SPRAT

THE JOURNAL OF THE G-QRP CLUB
DEVOTED·TO·LOW·POWER·COMMUNICATION
ISSUE NR. 87 | © G-QRP CLUB | SUMMER 1996

YEOVIL QRP CONVENTION 1996

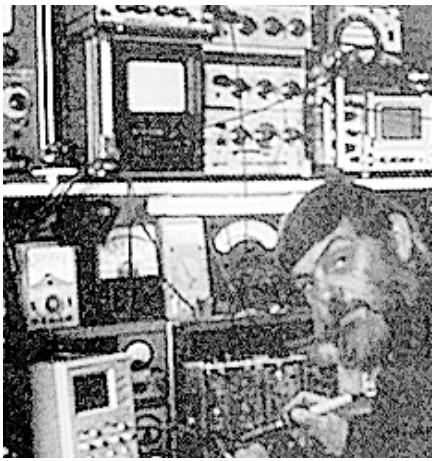
The busy scene at the successful Yeovil Convention
Some of the 32 Traders present at the event.

130MHz FREQUENCY COUNTER - VARICAP TUNING IRT - 455 SSB FILTER
SIGNAL TRACER - EP2 UPDATE - VALVE RESONANCE MONITOR - SMD JIG
SPECTRUM WAVEMETER - VU2ITI TRANSMITTER - MALTA 40 TIPS
TVI FILTER - MORE ON PL259 - NEW VLF BAND - QRP NEWS
ANTENNAS, ANECDOTES, AWARDS - COMMUNICATIONS & CONTESTS
SSB NEWS - VHF REPORT - NOVICE NEWS - MEMBERS NEWS

CLUB KIT OFFER : G4OPE FREQUENCY COUNTER

THIS IS OUR TWENTY FIRST YEAR

JOURNAL OF THE G QRP CLUB



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Rev. George Dobbs G3RJV

EDITORIAL :

THE GENEROSITY OF QRPers:

There is something about the nature of QRP operation which seems to make it attract people of a generous spirit. Which is quite odd since we appear to be based upon "radio meanness"! Two Stories :

1. My wife, Jo-Anna, GØOWH, works with a support group for a very poor village in El Salvador. They are concerned with primary health care and co-operative production. It is a fundamental help group, all moneys raised go directly to the local people. She visited the village last year and returns this winter to work in the village for a month. She pays her own fare and takes unpaid work leave to go.
Last year I sent a set of solar panels, which with a scrap battery and 12v. strip lamp gave the village its first street light (they have no mains services at all). Based upon this, I decided to gather some flexible, non break solar panels at Dayton for further lights. During the lunch at the (very successful) Four Days In May event, I asked for donations and we raised over $350 : enough to buy five 12v, 18w, flexible panels on the flea market. These are being held by a member at Houston until Jo-Anna passes through there on her way to El Salvador this winter. Our sincere thanks are due to the generous QRPers at Dayton. Incidentally - if anyone has a spare 12v caravan type fluorescent lamp, we would be pleased to have it.

2. For many years, usually unknown to members, we have sent free SPRATs, books and parts to many people in the Third World who want to be involved in amateur radio but lack the funds. This year in conjunction with NorCal, the G QRP Club is to ship 20 Ephipyte SSB Kits to Asia for young amateurs who cannot buy equipment. The generosity of NorCal has provided boards, parts and cases and we are to add the filters and some other parts. There will be a full report on this project in the next issue. Currently we plan to ship kits to India and Pakistan but suggestions from overseas members about deserving recipients are welcome.

72/3

G3RJV

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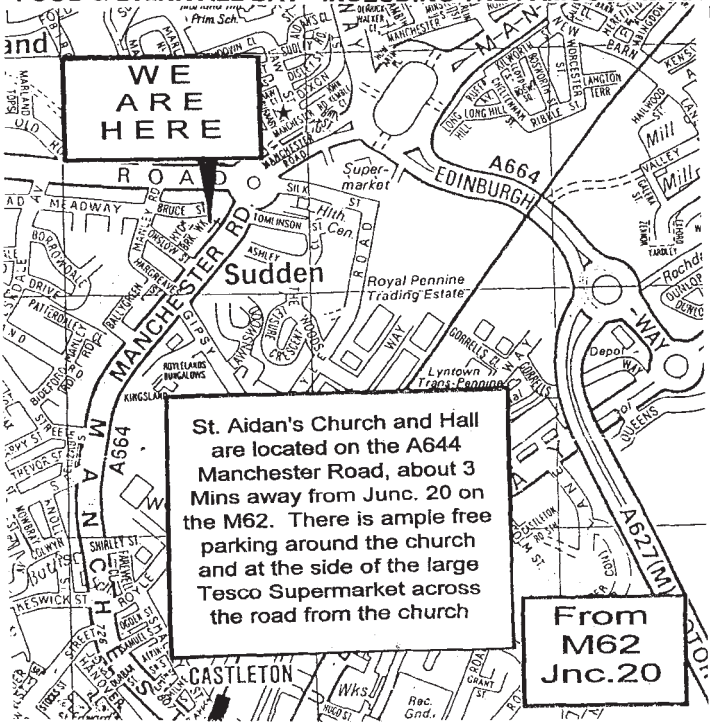
PRINTED BY SHOREHAM COPY, 3 JOHN STREET, SHOREHAM-BY-SEA. SUSSEX

THE G QRP CLUB
MINI-CONVENTION
SATURDAY 12th OCTOBER 1996
ST. AIDAN'S HALL SUDDEN ROCHDALE
ADMISSION £1 - DOORS OPEN 10am - TALKIN S22
LARGE SOCIAL AREA - LECTURES ON QRP SUBJECTS
BRING & BUY - SURPLUS - JUNK - COMPONENTS - KIT TRADERS
FOOD & DRINK ALL DAY - INCLUDING THE FAMOUS PIE AND PEAS



LOCAL ACCOMMODATION : ALL WITHIN 5 Mins OF THE SITE
Oakenrod House : 01706-42115 The Midway Hotel : 01706-32881
Norton Grange Hotel : 01706-30788 The Albany : 01706-369606

NEW CLUB LOGO ITEMS
G QRP CLUB T SHIRTS

The *Club Logo* printed on the breast with *Your Callsign* beneath on a high quality Hanes "Beefy T" shirt. Shirts in White or Ash grey, Logo in Black, Blue, Red or Green. £6.50 + 95p post (state colour & print Callsign) XL supplied as standard size - other sizes on application.

SPECIAL T SHIRTS WITH COLOUR PHOTOGRAPH

A really special shirt - a colour photograph of your shack, your self - or whatever you want - on a T Shirt with the Callsign and the Club Logo. Whole chest colour print - shirts as above. £7.50 + 95p postage. Please enclose photograph/picture required and your Callsign.

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A 130MHz FREQUENCY COUNTER

Direct Reading or Four IF Offsets - BFO Offset - High Sensitivity

Mick Hodges G4OPE, 40 Ennersdale Road. Coleshill. Birmingham B46 1EP
email : mick @g4ope.demon.co.uk

Processor	PIC16C55
Display	5 seven segment common cathode LED displays, multiplexed.
Refresh rate	Display refreshed almost continuously, including during gate periods. Each digit displayed for 150us, all 5 digits refreshed each 750uS.
Amplifier	MAR-8 monolithic high gain amplifier.
Input impedance	50 ohm
Prescaler	74F112 dual JK Flip Flop dividing by 4.
Sensitivity	<10mV 6Mhz - 50 Mhz <100mV 1Mhz - 130Mhz
Reference	4Mhz Crystal (Divided down to 1Mhz by processor)
Gate times	4ms 40ms 400ms
Resolution	1000hz 100hz 10hz Automatic gating to give best resolution unless IF offset selected. Gate time fixed at 4ms when IF offset selected.
IF offsets	Choice of 4 IF offsets, added or subtracted from count.
BFO offset	BFO offset of 2Khz can be added or subtracted from count.

Programming Offsets with 6 position DIL switch.

Switch	Function	Closed	Open
1	IF offset select	No	Yes
2	IF offset	Add	Subtract
3	BFO offset select	No	Yes
4	BFO offset	Add	Subtract

Switches 5 and 6 are used to select the IF offset.

Switch		IF offset
5	6	
Closed	Closed	455Khz
Closed	Open	4.433Mhz
Open	Closed	9Mhz
Open	Open	10.7Mhz

G QRP CLUB KIT AVAILABLE
See Later This Issue

Sensitivity figures for PIC16C55 Frequency Counter.

Measured using Rohde and Schwarz CMS 50 Test Set

Frequency / Mhz	Sensitivity / mV
0.4	200
0.5	170
0.6	150
0.7	120
0.8	100
0.9	80
1	70
2	30
5	13
10	6
15	6
20	6
25	6
30	6
35	6
40	6
45	6
50	6
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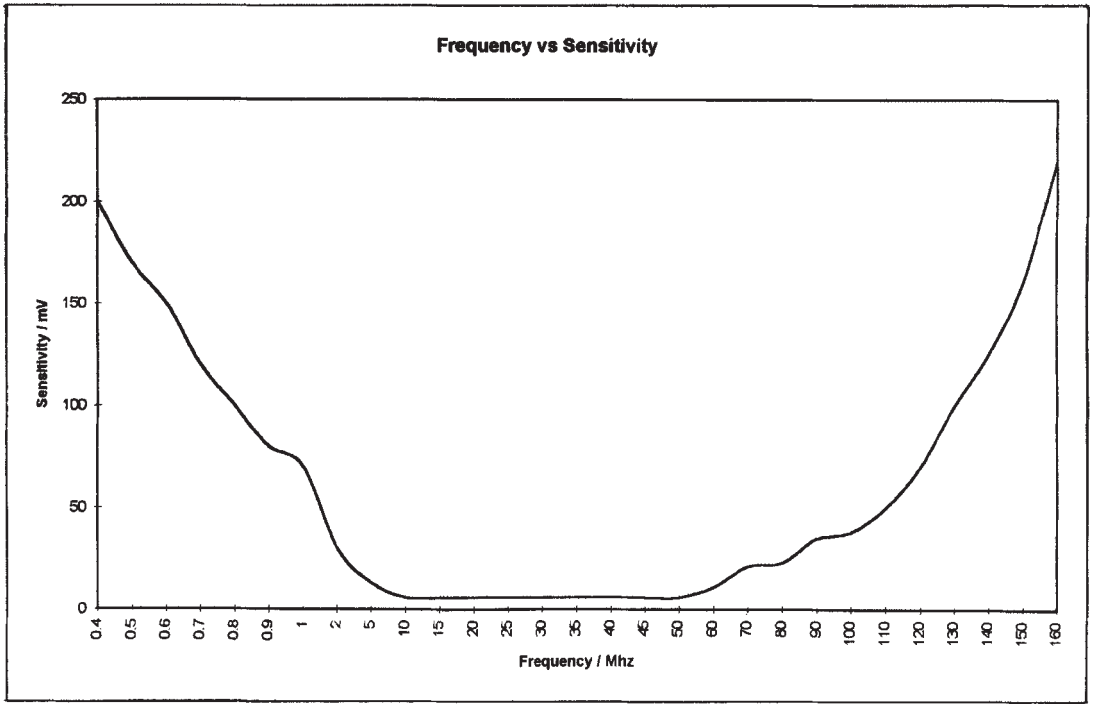
100	38
110	50
120	70
130	100
140	125
150	160
160	220



A 130MHz FREQUENCY COUNTER

Mick Hodges G4OPE, 40 Ennersdale Road. Coleshill. Birmingham B46 1EP
email : mick @g4ope.demon.co.uk

The frequency counter described was developed for use as an inexpensive digital readout for my ageing Ten-Tec Omni-A, as well as a general purpose counter for the shack. Specifications include a maximum count of 130Mhz, sensitivity of less than 10mV across the HF spectrum and a choice of four IF offsets.

Circuit description.

Amplification and wave shaping.

The applied signal is amplified by IC4, a high gain monolithic amplifier. Bias to IC4 is via R1, which must be chosen to suit the applied voltage. The formula required to calculate R1 is shown on the circuit diagram. Supply voltage to the rest of the circuit is 5V and is provided by a 78M05 regulator. R2 and R3 bias TR1, a high frequency switching transistor, and were chosen to provide fast switching with low drive. TR1 clocks the prescaler, two JK flip flops, arranged to divide by four. The prescaler increases the maximum count to at least 130Mhz as well as providing wave shaping of the signal, a Fast 74 series device must be used. R4 is used to pull up the TTL level of the 74F112 to the CMOS switching levels of the PIC. The amplified and shaped signal is applied to the timer pin, TOCK1, incrementing the timer with each negative edge.

Reference Oscillator.

The internal clock is used as a reference by connecting a 4Mhz crystal between the OSC1 and OSC2 pins. Use a fundamental mode crystal designed for parallel resonance, high stability types are preferred and will result in a more accurate count. Phase shift capacitors C7 and C8 are used to set the frequency and should be chosen to suit the crystal. The supplier will advertise the required capacitance, usually 30pF, which is made up of C7 and C8 in series. Two disc ceramics will work but for fine tuning use a trimmer for C7.

Display.

Five LED displays are multiplexed and driven directly by the PIC. All eight corresponding segments are tied together and connected to Port C via current limiting resistors. The cathode of each display is switched by transistors TR2 - TR6, low cost plastic package devices, used to limit the current drain of the PIC. Several displays have been tested and all worked well, but high brightness types gave the best results.

Offsets.

Switches SW1 - SW6 provide the user with a means of programming the PIC, allowing the addition or subtraction of fixed IF and BFO offsets. A six position DIL switch may be used, or chassis mounted switches, or a combination of both. The following tables summarise the function of each switch.

Switch	Function	Closed	Open
1	IF offset select	No	Yes
2	IF offset	Add	Subtract
3	BFO offset select	No	Yes
4	BFO offset	Add	Subtract

Switch		
5	6	IF offset
Closed	Closed	455Khz
Closed	Open	4.433Mhz
Open	Closed	9Mhz
Open	Open	10.7Mhz

Software.

A PIC16C55 was chosen as the processor because of it's low cost, but this meant several limitations had to be overcome with software. The internal timer, used to hold the count, is only eight bits wide but an onboard prescaler was programmed to increment the timer every 256 clock pulses. This resulted in a 16 bit timer but only the high eight bits could be read, the low eight bits are stored in the prescaler. In order to read the prescaler, after each gate period, the TOCK1 pin is repeatedly clocked until the timer is incremented. This is done after each gate period using RA0, configured as an output. The prescaler value can then be calculated as 256 minus the number of clocks required. RA0 also holds TOCK1 low in-between gate periods.

A 16 bit count would limit the maximum frequency to 65.535Mhz, 17 bits were needed to extend this to 130Mhz. The 17th bit is deduced by first gating for 1ms and observing the count. A count of 16386 or more would mean an overflow would occur after a 4ms gate and, if so, the 17th bit is flagged.

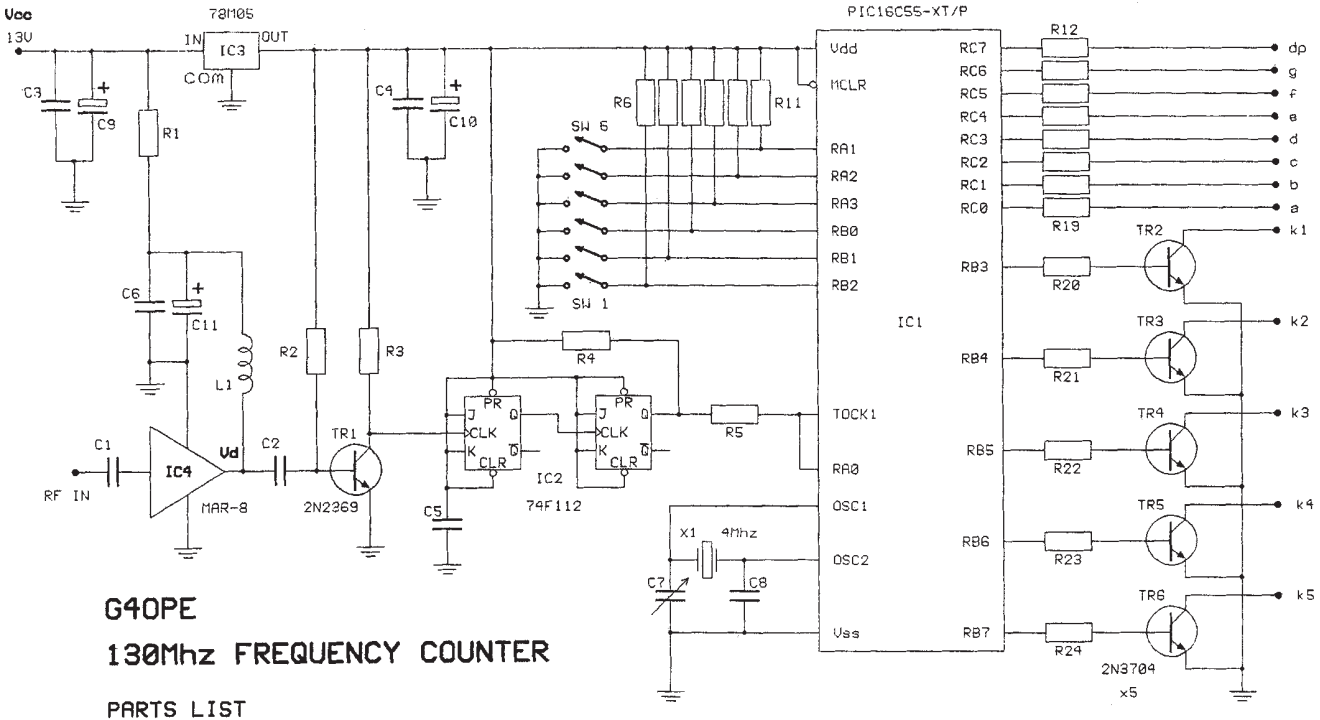
Frequencies below 10Mhz are automatically gated for 40ms and below 1Mhz a 400ms gate is used. This results in a resolution of 100hz or 10hz and no leading zero's. Above 100Mhz the gate time is held at 4ms and the most significant digit lost. This maintains a resolution of 1Khz and shouldn't present any problems since the lost digit is always a one.

When an IF offset is selected, the gate time is fixed at 4ms and after each count the offset is added or subtracted using a simple 16 bit binary addition routine. Should a BFO offset be selected, a further 2Khz is added or subtracted before the result is displayed. All six switches are monitored continuously and can be changed while counting is in progress.

Once the count is ready for display, a 17 bit binary to BCD routine is used and the code needed for the port pins found in a look-up table. The five digits are then multiplexed onto the displays. To avoid unacceptable flicker, the display routine was written to take exactly 4ms. This enabled the display to be continually refreshed even during gate periods; infact the display routine is used as the delay for timing the gate periods.

Construction and use.

Construction is straightforward and should present no problems. Ordinary 10 percent carbon resistors are fine and apart from the electrolytics, ceramic disc capacitors can be used. A suitable inductor is a miniature 1mH RF choke, made by Siemens and readily available. TR1 should not be substituted but TR2 - TR6 are less critical and any general purpose transistors should do the job. IC4 is soldered to the underside of the board, the dot on the package is next to the input pin. IC2 should be soldered directly to the board, but a socket can be used for the PIC . Use a BNC socket to connect the signal, either a length of 50 ohm coax or a short piece of wire can be used between the socket and board. The displays are connected to the board using ribbon cable or individual wires, keep the length of the cable as short as possible to avoid radiation. Leave the PIC until last and when all other components are in place, apply power and take a few voltage measurements. Check for about 7.5 volts at the output of IC4, around 2 to 3 volts at the collector of TR1 and 5 volts at IC1 and IC2 supply pins. If all is well fit the PIC IC and apply power again, the counter is now ready for use. When used with a receiver, use just enough injection to give a reliable count. A small value capacitor should be used to connect the receiver local oscillator to the counter, this will also minimise loading. When used with an aerial to check transmitters, care should be taken to limit the drive to a level that will not overdrive the MAR-8 amplifier. The maximum input power must be limited to 15 dbm to avoid permanent damage.



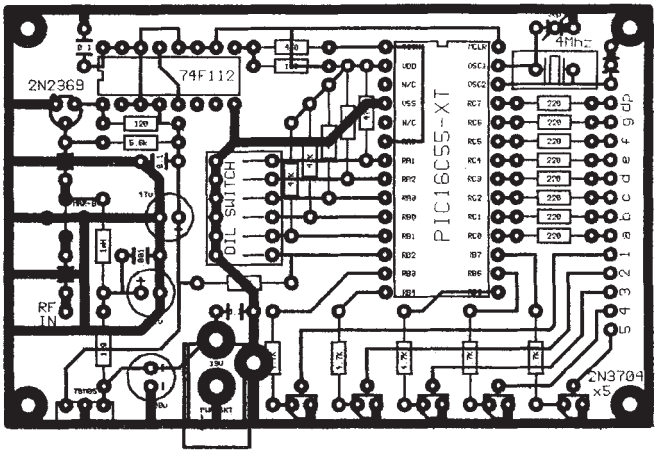
G4OPE

130Mhz FREQUENCY COUNTER

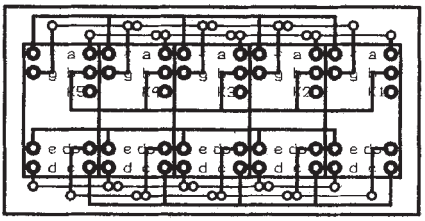
PARTS LIST

IC1	PIC16C55-XT/P	C6	0.001uF	R3, R4	120	SW1 - SW6 6 position DIL
IC2	74F112	C7, C8	To suit xtal	R5	470	
IC3	78M05	C9	100uF	R6 - R11	47K	Note:
IC4	MAR-8	C10	47uF	R12 - R19	220	R1 chosen to bias MAR-8 at
TR1	2N2369	C11	4.7uF	R20 - R24	4.7K	Vd = 7.5 volts, Id = 36mA.
TR2 - TR6	2N3704	R1	See note	X1	4Mhz	$R1 + R_{L1} = \frac{Vcc - Vd}{Id}$ ohms
C1 - C5	0.1uF	R2	5.6K	L1	1mH	Where R_{L1} = resistance of L1

G4OPE FREQUENCY COUNTER
Printed Circuit Board Layouts



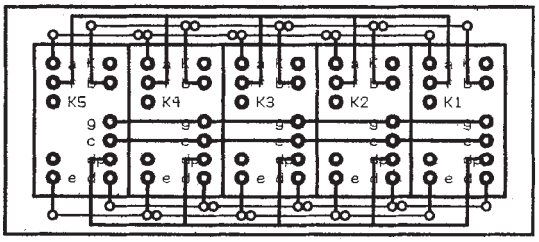
MAIN BOARD



0.3" Common cathode RH DP

DISPLAY BOARD

Alternatives for 0.3" & 0.5" LED Displays



0.5" Common cathode RH DP
HP 5082 -7653

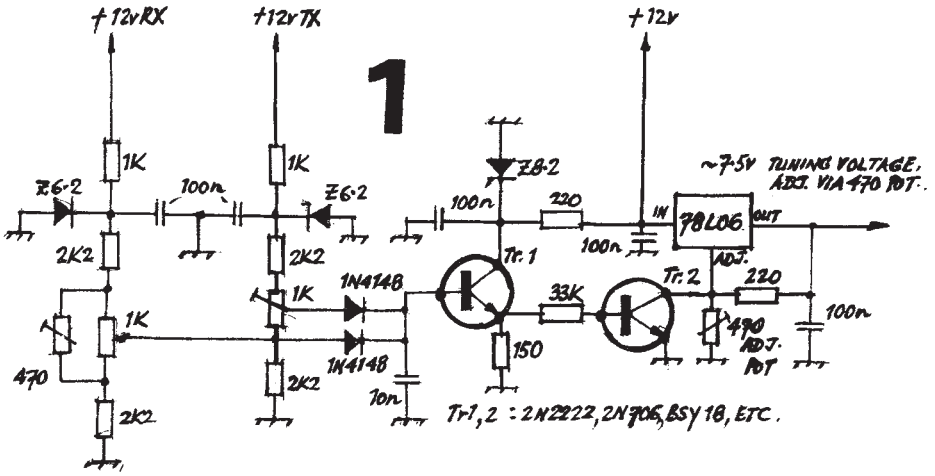
Specifications.

Sensitivity:	<10mV	1Mhz - 50Mhz	
	<100mV	100Khz - 130Mhz	
Input impedance:	50 ohms nominal.		
Maximum input:	15 dbm (approx. 1.2 volts rms).		
Accuracy:	+/- Crystal inaccuracy, +/- 1 count.		
Gate times:	4ms	40ms	400ms
Resolution:	1000hz	100hz	10hz
Decimal point:	Mhz	Mhz	Khz
	Automatic gating for best resolution unless IF offset selected.		
	Gate time fixed at 4ms when IF offset selected.		
Size:	2.25" x 3.5"		

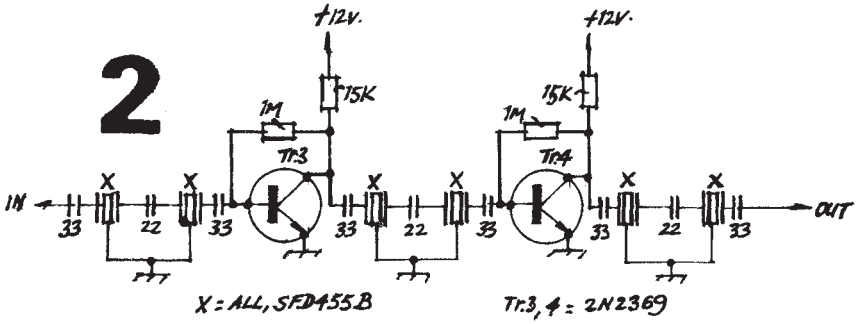
VARICAP TUNING WITH CONSTANT RIT OFFSET and AN INEXPENSIVE 455 kHz SSB FILTER

Elmar Vollar, DL2QA, Kielsbergstr.8. 36251 Bad-Hersfeld. Germany

Recently I have been very active with the soldering iron and build the K1BQT Transceiver for 20m and the EPIPHYTE SSB Transceiver for 80 m.
For both cases I use varicap - turning with constant RIT offset:



Though I am CW-OP I build the famous EPIPHYTE SSB Transceiver and found the CFM 455J Filter was more expensive than all the other parts together. (In my case). After a while I found a very good and cheap substitute:



I salvaged the small SFD455B Filter from old AM Radios. Glued the filters and transistors upside down, and wired ugly style.
Carrier and sideband suppression are excellent with this simple circuit.
Have made lots of DL-SSB QSO's with 6w RF and always great fun.

A SMALL RF/AF SIGNAL TRACER

C.M. Lindars, Providence Cott. Unity Lane. Misterton, CREWKERNE.

It was during recent experiments with crystal sets that the gadget to be described was built. There is nothing new in it, but it possesses the ability to test coil/capacitor combinations without undue loading and has a reasonable high gain. It can also deal with RF or AF without switching. A suitable container enables a PP3 type battery to be used, held in place with a 'sticker fixer'.

In order to keep a low component count, reasonable gain, high Z input & simplicity, a FET type transistor is used, with output to a crystal earpiece. However, better results may be obtained with a high Z magnetic earpiece; should one be available. One such type was the deaf aid earpiece of 1000 ohms Z which was marketed by Ardente. Alternatively, a small transformer (type LT700) together with an 8 ohm earpiece could be tried; but it is doubtful if this would be as good as the 1000 ohm type.

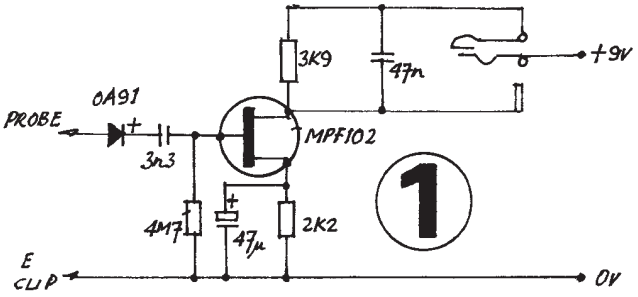
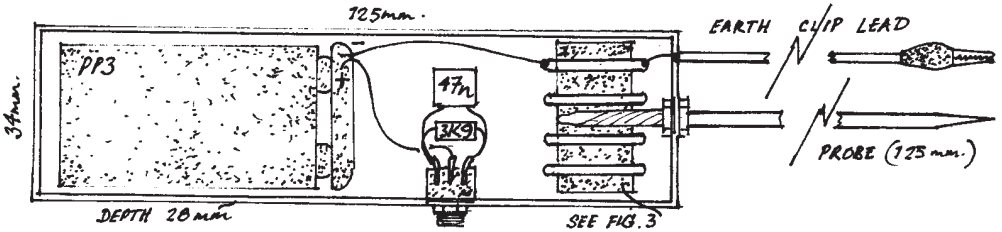


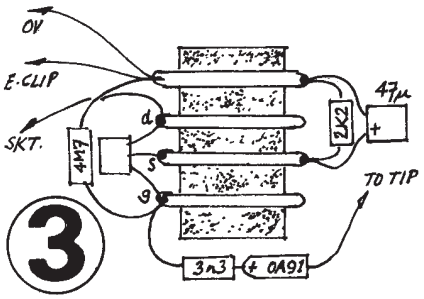
Fig. 1 gives the circuit, & Fig. 2 shows the general layout from which it will be seen that the case is drilled on the side to take a 3.5 mm socket (suitably adapted) & on the end to take the socket for the probe. Alongside the latter is another small hole for the earth lead to pass through. This lead is knotted to prevent strain on the components.

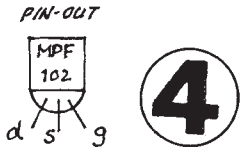


A four-way tag strip carries most of the components: the rest being either supported in air or else attached to the sockets. (See Fig.3)

It is advisable for C1 to have a high voltage rating, say 500v. The remaining C's are of a moderate rating.

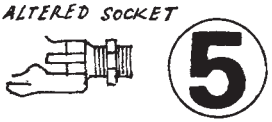
It will be noticed that the diode appears to have no proper load: but tests showed that it could be omitted and it was therefore left out in the interests of simplicity.





Other FET's could be used, provided that de attention is paid to the different pin-outs. See Fig. 4.

The 3.5 mm socket has to be altered such that the two contacts are 'made' when the earpiece plug is inserted. This is not a difficult operation if care is exercised. See Fig.5.



The probe can be a 125 mm length of 2mm electric power cable with the insulation removed at each end. One end is then filed to a point and the other soldered to a 'banana' plug. The earth lead is a piece of flex about 30 cm long with a 'croc. Clip' attached.

Uses

Tests may be carried out on equipment from the aerial to the output. The tuned circuits, including the IFT's should carry signals. Should signals be heard on the screens or cathodes of valves, this would generally indicate faulty decoupling capacitors. Amplifiers may be checked through, and no doubt readers will think of many other uses.

The total cost of the project is low and the battery consumption only about 3.0 mA.

You will need:-

1/4 resistors. 2.2k 3.9k 4m7
Capacitors. 3n3 (500v) 47n 47uF
MPF 102 3.5mm socket/switch PP3 battery and snap connector
0.5m insulated flex 125mm 2mm power cable 4-way tag strip
Plastics case, 125mm long, 34mm wide, 28mm deep.

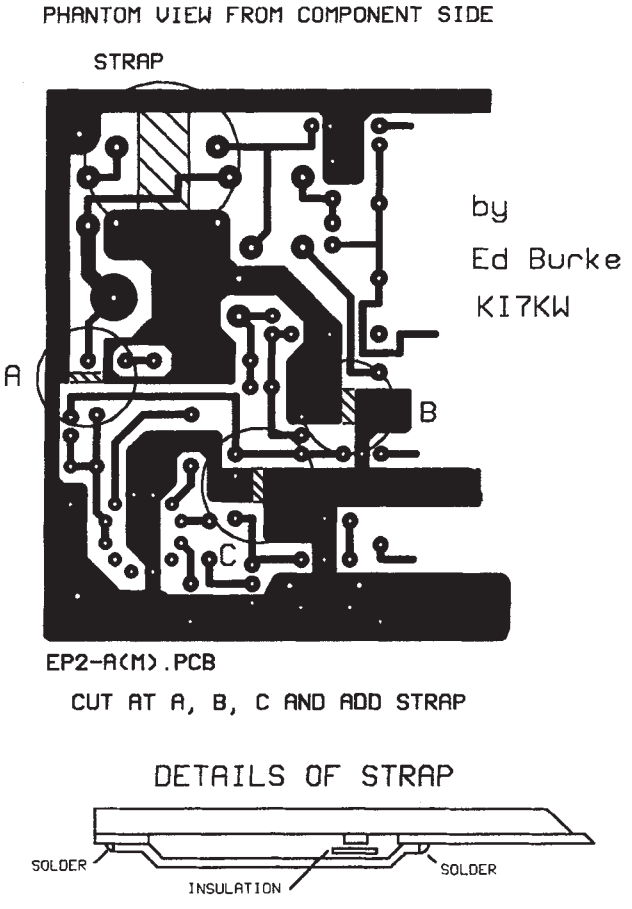
RSGB PRESS BULLETIN : EMC AND AMATEUR RADIO KITS

For more than six years, the RSGB has maintained a close watch on the European Union's legislation on electromagnetic compatibility (the EMC Directive) which eventually came into force on 1 January 1996. A number of submissions have been made to the government during that time.
A particular concern has been how the new requirements would affect the small manufacturers of kits aimed at the amateur radio market. Kits not only provide an inexpensive way to enjoy amateur radio, but also provide a degree of self-training which is absolutely fundamental to the Amateur Radio Service.
The Society's EMC Committee has recently secured replies to key questions on the subject, which appear to exclude from the EMC Directive kits which are assembled by radio amateurs.
In the reply, the DTI Standards and Technical Regulations Directorate states: "...If the kit, i.e.. set of parts is assembled by an amateur radio operator, it does not have to comply (with the directive). Also if a kit is deemed a sub-assembly it does not have to comply. When a kit is offered as a finished product when assembled (not amateur radio) it does have to comply."
This will come as a great relief to many kit manufacturers who faced going out of business because of the expense of the compliance procedure.

EPIPHYTE-2 UPDATE: ELIMINATING GROUND LOOPS

Derry Spittle, VE7QK,1241 Mt. Crown Rd., N. Vancouver, BC, Canada V7R 1R9
e-mail: jds@vcn.bc.ca

I have been bothered by occasional reports of "fuzzy" audio. Dave Meacham, W6EMD, and Ed. Burke, KI7KW, traced the cause to ground loops present in the PA/Driver section. After adopting Ed.'s simple "fix" for existing boards (see diagram), this problem disappeared and has not returned.



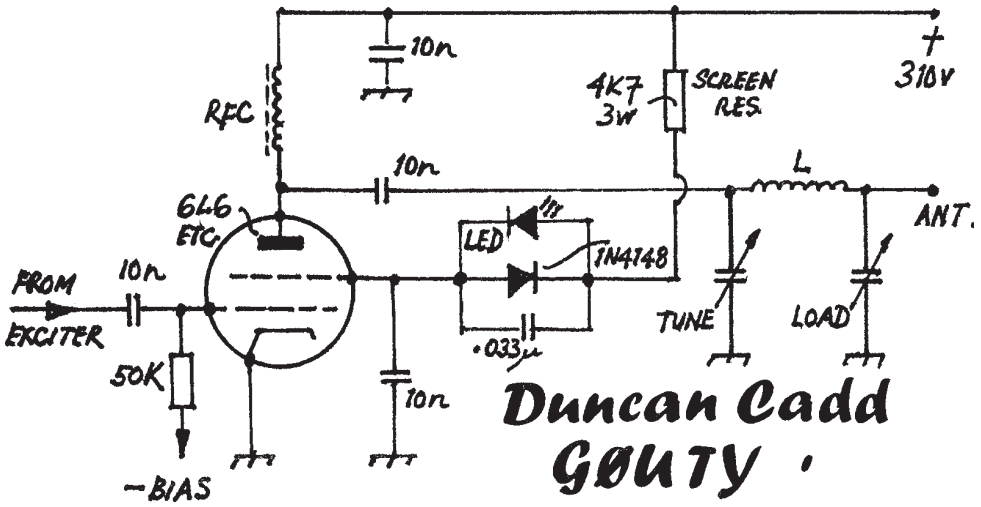
TETRODE/PENTODE RESONANCE MONITOR

Dr.Duncan Cadd, G0UTY DORPSSTRAAT 38,BUS9,
B-3590 DIEPENBEEK, BELGIUM.

The value of the screen series resistor is calculated in the usual way, (plate volts minus desired screen volts) divided by RMS screen current, the voltage drop across the LED is too small to affect the calculation. The current rating of the LED should at least equal to the peak pulsed screen current (important if Class C or B operation is envisaged, less so with AB) in practice since screen currents of low power tubes tend to be 10mA or less, almost anything will do.

According to the RSGB Communication Handbook, monitoring the screen current of a tetrad or pentad valve is a far more reliable method of determining plate circuit resonance than measuring plate current. Screen current peaks when the plate circuit is in resonance (or when you have large-amplitude oscillations in the PA caused by feedback - pretty much the same thing as I discovered inadvertently!!) and thus one simply tunes the plat circuit for maximum LED brightness, the relative brightness indicates of course the relative power output. At maximum brightness, the plate circuit is resonant and with a pi-tank, you also have the impedance about right. If you actually wish to know how much power, well that is something else, but I found this simple circuit quite satisfactory. The LED must be efficiently decoupled and reverse-polarity protected; all component leads here should be short. This little circuit saved my bacon when I realised I had no room whatever for a meter in the home-brewed valve transmitter.

Notes: Adjust tune and load (+drive) for max. LED brightness - peak shows resonance and impedance fairly well matched. Relative brightness varies with drive (i.e. power)
If there are two or more peaks in LED brightness, you probably have problems with parasitics or feedback induced spontaneous oscillations - useful to diagnose PA problems ?

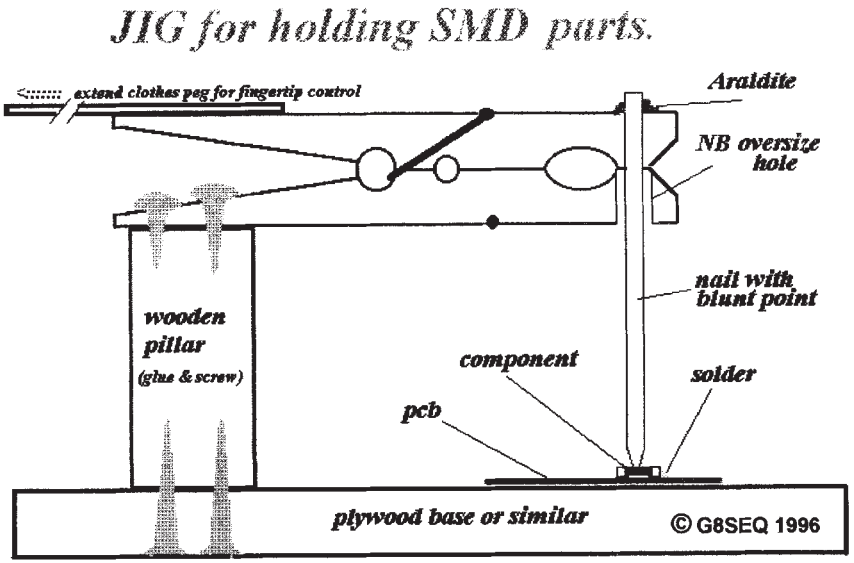


A JIG FOR HOLDING SMD PARTS

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

This jig is a simplified design based upon a version of the now defunct BRE company jig. It has been "value engineered" to make it as cost effective as possible. Since even the humblest amateur radio shack or workshop would have all the necessary materials to hand, it is not proposed to offer it as a kit of parts!

No dimensions are given either as none are critical, with the proviso that the length of the nail and the height of the pillar should be adjusted to give a firm but not excessive pressure to hold the component in place. If the point of the nail just touches the base-board when the peg is fully closed, it should be about right. The point of the nail should be dressed with a fine file or emery to remove any burrs.



TWO TIPS FOR CONSTRUCTORS: Doug Mepham, G4ERA.

As I am continually changing layouts, I don't get round to making printed circuit boards. I use doubled sided printed fibre glass boards, cutting two slots for IC pins to come through and Araldite the IC holder to the board. I find drilling one hole for each IC pin far too fiddly.

The other dodge is that mounting wire ended crystals is awkward when neither pin is grounded. The wire ends fir neatly into an IC holder. I have recently completed a receiver with 4 crystals in the IF filter and they fit nicely into a 14 pin IC holder.

PW SEVERN BUILDERS BEWARE: Although an old circuit (PW May-Aug 1983) the PW Severn is still being built. The BF256 FET is available in several types types BF256A/B/C and L all of which have different pinouts. The one required is the BC256L

FOR SALE - BEESWAX BLOCKS for coil and component fixing, as featured by G3ROO in RadCom, Send a £1 coin suitably disguised (taped to card) and your return address to : Gareth Evans, G4XAT, G QRP 2817, 7 Westland Drive, Hayes, Bromley, Kent. BR2 7HE.

A Spectrum Wavemeter : A Simple Alternative to a Spectrum Analyser

Tony Fishpool, G4WIF, 38 James Road. Dartford. Kent. DA1 3NF

I imagine, that many constructors cherished wish, is one day to own a spectrum analyser. Unfortunately (though not if you are selling), even second hand they hold their price well.

So we tend to fall back on the humble absorption wave meter for spotting rogue emissions from our transmitter. Unfortunately this often takes much knob twiddling and waving(!) around to find the signal and it can only "display" one frequency at a time.

This project is basically a posh absorption wave meter (which in its most simple form is shown in Fig1.)

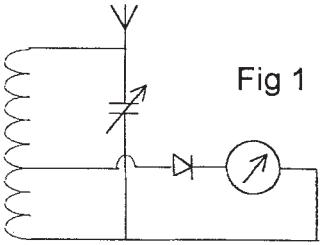


Fig 1

It uses the same principles i.e. a tuned circuit which is adjusted to the same resonant frequency as the circuit or signal source under test. Instead of using a conventional variable capacitor, a varicap diode is employed.

While this is not a new idea and I have seen at least one article previously that used this principle (1). what I believe is novel, is the use of a timebase independent of that contained within the oscilloscope and the wide frequency coverage of the design.

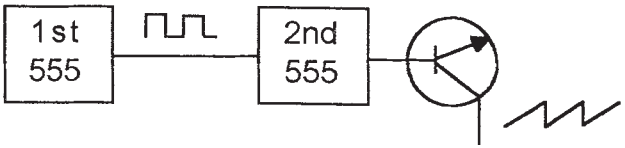
What is needed to tune the varicap, is a steadily rising voltage, the higher it goes the lower the capacitance, and consequently the higher the resonant frequency of the tuned circuit.

If that rising voltage is also taken to the X axis of an oscilloscope that had its internal timebase disabled, the dot will travel from left to right, (i.e from low frequency to high). The diode D3 will rectify any voltage that has developed across the coil and if connected to the Y input of the oscilloscope, it will produce a "bump" somewhere along the trace. The magnitude of the bump will depend on the degree of coupling between the signal source and the coil.

One of my oscilloscopes does not have an external output from its timebase and the other presents a waveform that I found unsuitable and so I designed my own waveform generator. It is based around the ever popular 555 timer chip, often found at rallies for pennies. I needed two, so to keep the chip count down, I used a 556 which contains two 555's in one package.

Describing the many applications for the 555 would be a series of articles in itself, so I will concentrate on the principal aspects of the design.

Fig 2



The first timer (see Fig 2) provides a continuous square wave output the frequency of which is given by:-

$$\frac{1}{0.5 \times R2 \times C1}$$

Which in practice worked out to 135 Hz with the components chosen.

This wave form would be enough to move the spot from the left to right on the oscilloscope but it would not spend very much time at all, between the two extremes which is where we want our "bump" to appear. So the second timer is used to produce a ramp or sawtooth waveform.
Each time a pulse from the squarewave generator arrives it triggers the timer, and capacitor C5 is charged via TR1 in a linear manner. It is the sawtooth waveform that is fed to both the varicap diode and the X axis of the scope.

The circuit Fig 3 shows the ramp generator on the left side of the diagram with the wave meter circuit on the right.

(FIG. 3 IS THE CENTRE PAGES OF THIS ISSUE)

The coil (L1) was constructed using a 35mm plastic film canister as a former and close wound with 44 turns of 26 SWG enamelled copper wire and tapped as shown in fig 4. If your junk box doesn't contain one they are usually obtainable from film processing shops free, and are very useful for all sorts of things.

I also have dabbled over the years with printed circuit boards and given it up as a time consuming messy job. While a boon for the kit constructor, I feel that for one off production there are better, quicker methods. I generally use single sided copper clad board and mount the components with the copper side up. Leads that have to be grounded are simply soldered to the board, while other components are linked underneath, either by their own leads or short pieces of wire. Of course it is necessary to ensure that components are not inadvertently grounded on their way through the board to the other side and this is accomplished by removing the copper around the hole, I use a veroboard cutter (but a small drill would do).

I use a small piece of perf board to provide a template for drilling the holes for I.C.'s which are then cleared with the vero cutter. A small blob of glue holds the I.C. socket in place.

Whenever possible, I lay out the components in the same position as they appear in the circuit diagram and on more complex circuits I use a computer PCB design package to work out the layout that produces the least amount of leads that cross underneath the board. The layout diagram (Fig 5) shows this in practice, The dotted lines show the connections underneath the board. Of course this could be used as a basis for a PCB if you should wish. This method has been successful with R.F. circuits as well.

Where components need to be soldered to a non-grounded point on the copper side, a pad may be easily cut using a modified wood drill, see sketch, the principle of which originated from an article by G4FQQ (2) thanks Roy! (see Fig 6) Using a grindstone I removed one of the outer cutting edges of the drill bit. Now by drilling a small pilot hole in the copper board and then (by hand) twirling the modified bit around in the hole, an island is formed onto which components may be fixed or a pin soldered so that components or leads may be attached. I buy the pins that are used to make up RS232 plugs, they are available quite cheaply in packets of 100 and provide convenient test points in circuits.

The varicap used was a BB212 and was chosen solely because I had one in the junkbox, others may be tried, and will no doubt work providing they have a similar capacitance swing. The BB212 is a double varicap, half of which is not used and the lead bent away or cut (see Fig 6). The cathode is connected via C10 to the end of inductor L2 which is actually just a piece of wire that becomes a significant part of the tuned circuit at high frequencies. The cathode is also fed with the sawtooth wave which is coupled to the

oscilloscope Y axis, the anode is taken to ground. While in circuit, L1 allows the coverage of approximately 1.75 MHz to 66.3 MHz. With L1 virtually out of circuit (by being grounded by SW1 in position 7), L2 allows the analyser to cover roughly 41 MHz to 82.5 MHz. If higher coverage is required, a means of grounding L2 further along is needed, and this is accomplished by soldering a small reed relay between a tap on L2 and ground. (see Fig 6.)
When SW1 is in position 8 it operates the relay and coverage of 64Mhz to 150Mhz may be achievable.

There is considerable overlap on each of the band positions. This is not a bad thing as the frequency response is not linear across the trace and neither is the Q which is better at the high end where there is a higher L/C ratio, affording a narrower bandwidth.

So we have a classic spectrum analyser trace on the oscilloscope. But how do we know what frequency we are seeing? For owners of a signal generator this is not a problem. If the signal source is presented at socket SK1 and the signal generator is connected to SK2 it can be tuned until the generator signal overlays that of the unknown source. At that point the two signals beat together and the frequency can then be read off the generator scale. Alternatively, perhaps the station transmitter (and a dummy load) could be pressed into use instead. If the oscilloscope's controls were always returned to the same setting, a removable scale could provide calibration marks.

The capacitors C7 & C8 provide enough coupling to inject a signal into the analyser without damping the tuned circuit too much. The table shown below indicates the approximate frequencies covered by each range as component variances will inevitably have an affect.

Measuring amplitude and bandwidth of a signal is the job of a real spectrum analyser but for a construction cost of around fifteen pounds is surprisingly effective.

References

(1) G4JST - Ham Radio Today - July 1983
(2) A PCB Pad Cutter by G4FQQ - Sprat Issue 74. Spring 1993

Range	From	To
1	1.75	3.5
2	3.5	6.9
3	6.2	10.6
4	10.5	20.1
5	18.1	33.5
6	32	68
7	55	90.5
8	90	155

Components List

R1	1K		C4	47nF
R2	27K		C5	0.1uF
R3	4K7		C6	0.1uF
R4	10K		C7	3pF
R5	10K		C8	3pF
R6	10K		C9	2.5nF
R7	33K		D1	1N4148
R8	3M3		D2	BB212
R9	220K		D3	1N4148
R10	10K			Small Reed Relay
C1	0.2uF		TR1	BC214
C2	0.022uF		IC1	NE556
C3	10nF		SW1	1 pole 12 way rotary switch

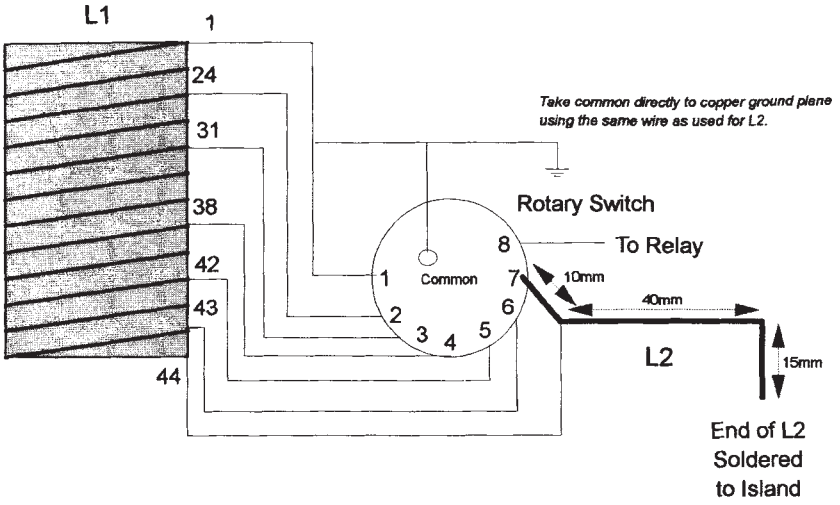
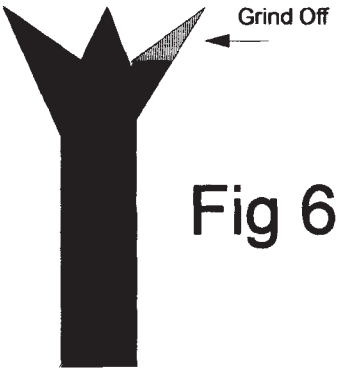


Fig. 4

Inductor / Switch Details

G4WIF SPECTRUM WAVEMETER



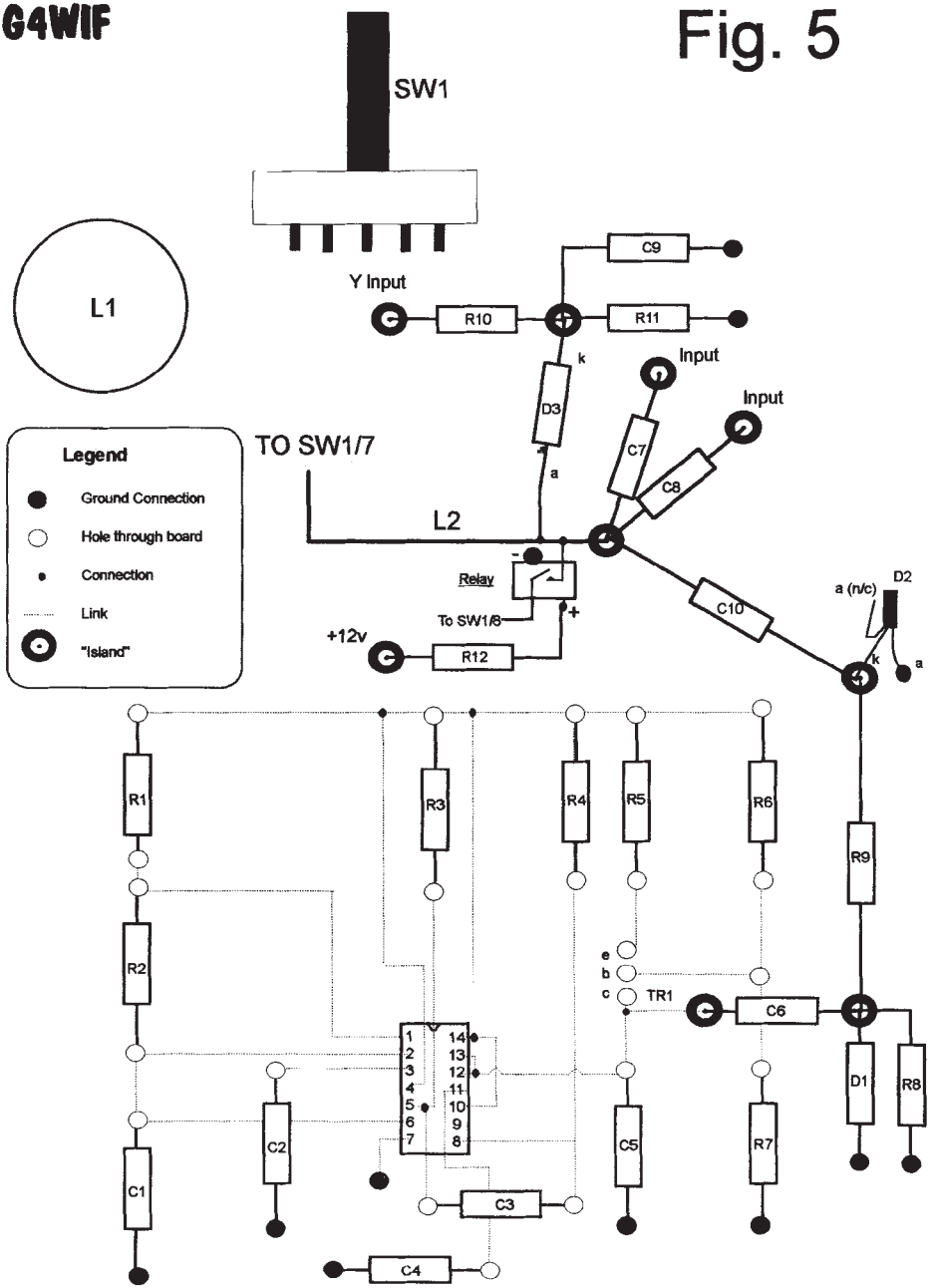
Modified Wood Drill

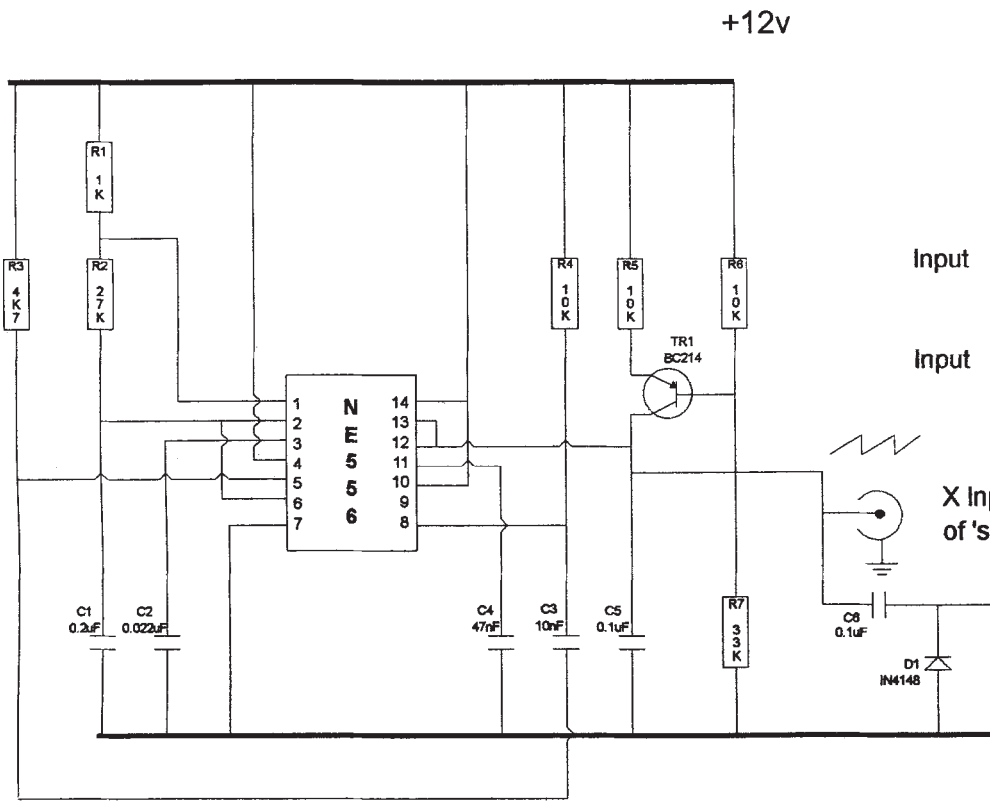
Fig 6

G4WIF

G4WIF

Fig. 5


SW1
L1
Y Input
R10
C9
R11
k
D3
a
Input
Input
C7
C8
TO SW1/7
L2
Relay
To SW1/8
+12v
R12
C10
a (n/c)
D2
k
a
Legend
Ground Connection
Hole through board
Connection
Link
"Island"
R1
R2
R3
R4
R5
R6
R9
e
b
c
TR1
C6
D1
R8
C1
C2
C3
C4
C5
R7
1
2
3
4
5
6
7
14
13
12
11
10
9
8


+12v
R1
1K
R3
47K
R2
27K
R4
10K
R5
10K
R6
10K
TR1
BC214
Input
Input
X In
of 's
1
2
3
4
5
6
7
NE556
14
13
12
11
10
9
8
C1
0.2uF
C2
0.022uF
C4
47nF
C3
10nF
C5
0.1uF
R7
33K
C6
0.1uF
D1
IN4148

COMING SOON - KITS FOR THIS PROJECT
KANGA ARE SHORTLY TO RELEASE A KIT
FOR THE SPECTRUM WAVEMETER
SEE FUTURE ISSUES OR CONTACT KANGA

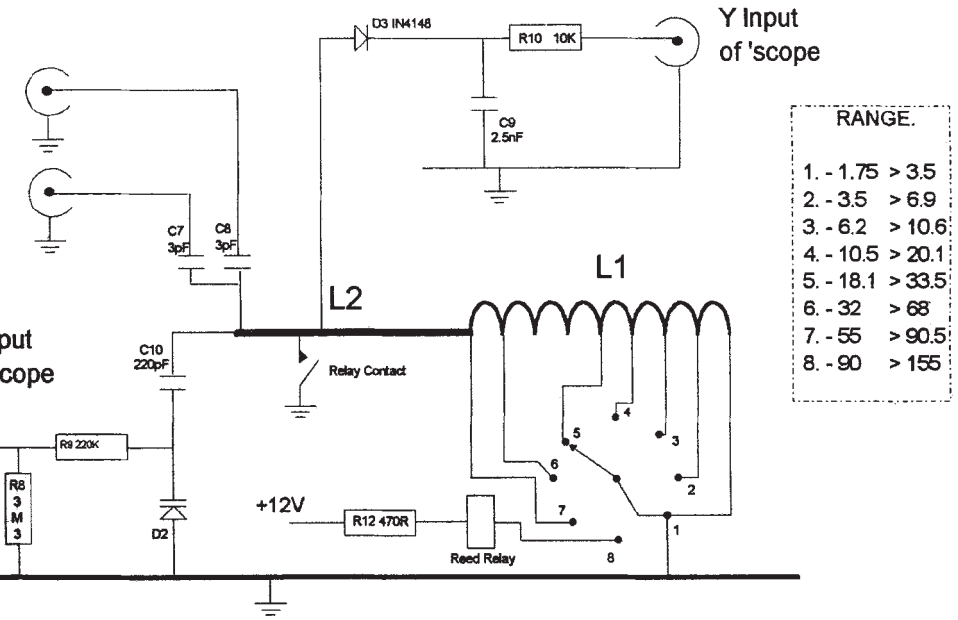


Fig. 3

SIMPLE "Common Parts" 80m. TRANSMITTER

T.K. MANI, VU2ITI, Thundiyil House, Nayarambalam.
PO 682 509, Vypin Island, Kerala, India

From India, a circuit that makes use of very common, inexpensive parts, with no toroids or difficult to obtain "western" components.

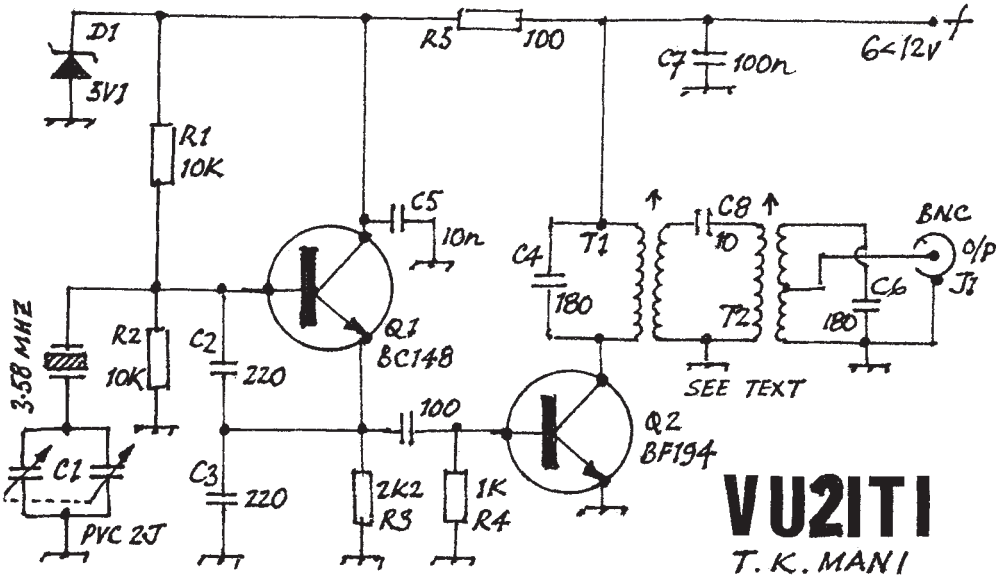
All Transformers are wound over strandard (scrap) 10mm 10.7MHz IFT Cores.

T1 Pri. 11 turns Sec. 4 turns

T2 Pri. 4 turns Sec. 11 turns with tap at 4 turns from cold end.

All winding are made using 36 swg (or similar) enamelled wire.

C1 Polyvaricon AM receiver tuning capacitor



MALTA 40 TRANSCEIVER TIPS

Andre Tarte, ON5UP, rue du Tige 37, Drehance. B-5500 DINANT. Belgium

Some Belgian stations having constructed the MALTA 40 **(Sprat 78),** note (in tx) that the driver transistor Q6 is prone to parasitic oscillation (for example when the ambient temperature increases, for certain settings of the ATU ....). This produces a very crucial regulating of C58 and C65 and R31 (which doesn't play the role of trimmer resistor anymore but an ON/OFF switch !!!!) and in order to cure this self oscillation it was necessary to put the finger on the collector of Q6. Despite all the modifications (Sprat 80 and 81) and that Q6 is a 2N3866 or 2N5109, the self auto-oscillation always existed.

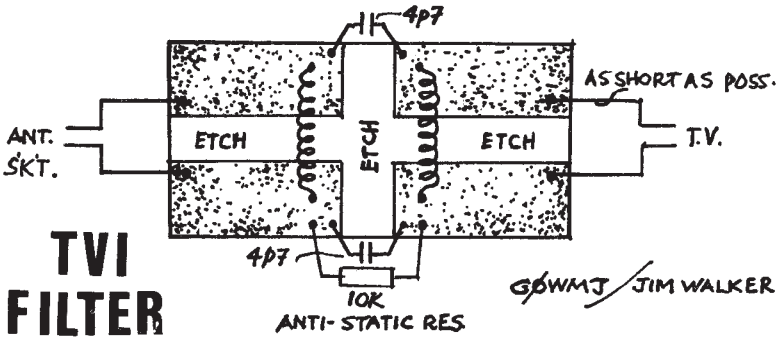
Also ON7EZ/QRP replaced Q6 by a 2N2219 (without the ferrite bead in the base and in the collector and without modification of the resistors) and he added a trimmer capacitor of 30pF between the collector of Q6 and the ground. After ajusting this capacitor (30pf) and C65, C58 the self auto oscillation is completely extinct and in this case the regulating of C65,C58 became very flexible and R31 permits now adjusting the output power from 0 until 5W. Then ON7EZ/QRP withdrew this ajustable capacitor of 30pF and measured it to the capacimeter then replaced it by a fixed capacitor of same value.

A JUNK BOX TVI FILTER

Jim Walker, G0WMJ, 15 Lawrence St. Blackburn, Lancs, BB2 1QF

A easy to build TVI filter which may be of interest to readers who have internal TVI or an antenna close to a neighbour's TV antenna. Most parts can come out of a junkbox and it can be built for pence.

L1 + L2 4 turns of 22swg (or any heavy gauge) wire formed on a 5mm (¼") drill
Completed unit place in small box with double-sided tape



The 12th Yeovil QRP Convention : Report by Peter Burridge, G3CQR

The event at the new Venue in Sherborne went very well despite the atrocious weather early in the day, not the usual Spring sunshine we expect for Convention day!
The general comments were: "The best one so far"!. "Like the venue"!, "The food is exceptionally good and extremely good value"!, (new caterers this year!) Even the 'full house' of Traders gave it a grudging thumbs-up!
Our Novice & Newcomers displays and advice centre created great interest and the station on the Aid (GB2LOW) was well used. Ham Radio Today Editor, Sheila Lorek made a fine opening speech and was followed by the Talks all to packed to capacity audience's.
In the other events the Walford Electronics Pitney Receiver building by G7SDD created so much interest that Mikes time was taken up in answering questions and so he was unable to complete the assembly, however the partially completed board and remaining parts were put into the Prize Draw and was won by QRP-C member Nr. 2229 Brian G3MBN, who will complete the job and no doubt find it useful in his Shack. Other prizes were donated by every one of the traders present.
The **Construction Challenge** was won by (me) G3CQR with a KISS principle effort using the best two glass encapsulated Germanium Diodes from his junk box, a half metre square 4 turn aerial coil of heavy duty Coax tapped at the most advantageous point.
The Results Table is:
1: G3CQR 57mV, 2: G3PCJ 55mV, 3: G3OFX 33mV, 4: G3ESP 17mV, 5: G0THX 16mV
The **FUNRUN** was not as well supported this year and conditions, particularly on 40 metres were not good even on local stations, and most contacts were made on 80 metres,
1st: G3GC, 2nd GW3JSV, 3rd G4ZLX, then, in order : G3IXZ, G3BPM, G4DDX, G6NA, G4OOS, G0THX, G3ICO, GD0LQE, F5LUX.
The exception was Spenny G6NA who's 200mW sigs seemed to have magical powers in getting through the QRM! Consequently he was awarded the Certificate for the Station consistently using the lowest power.
Although we offered a Certificate for the best SWL entry non was received. A discussion at the end of the day and a number of letters with entries indicate that most people feel that 40 metres at this time in the Solar cycle is hardly worth while retaining in the Funrun. We will be reviewing this problem before the next Funrun. Any alternate ideas would be welcomed.

FURTHER OBSERVATIONS ON PL259 PLUGS

Geoff Arnold, G3GSR, 9 Wetherby Cl. Broadstone, Dorset, BH18 8JB

I was interested in the piece by Peter Chadwick concerning the true picture behind the theoretical merits and demerits of PL259s.

Some years ago, Dick Ganderton G8VFH and I were involved in installing aerial systems for various bands at out respective homes.

At Dick's house, we fed the aerials in to a patch-panel in a corner of his bedroom where he had established his 'shack'. On testing the 2-metre Yagi, which we neatly terminated in an SO-239 socket mounted on the panel, and which had previously been working well in a plug-ended jury-rig, the VSWR was absolutely diabolical!

Afters various tests, we established that the problem was right at the socket. Due to limited space in the cavity behind the panel, we had brought the cable in from the side, so that there was effectively a sharp 90-degree bend in the conductors where the cable met the socket. We modified things so the cable-conductor was directly in line with the socket inner whereupon the VSWR returned to an acceptable figure. The coax braid was made off to a solder tag under a fixing bolt in the usual way in both cases.

Later experience with building VSWR meters and noise bridges tended to confirm that generally SO-239s did not like their connections approaching at right angles, but BNC sockets on the other hand seemed perfectly happy no matter how you aligned the cable.

Further Comments from G3RZP

Having just commissioned my new remote aerial switching and ATU system, the problems of QRO reared their heads as an EMC problem, with the RF getting into the control circuitry. This should give you a wry smile! However, after I "unburied" some UR67 that fed the 20m beam, I found the braid was black and so wet I could squeeze water out of it! No wonder the SWR was so good, but QRP would have been even more QRP by the time it got through that.

Moral: be careful what coax you bury. This was real mil spec UR67, while cheap RG58 from Westlake buried at the same time in the same run was unaffected.

Tips for putting on PL259s.

For cutting the braid back neatly, tin and use a pipe cutter (the DIY sort) to cut the braid through. For heating the plug up rapidly and neatly, a DIY type hot air gun paint stripper is ideal. It's also good for shrinking heatshrink tube.

VLF COMES TO THE UK : THE 73kHz ALLOCATION

Although there has been no agreement on a common European LF allocation the RA are prepared to allow operation on 73kHz in the meantime.

Operation will be on an experimental basis and granted by individual Notices of variation to holders of the full Class A Licence.

In summary, the conditions are:

Frequency : 71.6 to 74.kkHz - ERP : 0dBW (1 watt)

Status : Non Interference Basis - Modes : All (except FSTV !)

Location : operation at the main address, 7 days notice required for tempory location

The RSGB are to handle all application and forms can be requested from :

The Chairman, HF Committee, c/o RSGB HQ.

DON'T FORGET TO THANK THE RSGB - WE COMPLAIN A LOT BUT OFTEN THEY COME UP WITH THE GOODS !

TS50 on 5 WATTS: Walter, G3ESP, referring to the SPRAT 86 item on reducing power on a TS50, says that he simply reduces the supply voltage to 11 volts. Everything works, even the AF50 automatic ATU, and the power output on the 10w setting comes out at 5 watts.

QRP NEWS - QRP NEWS - QRP NEWS - QRP NEWS

GM3OXX GETS QRP HONOUR

George Burt, GM3OXX, has been inducted into the QRP HALL OF FAME. . The award, from the QRP ARC takes the form of a fine plaque which was received on behalf of GM3OXX by G3RJV at the QRP Banquet in Dayton in May. Accepting the plaque, G3RJV said the "If anyone ever deserved such an award, it was George Burt, GM3OXX".

GM3OXX is well known for his SPRAT designs : the OXO and the ONER (probably the most built amateur radio project ever ?). He was the first person to claim a Milli-watt DXCC (all under 1 watt output) and has always operated a completely home built station from a limited space QTH. His encouragement of other Builders and QRPers is legendary. The model of an extraordinary QRPer.

QRP WEB SITES ON INTERNET

Information on the **G QRP Club** can be found on Kanga's Web Page at http://ukinternet.com/ham/kanga with details of **Kanga Products**.

QRP Web Page from G3YCC can be found at http://homepages.enterprise.net/g3ycc/

DL0AQB Page is on http://ourworld.compuserve.com/homepages/Peter_DL2FI

The Home Page of the **Italian QRP Club** is available on http://www-dx.deis.unibo.it/htqrp/

The main **USA QRP Web Site** is at http://qrp.cc.nd.edu/qrp-l/

The **Northern California QRP Club** is on-line at http://fix.net/jparker/norcal.html

and links to QRP information may be found at http://www.raddev.com/biz/raddev/

The URL of **Activity Group QRP Berlin DL0AQB** is

http://ourworld.compuserve.com/homepages/Peter_DL2FI

CHRIS' SUMMER PARTY Saturday 3rd August 1996

The "alternative" summer party organised by Chris Rees, G3TUX is confirmed for Saturday 3rd August Due to parking difficulties and remote possibility of inclement weather it is moved to a local church hall! Layout similar to Rochdale : tables and chairs in the centre surrounded by displays from local clubs and trade. Plenty of real homebrew and QRP bargains. Definitely no computers or non-radio items !

Location : Our Lady of Lourdes Church Hall, Weydown Road, Haslemere, Surrey

Doors open at 11am, refreshments all day, lunch from 1pm. No entry fee but "buy your own grub"

5 mins walk from Haslemere railway station and 10 mins by road from the A3 at Hindhead. Talk in on S22. No raffle but modest prizes for greatest distance travelled (within UK) and for the best DX contact with the talk in station (GX4WWR/P). Hotel & B&B info available on request

FROM PETER BARVILLE G3XJS : QRP DXPEDITIONS

Andy, G4VPM, is going to Kuredo Island for two weeks starting 8 Sept. He has applied for the callsign 8Q7PM, but this has not yet been confirmed. He will be taking his Argo 535 for some QRP activity, and (*LARGE HINT* - if he can find one in time) an R7 vertical. It is primarily a holiday (not a Dx-Pedition) but he is keen to make some QRP/QRP contacts. Check around the normal QRP cw frequencies (no ssb) 40/30/20/15m, depending on conditions.

By the way, SV5/SM7DAY QRP should still be active - until 14 June - with his MFJ-9020 and MFJ-9017.

WANTED R7 ANTENNA BY G4VPM - See above expedition! Contact Andy on 01460 - 241711

ANTENNAS - ANECDOTES - AWARDS

Gus Taylor G8PG 37 Pickerill Road, Greasby, Merseyside, L49 3ND

THE SWISS ANTENNA - GERMAN STYLE

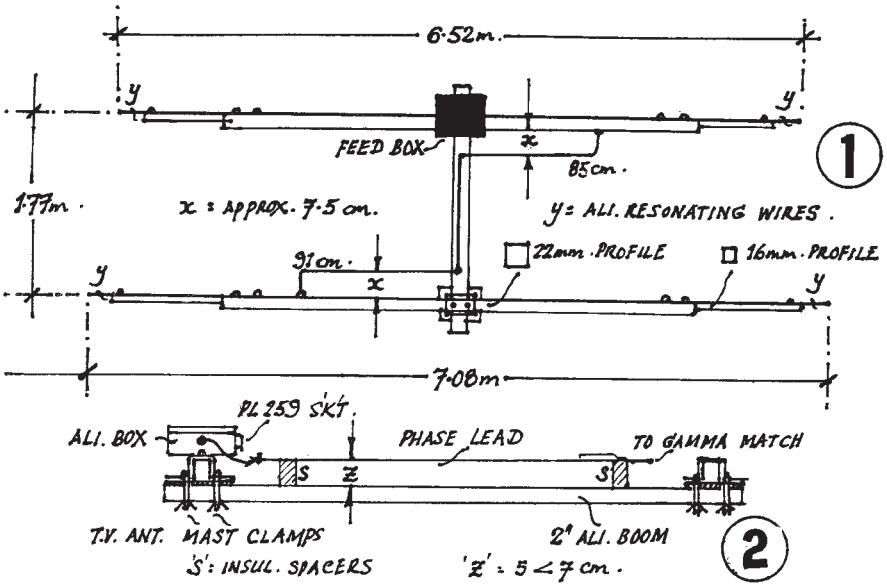
Lutz Bergner, DL2HRP, Wittenberger Str 64, 06888 Muhlanger.

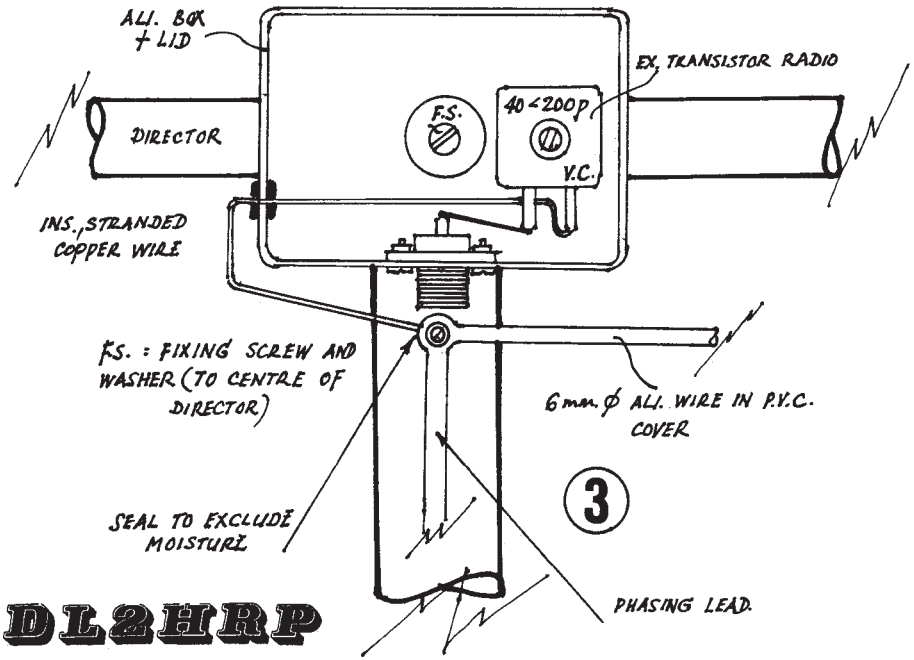
This 21 MHz version of the HB9CV beam is based on a design published by DM2ABK in the days of the DDR. The main metalwork is made from aluminium items used in connection with TV antennas, and the phasing line and end pieces are made from plastic covered aluminium wire. The phasing capacitor, which was salvaged from an old transistor radio, is housed in a diecast aluminium box. The various parts of the beam are held together by means of stainless steel self-tapping screws. The use of stainless steel is important to avoid corrosion effects. Connections to the plastic covered aluminium wire are made by stripping away insulation, then beating the wire flat with a hammer and drilling a hole in it to take the fixing screw.The only copper used in the antenna is the insulated , stranded copper wire used to connect the phasing line to the phasing capacitor.The connection at the phasing line end, and all other screwed connections, must be carefully weatherproofed with silicon rubber solution. The point where the copper wire enters the phasing capacitor box must also be carefully sealed. The insulated spacers which separate the phasing line from the boom can be taped into place. Figures (1),(2), and (3) illustrate the construction of the beam and the lengths of the elements.The phasing capacitor can be adjusted with the beam near to the ground. It should give a sharp peak on noise or incoming signals.Now we come to the tragic bit. I erected the beam at a height of 5 metres on an August afternoon and in came many South American stations I had never heard before, the last one being FY/DJoPJ/qrp. But my 21 MHz TX was broken down, so I could not call him !. The lesson here is never test a new antenna without having a TX available!! Weeks later a friend brought his commercial rig along and we tried it on the beam on an October evening. The first pleasant surprise was that the swr did not exceed 1:1.3 over the whole band. It was late, the band almost dead, but we heard a CE6,called him, and had a solid QSO. This was using the rig at 36watts, its lowest output setting. The beam certainly works !

SHORT,LINEAR LOADED HF ANTENNAS

(SPRAT No.68 or page 141 of the G QRP Club " Antenna Handbook")

Jack, GoDNC, sends an interesting report on the use of these antennas on 40 metres (3W) and 30 metres (2W) , both rigs homebrew. The antenna is coupled via G4LDY "No Cost atu". At no time was the top of the antenna more than 12 ft above ground. Jack found that he could work all round Europe on both bands with little difficulty, and that comparison tests showed the antenna to be only marginally down on a G5RV. At no time were there any TVI problems, even when tried next to a black and white TV in the shack. The antenna has caused much interest locally , with locals asking for details. It is very encouraging to know that the antenna is proving so useful and interesting to many people. User feedback on antennas published in SPRAT is always useful, and also very much appreciated. Many thanks Jack.


6·52m.
y
y
x
FEED BOX
85cm.
1
1·77m.
x = APPROX. 7·5 cm.
y = ALI. RESONATING WIRES.
91cm.
22mm. PROFILE
16mm. PROFILE
7·08m
PL 259 SKT.
ALI. BOX
PHASE LEAD
TO GAMMA MATCH
S
z
T.V. ANT. MAST CLAMPS
2" ALI. BOOM
'S': INSUL. SPACERS
'z' = 5 ≤ 7 cm.
2


ALI. BOX + LID
EX. TRANSISTOR RADIO
DIRECTOR
F.S.
40 ≤ 200p
V.C.
INS. STRANDED COPPER WIRE
F.S. = FIXING SCREW AND WASHER (TO CENTRE OF DIRECTOR)
6mm. ϕ ALI. WIRE IN P.V.C. COVER
3
SEAL TO EXCLUDE MOISTURE
PHASING LEAD

DL2HRP

ANGUS, 8P6SM, HAS CONFIRMED THAT ALL HIS CONTACTS DURING THE 1995 WINTER SPORTS WERE MADE WITH 5W OR LESS, so any of his cards for this period will be accepted for our Awards even though they may not show the power. Please do not send them back to be amended as Angus is very busy .

HOW CAN I GET ON 80m WHEN I ONLY HAVE A 40m DIPOLE ? asked David, GoUTF. Our suggestion that he strap the feeders and load them against a counterpoise wire via an atu soon had him working members around 3560 KHz.

IT HAS HAPPENED AGAIN ! After much trouble with TVI from his vhf phone rigs Paul, GoWAT,got his Class A licence and went QRP on hf. Recently his previously TVI-troubled neighbour asked him if he had given up amateur radio !

YOUR THOUGHTS AND SUPPORT ,PLEASE, FOR WILF ,GoTUJ. Having been diagnosed as having a potentially terminal illness Wilf has decided to fight back with hard exercise, medication, diet, amateur radio etc etc. We are all in there rooting for you Wilf.You can do it !!

AWARD NEWS

QRP MASTER. We welcome G3ICO,G4VPF,SM5CCT and G3JMZ to the Worshipful Company.

QRP WAC. G3JMZ.

QRP COUNTRIES. 200 (!!) GoIFK, SM5CCT;75 WJ7H (ex W7JH),G3ICO,G4VF, 3JMZ;50 G4NBI,GoTYM;25 GoWOU,G4ERA,GoSTR.

WORKED G QRP CLUB.460 GM3RKO;340 G4NBI,GoKCA;140 SM5CCT; 100 GoTYM, G3PBQ;60 G3JMZ;40 G4ERA.

TWO-WAY QRP.40 G3INZ;30SM5CCT;20 G3JMZ;10 G4ERA,GoSTR,G3PBQ.

Hearty congratulations to all the above.

OUR THANKS TO THE MANY MEMBERS WHO RESPONDED TO THE REQUEST FOR INFORMATION ON A COPPER WIRE SUPPLIER. A self-adhesive address label and a first class stamp produced the excellent catalogue of the Scientific Wire Company, 18,Raven Road, London E18 1HW (Tele 0181 505 0002, FAX 0181 559 1114).This organisation markets not only a full range of enamelled copper wires, but other products ranging through wires for laboratory use to precious metal wires for the jewelry trade. An intriguing product is their gold-plated copper wire. A gold-plated doublet is much less expensive than one would think ! A birthday gift for the man who already has everything ??

IF YOU HAVE DIFFICULTY IN FINDING AN RAE CLASS IN YOUR AREA why not consider a correspondence course ? As a qualified distance educator G8PG is always happy to advise in this area. A number of our members have in fact qualified via this route. When one considers the cost of fees ,transport, books etc required for a face to face course, the cost of a correspondence course it little different and most colleges offer tuition facilities for several years if necessary. In more remote areas this may indeed be the only way to qualify for an A or B Class licence.

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

FOR SALE : Codar AT5 CW/AM transmitter 160/80 in nice condition £20. R109 Receiver, complete. Offers. Prefer Buyer collects. G3PBQ, 71 Deaking Rd. B-Ham B24 9AL. 0121-373-2282

FOR SALE : Mizuho 21MHz cw/ssb Transceiver with 4 xtals £150. MFJ 9020 Cw Transceiver, New £200. Exchange Keys, List on request. F6AOU. Tel: 33[1] 69258417. Henri Heraud, 9 Avenue de Bellevue, RIS ORANGIS, 91130 France.

FOR SALE : Shack Clearance. Howes dual band 10 & 15m ssb/cw transceiver inc. DXR10, HPA10, DS2, HTX10, VF10, mike and all paperwork. Caesd with S meter TX is 10w complete 15m band and all 10m exc FM section - just £98 ono. Kanga 6-10m converter for just £6 ono, Howes CSL4 ssb/cw dual bandwidth filter, sutaoble any receiver with data £9 ono, Small Medium Wave Radio suitable convert to 160m or poss 80m and add BFO £2, Two cordless telephone base units, one is TX 49MHz/RX70.1MHz. Had at least 0.5w out on 49MHz, other untested £3 the pair, Car radio aerial just £1, Weller 40w mains soldering iron £12.50 ono. Call David on 0181-317-2223 eve and weekends.

FOR SALE : HF QRP Rig : Mizuho MX7-S, 40m SSB/CW Transceiver, 2 crystals fitted covering SSB part of the band. Complete with speaker/mic, instructions and case. £180 ono. Contact Stefan G0BJW Rochdale (01706) 39803.

DONT THROW AWAY YOUR PHONE CARDS ! Used Picture, Company and Series phonecards wanted for youth organisation. Peter Brent, G4LEG, 14 Stagelands, Crawley, RH11 7DE.

WANTED : Circuit and underchassis layout for national 1-10, plus any coils. J.S. Haggart, G3JQL, 22 Alnwick Rd. Newton Hall, Durham, DH1 5NL.

WANTED : Any modification for Yaesu FT301S QRP HF Rig, expenses refunded. Also Wanted - FT75 Mobile HF Rig. Pete, G1SFS. Tel: 0117 - 9633306

WANTED : Manual for the TRIO R-600 RECEIVER to photocopy and return - all expenses refunded. Tom Sorbie, GM3MXN Tamaur, 7 High Pleasance, Larkhall. South Lanarkshire. ML9 2HJ

WANTED: Copies of the circuit etc. For the Driver Board (80192) and PA Board (80207) for a Ten Tec Triton II. Costs refunded. Or has anyone got replacement boards?. Vicent Llario. EC3DFD, Zaragoza 60, 1er 2a, Barcelona 08006. Spain.

A NEW TRANSCEIVER KIT FROM WALFORD ELECTRONICS

The Bruton is a single band phone SSB superhet transceiver for any band of the builder's choice in the range 20 to 160m. It is supplied as a common set of parts with the appropriate coils and capacitors for the chosen band. It uses bi-directional 6 MHz IF system with a varactor tuned VFO incorporating special temperature compensating capacitors. The receiver can be built on its own and has audio derived AGC and double tuned RF filters. The transmitter has an output power of 5 Watts and uses a tuned FET output stage. CW facilities can be added with the **Adjustable CW Filter** kit incorporating a very sharp 8th order eliptic filter and digital readout is available with the **Three Digit Counter** kit. The PCB is 100 x 160 mm and the kit includes all hardware for an open style of construction as shown in the photo. There is also a special channelised variant of the Bruton for ATC squadrons. Very detailed building instructions are contained in the smart 26 page Manual which can be bought on its own first for £5.

The **special launch price is £84** for the transceiver plus £1 P & P.

For full details send a stamped self addressed envelope to Walford Electronics - see page 40

THE DKØWCY STAND-OFF

Dr.Gordon J. Bennett, G3DNF, 52 Whinmoor Crescent, LEEDS, LS14 1EW

Those of us in Europe who frequently use the 80m band for QRP cannot have failed to notice the amateur radio beacon DK0WCY, which has been transmitting general propagation data for the past two years to an early morning and late afternoon schedule. The reason for its presence is that while solar activity is so low, reception of the main DK0WCY beacon on 10144kHz has become difficult and uncertain for listeners in Europe. Understandably, the times during which its 80m offshoot transmits are the best for reception in European countries. It is no coincidence that they are also most fruitful for QRP/QRP contacts in this continent. The beacon is operated by DARC,with the approval of IARU. In an exchange of correspondence with DL1VDL, who runs the project, it was learned that the frequency of the beacon, 3557.5kHz, was internationally agreed and allocated by the German licencing authority, and cannot be changed.

For QRPers,this was an unfortunate development.The problem came to a head in November 1995,when the beacon drifted off frequency to 3559kHz and developed a T7 note. This led to complaints being made to DARC by G3MCK on behalf of the G-QRP Club, by DJ7ST (G-QRP 110) for DL-AGCW and by G3DNF on a personal level. In reply, DL1VDL offered little prospect of change, but undertook to keep the beacon under control in future and to switch it off during major contests and QRP events. The beacon has since kept to its assigned frequency and has been reprogrammed to a new format and faster message speed, but its note could still be improved.QRPers must therefore continue to endure its plaintive warbling! Moreover, the promise to close it down during contests has proved worthless.

When it was pointed out to DL1VDL that the beacon gave problems to QRPers, his response was to issue a misleading statement (CQ-DL February 1996) that DJ7ST and the G-QRP Club want the segment around 3560kHz to be QRM-free. He also claimed that CW QRPers are opposed to progress and use antiquated technology! It is a pity that the discussion has been degraded in this way, but it is clear that the time has come to make the facts available to a wider audience.

It is true that 3560kHz, like all other internationally recognised QRP frequencies, has no status in band plans. We cannot therefore lay claim to it or its adjacent segment, as DL1VDL believes we are doing. So far as the segment 3560+/-5kHz is concerned, all that we QRPers are saying is that anyone wanting to find us should look there. In among the QRM from commercial stations, "fishfone" and other non-amateur stations, there is a higher probability of finding QRP CW activity there than elsewhere in the band. To the list of other likely sources of QRM, we must now add DK0WCY. This reduces our options in what is often a crowded segment. DL1VDL does not accept that there is a problem but urges us to improve the selectivity of our receivers. "A bandwidth of 1kHz is sufficient" he claims.....if only it were! He also offers a curious interpretation of "IARU policy on meeting frequencies" to the effect that QRP QSOs should be initiated on 3560kHz but completed elsewhere....a recipe for total chaos.

Clearly, if there is a problem, it is not going to be easily resolved. One can only hope that DARC and their licencing officials can assign DK0WCY to a part of the band that is more suited to beacon operation. Regrettably, band planning prescribes no segment for this purpose, such as is found on some other bands. There is no denying that the beacon fulfils a useful role by providing regular propagation data, but once the listener has absorbed the 25 percent of its message that is of real interest, its repetitious signals begin to lose appeal. Is its presence on 3557.5kHz of no concern except to those who require it? Does it bother you, the QRPers who frequent the 3560+/-5kHz segment? **Please let me know!**

Jack Hesling G0AEO - We regret to announce the death of Jack, G0AEO on March 23rd. Jack was one of our club unsung heroes. For many years he was "distribution officer" for SPRAT and did much to create the smooth running system we now use for each mailing of SPRAT. Jack was an active QRPer with his HW8 to an FD4 antenna. Our sympathy goes to Sylvia, his widow.

COMMUNICATIONS AND CONTESTS

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

The gremlins got loose in the last edition of SPRAT. In the Winter Sports certificates were awarded to G3LHJ. For the log with the most QRP/QRP contacts (60)...
8P6SM. For giving a lot people a lot of pleasure.
also:
IK7MXD should read IK7HIN G3XJS4S1 Should read G3XJS

Chelmsley Trophy
To try and encourage more entries I have again simplified the rules. For 1996 all you need to do is to send me the total number of QRP/QRP QSOs, QRP/QRO QSOs and the total number of DXCC countries worked on QRP.. That is just three numbers, no back up is needed. A DXCC country can only be claimed once and it can be a QRP/QRO QSO. Please start keeping a running check in your log or QRP QSOs and a DXCC tick list. This way little effort will be needed to submit your entry.

CZEBRIS
I am waiting for details of non-UK activity from OK1CZ. However this event was very poorly supported by the UK. Only 4 logs were submitted and all of them remarked the absence of OM activity and poor conditions.

CALL	POINTS	Tot.QSO	80	40	20	PWR	EQUIPMENT
G4JFN	137	53	31	5	17	5	CORSAIR, TRAP DIPOLE
G3ESP	96	43	30	2	11	5	TS-50, PARALLEL DIPOLES
G3JNB	42	20	19		1	1	HW-8, 285 FT DOUBLET
G3LHJ	38	11			11	5	OAK HILLS, TA33JR

Check logs received from G8PG and G0KZO with thanks

SOMERSET CONTEST
Again very few entries despite valuable prizes being offered. Just 4 logs were received, the winner being VU2NGB and G3XUO winning the prize draw.

CALL	QSOs	POINTS	COMMENTS
VU2NGB	29	106	All on 40m.. mostly AM, 3W, inv-V-dipole
G3CQR	15	71	14 on 80m CW, 4W 100 ft doublet
G0OZO	11	31	80/40/20m CW, 5W, 100 ft doublet
G3XUO	5	20	All on 80m CW, 5W, 60 ft wire

REMINDERS
AGCW Summer Contest, 20 July 1500z to 21 July 1500z.
Call CQ QRP TEST. There are four categories: VLP (under 1W out, QRP (1-5W), MP (5-25W) and QRO. Exchange RST serial and category i.e. VLP or QRP. Full details from me. Please send an SAE
IARU Europe for QRP, 17 June. Rules in QRP Club Handbook.
Europe for QRP 27/29 September. Rules in SPRAT 85.
Please check the rules of major contests as many of them now include a QRP section.

Note to all contest organisers. I am happy to publicise all QRP contests and include them in the QRP Calendar.

SSB COLUMN : Dick Pascoe GØBPS

Seaview House, Crete Road East, Folkestone. CT18 7EG. Tel: 01303 891106
Email : Dick@kanga.demon.co.uk. via packet to GB7RMS

My last column with details of the new Activity Time seemed to generate a little interest in this side of the hobby. Some E-mail comments on gqrp-l about it have been made with little activity being reported. As summer approaches we can hope for a little more.

Walt N1CJB (8105)wrote with some information on his latest catches on ssb. With over 30 countries worked in just a few days. Some fairly exotic ones nabbed included; CF4, HP2, 8R1, 9L1, HK7, 9L1, ZX0, 9A1 and several other more usual Europeans for us. Walt was using the Ten Tec Argo 556 the dedicated QRP version of the Scout 555. His antenna was just a ground mounted Butternut for 80-10m. I have heard other good reports on these antennas from varying sources. I know that Chris G4BUE used one for some time. My own Cushcraft R5 is horizontal for a while for servicing. I hope to have that back in operation soon.

As I write this, the cases are being packed for the annual Dayton trip. My credit card took a beating even more so this time. The change of date has increased the fares by 25%. Reports from 'RJV and myself in the next issue.

Don't forget that this column is not just for the hf man, vhf and uhf reports of ssb activity is also accepted.

Your comments and views are eagerly awaited via snail mail, packet (GB7RMS) or via E-mail to Dick@kanga.demon.co.uk

72 de Dick G0BPS

NOVICE NEWS Steve Ortmayer G4RAW

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

City and Guilds Exam Questions. City and Guilds are always looking for new questions for the Novice Exam and they pay for any they think are suitable and will go into the bank of questions. So if you are familiar with the syllabus you may be able to help and earn some cash. The Novice training scheme has been running for five years now and the RA are keen to have a joint review of it with the RSGB. So if you have any comments on problems with the Novice Scheme and how it can be improved then pass them to the RSGB project YEAR Co-ordinator Phil Mayer G0KKL (QTHR) or via the RSGB. There is still no news on extra frequencies for novice ops so I hope this is taken up with the RA.

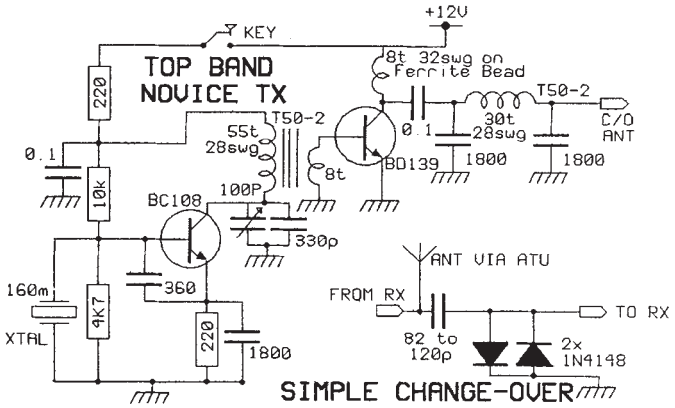
If you find the speed than some DX CW stations send Morse a bit daunting then try the G4OPE keyer from Sprat available as a Club Kit. The speed control works on the Morse in the memory so that you can enter your callsign nice and slow and then adjust the speed control to match the speed of the DX station and when he sends QRZ press the send button on the keyer and out comes your call at high speed.

The mustard tycoon Colman said that he made his fortune not out of the mustard people ate but out of what they left on their plate! A Colmans mustard tin is a well used enclosure at G3ESP and Walter has written to say he has squeezed a Pixie TXCVR into a mustard tin. G3ICO has also built Pixie and both have used a 2N3866 for a PA.

Getting simple transmitters to go. Gerald G3MCK has written with advice on the Universal QRP TX. If you are getting poor results try changing the values of the two capacitor on the Xtal oscillator transistor (360p and 1800p in the top band version).

Novice Top Band I have been advised that Novice calls have been worked on top band so you may like to put a bit of RF on the "Gentleman's Band" with our old friends the Universal QRP TX I have built this version but have not been able to work any Novice Stations with it. What frequency are you all on??

Bye for now keep sending me your news and ideas.



VHF MANAGER'S REPORT

John Beech, G8SEQ 124 Belgrave Road, Wyken Coventry CV2 5BH
Tel. or Fax 0203 617367. Packet Homebbs : GB7COV

An enquiry from Pierre F1CCE about a VHF antenna I designed more years ago than I care to remember, reminded me that one of its uses was for a VHF DF antenna, so I thought I would put down a few thoughts bases on past experiences with VHF DF's with the local club.

Our club, CARS organises 2m foxhunts as a sort of "hide and seek" with radios, with a set of rules designed to make the fox relatively easy to find within an hour or so. This (in theory) allows us to find the fox during daylight and have time to discuss the event over a pint in the nearest pub. The first to find becomes the fox for the next event.

When I first started I used to plot bearing on an Ordnance Survey map and use sophisticated antennas with calibrated nulls. Nowadays I tend to use a handheld & helical with body shielding for directivity, with about the same degree of success as before. I often don't even have a map with me, as our rules stipulate that the fox has to be within a 10 mile radius of the clubhouse.

A large element of luck is often involved with finding the fox first. When the fox is particularly strong you know that you are very near if you can still hear him/her with the antenna disconnected, so I always remove the antenna during a transmission to see if I can still hear the fox. Even so it has still taken me over 20 mins to find a fox that I could hear without an antenna! One of the problems is that the average amateur RX is just TOO sensitive when close in (say ,<100m)..

I reckon a dipole with a diode probe & 50 uA meter would work better i.e. a VHF field strength meter. When all said and one, a variety of techniques & equipment need to be tried. Antennas with directivity and gain can be useful when far off. One club member improvised a short antenna from 2 inches of barbed wire when he got close in!

VHF signals can be very deceptive. One fox put a very weak signal into the start by running a lot of power into a mobile whip while in an underground car park! Another was a few miles away, but used a beam antenna. Very confusing when you happened to be in a null. One even used very low power less than 100m from the start. He was found by the first person within 10 mins but no one else found him for TWO HOURS The first to find admitted it was pure luck that he acted on impulse & searched the local area first.

On one DF event I was late coming home from work. I actually heard the fox's first transmission while over 50 miles away! The fox had gone to a high spot outside Coventry & I picked him up from between Newbury and Oxford! (I've since used that location to work Scotland and Cornwall during a QRP contest.) That guaranteed nobody would find the fox in the first half hour, as it took nearly that long to drive there from the start!

Whatever the outcome of the event, someone always has an amusing or downright funny tale to tell after the event - one person even got himself arrested after being spotted acting suspiciously by the local neighbourhood watch!

If you fancy organising your own event, but aren't sure how to go about it, send and SASE to me & I'll send you a copy of our rules with some explanation as to how/why we arrived at them. All the equipment you need is Fax : a transmitter, antenna, spare batteries and if possible a spare rig - oh and some local knowledge is useful. Seekers: minimum requirement a receiver and an antenna and transport. A map and a compass is useful, especially if you don't know the area very well.

(I've cycled down most of the country lanes around Coventry and know where a lot of the footpaths are, so I can usually get away without a map)/.

If you have any anecdotes on VHF DF or want to organise a G-QRP Club event please write and let me know. We could have one at George's Bash in Rochdale (October) if there is enough interest.

72 & 72 de John G8SEQ

MEMBERS' NEWS

by Chris Page G4BUE

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

Elsewhere in SPRAT is **G3TUX**'s announcement of the *Summer Party* on the 3rd August. My thanks to Chris for continuing the party and providing a meeting place for QRPers in the south-east to meet and socialise. June and I look forward to meeting some of you there.

Before that we have the *Dayton Hamvention* in Ohio, USA, later than usual in the middle of May. This is an attempt to have better weather than recent years, something which we in the UK applaud! June and I will be in the USA between 9th May and 4th June and look forward to meeting members at Dayton. This column is being written prior to us leaving for the USA, also earlier than usual, to catch George's deadline for the Summer SPRAT. My apologies to members who may send news and information after that; I will hold it over for the following SPRAT.

Gabriele's, I6QGA, homebrew QRP station.

I6QGA has an impressive station of all homebrew equipment (see photograph below), including the keyer and paddles. Gabriele has a MFJ 9020 (5W) transceiver to a two half-wave collinear array antenna, and a KK7B receiver and W7ZOI broadband 5W PA transmitter for 40, 80 and 160m. His 40m antenna is a centre fed zepp and W3TS ATU, his 80m antenna a half wavelength zeppelin with W3TS ATU and the same for 160m but with a Lake ATU.

Al, KB1FK, with the remains of the *DX Hog* after a barbecue at his Alva, Florida QTH.

GM6JAG thinks he bought the last unbuilt HW9 in the UK and is seeking tips and mods for it that won't spoil its originality, i.e. by building them into an external matching case. He is going to add the WARC kit to it, and had to buy it with a few bits missing and would like to hear from anyone with a scrap HW9 but with case, chassis and shield metalwork in good condition. Mel is also after a copy of the *Hot Water Handbook* if anyone has one to spare.

G4VPM, will be in the Maldives on holiday for two weeks from 8th September and is planning to be QRV, hopefully as 8Q7PM. Andy will be QRP only and if he takes his Butternut vertical, will have a good selection of bands.

DL2BQD will be on holiday in Yorkshire between 24th June and 6th July and hopes to meet members on his 30m 1W rig. Dieter is also going to the G/DL QRP meeting in Pottenstein in May.

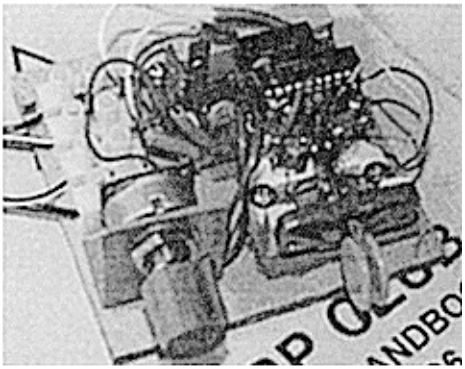
GØBXC is after any information on modifications to the side-tone of his Atlas 100 QRP transceiver so that it sounds "less puffy and more of a pure note". Paul has a good range of equipment in his shack as the photograph below shows.

Paul's, GØBXC, impressive shack.

G3JNB is also being plagued by the 'fish phone QRM' close to 3560kHz. Victor says they don't use callsigns or procedures and do not speak English and are often quite strong in Norwich. The signals appear at random, stay a long time and then just switch off. He wonders whether an approach by the Club to the RSGB may be worthwhile.

ON5UP was planning to be QRV with QRP on 40m from Noimoutier Island (near Nantes) between 9th and 20th April. Andre was going to use his homebrew Malta 40 which he says works very well on receive and transmit. He is going to build a Malta 80 (for 80m) with a FT50 and 5MHz cystal filter. Andre asks if other members are using the Malta 80 and what modifications to the original circuit have they done?

DL2BQD stayed in Norwich over Easter and had some nice QSOs on 2m via the Norwich repeater. Dieter tested his son Tom's (**DL4NSE**) little QRP rig with a FD4 antenna. The circuit is by **DK6SX** and it worked immediately with a QSO with HB9COI. Dieter has finished the SPRINT and was going to test it with a wire pyramid antenna.



Dieter's, DL2BQD, Kirsta keyer.

Dieter has also built the Kirsta keyer from *Kanga* (pictured above) but says " I was so lazy to solder a box from copper plated tins that I put it all on a scratch of bread board". The little paddle knobs are made from a children's play toy, a flea hop, but the mechanical part is well done from an old ex GDR telegraph relay which enables sensitive adjustment.

Jean, **ON7EZ**, has built the Malta 40 and is now building a matching ATU. **ON6QF** has begun building the 10MHz transmitter from SPRAT 86. Louis has just finished building an ATU for symetrical antennas in series or parallel and with one spool for 80 to 10m only. **ON4KAR** and **ON5AG** are regularly QRV on 80m in the mornings. Rene has built a European version of the W7ZOI receiver from Handbook 90 and his next project is a matching transmitter.

Kang, Secretary of the *VU QRP Club* working from his lab.

Kang (8563) is the Secretary of the *VU QRP Club*, which has recently been formed in North India and "is another milestone in QRP history. The club started with 50 members and is functioning well. A few QRP projects have been developed and a club magazine */P* is being produced". Kang acknowledges the help and advice given to them by George, G3RJV, and Gus, G8PG. The Club is now busy desiging a multi-mode multi-band QRP transceiver.

Yves, **ON4YD**, has built the GQ40 after finding some mistakes in the printed circuit and Willy, **ON5KN**, is using a PIXIE 3 (version by ON5KN) regularly for QRP QSOs. **ON6GW** has also built a Malta 40 and is now going to build a Malta 20 (for 20m). Guy is also going to build the c-mos keyer from SPRAT 84. **DL4EEC** is running a FT840, an old HW101 and some homebrew QRP transmitters and receivers for 20, 40 and 80m. Alexander's antennas are a two element beam for HF and a W3DZZ. His best QRP QSOs are with a VE2 with 100mW CW and a UA3 with only 10mW SSB.

WB6FZH/KH6 has a new QTH on the edge of Kaneohe Bay, Oahu north of Honolulu. Greg is using a Butternut vertical and his 2.5W from a Ten-Tec C21 is "doing well" on CW and SSB. He is using a HRO receiver with plug-in coil drawers and a Drake 2B/BQ "when the bands are populated". Greg frequents 14060 and 10106/116/123kHz and can sked any HF band. Graham, **G4NMD**, has moved to Henfield in West Sussex, about five miles north of me.

G4AWY asks about QRP calling/working frequencies on VHF in the UK. Richard says there does not appear to be a dedicated channel for QRP FM QSOs on 2m or 70cm and suggests channels for stations using 3W or less ERP.

Con_ .ulations to **2EØANY** who is very QRV, especially on 80m. Paul, who is 13 years old, passed the 12wpm Morse test when he went for the Novice test and is now studying for the RAE in December.

G4XNP has traded his faithful Argosy for one of the new *Index* QRP Plus transceivers. Dave was able to work around Europe on SSB with it, but not to the USA. After ensuring his antennas were ok, he checked the ouput and found it was only 1W average and 3W PEP, whereas it was 8W on CW. He says that although the radio is not designed for AM reception, the BBC World Service can be received by slope detecting the signal giving acceptable reception of speech for those who want the news while on their travels! In answer to **GØLCQ**'s comments, Dave says he is able to improve the audio quality of the Index by backing off the mic gain; his microphone is the small electret item supplied by the same company that supplied the radio.

G3JQ thanks **ON5LJ** for his well-drawn circuit and chassis details of his 'Paraset' copy. Ian says the receive section is particularly good and the reaction smooth and stable, making it very easy to use. He acquired an old HRO and says "there is just 'something' about owning and using old gear, and even replicas of old gear, and it can be used QRP". **PAØLH** is also using a 'Paraset' and worked **ON5LJ** with it on 80m in December. Lew was encouraged by his father, PAØFF in 1946 to build his first receiver and made his first CW QSO on 6th July 1947 with G2ZC, the QSL still hangs on the wall of his shack.

I welcome more photographs for this column and please remember you can also send me information and news via the Internet, my e-mail address is at the top of the column. Let me know how your summer goes, by 20th July please.

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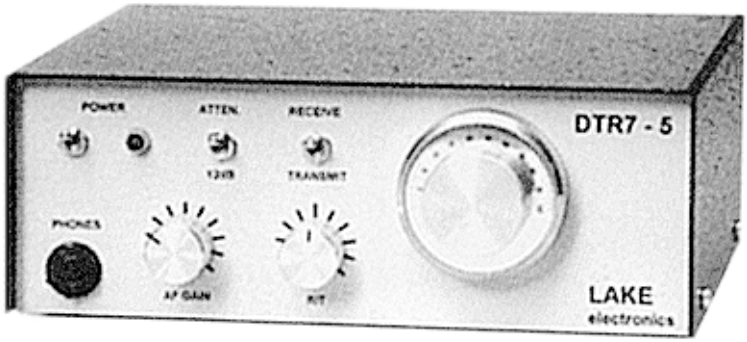

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RIT ± 4kHz
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