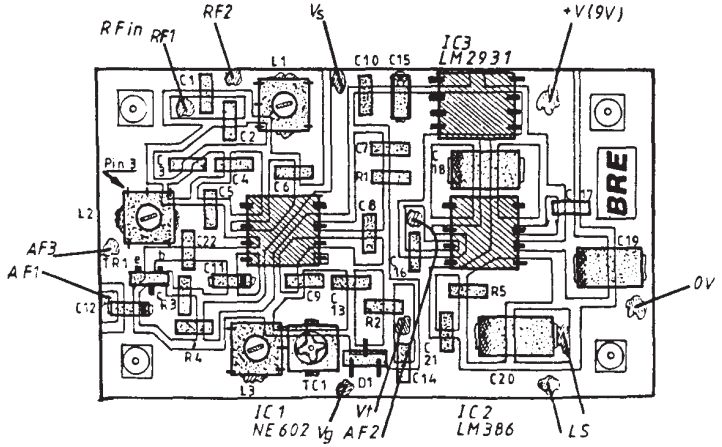


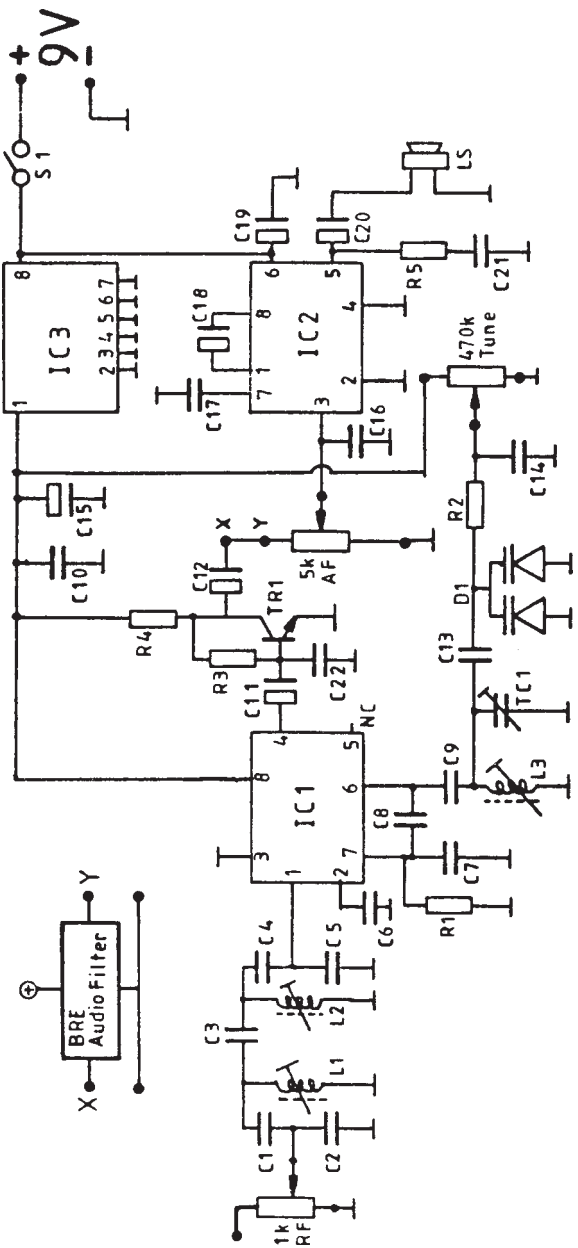


THE SUDDEN RECEIVER GOES SMD
The 4Ø Metre (or 8Ømm) Super Sudden

This receiver is based upon the Sudden (SPRAT 58) using the NE6Ø2 mixer/oscillator + LM386 Audio amp. Additional AF Gain is provided by a single low noise transistor. Enhanced oscillator stability and battery life is achieved by using the LM2931 Regulator IC. This has a very low drop out voltage enabling the battery to be used down to about 5.5v. The VFO has been converted to varicap tuning. The 4Øm version is the basic model and will cover the 7MHz band with a tuning voltage of about 1 - 5v. Information is provided for 8Øm.
The COG dielectric chip caps have zero temperature coefficient and are therefore ideal for oscillator use. the TOKO miniature 5CD coils are likewise very temperature stable. A doubled sided PCB helps prevent hand capacitance and similar effects. The weak link in the chain, as always, is the varicap used for voltage tuning but in practice the stability is probaly good enough for basic transceive working.
However for transceive operation the oscillator part of the NE6Ø2 can be disabled by removing C8 & C9 and injecting the TX VFO into pin 6.
The mixer gives some 15dB of gain. This is followed by a low noise AF amp (1ØdB) which is particularly useful if the BRE audio filter is to be added. the LM386 is connected in the high gain mode and provides a voltage again of some 46db. All this results in a receiver which is sensitive enough for work on the LF bands and provides about 1 watt of audio into 8 ohms.
DC receivers on the LF bands, particularly 4Øm are prone to breakthrough. The use of a 1K carbon pot RF attenuator is therfore VITAL with this receiver. The amount of breakthough depends upon location and propagation conditions. Positive steps can be taken to eliminate breakthrough as follows:
1. Loosely couple the receiver to the antenna
2. Use a high Q ATU in front of the receiver
3. Use a high Q parallel tuned circuit with link coupling to receiver
4. Use a series tuned trap at RX input to null out offending stations

THE B.R.E. KIT VERSION
This kit comprises: the PCB and all the mountable components. In order to achieve a reasonable price, RF Gain, AF Gain and Tune pots, On/Off switch, plug sockets and case are not provided. Enhanaced performance can be achieved by using a good loudspeaker and audio filter. A fine tuning bandspread pot may also be added. Further miniaturization may be achieved by using the P16 Knob Pots and low profile speaker.(see BRE Catalogue)
The SMD Sudden Kit (if 8Øm version is required please request) is available from :
BLUE ROSE ELECTRONICS, 538 LIVERPOOL ROAD, GREAT SANKEY, WARRINGTON. WA5 3LU TEL Ø925 - 72 - 7848.




+
9V
-
S1
IC3
IC2
IC1
NC
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
R1
R2
R3
R4
R5
L1
L2
L3
L5
TC1
TR1
D1
1k
RF
5k
AF
470k
Tune
X
Y
BRE
Audio Filter

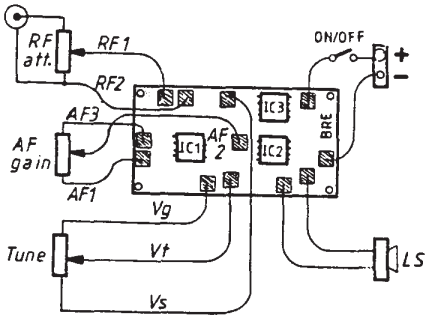
80m OPERATION:

The following components must be changed for 80m operation;

C1, C2, L1, L2, C4, C5, L3, C7, C8, C9, C13

All these components have identical appearance to the 40m values and the setting up procedure is the same. The comparison table is as follows;

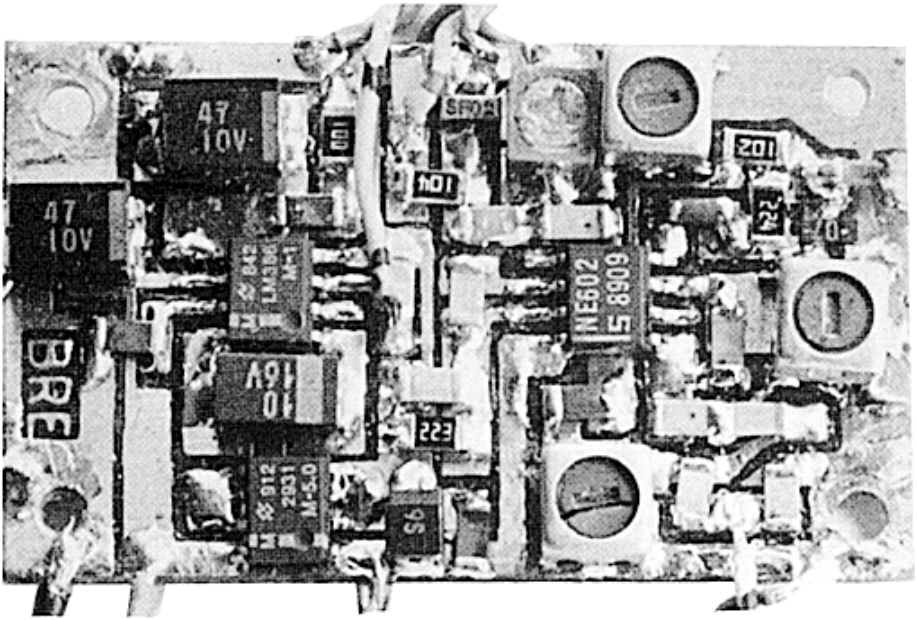
	40m	80m
C1	220pF	120pF
C2	330pF	220pF
L1	3.3uH	22uH
L2	3.3uH	22uH
C4	470pF	220pF
C5	180pF	120pF
L3	3.3uH	22uH
C7	330pF	180pF
C8	330pF	180pF
C9	150pF	68pF
C13	47pF	100pF

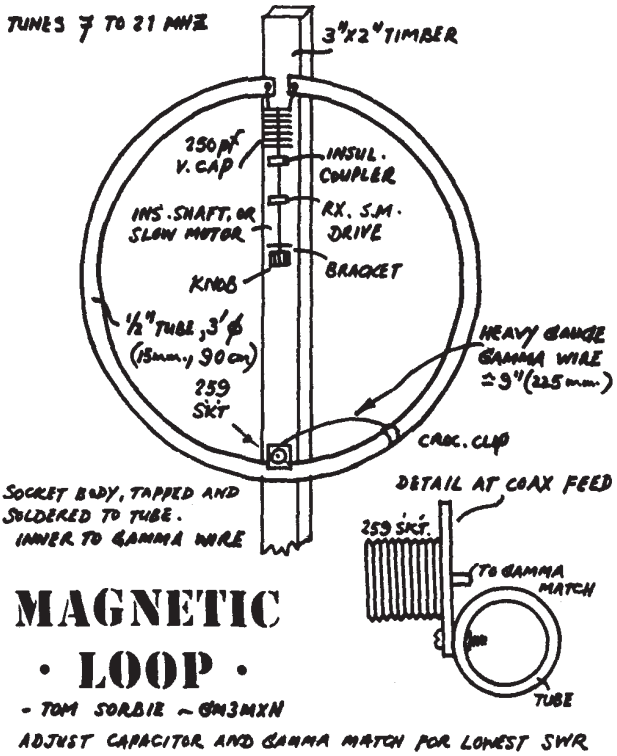


COMPONENT CHECK LIST:

C1.....220pF 1206 Chip cap.
C2,C7,C8.....330pF 1206 Chip cap.
C3.....10pF 1206 Chip cap.
C4.....470pF 1206 Chip cap.
C5.....180pF 1206 Chip cap.
C6,C14,C22...22nF 1206 Chip cap.
C9.....150pF 1206 Chip cap.
C10,C17,C21..100nF 1206 Chip cap.
C11,C12.....1uF Tantalum cap.
C13.....47pF Chip cap.
C15.....4.7uF Tantalum cap.
C16.....1nF Chip cap.
C18.....10uF Tantalum cap. 16V
C19,C20.....47uF Tantalum cap. 10V
TC1.....6.5 to 30pF Trim cap.
R1.....22k 1206 Chip resistor.
R2.....100k 1206 Chip resistor.
R3.....1M 1206 Chip resistor.
R4.....150R 1206 Chip resistor.
R5.....10R 1206 Chip resistor.
Tr1.....BCF32 Transistor. SOT23.
L1,L2,L3.....3.3uH TOKO 5CD Coil.
D1.....BB804 Dual varicap diode.
IC1.....NE602 Mixer/oscillator IC.
IC2.....LM386 Audio Amp IC.
IC3.....LM2931 5V Regulator IC.
PCB.....Double sided, roller tinned.

CONNECTIONS OF EXTERNAL COMPONENTS TO PCB





7 - 21MHz MAGNETIC LOOP ANTENNA TOM SORBIE GM3MXN

This magnetic loop has gained the interest of several members. I made one some time ago which was improved by Tom, GM3HBT, with a most informative article in HRT but some members may not have access to this magazine. The inner of the coax goes to the Gamma Match and when the compromise point is found, remove the slip and solder match line to the tube. I made a timber base and the whole thing sits at ground level and has been used indoors. Radiation is doughnut shaped - null when broadside.

PLEASE MAKE A NOTE IN YOUR DIARY
MARCH 25TH 1990 10:00HRS TO 16:00HRS
THE SOUTH EASTERN QRP CONVENTION
DOVER (YMCA) RADIO CLUB
LEYBOURNE ROAD DOVER
Talk-in on KS (145.625) and S22
Bring and Buy. Table available for members to sell
Components, kits and lots more available
NOT A RALLY - Come and chat and listen to talks by club officers
Entry ONLY 50p - Tables £5.00 each
For more information write to:
R.A. PASCOE, 3 LIMES ROAD, FOLKESTONE. CT19 4AU

ANOTHER RIT CIRCUIT G3ZOM

Having constructed a 40m qrp cw transceiver from JANDEK kits, I came across the old problem of how to arrange for RIT (IRT?). The description which follows should prove useful to those of you who find yourselves in a similar situation.

For the rig in question I used varicap tuning via an ex-MOD type 10:1 slow-motion drive. The basic arrangement, taken from the JANDEK instruction sheets, is shown in fig 1. The resistors on each end of the main tuning pot are arrived at by trial and error.

Fine tuning on receive can be easily obtained with the simple modification of fig 2. The resistor values are merely suggested starting points for experimentation.

With this arrangement the fine tuning pot also alters the tx frequency, so to provide RIT it needs to be replaced with a fixed resistor on transmit (see fig 3). If R is made equal to half of the maximum value of the fine tuning pot, then the mid-position of the latter will correspond to the transmit frequency (R could be a preset pot). Hence, the receiver can be tuned above and below the transmit frequency.

Switch S is part of the T/R switching and could be changeover relay contacts. Alternatively, it could be constructed from solid state switches, such as the CMOS 4066B, shown in fig 4.

With point T either open or at OV, switches Sa and Sb are open and Sc closed. On transmit, T is connected to +12V so Sa and Sb close while Sc opens. This is the final arrangement used in my rig and whilst this circuit was developed for a specific transceiver set-up, it could of course be used in many similar situations. A kit is available, consisting of a pcb, 4066B, IC socket, 47k resistors, 100n capacitor and terminal pins, as product code JD014 RIT MODULE, price £1-95 (plus £1-00 p&p), from:
JANDEK, 6 Fellows Avenue, Kingswinford, West Midlands, DY6 9ET.

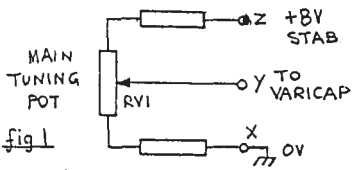


fig 1

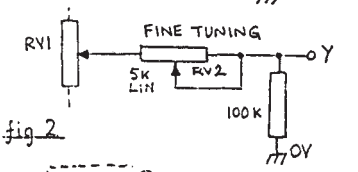


fig 2

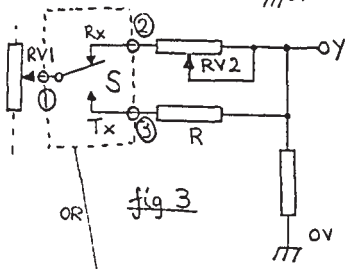


fig 3

OR

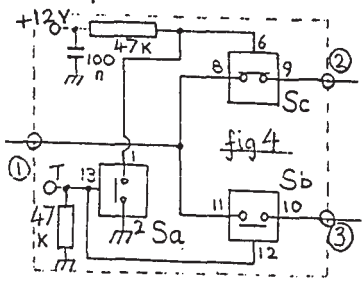
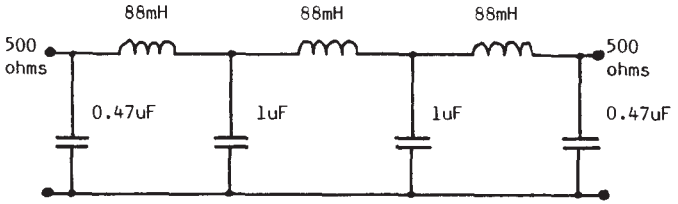
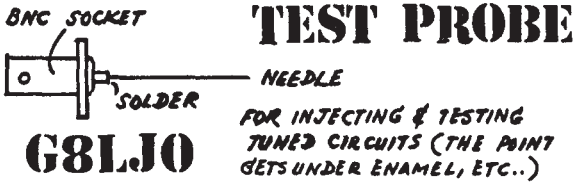


fig 4

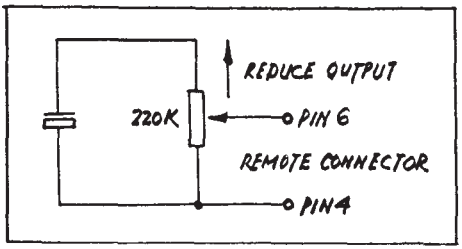


1KHz LOW PASS FILTER FOR RECEIVERS HO-JO BRANDT DJ1ZB

This circuit uses easily available component values. The pass-band is very smooth up to 1KHz. The attenuation then rises smoothly, being 20dB at 1200kHz and 40dB at 1500Hz. The filter is suitable for use immediately after the mixer in a dc cw receiver to define the "broad" selectivity of the receiver, more selective filters such as those already described in SPRAT being used between the receiver output and the phones when sharp selectivity is required.



QRP MODIFICATION FOR TS520S G4MYB



The Trio TS520S is well suited to QRP work as in the standard form the power can be reduced to below one watt. A simple addition will allow true milliwatt powers. The mod is simply a 9 volt battery and a 220K pot in a die cast box, although a screened case is not essential.

The TS520S has an ALC input on the rear panel with a threshold of around -6v. Any negative voltage greater than this reduces the gain of the transmit strip and thus reduces the output.

The voltage is applied through the REMOTE connector, with negative to pin 6 and positive to ground, pin 4. Virtually no current is drawn so the drain on the battery is limited to the standing current passing through the pot. My example measured 34 micramps. This ALC arrangement is virtually standard through the Trio range so the technique may be of wider interest.

IMPORTANT MESSAGE TO ALL MEMBERS

G-QRP CLUB QSL BUREAU

Due to the amount of work involved the QSL bureau system has had to be changed. The work of the dispatch team was becoming impossible and this was causing delay to your receipt of SPRAT.

STATIONS OUTSIDE THE UK WILL CONTINUE TO RECIEVE QSL CARDS VIA SPRAT AS BEFORE
UK STATIONS (INC EIRE) WILL NOW RECEIVE CARDS DIRECT FROM THE BUREAU

For UK stations the system will now be as follows:-

Cards will be dispatched in envelopes. The first envelope will be paid for by the club. After you receive your first envelope of cards, if you wish to receive further cards send an address label (self adhesive if possible) and stamp to the bureau.

The Club will continue to provide standard size envelopes. Cards larger than 6" x 4 " (155mm x 100mm) may have to be folded. Cards will be dispatched when the full postal limit is reached unless you specify otherwise (e.g. Wait 6). Members in receipt of a small number of cards will receive their first envelope about 6 months after the start of the new system.

ALL CARDS FOR THE BUREAU SHOULD BE SENT TO:
Dave Aizlewood, G4WZV,
36 King Street,
Winterton,
SCUNTHORPE,
South Humberside. DN15 9TP

Please help to speed up the service by following the following dispatch proceedure:-

1. Put the receiving station's membership number on the TOP RIGHT HAND CORNER of the card.
2. Sort cards in ASCENDING NUMBER ORDER.
3. Do not include cards with no number or cards for non-members.

Cards which cannot be handled will be returned to sender.
Unclaimed cards will have to be destroyed after 6 months.

North American members can send cards to:
David Gauding, NFØR,
830 Coalport Drive,
St. Louis,
Mo. 63141

David will send these to the UK bureau for distribution.

I hope that the new system will be at least as efficient as the old one. I look forward to receiving cards from you soon and would welcome your comments once we get this system going.

73 and hope to see you in the Winter Sports, Dave, G4WZV.

PROJECT FREQUENCY BAND - A CONDENSED REPORT G8PG

Early in 1989 our member Ed, W3NQN, who is Honourary LC Filter Technical Advisor to ARRL, approached the Club with a request for assistance in evaluating outboard LC af filters suitable for use with direct conversion and other receivers. In response the Club set up a small project team consisting of G3XJS, GWODYT, and G8PG, and Ed very kindly shipped over the majority of the components required to construct the filters, which were the W3NQN 75Ø Hz design and the DJ1ZB 45Ø Hz design already published in SPRAT. The Project was given the name "Frequency Band", and it was completed by mid-October 1989, including the writing of a fairly lengthy Report which has been circulated on both sides of the Atlantic. Some of the most important ideas contained in the Report will now be summarised.

1 45ØHz filters are in general more useful for cw reception than 75Ø Hz filters, although having both available gives additional flexibility.
2 45Ø Hz filters also seem better from a noise point of view. The unanswered question is whether this is a function of the filter, of the improved discrimination of the ear at this frequency or of a combination of both factors.
3 A low gain af amplifier fitted at the output of an LC filter is an effective way of making good the passband loss. It will often make the task of the filter designed easier by allowing him to concentrate on suitable bandwidth and skirt performance without at the same time having to consider losses.
4 LC filters have a better noise performance than active filters, and produce an output which is more pleasant to read.
5 Permanently connected agc circuits can degrade af filter performance owing to strong signals outside the af filter passband capturing the agc circuit. Ideally dc receivers should have fully variable input attenuator and af gain controls, and superhet receivers fully variable input attenuator, if, and af gain controls for most effective cw reception. With practice this allows the controls to be adjusted for maximum performance on a given signal. No agc should be used.
6 RIT circuits must be carefully calibrated to ensure that when the received signal is in the passband of the af filter(s) the transmitted frequency will correctly zeroed on the incoming signal. (VFO stability must also be of the highest order when af filters are used, otherwise the signal will be lost.)
7 If more than one af filter is used the sidetone must be switchable to the centre frequency of the filter in use, or alternately routed to the ouput side of the filter.
8 Current morse training practise and testing for amateurs is largely based on old fashioned practise using oscillators in the 8ØØ to 1ØØU Hz range. For the training to have maximum effectiveness half the training should be at the present frequencies, and half at 4ØØ - 5ØØ Hz. Unless this is done students become conditioned to the higher frequency and have to retrain themselves to use the more effective lower frequencies. Knowledge that morse examiners may use either frequency would help in this respect.
As can be seen from the above, the project has raised many useful points which may help to improve QRP CW reception. The Club would wish to thank Ed for his design and the supply of components, Ha-Jo for his design, and the members of the team for their efforts.

SPECIAL OFFER: RG178U/B COAX - Dia 1.8mm, VERY FLEXIBLE: 96pF per m: Attn. per 1Øm 1.8dB @ 1ØMHz, 4.4dB @ 1ØØMHz. Max volts 1kV RF RMS. First Class for interboard wiring.Normally 9Øp a metre. To club members, while stocks last, £1.ØØ for 5m length (5Øp postage) Cheques to "K.Ruiz" 43 Barncliffe Rd. Sheffield,S1Ø 4DG.

DO YOU USE RTTY ON HF QRP? Please contact DL2HAJ with short letter stating QRV and interests: Juergen Wenck, P.O. Box 12Ø8, D-2Ø58 Lauenburg, Fed. Rep. of Germany.

LCK UPDATE AND MODIFICATIONS IAN KEYSER G3ROO

Sorry to report that in the rush to get the LCK into SPRAT 60 several layout drawing problems appeared - as follows:
10nf capacitor to the left of X1 should be 18 ohm resistor
Two unused holes below this 18 ohm resistor should be populated by a 10nF.
C7 is not used in this application, it is a fixed value in parallel with the tuning capacitor - if required
0.1uF capacitor to the right and touching T4 should not exist.
1K8 resistor above and between the NE602 and the LM386 ICs should be 18 ohm.
Above the NE602, alongside T4, two spare holes between the 18 ohm (1K8 in error) resistor and the two 68pF capacitors should be populated by a 0.1uF capacitor.
L/S should be connected between ground and the spare hole above the right hand 100uF electrolytic capacitor.

MODIFICATIONS REPORTED BY BUILDERS
TO REDUCE HEAT IN THE PA:
Pre-driver transistor (coupled to T3 via 10nF and 470 ohm resistor) increase collector load from 1K to 2K2.
FOR 14MHz USE:
Using 9MHz crystals in the filter and oscillator crystals with :
C8: 18p, C9: 60p, C10: 100p, C11: 60p, C12: 18p, R1: 1K
5 - 5.5MHz VFO, KANK3334 (caps 3 * 560p)
Bandpass Filter Changes: coils to KANK3335, C1,C3: 100p, C2: 3p
Low Pass Filter: 200p/ 400p/ 200p, L- 0.49uH (11t on T37-2)
Output about 500mW
MODIFICATION 2
Similar lines to above but change VN46 to 2N3866
Cut track between junction of emitter of driver transistor and the base 2N3866, span cut with 0.1 capacitor, wire 47 ohm resistor from base 2N3866 to ground. Output about 750mW.

==========

SWOP: Trade unmodified HW8 for 123 set, also want 128 set and a MKIII set. Also wanted any Short Wave Magazines before June 1985. Glad to pay surface postage. Mike Michaels. POB 593 - Church Lane, Halifax, PA 17032-0593. USA.

WANTED: HW8 (price about £80 plus postage) Paul-Pierre Bel, 14 ave de Rodez, 81400 CARMAUX. FRANCE.

FOR SALE: Howes CTX/DCRX/VFO 40m Transceiver. VFO is boxed separately with digital readout. CW output 1.75 watts. Auto tx/rx changeover (crude but functional). £60. Greg Mossop, G0DUB, 9 Rakeway, Saughall, Chester CH1 6AZ. TEL: (0244) 880343.

WANTED: HW8 or HW7 by GU4YBW. Home Tel: (0481) 49144.

FOR SALE: Howes 20m RX, TX, VFO in box with built in SWR, ATU. Working unit. £50. TEL: 061-301-3750

FOR SALE: CW filter for FT101Z, FT901, FT107, FT707. 250KHz XF8.9HCN. £30. G4GIY 0482 - 848958.

FOR SALE: Drake 2B receiver. Very good condition. Matching Q Multiplier and Speaker. £125. Martyn Lindars (0460) 76143.

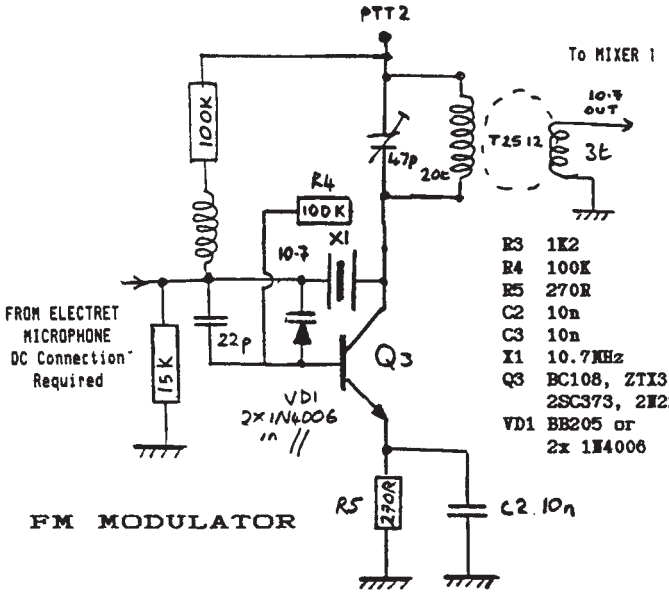
WANTED: ICOM 202S. TEL: Bolton 657410

FOR SALE: CENTURY 22 Transceiver. As New Condition with Keyer, Calibrator and DC cutout. £250. Tel: Tom on (0276) 24482.

VHF JOHN BEECH G8SEQ
123 Belgrave Road, Wyken, Coventry. CV2 5BH

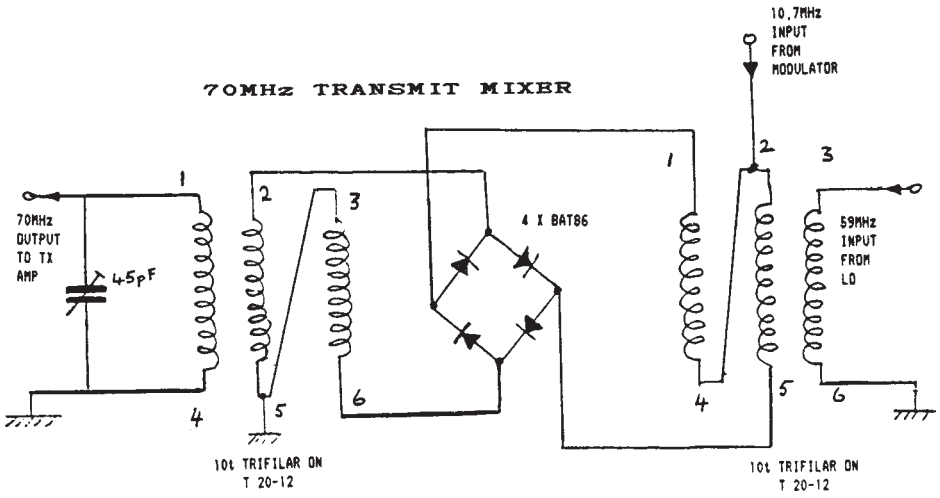
THE 70MHz SINGLE CHANNEL FM TRANSCEIVER

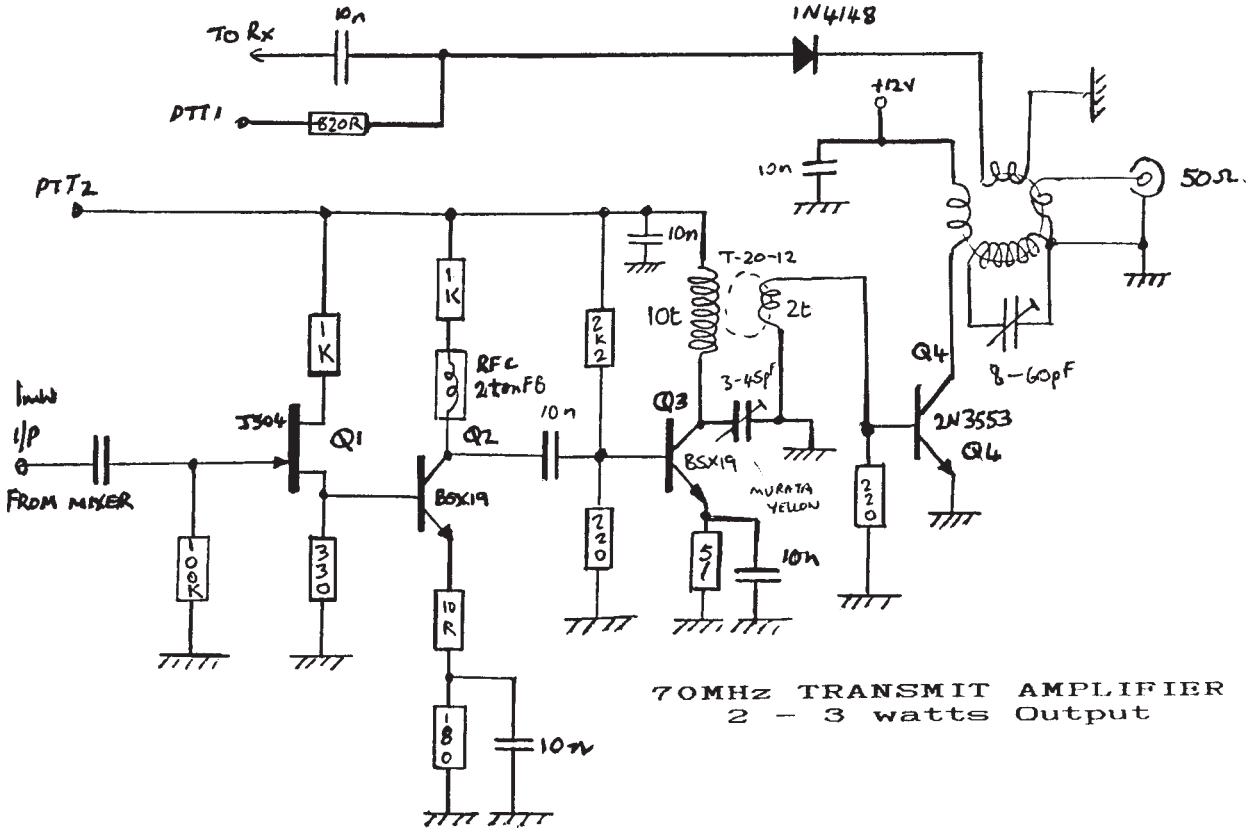
CONTINUED FROM SPRAT 60



FM MODULATOR

NB. Apply DC bias to diode to linearize Modulation
1v p to p must produce ± 2.5kHz deviation





70MHz TRANSMIT AMPLIFIER
2 - 3 watts Output

QRP COMMUNICATIONS FORUM G8PG
37 Pickerill Road, Greasby, Merseyside, L49 3ND6

MARCONI. CONSTRUCTION, COMMUNICATION, AND THE MISSING QSL!! Marconi is said to be the first great radio amateur. This is probably true. Although no scientist - he relied greatly on the theoretical work of others, Hertz and Lodge in particular - he had the ability to experiment, improvise, and go without sleep and food when immersed in a project. The eager young men he gathered around him were similarly inspired, some of them being capable of designing a radio station, and all of them being capable of installing, commissioning, and operating one. They had to be, for a rig sitting on the bench, however perfect, was of little use to Marconi. To prove its worth it had to be used for communication, ideally over ever-increasing distances. We can learn a lot from his approach. Firstly, that radio equipment is useless unless used for its primary purpose of communication. Secondly that it is only when used on the air that the potential (and shortcomings) of a given rig can be assessed. Thirdly, that no rig is better than its antenna ; Marconi often spent far more time on antenna work than he did in his laboratory. Fourthly, that a knowledge of propagation is essential for successful radio communication. Pure "Let us try it and see if it works" lead to successful over the horizon transmissions despite all current scientific opinion being that this was impossible. A complete lack of theoretical knowledge of how the ionesphere produced such over-the-horizon transmissions lead to near technical and commerial disaster in the early years of his trans-Atlantic radio service. Finally, despite his immense contribution to radio and his great prestige, there is a question mark against the honesty of Marconi. Careful research by a number of people has been unable to substantiate that anyone other than Marconi claimed to have heard signals from Poldhu on Signal Hill, Newfoundland, in December, 1901. One of his companions could not read morse, and the other was deaf. At this time Marconi was in desperate straits. He had expended a fortune of Company money on the trials, both his stations had had their antennas wrecked by storms, and the Newfoundland experiment was a last desperate attempt to salvage the project by receiving signals from a temporary antenna at Poldhu. A number of authors of considerable reputation feel that Marconi may have "faked the log" to retrieve the situation. The fact that it took a further six years of experimentation, and a lot of money to establish a reliable trans-Atlantic radio service adds weight to this viewpoint.

Now what has all this to do with our Club? I believe a great deal. Within our ranks we seem to have a number of people who regard building equipment as being somewhat superior to operating equipment, and who rarely communicate with their fellow members. There are others who regard contest operating or working for awards as beneath their dignity. This is a pity. You do not have to try to win a contest or even send in an entry, but contests are the proving ground for both equipment and antennas. The high level of band occupancy will show up every defect in receiver design and transmitter control, and the high speed of contacts and activity from so many areas provide an ideal means of finding out what an antenna can do. To do similar tests off the air would require thousands of pounds worth of laboratory equipment, and a fully equipped antenna range. Award hunting also requires the maximum efficiency from equipment, antenna, and operator, plus a good working knowledge of propagation. Had Marconi been able to contest test his equipment before the event he would have avoided a humiliating failure in the US Navy selectivity tests. Then there are, of course, many people who derive pleasure from sending and receiving QSL cards. Marconi would probably have been very happy to receive one in 1901! Proper verification would have removed the question mark which even today hangs over the reputation of this great man.

If there is any moral in the above it is this. The whole reason for amateur radio is communication, and a rig sitting idle on the shelf cannot communicate with anyone.
(Reference. "Marconi - DXer of Can Man?", A.D.TAYLOR, "MORSUM MAGNIFICAT" ISSUE NO. 4).

!!!!!!!!!!EAST TO WEST QRP WEEKEND, 199Ø : THE DATES!!!!!!!!!!
This event will take place from 16ØØ utc 28 September 199Ø until 2359 utc on 3Øthseptember, 199Ø. Using all hf QRP cw frequencies it will embrace all QRP operators in Europe and Asiatic Russia. Organisers are G QRP C and the Czech QRP Group. Very wide publicity is being organised. Full rules in next SPRAT. Book the dates now.

RSGB LP FD attracted more entrants this year. Out member G4JKS won the 8w section with G3VER second. 3W leaders were G4ARI and G4OGB. More than half the 3w stations had built their equipment.

A 7MHZ QRP CW DXCC using less than 5w dc output, and with all contacts confirmed is the magnificent avhievement of our member Bill, AJ1Q. We salute you OM!

SCOTAM 89 This took place in the sports complex at Glenrothes Technical College on 16th September, and was well attended. We had lots of stand space, and were visited by a large number of people, including 45 of our own members. Eight new members were enrolled, and sales were quite good. A new and interesting feature at this event was the number of trade stands displaying QRP kits. Obviously our work for QRP over the years is beginning to pay off. as far as could be seen we were, as usual, the only stand displaying genuine home constructed equipment ; it aroused much interest. Many thanks to Nor, GM3RKO for stand assistance and hospitality, George, GM3OXX for stand assistance, and Ty, KA9WRI for the bottle of red liquid. It was a good day.

SOME OF NEWLY LICENCED MEMBERS WILL NOW BE EXPERIENCING THEIR FIRST SUNSPOT MAXIMUM. This is an exciting experience provided that you know how to take advantage of it. Recent letters complaining about "lack of activity on 8Ø" or "bad conditons on 8Ø" show that not everybody has this knowledge. What happens at a sunspot maximum is that there is high ionisation of the ionesphere, producing maximum D-Region absorbtion at the lower frequencies during daylight (25% greater than at a sunspot minimum). But at the same time MUFs are about double those of a sunspot minimum, so the much greater losses on bands such as 8Ø are compensated for by excellent conditons for inter-G working on 4Ø, and excellent DX conditons on the higher bands.
This autumn 4Ø has consistently produced outstanding QRP signals for inter-G working, and the vicinity of 28Ø6Ø regular daylight two-way QRP contacts with W, VE, VS6, UA3 ETC (INDEED UA3s running 5w are regarded as local ragchew contacts). Acting on our advice a number of members have moved from 8Ø to 4Ø and say they are very satisfied with G and W European results. Those who have tried 28 have had some pleasant surprises also. Are you getting full benefit from the present excellent conditons?

AWARD NEWS. Congratulations to the following on their Awards.
QRP WAC. GØIFK, HB9XY.
QRP COUNTRIES. 1ØØ (ALL 7 MHZ CW) AJ1Q; 1ØØ GM4UYE; 75 GI4DQO; 5Ø G4CFS; 25 GØIFK, GØFIU.
WORKED G QRP CLUB. 3ØØ GM3RKO; 24Ø G4LQF; 2ØØ GØFYP; 18Ø GM4OSS, G4XVE, G4VPV; 14Ø GWØDNR, G3ZJJ, GØIFK;1ØØ G3DOP, G4UIQ, GØCQA; 8Ø GW3SB, GØBOP; 6Ø GØEVJ, G4WUS; 4Ø GØEYX; 2Ø G3BGR, GØJKQ, GØKCA, G4HKM, G4CZL.
TWO-WAY QRP 1Ø G3INZ, G3FCK, G4AWT, GM4XQJ, GWODYT, UB5LST, PA3ELM, G4MSN, G3DDP, G4UIQ.

SSB NEWS G3ROO
"ROSEMOUNT", CHURCH WHITFIELD, DOVER, KENT.

Those of you who did not make the Rochdale convention missed a superb day! Many thanks George, Jo-Anna and all the helpers for laying it on and we (The Kanga Gang) hope that it becomes a yearly event. We are, at the moment, trying to pursuade the Dover club committee to make our spring table fair into a QRP Convention for the south!!
Now for the thorny subject of QSL's, after the convention a very serious discussion was held on this subject. There are two sides to this problem, firstly the fact that any person doing any job in the club has always had the last word in how the job was done. We ALL agreed that this was the only way the club could continue to run so smoothly and successfully.
This concept being so important it was agreed that the majority of those in favour of awards without QSL's would bow to Gus's wishes that QSL's continue to be required for club awards. This can only be considered a vote of confidence in the admirable way in which Gus has carried out his duties as Award Manager.
At the meeting I did make the point that I do not insist that everyone tries QRP SSB. John does not insist everyone trie VHF so award chasers should not involve unwilling members of the clubn in their section of the hobby. Before more letters start flying on this subject attacking me may I point out, yet again, that I have always QSL'd club members via the bureau.

"THE TABLES"

Interesting to note that the "Tables" so far has caused a lot of favourable comment from members at the convention but still very few have sent in applications! You will notice that the tables have been split again to separate HF and VHF to enable the VHF lads to compete with themselves. VHF is classified "Above 30 MHz".
I have been asked to clarify a point regarding countries, of course these contacts can be one or two way QRP, the other chap can run a kilowatt!
"Members Worked" are two way QRP QSO's
Way in the lead is Chris, GN4LYN (2891). I am not totally clear from his letter but I think these are all CW QSO's. He runs 3 watts to a 15m dipole only ten feet high! For the LF bands he uses 73 ft long wire.
Gus, G8PG is second and again CW only entries but with an excellent members worked score.
James, G3PBA a new member this year comes in with a good score but adds in his letter that he has 22 countries 2 way QRP.... Not bad!
SSB score virtually nil, if it had not been for Peter, PE1MHO I would still have been top of the SSB!!!
By the way folks when Peter and Jenette left my place last week he was muttering about morse and getting on 80 metres, so keep a listen out for him.

MEMBERS WORKED. H.F.			
CALLSIGN	CW	SSB	SPRAT
G8PG	82	0	61
G3PBA	53	0	61
G3ROO	8	2	61
MEMBERS WORKED. VHF			
G0DJA	3	0	61
PE1MHO	0	11	61

COUNTRIES WORKED. H.F.			
CALLSIGN	CW	SSB	SPRAT
GM4LYN	120	0	61
G8PG	72	0	61
G3PBA	32	0	61
G3ROO	3	0	61
COUNTRIES WORKED. VHF			
G0DJA	1	0	61
PE1MHO	1	18	61

HINTS AND TIPS

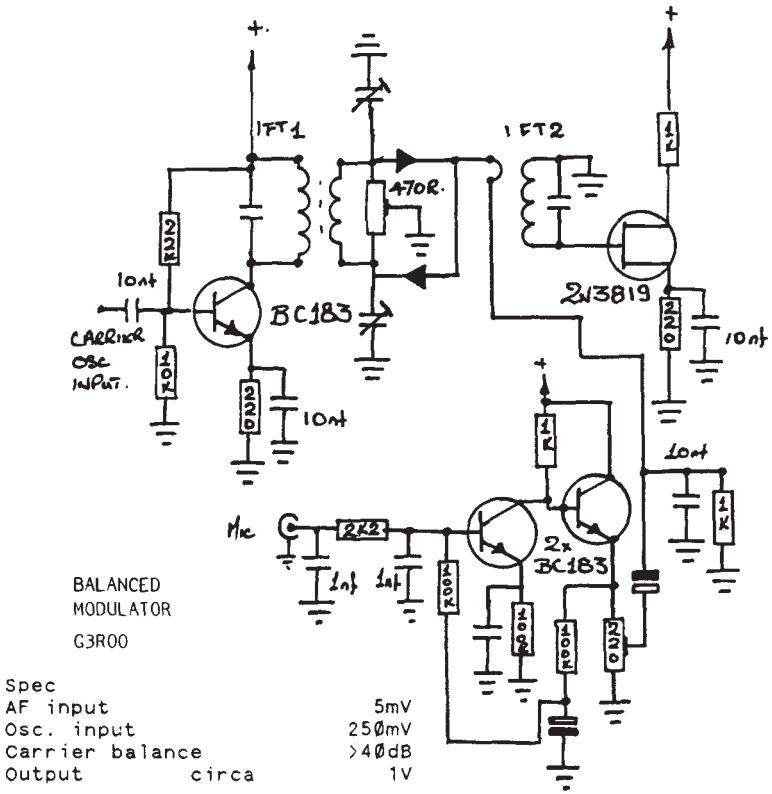
I am introducing another section into this column : useful SSB Circuits. So often constructors build very interesting features in their designs published in SPRAT. My intention is to extract these features and publish them as a building block, hopefully, in time, we will then develop a library of building blocks. If you have any ideas on these lines drop me a note and we will get them in print.

This edition I am inserting one of my own. So often for balanced modulators we pull an IC off the shelf and use it so forgetting older circuits. These older circuits can often be duplicated in their semiconductor versions with a great saving in cost.

The circuit I used in the CHERITON transmitter section and in the LYNX SSB generator is the diode ring. It is designed for use at 9 or 10.7 MHz. but by changing the IF transormers and resonating them at the required frequency it can be used anywhere.

The signal input from the carrier oscillator is fed to an amplifier (TR1) whose output is tuned by IFT1. The low output impedance from IFT1 drives the diode balanced modulator. Audio is applied balanced modulator via the low impedance winding of IFT2 and the resulting DSB signal is extracted by IFT2. This DSB signal is amplified in TR2 and the drain load is used as the terminating resistor for the filter.

The microphone signal is amplified in a two stage amplifier which will be recognised as a circuit used in many RF applications, values are changed for AF applications. This is a wide band amplifier and suitable input filtering must be included to remove RF problems.



Spec		
AF input		5mV
Osc. input		250mV
Carrier balance		>40dB
Output	circa	1V

MEMBER'S NEWS

Chris Page G4BUE

"Alamosa", The Paddocks, Upper Beeding, Steyning, West Sussex, BN44 3JW

The first column of 1990 starts with an apology for the last column of 1989! It was done on my new computer, (Tandon PCA-sl 40Mb) with a desk top publisher, (Timeworks) and my old dot matrix printer. I completely forgot it had to be reduced to A5, the size of SPRAT. *I'm hoping you will like this layout and* will agree it's a big improvement over what has gone before. The "experts" say that two columns makes for easier reading, but what do **you** say as you're the people that matter.

I came away from the Rochdale QRP Convention with a sore throat from talking too much and wondering why we hadn't done it before. G0IFD says a big "thankyou" to all who organised it. Tom says that two long standing antenna problems were solved in seconds and then the Kanga gang took time off to demonstrate how to solder properly. This has resulted in a Sudden up and running after many other projects had failed. Finally, Tom says he negotiated a 30% discount at the Midway Hotel and they have promised a similar discount to members in 1990. Members interested should drop Tom a line. Everyone else I spoke to thoroughly enjoyed themselves, so if you missed it make sure you go next year. It was also nice to meet many of you at the RSGB HF Convention at Oxford.

G3OEP had to reluctantly cancel his QRP Beside the Seaside in October, due to being unwell. We hope you are now better Dave and appreciate what you have done in previous years. If anyone in the area would like to take over the organising for next year, perhaps they can get in touch with Dave. Those of you QRV on 6 metres have obviously been enjoying the good conditions recently. WB2CZB heard AA2U working EA8/G3JVL and then called the EA8 whilst running one watt, receiving a 579 report. Mario asks members not to forget the band as the F2 propagation rises. New countries worked by G3XJS recently include HL5BDS (S. Shetland) and KN0E/KH3. Peter asks if members in rarer countries can tell us when they're active so we can try two-way QRP contacts with them. G0EBQ is using milliwatt levels to 35mW to work Europe. Nigel quotes G0KYR: "Isn't QRP wonderful. To talk to the USA using gear that cost in total less than half of my recently acquired Kent key , that's amateur radio".

I plan to be at the new London Show on 9/10th March, and hope to see some of you there. 1990 is the year I shall get back to Dayton, to renew friendships with the ARCI gang and get up to date with what's happening in the USA. Finally, I hope to attend the Yeovil QRP Convention on 13th May at the *Preston Centre, Monks Dale, Yeovil starting at* 10am. Lectures include daytime milliwatting on 80 metres by G3MYM, home construction by G3PCJ, coherent cw by G3RHI and "QRP, a Way of Life" by GM3OXX. All the usual attractions, traders and a Club stand. Further info from G1MNM or G3CQR, both QTHR.

Unfortunately I will have to miss The QRP Fun Run the week-end before the Yeovil Convention as it coincides with the new style North American FOC Dinner in Virginia. The Fun Run will be from 0800z 5th May to 2000z 7th May around 3560 and 7030. Only QRP stations (5 watts output) take part and each station can be contacted on each band. Scoring is rather complicated with 5 points initially for each QSO, and then extra points for each QSO once you work the Fun Run stations of GB2LOW, G3GC and G3CQR. (e.g. 5 points per QSO until you work one of the Fun Run stations, then 10 points per QSO until you work another, then 15 points per QSO until you work the third Fun Run station and then 20 points per QSO). Bonus points of 20 for QSOs with G3CQR and G3GC and 50 bonus points for GB2LOW. Logs to be brought to the *Convention by 1300 local time on* Sunday 13th May or posted to G3CQR by 24th May.

G0EBQ has got his Imp going on 7-21MHz, including 18MHz, but it wouldn't tune on 24MHz. Nigel is therefore willing to swap his redundant 24910 crystal. He would also like to hear from other members who have built the Imp, and can be reached on 0473.270335. G3XJS has started building the G3TSO transceiver and thanks G4VPM who kindly rang Peter with an offer of bits for it. Talking of Andy, he hopes to be QRV as GU4VPM over Christmas and the New Year with his Argonaut. Look for him in the Winter Sports, and don't forget the 0700-0800z period on 3560 for two-way QRP trans-atlantic QSOs.

New member, FE6EEQ uses a TS430 at 1 and 7 watts. Gerard is intending to build a rig from Sprat. Another new member is KA9VAX from Wisconsin, who is also a member of ARCI. Gary currently uses an Argosy and HW9 and has built a 14MHz Two-fer, but says it needs debugging! Another new member, G3RYZ from Plymouth, uses a home brew 5 watt rig on 14MHz with which he has worked the USA. Mick is also active on RTTY with QRP. G0FIU has tvi problems so got his boss's permission to work /P from his work QTH. Roger uses a home brew rig with 2w SSB on 28MHz and has worked JA, UA0 and YC, much to the amazement of his work mates. G4EHU is using the loop antenna, similar to the Capco, from the February RadCom for 80/40/30 metres in his roof space. Bill has worked ZL2APW and KL7RA, both on SSB, so it's obviously working well.

Congratulations to John Bisson, who is now licensed as G0MHF. He will be on 80 metres with a Howes and a long wire soon. Congratulations also to G0MBD on his A licence. John uses a TS120S at 4-5 watts and is building a Howes kit for 7MHz. I3MDU says how amazing QRP and propagation can be. Mike switched on to 10 metres during the Saturday afternoon of the CQ SSB Contest and heard all the QRM from the USA stations pinning his S meter full scale. With 5 watts he decided to see what impression he could make amongst the contest QRM and within four hours had made 46 QSOs in 15 zones and 28 countries in five continents.

SM6BSM is the QRP Manager for The Scandinavian CW Activity Group, (SCAG), and reports on the Group's QRP Cup, which is offered for the most DXCC countries worked every six months with 5 watts or less. Rune says the top three places in the first period of 1989, (January to June) made 118, 109 and 109 countries. if you hear any QRP stations from Scandinavia you could be helping them win the QRP Cup if you give them a QSO.

The Union of Belgian Amateurs (UBA) are holding their annual cw contest on 27-28th January 1990 and this year have a Class D for QRP (10 watts input!). QSOs with all amateurs, not just ON's, count on all the usual bands, and exchange is RST and serial number. ON QSOs count 10 points, other EEC QSOs 3 points and remainder 1 point. Multipliers are Belgian provinces and EEC countries on each band, and total score is QSO points multiplied by multiplier total. Logs within 30 days to ON6JG, Oude Gendarmeriestraat 62, B-3100 Heist Op Den Berg, Belguim.

DJ1ZB and his wife celebrated their 25th wedding anniversary in 1989 by visiting Tahiti. Ha-Jo took two home brew transceivers for 14 and 21MHz with him, and with a dipole fed with open wire feeders went on the air as F0/DJ1ZB/P using 2 watts. He worked all the main countries around the Pacific and on several evenings worked into Europe on 21MHz. Some of the QRP stations worked by Ha-Jo included NH6LT (4w), KH6JOI (HW9), JA1IXI (2w), K6LNY (HW8) and AA6KS (5w). DF2OF has also been travelling. Mat went to VE3 in September and made QSOs into the USA with an Oxo and Uniceiver on 14MHz.

Ken Heeley (5157) would like to propose an award based on QRP QSOs with different parts of the British Isles to encourage /P QRP operation from some of the more remote areas. He suggests locations could be based on O.S. squares, islands or similar and wonders what interest there is for such an award. I should mention the Islands on the Air Award, (IOTA), which is promoted by G3KMA through the RSGB DX News Sheet. Although IOTA covers islands world-wide, if there is sufficient interest in Ken's idea, perhaps Roger could be persuaded to have some sort of QRP class covering the British Isles.

That clears the files except to wish you all a very happy Christmas and the very best of QRP for 1990. Let me know how your winter goes, by 20th February please.

73, Chris

YEOVIL AMATEUR RADIO CLUB
SIXTH QRP CONVENTION
SUNDAY MAY 13TH 1990 FROM 0900 HRS
THE PRESTON CENTRE, MONKS DALE, YEOVIL
Lectures from 10.30am by GM3OXX, G3RHI, G3PCJ, G3MYM
All the usual Traders, Food and Drinks
Further details : Mr. D.J. Bailey G1MNM (QTHR) By post only

SPECIAL OFFER ON TANDY CATALOGUE ITEMS: To club members only, any items from the TANDY catalogue at cost price plus 10% - minimum order £25, plus P&P, subject to availability from Mike Bowthorpe, GØCVZ, LINK ELECTRONICS, 2 Chancery Lane, Eye, Peterborogh, PE6 7YF.

CORRECTIONS TO G QRP CLUB HANDBOOK:
Please add: GØKFO 3949 John, GØKQG 4062 Arthur, GØJXX 4105 Mike, GØCPV 4637 Steve, GØEUR 4846 Brian, OH5TF 1469 Penttic, G3HNP 4999 Tony (G3HNP was recorded as G3NHP) also 3187 should be G4PPG NOT G4PGG.

CLUB STAND AT ARRL NATIONAL CONVENTION DALLAS 1989
As reported in SPRAT, the trip was a success, although the team of two, G3RJV and G3ROO was perhaps a little small for the venture. The shortform account below also shows that the visit was a financial success, although some goods have yet to be sold.

Subscriptions:	£ 165	Subsidy to Officers:	£367
Sales:	£1116	Kanga Kits (Trade):	£979
Kit Stock:	£ 241	Goods Bought in USA:	£394
MLX Stock:	£ 300		
Filter Stock:	£ 450		
INCOME	£2272	EXPENDITURE:	£1740

Including stock held, there is an excess of £532 which more than covers the subsidy to the two officers.

==========

ONCE AGAIN AVAILABLE : 9MHz SSB CRYSTAL FILTERS AT £15.00 EACH
6 pole, 2.2kHz bandwidth at 6dB, Shape Factor (6-60dB) 1.8:1
In/Out Impedance 500 ohms, Insertion Loss less than 6dB
From Dave Aizlewood, G4WZV, 36 King Street, Winterton, Scunthorpe. DN15 9TP at £15 (£1 postage) Cheques "G QRP CLUB" Limited Stocks
Also a few Pairs of 8998.5 / 9001.5 Crystals at £3.00 the pair.

==========

FOR SALE: Enamelled Copper Wire, 50 mtrs, 16swg £5 plus P&P
Other lengths and swg available. 15 amp Variable Transformer, £15. plus P&P. Bill, G4WUS, (0287) 42596.

ROCHDALE QRP CONVENTION 1989

Thank you to all the members who attended and wrote letters of comment, there were really too many to reply to them all. Everyone appeared to enjoy the day and we have had some useful suggestions for future events. Based upon what we learned this time, we do hope to run the mini-convention again next year...with improvements.

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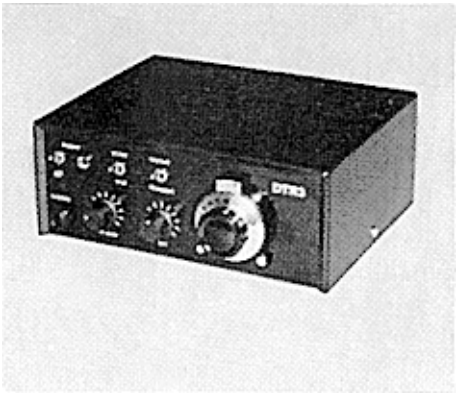
ERNIE GRAY G4TXH : We regret to announce the death of Ernie, G4TXH, member number 1591 at Crawley Hospital in September.

QRP KITS – QRP PRICES!



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