SPRAT

THE JOURNAL OF THE G-QRP CLUB

DEVOTED·TO·LOW·POWER·COMMUNICATION

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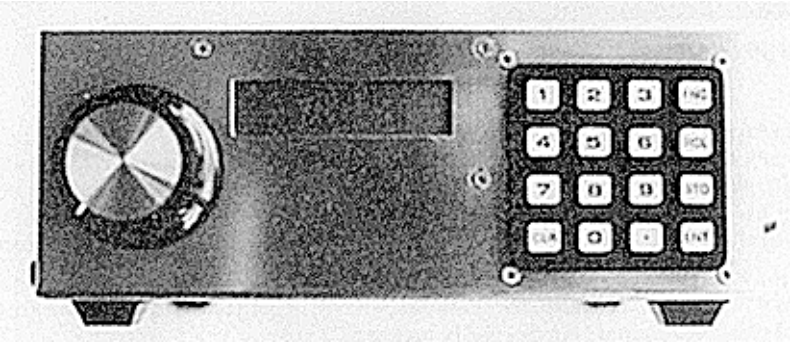

The G4OPE Direct Digital Synthesiser

A Exciting New Project with Lots of Features + A Club Kit

MINI CRYSTAL CHECKER/XCO - W1FB 455 BFO - DUMMY LOAD
SUPER SNIFFER - MUSICAL WAVEMETER! - W1FB PIXIE - VLF CONVERTER
LIPSTICK ATU - HW9 TUNING MOD - ALTERNATIVE POWER WEEKENDS
IF AMPLIFIER IN SARDINE CAN - G4OPE DIRECT DIGITAL SYNTHESISER
QRP CALENDAR - ODDS & ENDS - QRP NEWS - YEOVIL & ROCHDALE 1997
ANTENNAS, ANECDOTES, AWARDS - COMMUNICATIONS & CONTESTS
NOVICE NEWS - SSB NEWS - VHF REPORT - MEMBERS NEWS

1996 WAS OUR TWENTY FIRST YEAR !

JOURNAL OF THE G QRP CLUB

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EDITORIAL :

ANOTHER SPRAT SCOOP

This issue of SPRAT is the first UK amateur radio publication to feature a Direct Digital Synthesiser. The project by G4OPE is a very useful item to have on the bench. It could form the basis of a multiband transceiver (it has mode and band switching facilities), an external VFO for an existing transceiver or a high quality signal source. It has a 0-15MHz signal generator function. A kit will be available shortly.

But SPRAT is not only about complex projects, in this issue we also feature a range of simple small items to build. This time news and other items have crowded out some of our practical projects (we like to keep SPRAT about two-thirds practical) but they will be back in full force next time.

RENEW YOUR SUBSCRIPTION.

Your G QRP Club subscription is due by January 15th 1997. Please help us by paying it promptly and using the instructions in the pull out section in the centre. UK members are urged to **pay by standing order** as this attracts lower bank charges .... and ensures your continuing membership without having to remember about it each year.

It also helps us if you refer to the "Who Does What" section in the Members Handbook when writing to club officers. It would certainly reduce my mail by half and save the postage as I send on the information or query to the correct officer.

May I wish you all a happy and fulfilling year in 1997.

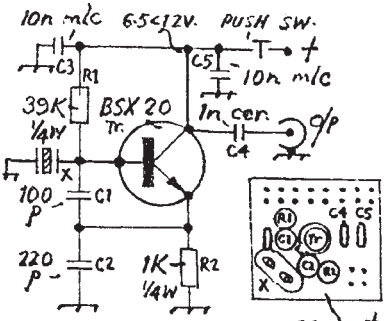
72/3

G3RJV

EDITED BY GEORGE DOBBS G3RJV ARTWORK BY A.W. (MAC) McNEILL G3FCK
PRINTED BY SHOREHAM COPY, 3 JOHN STREET, SHOREHAM-BY-SEA. SUSSEX

MINI CRYSTAL CHECKER / X.C.O.

Mr. A.W. McNeill G3FCK 40 Turnpike Road. NEWBURY



XTAL.	D.F.C.
3·560	3·559
7·030	7·027
10·106	10·104
14·325	14·322
18·070	18·067
21·060	21·056
24·910	24·906

m/c - multi-layer ceramic
p - polystyrene, cer - disk

G3FCK

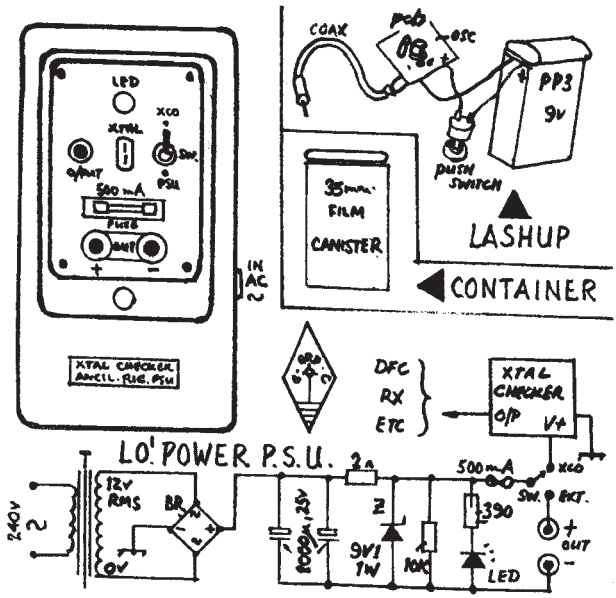
This circuit provides coverage of seven bands, 80 - 12m, inclusive, a very small piece of perfboard, and can be used as a handy crystal checker or as the basis for a QRP transmitter.

The unit fits on a 22mm square board with room for flying leads to V.pos, V.neg, output and ground.
It may be used in a lashup state with a PP3 battery connector, push switch and small length of coax with plug, or can form part of a more ambitious checking device.

At present it form the purpose of a duplex unit in this station; acting as an integral part of a home brew, low power PSU for ancillary gear.

As crystals are connected directly to ground, values of QRG will be found to be a few kHz lower, as shown in the table.

The complete mini-rig can be stored with leads etc. In a 35mm can, appropriately labelled.
Checks can be made on receiver calibration, and use can be made of the "mini" as a source for homebrew receiver projects etc.



Dont Forget..
The G QRP Club Annual
WINTER SPORTS
Call "CQ QRP"
Any Band, Any Time from 24th December to 1st January 1997
Reports to G3MCK
[See QTH in this issue]
G4DQP Trophy for the "Best Overall Effort"
5 watts or less on
3560 - 7030 - 10106
14060 - 21060 - 28060

A TUNEABLE 455kHz BFO

Doug DeMaw, W1FB, PO Box 250, Luther, MI 49656. USA

Many amateurs own 455-kHz mechanical filters that were purchased without the matching USB and LSB BFO crystals. These crystals are very expensive. A quick and cheap solution for receiver builders is a tuneable BFO. Fig. 1. Shows a practical circuit.

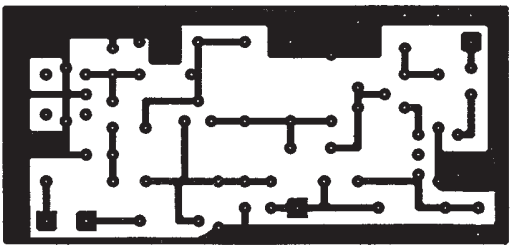
L1 and T1 are transistor radio 455-kHz IF transformers. D1 is a tuning diode with a nominal capacitance of 56 pF. C1 determines the amount of frequency change via R1. The frequency shift is 4.5 kHz with the values shown. R12 is added only if Q2 self-oscillates when T1 is tuned for resonance.

A quality 2-watt carbon control is best for R1 to ensure longevity from frequent use. A 10-turn helipot and dial would make tuning less critical. Avoid getting peak output with the T2 slug at the upper end of its range. This gives rise to maximum output at 910 kHz. The slug should provide a 455 kHz peak at midrange.

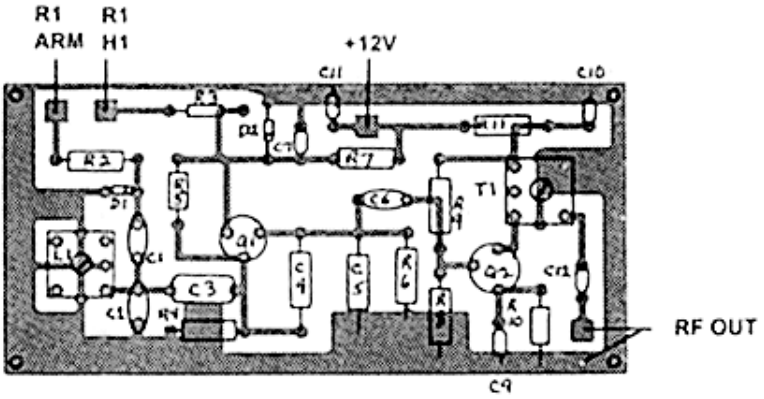
Fig. 2 is a scale PCB pattern as viewed from the etched side. Fig. 3 shows the parts placement as seen from the component side of the PCB.

This circuit may also be used as a carrier generator in an SSB exciter. Two Trimpots and a SPDT switch may be substituted for R1 to provide preset LSB and USB operation.

Frequency stability is good. I measured 65 Hz of short-term drift from a cold start to one minute later. Thereafter, random drift was plus-minus 6 Hz with the circuit enclosed in a shield box at a room temperature of 70 degrees F.



W1FB BFO ETCHED SIDE



W1FB BFO COMPONENT SIDE

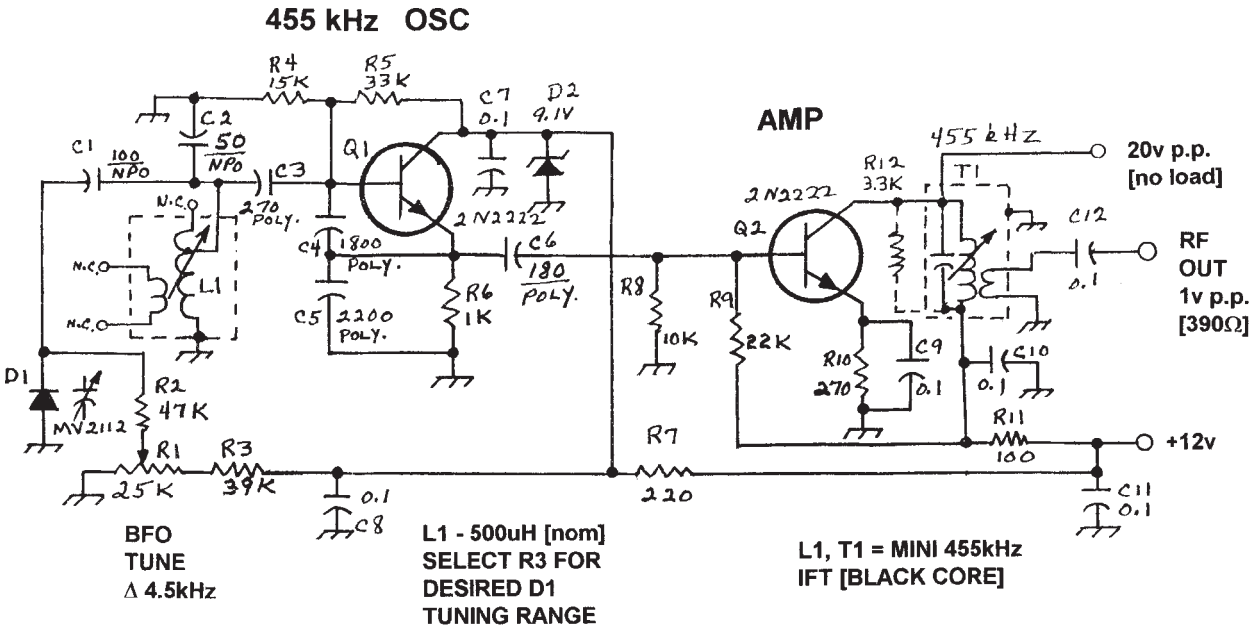


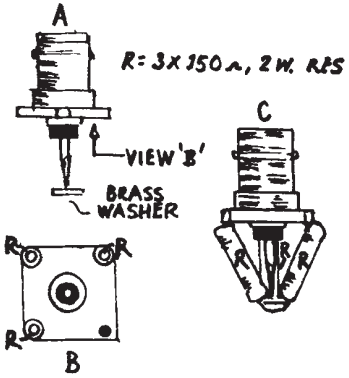
FIG.1

DOUG DEMAW
9-24-96

W1FB BFO CIRCUIT

GM3OXX TECH TIPS : 50Ω DUMMY LOAD & SUPER SNIFFER

George Burt, GM3OXX, 6 Glenside Ct. Armdale, Bathgate, West Lothian. EH48 3RX



Trying to build the G3PCJ 5w power meter, I used some old 2w carbon resistors which, alas, changed value during soldering. I looked for a modern equivalent and spotted the Maplin 2w metal film resistors. I ordered some 68Ω resistors and noticed they also sold 150Ω. I converted all my home-brew 50Ω dummy loads using three 150Ω resistors, giving 50Ω at 6w input. The SWR was perfect to 28MHz.

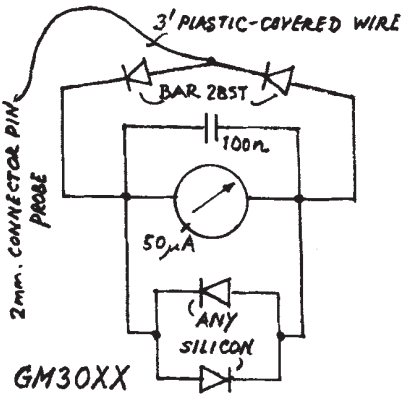
The resistors are mounted on a BNC socket (or, if you can find one, a BNC male socket). Solder a thick piece of wire to the centre, then place one resistor into three of the socket holes. Take a clean 6BA brass washer, slide over the four wires, bend and solder. With a large soldering iron, or gas gun, solder three leads on the base.

The result - a perfect 50Ω, 6w, load. The resistors cost 10p each. My power meter works like a charm!

I spotted this idea in a very old Handbook but without the meter protection diodes and it is also in the new 1996 ARRL Handbook page 22.64 chap. 22.

I had some BAR28ST Schotty barrier diodes I had bought from the Maplin catalogue : Code QQ13P at 55p each. They have a low forward voltage, 410mV and are good to 10GHz.

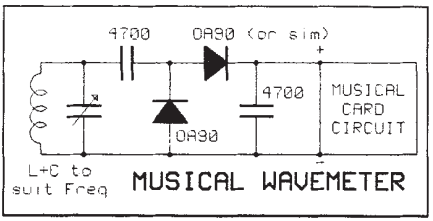
Solder a pair across a 50uA meter and a 0.1uF decoupling capacitor. It produced a better sniffer than my RF choke / diode type.



THE AFTER CHRISTMAS PROJECT

A MUSICAL WAVEMETER

Rodney Seymour, G1TNE, 134 Beaumont St. Plymouth PL2 3AH

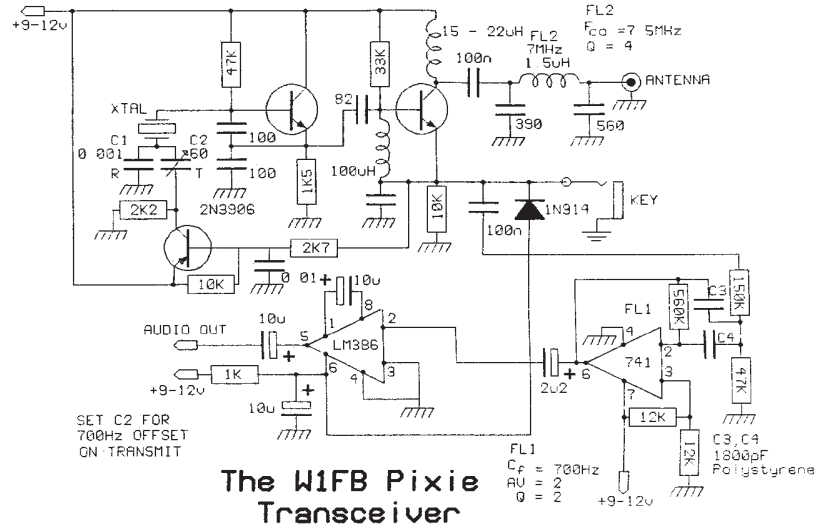


A little novelty circuit for after Christmas! It uses RF Energy to power the circuit in a Musical Christmas Card. The wavemeter is placed near an RF Source and tuned in the usual. It may need close coupling to drive the circuit. The tune plays loudest at resonance and die either side of peak. To modify the Christmas card : Remove from its housing. Remove the battery and connect the output from the voltage doubler. Short out the switch contacts on the card to leave the circuit switched on.

MY VERSION OF THE PIXIE with Transmit Offset & AF Filter

Doug DeMaw, W1FB, PO Box 250, Luther, MI 49656. USA

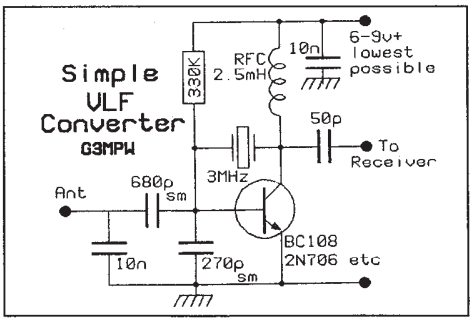
My version of the PIXIE Transceiver (see SPRAT 88 for the G3LHJ version) is shown below. It includes 700Hz offset on transmit and a single AF filter stage set at 700Hz.



The W1FB Pixie Transceiver

A SIMPLE VLF CONVERTER

Stan Walker, G3MPW, 14 St. John's Dve. Scawby, Brigg. S. Humberside

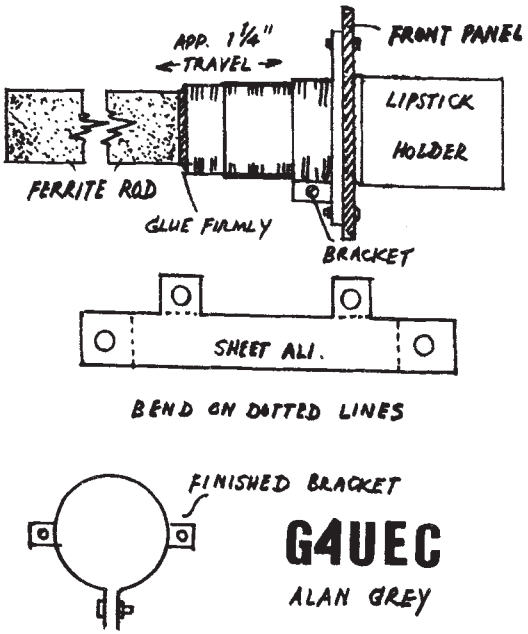


I built this converter about 30 years ago from an American publication. It is a mixer/oscillator. The incoming VLF signals mix with the oscillator frequency and are tuned on the station receiver.

In my case I use a 3MHz crystal and 73kHz would be tuned on 3.073MHz (3.00MHz + 73kHz) and 2.927MHz. The converter can be easily checked by listening for BBC Radio Four (198kHz) which can be tuned on 3.198 or 2.802MHz. Other crystal frequencies can be used provided the output frequency can be tuned on the receiver and there are no strong adjacent signals

"Lipstick" NO COST ATU

Alan Gray, G4UEC, 59 Little Mead, Hatfield, Herts. AL10 0UQ



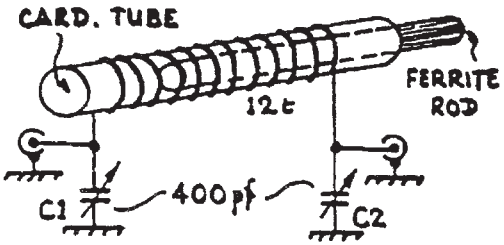
When looking through the *G QRP Club Antenna Handbook*, I came across the "No Cost ATU" by Tony Haas, G4LDY. I wondered if I could build it but control the movement of the ferrite rod from the front panel. Sometime later I saw my XYL using her lipstick. The idea came to me. I could use a lipstick container with its twist movement to slide the ferrite rod in and out of the coil.

After some sweet talking .... I was given an old lipstick container to try the idea. The following design was the result.

It works well - give it a try.

BELOW :

The Original G4LDY No Cost ATU from the G QRP CLUB ANTENNA HANDBOOK



"Now You See It - Now You Don't" HW9 TUNING MOD

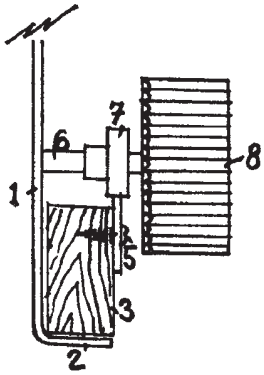
Gus Taylor G8PG 37 Pickerill Road, Greasby, Merseyside, L49 3ND

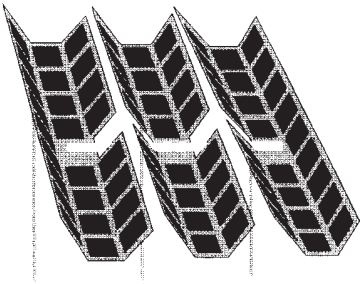
The narrow band crystal filter modification gave my HW9 excellent selectivity, but one could not really use it because the main tuning rate was far too fast.

Then I added this modification. Fitted quickly and without even scratching the HW9, it can be removed in seconds.

The number references to the drawing are as follows:

1. HW9 front panel. 2. HW9 cabinet lip. 3. Hardwood block cut to fit snugly (if necessary pack at the base with thin strips of plastic to prevent movement). 4. Securing claw of slow motion drive. 5. Wood screw. 6. HW Tuning capacitor spindle. 7. Slow motion drive. 8. HW8 tuning knob.





ALTERNATIVE POWER WEEKEND WORKSHOPS

Have you wanted to build a Wind Generator, Solar PV, Water Heating System or any alternative technology project? Don't know how or where to start or have no workshop available. Working with other people of varying ability in a well equipped workshop can solve many problems !

A series of practical workshops are being held by **Robert Keyes, GW4IED, of KEYSOLAR SYSTEMS** working from plans or to your design. Held in Newport, close to the M4 J25, with Hotel and B/B close by, hard standing suitable for caravans available on site. Workshops run through 1997.

Tel/Fax 01633 - 280958 during office hours for more information.

OUR CONGRATULATIONS TO G3PDL

The G QRP Club Treasurer, Peter Linsley, G3PDL, was recently installed as the 49th President of FOC (First Class Operators Club) joining a very distinguished band of radio amateurs who have been past presidents.

TRIP TO 1997 FRIEDRICHSHAFEN HAMFEST

Tuesday 24th June to Tuesday 2nd July 1997

with Discount for G QRP Club Members (note the club will also have a stand)
Coach Trip from Barnley, South Yorkshire, with picking-up points en route to Docks
The Biggest Amateur Radio Event in Europe set on beautiful Lake Constance
Information from: Mr. E. Bailey, G4LUE, 8 Hild Ave. Cudworth, Barnsley. S72 8RN.
Tel: 01226 - 716339, Mobile 0836 - 748958 [Book Early to Avoid Disappointment]

AN IF AMPLIFIER IN A SARDINE TIN with SMD & Conventional Parts

F. AMBRI (I4AFQ) & E. MARTINETTI (IT9VKY)
Via Prov.le 112/f S.M.Ammalati 95020, Acireale. Italy

Please note this article uses the now obsolete Plessey SL range but surplus TO3 SL devices are available from J. Birket, 25 The Strait, Lincoln, LN2 1JF. 01522 - 520767

The main philosophy of this project was to build an essential stage of Intermediate Frequency amplifier, a crystal filter and a product detector all assembled into a metallic box as small as a sardines tin. This "plug and play" module can be used for any QRP portable rig. Your fantasy is its only limit. By using few IC's and one mosfet, this stage performs as follows:

- more than 70 dB gain;
- more than 100 dB AGC range;
- SSB of 50 dB at 1.5 Khz (depending on the quality of xtals)
- manual RF-Gain control;
- meter output.

Inside the circuit

Figure 1 shows the electric diagram of the huddle. A mosfet has been chosen for the first amplification. Manual RF-Gain can be achieved applying a voltage from 0V to 4V to Gate 2. The high-impedance input allows any adaptation to the front-end. The Drain resistor determines the input loading impedance of the filter. An identical impedance must be "seen" by the filter at its output. This is performed by Rx plus the input impedance of the next IF amplifier.

The filter is the "well-known" ladder [1] made of four computer crystals at the frequency of 8 Mhz. Experimental adjustements have allowed us to reach a good performance.

Two "evergreen" SL612 (or SL1612) by Plessey, [2] make a clean amplification of 60 dB. The voltage at their pin 7 controls the gain in a range of 70 dB (for each stage). The "S" meter can be placed here (via a proper resistor) in order to display the AGC voltage, directly proportional to the strength of the received signal.

The SSB is detected - injecting an external BFO - by the NE602 which has itself an additional gain of about 18 dB.

An essential active filter has been made with an op-amp (the low-noise NE5534) meanwhile the SL621 generates the AGC voltage [3]. The AGC dynamic range is setted by VR1. The attack and decay times are set by the capacitors C31,C32 and C33. Details are shown in our circuit for an hold-time of 1 second.

Mounting the board

The assembling of this board requires a minimum of patience. Fig. 3 & 4 show the layout of the board from the solder and the component side.

The 8-pin DIL socket allows us to mount two different kinds of IC. The DIL series (SL1612 and SL1621) can be placed as usual but the SL6xx (in TO5 can) is inserted as shown in fig. 5. The choice of tulip sockets is imperative!.

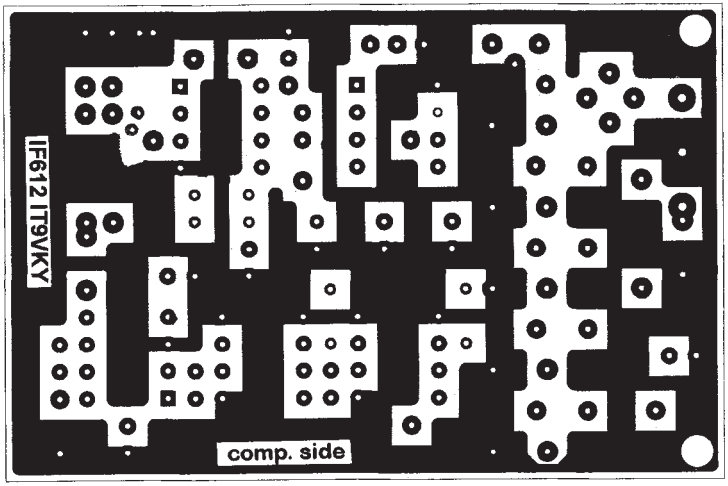
The board must be enclosed in a tin (of sardines, empty please!) for shielding. The input and the BFO can be fed by using a piece of UT-141. Feed-through capacitors are employed for all the remaining lines.

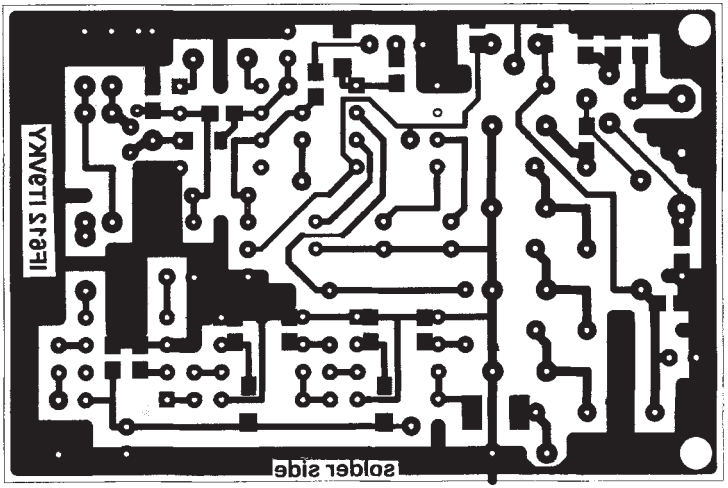
The capacitors in the xtal-filter make a detuning of a couple of KHz. An apposite VXO circuit must be inserted for LSB, USB or CW detection; we preferred to enclose it in another ST with the SSB exciter (we'll see later).

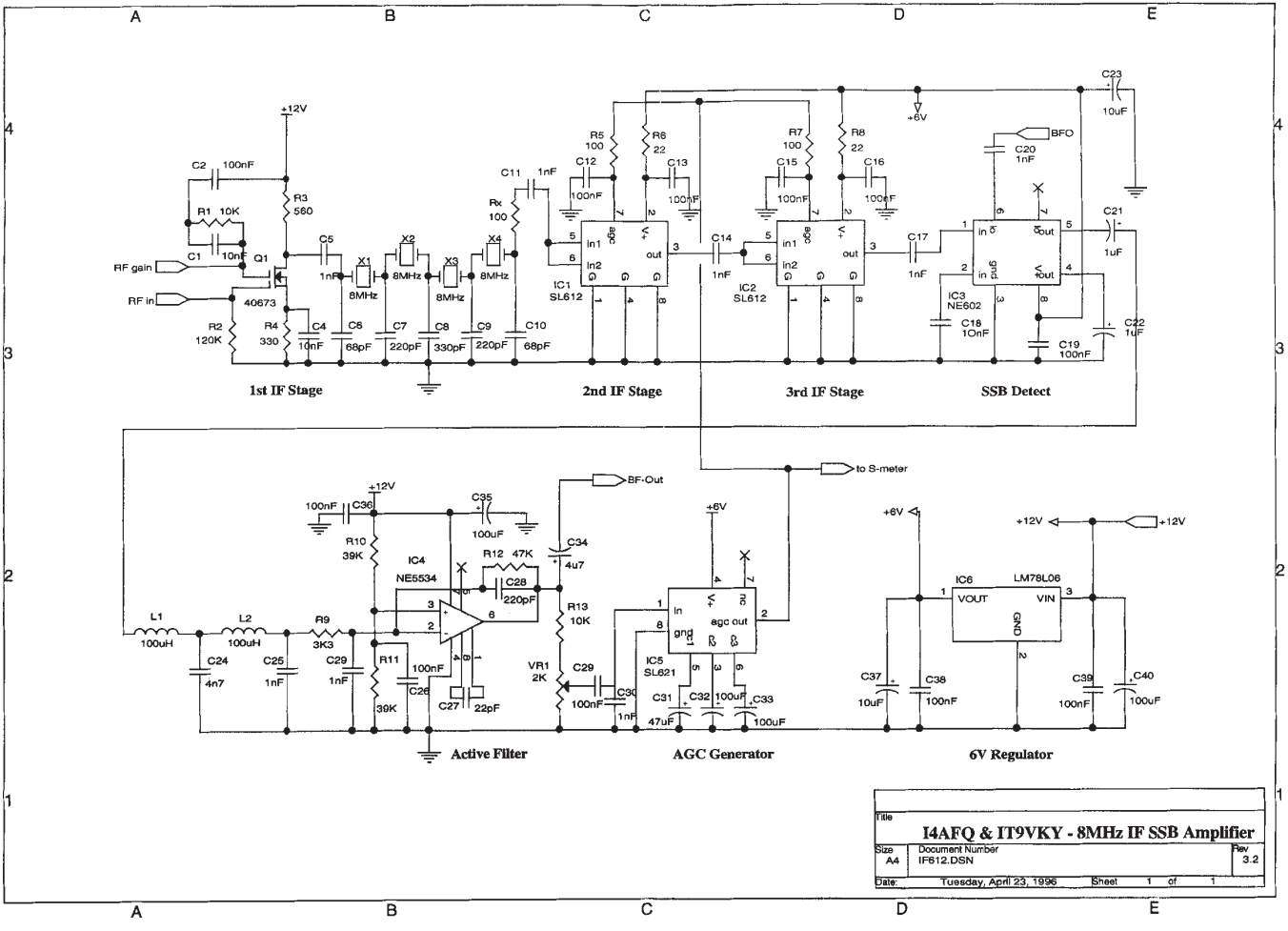
This board has no secrets. Once mounted, it should work at the first attempt. VR1 is the only trimmer to be set (as said before) for the AGC action: the ear is enough, the oscilloscope is fine!.

Troubles?
For any problem, or for download diagrams, PCB drawings or news, it is possible to reach us by Internet at the following E-mail address:
emartin@alpha4.ct.astro.it (web page is under construction - http://w3.ct.astro.it/emartin/qrp/qrp.html)

References
[1] **W. HAYWARD (W7ZOI)** *"A unified approach to the design of Crystal Ladder Filters"*- QST, May 1982 and *"Designing and building simple Crystal Filters"* - QST, Jul. 1987
[2], [3] **PLESSEY SEMICONDUCTORS** - *SL600 Series Communication Circuits Databook*







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Size A4	Document Number IF612.DSN	Rev 3.2
Date: Tuesday, April 23, 1996	Sheet 1 of 1	

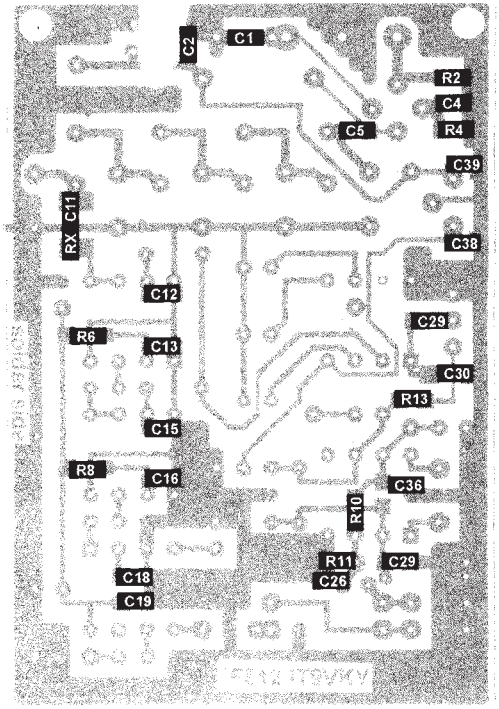


Fig. 3 SMD Layout
on solder side

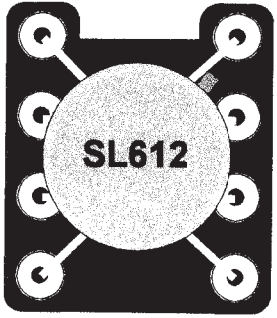


Fig. 5: Placing a TO3 IC in a DIL socket

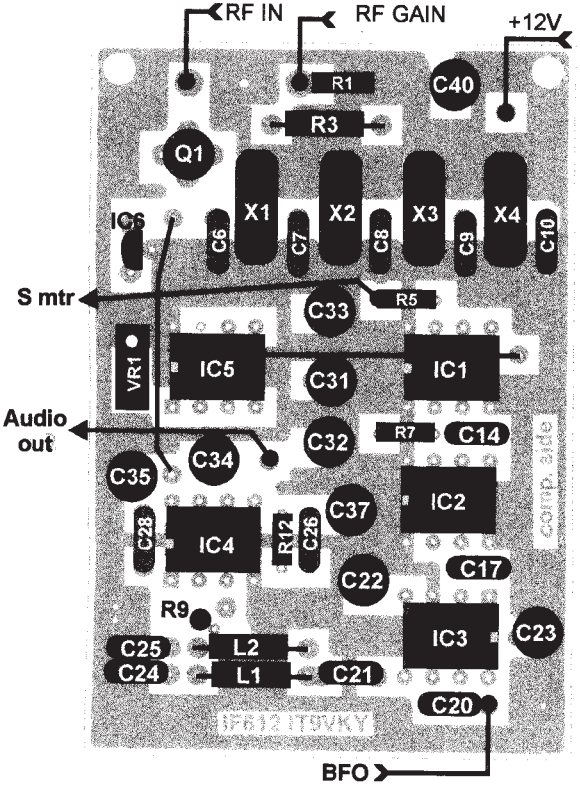


Fig. 4 IC & discrete layout
on component side

A DATE FOR YOUR DIARY

ROCHDALE MINI-CONVENTION 1997

SATURDAY OCTOBER 25th 1997

WE HAVE MOVED THE DATE TO AVOID THE LEICESTER EVENT WHICH AT THE TIME OF WRITING WAS NOT FIXED BUT WILL NOT BE ON THE 25th

G QRP CLUB US REPRESENTATIVE : CHANGE OF ADDRESS

Mike Kilgore KG5F, 10000 Walnut Street #2062, DALLAS, TX 75243.

The NORWICH TRANSMITTER [SPRAT 88]

The author, Bruce G3WCE, has pointed out a number of errors in the SPRAT article and is willing to supply the correct circuit information for an SAE to Bruce Edwards G3WCE, 232 Earlham Rd. NORWICH. Norfolk. NR2 3RH

GERMAN G QRP CLUB MEMBERS MEETING IN MAY 1997

For more information please contact
Rudi Dell, DK4UH
Weinbietstr. 10, 67459 Boehl-Iggelheim. Tel: 06324 - 64116. PR via DBØGE

THE INDEX TO SPRAT ARTICLES:

The index of SPRAT articles from issue one is now updated to include all issues for 1996. It is available for a FIRST CLASS STAMP from: **REVD. TREVOR WALKER , G0TWE, THE RECTORY, BINBROOK, LINCOLN. LN3 6BJ**

A DIRECT DIGITAL SYNTHESISER

Mick Hodges, G4OPE, 40 Ennersdale Rd. Coleshill, Birmingham. B46 1EP

The Direct Digital Synthesiser described has been designed to replace the 5MHz free running VFO commonly found in multi-band HF transceivers. The board also includes logic for switching 10 bands and three modes, EEPROM storage for 100 memories and two low pass filters. The board can be configured via the keypad for use with transceivers covering any number of the HF bands, and reverse tuning can be selected for some or all of the bands used as required. A second mode of operation will produce any frequency between DC and 15MHz in 1Hz steps for use as a general purpose Signal Generator.

Circuit description

PIC16C74

The microcontroller communicates with most other devices using programmable I/O pins, some configured as interrupt lines. Port D is used as a bi-directional parallel bus and two pins of port E are used as serial data and serial clock lines. The device contains 4096 x 14-bit EPROM programme memory, 192 x 8-bit general purpose SRAM, 45 special function hardware registers and 33 I/O pins.

AD7008

The direct digital synthesis IC is a numerically controlled oscillator using a 32-bit phase accumulator and integrated 10-bit D/A converter. A 32-bit frequency programming word is sent to the IC using the parallel bus and the frequency is calculated as follows:

$$freq = \frac{\text{32-bit word} \times 50MHz}{2^{32}}$$

Two 32-bit registers are available for frequency information storage, the logic state of the FSELECT pin determines which register is used. The two registers are programmed with TX and RX frequencies and, unless RIT is selected, will be the same. When RIT is selected the two frequencies differ by the RIT offset. The FSELECT pin is used for TX/RX switching but can also be used for FSK by selecting RIT and tuning to the difference between mark and space frequencies, logic is then sent to the pin.

I_{out} is a high impedance current source with full-scale current controlled by the resistor (R_{set}) connected to the FSADJUST pin and calculated as follows:

$$I_{out} = \frac{6233 \times V_{ref}}{R_{set}} \qquad \text{where } V_{ref} = 1.27V \text{ nominal}$$

A value of 390Ω for R_{set} will supply 20mA into the 50Ω load resistor.

Keyboard

Port pins RB4 - RB7 are programmed as inputs and pulled high internally, pins RB0 - RB3 are outputs and programmed low. RB4 - RB7 are also programmed as interrupt-on-change pins. When a key is hit, one of the interrupt pins will be pulled low and the PIC is made aware of keyboard activity.

Shaft Encoder

RC0 is programmed as an input pin while RC1 uses a capture and compare module interrupting the processor with each rising edge. Output from the encoder is two pulse trains, one lagging the other by 90 degrees, with 50 pulses per revolution. Tuning direction is determined by reading RC0 immediately after each interrupt.

LCD

A Hitachi LM016L LCD with two lines of 16 characters is used for the display. The LCD uses the bi-directional parallel bus, together with three control lines. Display information is stored in the LCD RAM which the PIC reads or writes to as required.

74HC195

Two 74HC195's are used as band select and mode logic for switching external crystals or oscillators, and programmed using the serial data and clock lines. Information is sent to both devices simultaneously, with the first 8 bits latched onto the output pins of the first device, and the following 8 bits latched onto the output pins of the second. Maximum current sourced from each pin must be limited to 35mA.

74HC163
A 4 bit binary counter is programmed to divide the 50MHz oscillator by 16, providing the PIC with a 3.125MHz clock signal.

93LC66
A serial EEPROM is used for memory storage with 4K bits arranged as 256 x 16 bit locations. Two locations are used to store frequency and mode information providing 128 memories. Only the first 100 memories (00 - 99) are user programmable with locations 100 and above used by the PIC to store configuration information. Separate read and write lines are used together with chip select and clock signals.

74HC4066
A 15MHz low pass filter is used between the DDS output and a 74HC4066 quad analogue switch. The signal is available at the YB pin at all times but the signal at YA is switched off by the PIC when the DDS is used as a DC-15MHz Signal Generator. Normally, the 5-6MHz signal at YA passes through a 6MHz low pass filter ready for connection to the transceiver.

Operating instructions

Entering frequencies
Simply type in the frequency and hit the ENT key. Include the decimal point and as many of the remaining six digits as required, zeros will be added to short entries.

Example	14.25 ENT	14.250000 MHz
	7. ENT	7.000000 MHz
	28.48392 ENT	28.483920 MHz

The digits before the decimal point are used to programme the band select logic and the remaining digits are added to 5MHz (or subtracted from 6MHz if reverse tuning is selected) and sent to the DDS.
Each time a frequency is entered with the keypad or a memory is recalled, the new displayed frequency and mode are stored to EEPROM. When the DDS is powered up, the last frequency and mode stored in this way is read and displayed. To store a frequency tuned with the shaft encoder ready for next power-up simply hit the enter key.

Memories
At any time the displayed frequency and mode can be stored to any one of 100 memories, (00 - 99), by pressing the STO key followed by a two digit location. To recall a memory press the RCL key followed by the two digit location. Memories remain in EEPROM when power is removed from the board.

Example.	STO 23	**frequency and mode stored to location 23**
	RCL 23	**recall that same frequency and mode**

After recalling a memory, the location is displayed on the LCD and remains until the encoder is turned or a new frequency is entered.

Example	3.561450 MHz 23 CW	**memory 23 recalled**

When an empty location is recalled, the DDS is programmed with the base frequency of the lowest band previously configured using function 7, and the mode selected is CW.
The STO and RCL keys are disabled when the Signal Generator mode has been selected.

Functions.

Nine functions are used to set operating modes or select/deselect features of the DDS. Press the FNC key followed by the function number and follow the on-screen prompts. Press the CLR key to abandon selection.

1 - RIT

Function 1 is used to enable or disable RIT.

Example	FNC 1 1	**enables RIT**
	FNC 1 2	**disables RIT**

Entering a new frequency will disable RIT and recalling a memory will zero the displayed RIT if enabled.

When enabled the RX frequency offset is displayed below the TX frequency together with a + or - sign, and the shaft encoder now tunes the offset. The RX frequency is the sum of the two, allowing for the sign. When the TX/RX pin on the board is grounded, the frequency tuned is that shown on the top line.

Example	21.257212	**TX frequency = 21.257212MHz**
	+0235	**RX frequency = 21.257447MHz**

2 - Mode

Function 2 is used to change between USB, LSB and CW.

Example	FNC 2 1	**selects USB**
	FNC 2 2	**selects LSB**
	FNC 2 3	**selects CW**

Three pins of the second 74HC595 are used to switch mode. The CPU will programme the corresponding pin high, the remaining two pins are programmed low.

3 - Tuning steps

Function 3 is used to select tuning step size.

Example	FNC 3 1	**selects 1Hz steps**
	FNC 3 2	**selects 10Hz steps**
	FNC 3 3	**selects 100Hz steps**

As the shaft encoder is turned, the frequency is incremented or decremented by the step size selected. Tuning below the band edge or above the band edge will cause the frequency to roll over, i.e. tuning below 7MHz with 1Hz steps will tune 7.999999MHz.

4 - Erase all memories

A memory location can be overwritten simply by storing a new frequency and mode to that location. Function 4 is used to erase all 100 memories at once and reset the default band and tuning direction configuration.

Example	FNC 4 1	**erase all memories**
	FNC 4 2	**cancel erase**

5 - Sweep band

Function 5 is used to initiate sweeping of the band, either up in frequency or down.

Example	FNC 5 1	**sweep up**
	FNC 5 2	**sweep down**

Sweeping can be stopped by any one of the following actions:

1 - Striking any key on the keypad.
2 - Turning the shaft encoder.

3 - Grounding a dedicated pin on the board.
4 - If the key pressed to start sweeping is held down, sweeping will stop when the key is released.

The dedicated pin may be driven with external circuitry used to detect a signal, and so provide a search feature.
The tuning step size will set the rate at which the band is swept between 40Hz/sec and 4KHz/sec.

6 - Scan memories
For the purpose of scanning, the 100 memories are divided up into 10 banks of 10 memories each. Function 6 is used to start scanning one of the ten memory banks. The first location of the selected bank is recalled and held for two seconds before moving on to the next, after the tenth memory is recalled the sequence is repeated. Any of the methods used to stop sweeping will also stop scanning.
Memory banks are numbered as follows:

Bank 0 00-09
Bank 1 10-19
Bank 2 20-29
etc

Example `FNC 6 0` **scan memory bank 0**

7 - Config bands
By default, the DDS board will accept entry of any frequency in any HF band. When used with a rig that does not cover all bands, it may be desirable to reject the entry of out of band frequencies. Function 7 is used to configure the DDS to accept frequencies in only the bands of interest. This function is a little different from the previous functions, pressing `FNC 7` will bring to the display the current configuration in the form of ten binary digits. The leftmost digit represents Top Band with the rightmost digit representing 29MHz. A 1 indicates that the band is selected with a 0 indicating a deselected band. Simply overwrite the current configuration with 1's and 0's to select or deselect each band and press the `ENT` key. The new configuration is stored to EEPROM and read each time the DDS is powered up.

Example `FNC 7` `1111111111` **all bands configured**
`0100100000 ENT` **80m and 20m only**

8 - Config direction
The default tuning direction is 5-6MHz as the displayed frequency is increased. Some rigs may require reverse tuning where the output decreases (6-5MHz) as the displayed frequency is increased. Function 8 is used to configure some or all of the bands for reverse tuning. This function is similar in use to function 7. Again, ten binary digits are displayed showing the current configuration, a 1 represents normal tuning and a 0 represents reverse tuning. Overwrite the current configuration and store to EEPROM with the `ENT` key.

Example `FNC 8` `1111111111` **all bands normal tuning**
`1111100000 ENT` **Top band through 20m normal, 15m through 10m reverse tuning**

9 - Signal Generator.
The DDS can be used as a general purpose Signal Generator and will produce a 1volt pk to pk sine wave from a second 50Ω source on the board. Any frequency from DC to 15MHz can be programmed in 1 Hz steps.

Function 9 is used to select this mode.

Example `FNC 9 1` **selects the Signal Generator**
`FNC 9 2` **return to transceiver mode**

The RCL and STO keys are disabled in this mode, and only functions 3, 5 and 9 are available.

Specifications

Output frequency:	5-6MHz or DC-15MHz
Impedance:	50Ω
Amplitude:	1V pk-pk max
Accuracy:	+/- CMOS clock inaccuracy, +/- 0.1Hz
Current consumption:	160mA

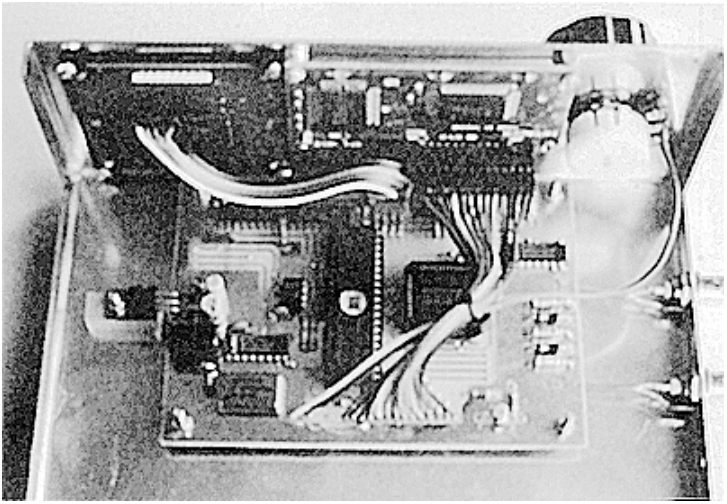
DIRECT DIGITAL SYNTHESISER : A CLUB KIT OFFER

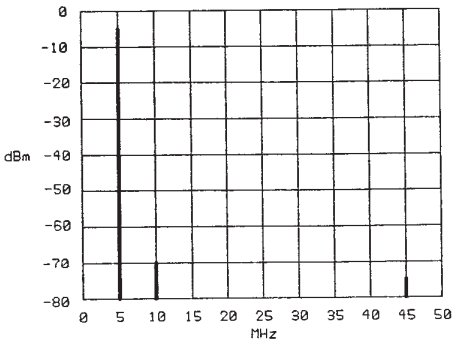
A Full Kit for the G4OPE DDS will be available shortly. The kit includes PCB, all board parts, keypad, LCD display and a shaft encoder. The Member's Price is £105. (Registered postage inc. insurance £5.00) Overseas Airmail postage : Europe - £6.00, DX - £11.00. Cheques to G QRP Club. Visa/Mastercard available for overseas members - include Card Number/ expire date, Name, Callsign, Club number

Orders to : **Mr. Ian Wye GØOKY, New House, Hook Road. Amcotts, Nr. Scunthorpe. DN17 4AZ.**

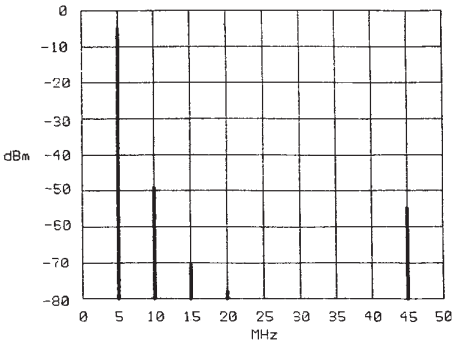
We expect to be able to make kits available by mid February. This is a limited number offer.

Below : The Prototype of the G4OPE Direct Digital Synthesiser





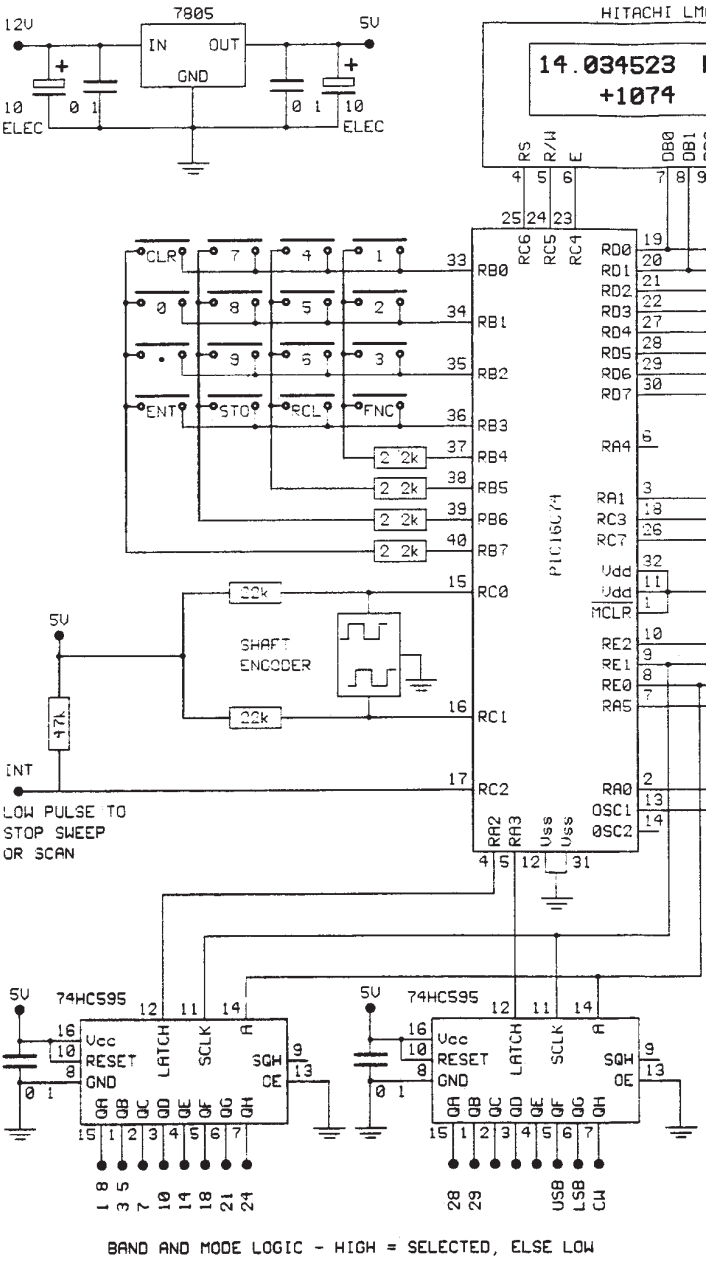
DDS tuned to 5MHz 5-6MHz output



DDS tuned to 5MHz DC to 15MHz output

A DIRECT DIGITAL SYNTHESISER by Mick Hodges G4OPE

The Circuit Diagram - A Full Size circuit diagram is available for an SAE to G3RJV



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UK members can use the form provided overleaf if they would like to pay by standing order or to amend their existing standing order to the 1997 subscription rate of £6.00.

All cheques must be made payable to "G-QRP CLUB"

Please do not make cheques payable to individual club members

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NWB1320 Rev Feb 85-1

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Bitte keine Schecks und kein Bargeld senden!
Fuer weitre Infos und Aenderungen z.B. der Anschrift oder des Rufzeichens zuständig: Rudi Dell, DK4UH, G-QRP-Nr. 2901, Tel 06324/64116

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Voor meer info. bel Peter, PE1MHO. 074 771832

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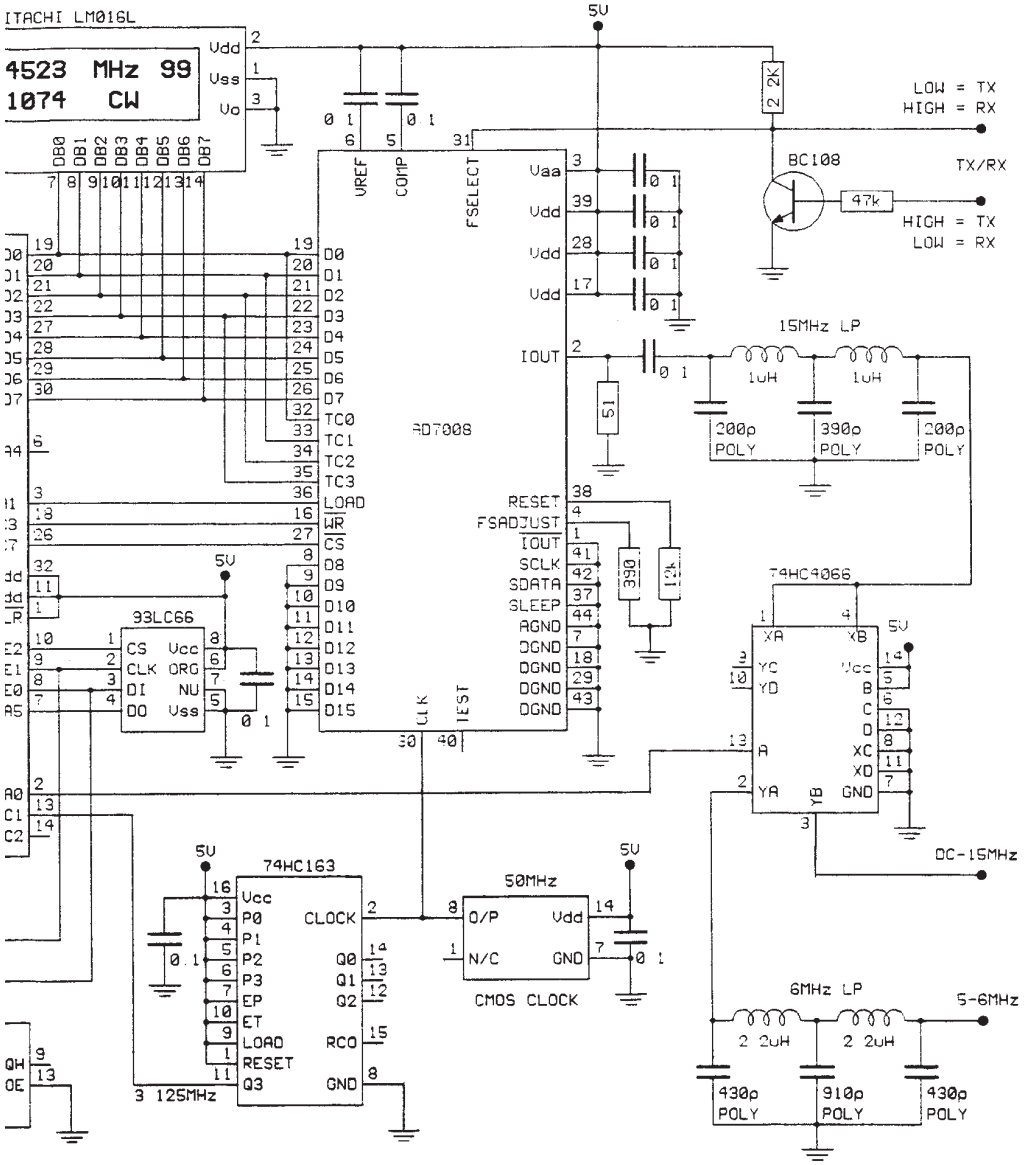


ALL CAPACITORS DISC CERAMIC UNLESS OTHERWISE NOTED

ALL RESISTORS 10 PERCENT 1/3 WATT

MICK HODGES G4OPE

ANTENNAS - ANECDOTES - AWARDS

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

THE SO-CALLED "ARTIFICIAL EARTH"- REALLY A LOADED COUNTERPOISE

Supposedly originated by the U.S. Army Signal Corps and revived over the years by 9V1LK, G3VA and others, this version is from the French text of an article by ON4EG from what we think is the UBA Journal. The sender remained anonymous, but the stamp was Belgian.

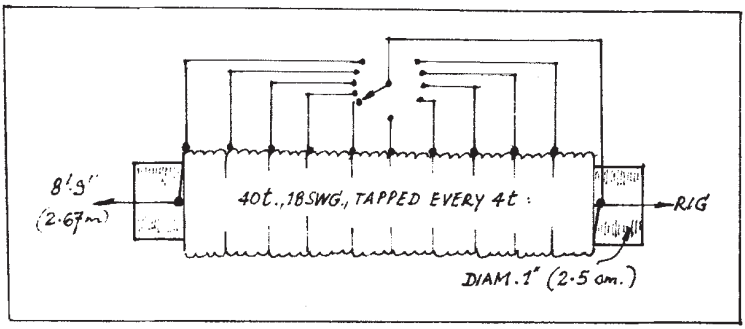
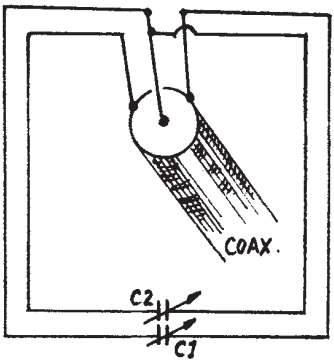


Figure 1

The circuit, which is of particular interest to those operating from a shack where a good earth or long counterpoise are not viable, is shown in Figure 1. The coil consists of 40 turns of 18 s.w.g. on a 1 inch (2.5cm) diameter former, and tapped at every four turns. This coil is suitable for use over the range 7 to 28 MHz. On 28 MHz the coil is shorted out and only the 8ft 9 inch wire is used. On the bands below 28 MHz a radiation meter is coupled to the coil and the tap is adjusted to the position where maximum radiation is indicated. The system is excellent for taming "rf in the shack" when a good ground is not available. It has not been tried on 3.5 MHz, but an 80 turn coil and 16 ft of wire would be a good starting point for this band.

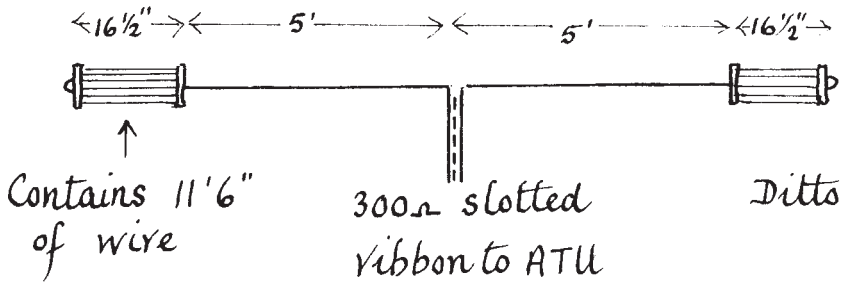


THE W9BRD COMPACT LOOP

This excellent loop was developed by non-member Rod Newkirk,W9BRD, and sent to us by Rockey, W9SCH. The AAA test model was made from single, multi-strand lighting flex and the W9SCH model from 18 A.W.G. wire. The capacitors were 500 p receiving types and the feeder was a length of ancient 75 ohm TV co-ax. When assembling the loop note carefully how the two turns are connected to the co-ax: turn 1

runs from the co-ax inner via C1 to the co-ax outer, and turn 2 from the co-ax outer via C2 to the co-ax inner. The recommended size is a 5 foot square (4, ten foot lengths of wire). As the tuning range is very wide the turns must be kept taut: if they are allowed to move tuning will vary. Tuning is similar to tuning a pi coupler. Adjust one capacitor in small steps and the other through its full swing until swr drops, then make smaller adjustments to get zero swr. The AAA version of the loop covered 3.5 to 14 Mhz, so careful tuning is essential (cheap slow motion drives could help). As one would expect, only short ranges were achieved on 3.5 MHZ, but on 7 MHZ and upwards excellent results were achieved using both the AAA model and a smaller (3 FT Square) version at the W9SCH QTH. It is an excellent restricted space or /P antenna.
NOTE. Rockey, W9SCH, has produced an elegant vector analysis of how he believes this antenna works.His conclusions are that, because of the way the two loops are connected, at resonance the transmitter will feed into a reasonably high load impedance (probably resistive),that the two loops will produce a sum current considerably larger than either of their individual currents, and that the radiation will therefore be very effective.
LATE NOTE. Using his small version in a downstairs room Rockey has worked all U.S. call areas. Also, additional information from W9BRB is that if you are prepared to accept a slight swr (say 1.2;1) the loop bandwidth is very much increased.

THE G3WQW MINI DOUBLET



Based on an antenna described in SPRAT No.64, this version should be fed via an atu having a balanced output. The end loading coil formers are made from 3 inch square pieces of suitable thickness outdoor grade plywood, well varnished. Each piece has 8 holes drilled equidistantly into it to take the wire, and also a larger, 22 mm diameter hole in its centre which has one end of a 16½ inch length of white electrical conduit (plastic pf course) cemented into it to act as a spacer.Each end piece also has a hook attached to it to allow a piece of thin cord to be attached to it for tensioning the whole assembly. It should be possible to load the antenna on all hf bands, but its best performance is likely to be from 10 MHz upwards.

REMEMBER THAT AAA IS A TWOWAY FEATURE. We are always delighted to have reports on how antennas described here work, or details of any good antenna ideas that you yourself have come up with. No need to be an auther - a sketch and a few lines can be edited into a SPRAT feature,

CONGRATULATIONS TO RANDY, AA2U on being placed second in the worldwide, all band, QRP Section of the CQ WW DX CW Contest. Great work from the old maestro !

AWARD NEWS

QRP MASTER. The Worshipful Company welcomes SP9NLI and ON5SE to the Roll. Well done Gentlemen !

QRP WAC. ZS2ACP (ssb). QRP COUNTRIES.

100 DL2HCB,G2HLU (well done !); 75 SP9NLS, ON5SR, F5SJB; 50 GoBXO; 25 DL1HTX, DJoMAQ, ZS6ACP (ssb).

WORKED G QRP CLUB. 1200 GM3OXX (The laird strikes again), G4JFN (Literally only days behind). 380 GoKCA; 360 G4NBI, 300 GoMOU; 200 G3ZHE; 180 GoKJN; 140 G4EIB; 120 G3FNM,F5LUX; 60 F5SJB, ON5SE,GoBXO; 20 GoOUP.

TWO-WAY QRP . 40 GoMOU; 30 G3FNM; 20 GoBXO, ON5SE, F5LUX;10 DL1HTX

Congratulations to all the above on their excellent performance.

A CAUTIONARY NOTE ABOUT THE 50p POWER UNITS SOLD FROM THE CLUB STAND AT ROCHDALE.

Unless the mains are connected the right way round the chassis of these units is live and floating well above ground. If the brown wire from the switch is connected to the live mains lead and the blue to the neutral mains lead there is no problem. Also,, if you mount the pcb in another container (we suggest plastic) strap the two holes which were used to mount the board onto the metal pillars together with a piece of wire. The wire replaces the metalic contact previously provided by the metal chassis. The circuit will not work without this connection. The two we bought give just under 12v and just under 5v out, and were a snip at the price. They will actually power an HW9, but at reduced output on transmit.

THE REALLY GOOD NEWS IS THAT THE CLUB HAS RALLIED ROUND THE JO-ANNA DOBBS APPEAL IN A WONDERFUL WAY. All sorts of gifts in money and kind have been coming in, so Jo-Anna will really be able to help the people living in El Tular when she goes there at the end of the year. I have not been to El Tular, but having been in a few backwoods villages in South America I can imagine what it is like. Only when you have seen that sort of poverty can you understand the great work that Jo-Anna and her colleagues are doing, and just how much good out donation will do.

A HAPPY CHRISTMAS AND NEW YEAR TO ALL. CU IN THE WINTER SPORTS.

Coming In the next issue of SPRAT : The GQ-2000.

Following the success of the GQ-40 & GQ-20, the Multiband GQ-2000 begins in the next issue of SPRAT. A high quality multiband CW Transceiver to be available as a club kit.

"Four Days In May (c)" QRP Symposium
The Amateur Radio QRP Event of 1997

QRP Amateur Radio Club, International (QRP-ARCI) proudly announces the second annual "Four Days In May (c)" QRP Symposium to be held on Thursday, May 15 1997 - the first day of four festive days of 1997 Dayton Hamvention (c) QRP activities. Mark your calendar for this extra bonus day and register early for this not-to-be-missed QRP event of the year.

Amateur radio QRP presentations, workshops and demonstrations will be the focus of the full day Thursday activities to be held at the Days Inn Dayton South (513-847-8422). Last year, this sold-out event was a "standing room only" crowd of 100 enthusiastic pre-registered attendees. For 1997, the FDIM QRP Symposium will be moved to the hotel's larger ballroom facility so make your reservations early before it's sold out again. FDIM QRP Symposium attendees will start their day with a wake-up coffee social and then plunge into a morning of multimedia QRP presentations by renowned QRP authors and designers. At midday, attendees are treated to a catered lunch and QRP door prizes. Then it is back to an afternoon of more exciting QRP technical presentations. Culminating this first day, will be an evening of guest QRP tutorials sponsored by regional QRP clubs. The 1997 "Four Days In May" QRP Symposium will be the talk of the 1997 Dayton Hamvention (c).

The "Four Days in May" QRP extravaganza continues with the annual Friday night QRP-ARCI Awards Banquet honoring QRP dignitaries for their service to the amateur radio community. Following the Awards Banquet, a special evening has been set aside for the FDIM QRP Vendor Social where prizes will be drawn. Saturday will also be special this year with an evening for QRPers to meet the many regional North American and International QRP Clubs - bring your banners! QRP Club awards will be presented to those who submit their "pride and joy" QRP construction projects for judging.

"Four Days In May (c)" QRP Symposium: Frequently Asked Questions:

- QRP SYMPOSIUM PRESENTERS - Please submit your QRP technical manuscripts to FDIM Technical Paper Chairperson Bruce Muscolino W6TOY/3 at PO Box 9333, Silver Spring, MD 20916-9333 or Email: w6toy@erols.com Presenter's papers will be bound in the 1997 FDIM QRP Symposium Proceedings. All attendees receive the Proceedings.

- FDIM QRP SYMPOSIUM REGISTRATION FEE - Registration for the Thursday, May 15, 1997 FDIM QRP Symposium will be $30 if prepaid by May 1, 1997 and $35 after that date or at the door. "At the door" registration may be limited if, once again, we sell out. Please register early to guarantee a seat. Registration will cover a full day of QRP Symposium activities, which include the QRP technical presentations, the 1997 FDIM QRP Symposium Proceedings, the scrumptious QRP luncheon , those famous "special" Symposium bag stuffers and finally an endless QRO coffee pot.

Please send your $30 registration fee (US check, money order, international money order) made out to "BOB FOLLETT" by May 1, 1997 to: Bob Follett AB7ST, FDIM Registration Chairperson at 2861 Estates Dr, Park City, UT 84060 or E-mail: bfollett@ditell.com

- QRP-ARCI AWARDS BANQUET - This not-to-be-missed Friday May 16, 1997 event is once again being hosted by FDIM Banquet Chairperson - Pete Meier WK8S. Please send your $15 banquet ticket fee (US check, money order, international money order) made out to "PETE MEIER" by May 1, 1997 to: Pete Meier WK8S at 4181 Rural, Waterford, MI 48329 or Email: pmeier@tir.com

- FDIM QRP VENDOR SOCIAL - A tradition was started at FDIM 1996 - a special evening was established to officially introduce our QRP Vendors from around the world. All are invited to attend this wonderful Friday, May 16, 1997 evening social. Preston Douglas, WJ2V will once again be our gracious host. QRP Vendors - for registration information please contact Preston Douglas WJ2V, QRP Vendor Evening Chairperson, at 216 Harbor View N, Lawrence, NY 11559 or via Email: Pdouglas12@aol.com

On behalf of the FDIM team we invite you all to join us for the QRP Event of 1997 - the "Four Days In May (c)" QRP Symposium at the 1997 Dayton Hamvention. See you all there. Bob Gobrick VO1DRB/WA6ERB FDIM Publicity Chairperson (email 70466.1405@compuserve.com).

COMMUNICATIONS AND CONTESTS

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

1997 Handbook

Unfortunately two errors have occurred. To avoid future problems please amend your copy NOW:
Awards. On p26 delete paragraph number 5. All matters regarding awards must to Gus.
Chelmsley Trophy. See new entry format as described below.

1997 QRP Calendar

You will find the 1997 QRP Calendar elsewhere in SPRAT. Many thanks to those who sent me details of their QRP Contests. I am very happy to give publicity to QRP events but you must tell me about them in good time. I am not psychic and there are such things as printer's deadlines. My deadlines for 1997 are the beginning of the following months: February, May, August, and November.

Chelmsley Trophy

For some reason this does not attract many entries so why not have a go this year. To make it easier to enter the rules have been changed. The new rules were published in SPRAT 87 but are repeated below:

Send me the total number of QRP/QRP QSOs, QRP/QRO QSOs and the total number of DXCC countries worked on QRP in 1996. That is just three numbers, no back-up is needed. A DXCC country can only be claimed once and it can be a QRP/QSO QSO.

NB Ignore what it says in the Hand Book.

CZEBRIS

Elsewhere you will find the rules. To try to promote UK entries we are issuing a certificate to each UK member who enter. They will be sent out via the QSL bureau so keep your envelopes stock up-to-date.

Yeovil 13th QRP Convention

Yeovil Amateur Radio Club will hold the 13th QRP Convention on 18 May 1997, at the Digby Hall, Hound Street, Sherbourne. (The same venue as last year.) The convention will feature lectures by experts in their field, Trade Stands, Junk stall, (with an element of bring- and- buy), prize draws, the ubiquitous "Constructors Challenge", and Top Class refreshments. Start time 0900, Talk-in on S22. Remember too, that the historic town of Sherborne offers a wide range of interest for the XYL. For further details, contact Peter G3CQR, who is QTHR, or telephone 01935-813054. This is great event and not to be missed.

Winter Sports

The premier event of our year is on us again. Last year I was asked for copies of the rules, please remember there are non! This is a fun get together. We ask for logs to be sent in as we like to give awards to those who contribute most to its success. However the main thing is to get on the air and enjoy yourself in the manner which gives you most pleasure. Look out the CT1/G3KJX and perhaps we may hear G4AZT/LU who has moved out there. Also check 3579 kHz as some newcomers to QRP may be trying it out the cheap way so lets encourage them.

There may be other QRP events taking place during that week so try to help them by giving serial numbers, power levels, etc., if requested. You may have contacted the guy before but outside his contest so e sure to go back to him if he calls you, remember WS is not a contest and duplicate QSOs are not penalised; please report them and say why.

Original QRP Contest

This is an example of the above and is 1500z 28 Dec to 1500z 29 Dec 1996 on 80/40/20 CW. Call OQRP and exchange RST/Serial/Class. Classes are; VLP under 1W, QRP under 5W and MP under 20W. For more details contact me. Sorry for the short notice but I have just got the details.

WARC QRP Frequencies

We are looking at this thorny problem again. Any comments please? May I remind members that the QRP frequencies are NOT calling frequencies but centres of QRP activity.

Somerset Contest
NB Change of Date to 22 March 1997 [Rules in SPRAT 88]
Walford Electronics are very kindly again sponsoring this event with two valuable prizes. Last year the number of entries way very disappointing. This year we have responded to comments and reduced the scope of the contest to encourage people who can only afford to spend a few hours on the air. Let's try and get a really good turn out this year.

1997 Handbook
You have made the changes haven't you?

RULES CZEBRIS 1997

1. When. 1600z 28 February to 2359z 2 March 1997
2. Modes and frequencies. CW only on 3560, 7030, 14060, 21060, and 28060, all +/- 10kHz.
3. Power.. Not to exceed 5 watts RF output. Stations unable to measure their output take half DC input power to PA, i.e. 10W DC = 5W RF.
4. Stations eligible. Any licensed amateur.
5. Call CQ ARP
6. Contest exchange. RST, power, and name of operator.
7. Scoring:

   Stations worked once per band
   Only QRP/QRP QSOs score
   Points score as follows:

QRP Stn located in	QSO with QRP Stn in			
	UK	OK/OM	EU	Non-EU
UK	2	4	2	3
OK/OM	4	2	2	3
EU	4	4	1	2
Non-EU	4	4	2	1

   No multipliers
   Final score is the sum of points obtained on each band.

8. Logs. Separate log sheets for each band showing for each QSO, date, time, call, exchanges (RST, power, name) sent and received. Also a summary sheet showing name, QTH and call-sign, claimed score for each band and brief details of equipment used must be submitted to:

For UK stations to	G P Stancey G3MCK 14 Cherry Orchard Staines TW18 2DF UK	All other logs to	P Doudera OK1CZ U 1. Baterie 1 16200 Praha 6 Czech Republic

All logs to be received by 15 April 1997

9. The leading three stations in each continent will receive a certificate.
   All UK s/t will receive a certificate to show that they participated.
10.. Disputes. The decision of the organisers will be final.

QRP CALENDAR 1997

1 Jan	Last day of 1996 Winter Sports
1 Jan	0900-1200z AGCW Happy New Year (1)
4 Jan to	1500Z AGCW QRP Contest (1)
5 Jan	1500z
1 Feb	1600-1900 AGCW Straight Key Party (1)
7 Feb	Last Day for Winter Sports logs to G3MCK
15 Feb	Last day for Chelmsley logs to G3MCK
28 Feb to	1600z CZEBRIS 1996
2 Mar	2359z Rules SPRAT 89
22 Mar	Somerset Contest Rules in SPRAT 88 [NB change of date]
31 Mar	1500-2000z Slovak ARA Contest (1)
1 May	1300-1900z AGCW-DL QRP Party (1)
6 May to	Yeovil Fun Run
9 May	Rules SPRAT 90
18 May	Yeovil QRP Convention
17 Jun	IARU Region 1 ARP Contest
29 Jun	0900 - 1500z WAB 144MHz (2)
19 Jul to	1500z AGCW DL QRP Contest (1)
20 Jul	1500z
26 Jul	G3TUX Summer QRP Party
17 Jul	Last day for International QRP Day logs to G3MCK
6 Sept	1300 - 1600 AGCW Straight Key Party (1)
25 Oct	Rochdale QRP Convention
16 Nov	1300 - 1500z AGCW-HOT Party (1)
26 Dec to	G QRP CLUB Winter Sports
1 Jan 1997	Maximum activity on all QRP frequencies
	Logs to G3MCK by 7 February 1997
	G4DQP Trophy and Certificates

Notes
1. For details send SAE to G3MCK
2. For details send SAE to G8UYD, 6 Rosewood Ave.,Blackburn BB1 9SZ

The 13th Yeovil QRP CONVENTION

Sunday May 18th at The Digby Hall, Hound Street, Sherborne, Dorset Talk-in on S22, Free Parking, Doors open at 9.00am. Only minutes away from Sherborne Town Centre, Railway and A30. Three Lectures by notable speakers, Superb in-hall Catering, Trade Stand, Bring and Buy, Novice Display, Construction Challenge, Prize Draw and lots more. Further details from

P.R. Burridge, G3CQR, 9 Quarr Drive, Sherborne. 01935 - 813054

The 13th QRP Convention Construction Challenge

The 1997 challenge differs from the usual specific requirement, and is of a more light hearted nature

To build a piece of equipment for use in the radio shack, using any number of conventional (or unconventional) components, and novel ideas. The entry is to include a very brief description of the intended purpose of the equipment, (which may or may not differ from what it actually does!). The decision of the adjudicator will be final.

VHF MANAGER'S REPORT

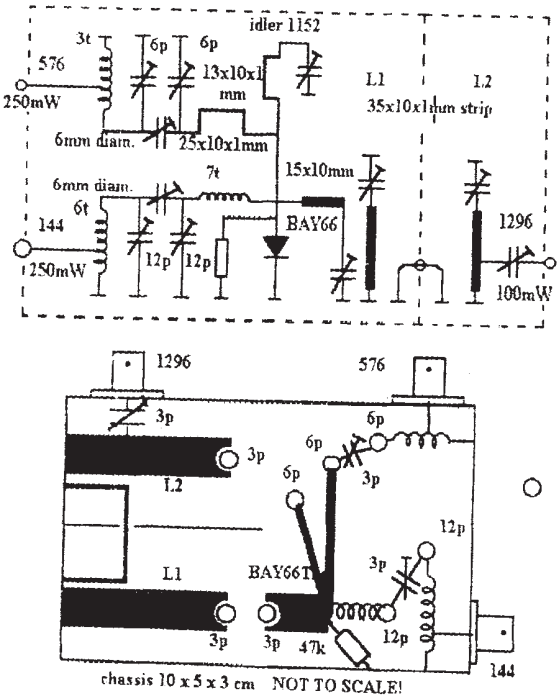
John Beech, G8SEQ 124 Belgrave Road, Wyken Coventry CV2 5BH
Tel. or Fax 0203 617367. Packet Homebbs : GB7COV. Email : johng8seq@aol.com

First my apologies for the typos in the last SPRAT article. The spell-checker is no substitute for proof reading! The date was 1996 and it should be 47MHz, not GHz.

Robert, PA3BHK, wrote to me with a similar circuit to the one I had described, which used a harmonic mixer (BAY66 varactor diode) in the transmit mixer. It uses an xtal osc chain to get to 576MHz and is a good technique for reducing the number of stages in a 23cm transmitter.

However Robert also sent me a component list from a Dutch supplier, who has VCO modules which cover 1152MHz, without any modification, which makes the second scheme I published in SPRAT 88 more attractive. Incidentally, the RFC should be connected directly to ground to provide a DC path for the emitter current and not via the leadless capacitor as shown.

The Dutch circuit, by Hans PA0DBQ (1977) has its origins in circuits by G3LQR, G3ZEZ, PA0SSB and PA0WFO. It is shown below:



With a transceiver connected to the 144MHz socket, this should also work as a receive converter, though the noise figure will not be good. A switched pre-amp would improve this to an acceptable level.

The 576 MHz drive circuit used a 96MHz xtal oscillator with a 3-stage RF amp. at 288MHz, followed by a diode doubler (BAY66). With the availability of VCOs covering 1152MHz, a simpler solution would be to use one of these with an RF amplifier (BFG96 or MAR6) and modify the input circuit to cope with the higher frequency. The diode would then act as a straight mixer, with improved efficiency.

VCO type VCO6 950-1200MHz.: 9.90 Guilder from : Baren Hendriksen, HF Elektronika Holland Posthus 66-6970AB Brummen. Tel: 0575 561866.

NOVICE NEWS Steve Ortmayer G4RAW

14 The Crescent, Hipperholme, Halifax. HX3 8NQ. Tel: 01422-203062

I have just had a long letter from Robert G4OBH. Robert is Senior Novice Instructor for the London area. Robert has given many talks to radio clubs on the novice scheme and has carefully recorded the feedback from the club numbers present. This has been compiled for the Novice Forum at the RSGB HF convention. Some of the points made are interesting.

The training and on air behaviour of Novice ops is very good. The only comment is that some are too keen on the air and will have to be a bit more patient!!

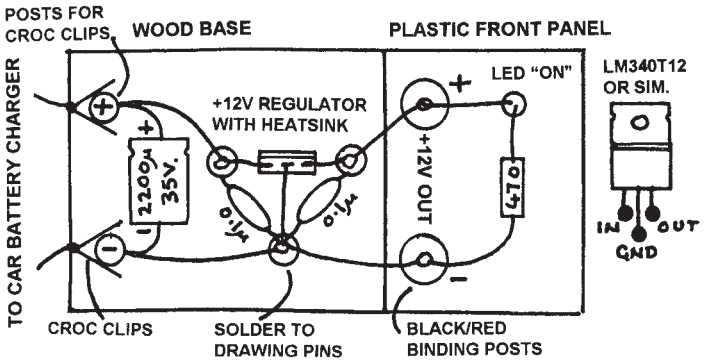
The modes permitted should be amended slightly to fit the Bandplans. For example the SSTV activity frequency is 432.500 and Novices are not permitted this frequency. With programmes such as JVFAX many Novices are trying these modes.
Our country cousin novices would like 2m because there is not much on 70cm, but city dwellers are happy with 70cm. Access to 4m FM would be good because of the cheap PMR rigs available.

On 80 access to the GBRS news frequencies would be good so that Novices can take part in the pre-news nets. More room on 30m would pull the Novice ops clear of the RTTY QRM. Access for Novice ops to 17m would give them experience of a DX band like 20m, 40,20 and 12 should remain as an incentive to the Novice to upgrade.

Power out could be raised to 5w out to be in line with our club's limit.

The Surrey Radio club would like to see a poster about the Novice scheme for use in schools. The RSGB have lot of stuff they will send to members who are giving talks to schools back editions of DIY Radio and similar.

Quick Power Supply.
In these safety conscious times young members may not be allowed to construct any gear for connection to the mains. I used to tinker with valve sets in a damp tin shed and must have come very close to and eyeball QSO with St. Peter!! If Dad (or Mum) has a car battery charger then you can turn it into a 12v power supply without coming into contact with the mains. If Dad does not have a battery charger then nip out and switch on his car head lights he will soon have to buy one!!



QUICK 12V POWER SUPPLY FROM A CAR BATTERY CHARGER

MEMBERS' NEWS

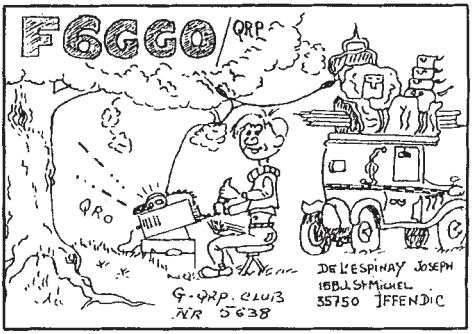
by Chris Page G4BUE

"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

G3YCC built the Sprat project from *Practical Wireless* for 80 metres, but found the tuning range was limited to 2kHz! After talking to G3RJV, Frank added a variable capacitor tacked on to the tuned circuit, with the moving vanes earthed, and now has as much 'swing' as he needs. He then re-built it for 40 metres with the VFO on "2MHz-ish", and a QSO with a DL from the first call with 2 watts output was followed by a HB9, then another DL station. Frank used a BD139 for the PA, priced 60p! and says it is good for at least 4 watts output on 40 metres. Frank is building another Sprat for 20 metres and asks if anyone else has built one.

Congratulations to **G3XJS** on managing to work **G4VPM** on two-way QRP on 20 metres while Andy was on holiday as 8Q7AS in September. Peter used 3 watts to his DX32, a two element tri-band yagi. Peter also QSO'd Stan, **CT3/G4MQC/P**, on 20 metres at the beginning of October. Stan was using 2 watts to a G whip out of the hotel window, but was having PSU problems. **F6GGO** holidayed in the Alps near Grenoble with **F6GPA** this summer, and operated /P from the Broceliande Forest Hills near Rennes. Joseph used his HW8 and dipoles for 20 and 40 metres to make many QSOs, including **GU4YBW/P** and **ON5UP**.

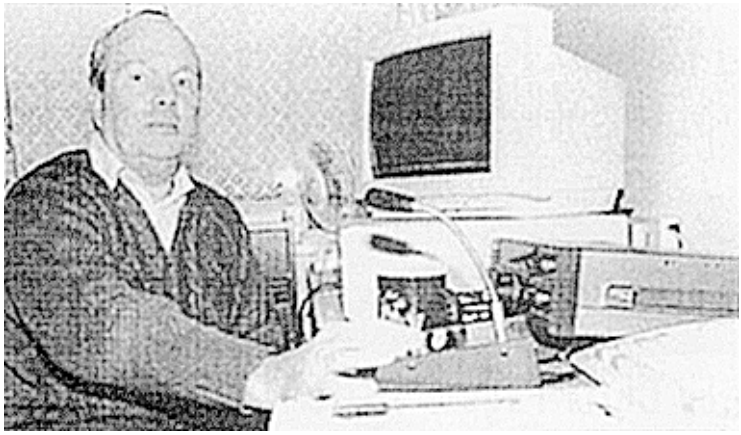
The portable equipment used by F6GPA in the Broceliande Forest Hills this summer.



Joseph's humourous F6GGO/P QSL.

G3YCC is modding his MFJ 9420 SSB 20 metre rig to add CW and asks if anyone has details of the CW add-on supplied by MFJ. Frank wonders what form of keying is used by MFJ? **AL7GQ** in Denver, CO is using attic dipoles for 40 and 15 metres and is QRV on 30 metres (10116kHz) around 2300z most days listening for Europe. Geno lived in a condominium for 1½ years and used a metal gutter and down-spout for an antenna, fed at the bottom of the down-spout, giving him a 20 feet vertical and 20 feet horizontal antenna (inverted L fashion). Using a HW9 and MFJ-989C ATU he maintained a frequent sked with a QRPer in California. Geno would like to hear more about the innovative antennas and ideas that members living in multi-family housing (flats, condominiums, apartments, etc.) are using to get round the restrictions on putting up antennas.

WBØGAZ is putting together a MR-1 radio (c 1969) and is in need of a PM-1 transmitter module. Dave can be reached via e-mail (dgf@netcom.com). **G4EDX** wants to like to get in touch with UK members who have built the NorCal 40, in particular John seeks information on the driver transformer T2.



Tim, GØNCS, after he cleaned himself up! (see story below)

GØWZY asks if anyone is experimenting with DSP on a 9MHz IF? Mike noticed the trainer kit for the TMS320C50 DSP chip for £130 in *Practical Wireless*, and not knowing anything about DSP, wondered if it is a good starting point? Does the chip work at IF frequencies or is it just for audio frequencies?

GW8ELR says the AF lowpass filter for the GQ by DK4RW (SPRAT 88) is highly recommended. The filter is easily implemented on a 38 x 25mm vero strip and on the 40 metre version sits nicely in the empty pre-mixer area. Sheldon says if you want to try it without unlacing any loom you have, it works by connecting at the input pin to IC5 from the AF gain control. Any insertion loss can be made up by replacing R13 with a RF choke, and any remaining IF and AF noise may be removed by replacing C28 with a 4.4336 crystal, (it is not possible to get the crystal down on the board and so a ground wire is needed to the can). **GØFFQ** has replaced RFC 7 with the C66 side leg as a PCB pin, allowing the PA Vcc line to be fed independently via a switch with either 12 or 24V. The maximum power is increased to about 20 watts in the 24V position and **GW8ELR** says C67 would need changing as the kits are supplied with a 16Vw capacitor. This mod will also be of interest to owners of the ANV20 and RTZ transceivers (all models) which use the same PA circuit.

GØNCS is the QSL Bureau sub-manager for the G6AAA/ZZZ series and recently removed all the envelopes without current stamps on (about 150) to return for updating of stamps. Tim placed them in a cardboard box and then got on with some decorating while his xyl was away on holiday. He was up the ladder with a full gallon tin of paint when the tin fell and landed upside down, of course, all over him and inside the cardboard box! The box and envelopes had to be disposed of and Tim has now been given the nick name of 'Snow White' on his local 2 metre net!

Ten-Tec announced at the beginning of November that the 40 metre version of the new QRP HF CW transceiver kits will be available first (from 1 December). The 30 metre version will be next followed by the 20 and 80 metres versions shortly after with all four being available by Christmas. If you are new to the Internet, send an e-mail to **G3MBN** (brian@brimar.demon.co.uk) and ask him to send you a copy of his list of club member on the Internet. Brian has compiled and maintains this lengthy list, and I thank him on behalf of the club. Also, take a look at **G3YCC**'s web page (http://homepages.enterprise.net/g3ycc/) which includes QRP leagues. Frank has run two leagues for members on the Internet; the first was won by **ON5UP** with **G3XJS** runner-up, and the second, which closed at the end of November, is the 'Weekender League'

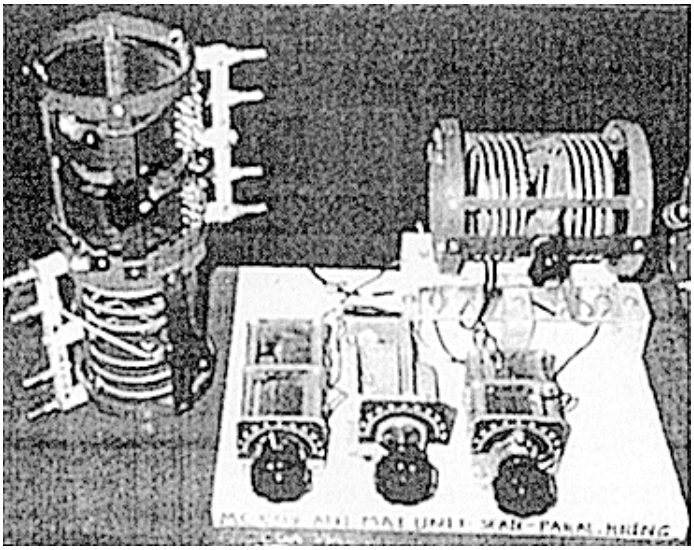
where only QSOs during the weekend and for two nights a week are allowed. **KA1CZF** was leading by 1000 points when this column was being written. Frank is planning more leagues in the spring and more information can be obtained from him (g3ycc@enterprise.net).

KF4JSV is looking to work Europe with his dipole and Scout cranked down to 5 watts in the USA Novice portions of 40 metres (7100-7150kHz) and 10 metres (28100-28500kHz). I think Jeff will have to work 'split' on 40 metres and prey for more sun spots for 10 metres! **OA4DBO** has worked QRP SSB to Italy on 40 metres using a vertical on top of his apartment building. Kris says he received a poor report but hopes to improve on that as the European winter approaches.

KH6CP asks if anyone has worked the ten DXCC countries for the club's two-way QRP award in less than two hours? Zack's closest is working N4BP/VP9, VE3VA, YS1ZRB, **G4APO**, **ON4US**, FB1MUU (10W), YO5CL (8W), KP3S, **EA8/DK8SX**, TA2BD and lots of USA stations between 1216z and 1901z during the Fall ARCI QRP Contest. Apart from the contest, Zack has been operating SHF and has had 159 QRP QSOs in the last five months between 3456 and 24GHz. Anyone else working QRP on these very high frequencies?

G3YCC recently erected the *Cobweb* antenna, a UK commercially produced five band (20 to 10 metres) antenna similar to a quad but used horizontally without the need for rotation. Frank brought it secondhand but thinks they cost around £180 new. Frank has also bought a Target HF receiver and says you must use it with a decent PSU, not the one supplied, if you want good SSB and CW reception. Like the two reviews he read, there is a bit of a 'squiggle' on 80 metres. **DL2EAS** suggests **G4GUN** should contact Electronicladen, Eichelkraut und Partner GmbH, Hammer Str. 157, D-48153 Munster, Germany (fax ++251 74301) if he is still having difficulty obtaining the CA3020 (SPRAT 88). Alexander says the price in their 1993 catalogue was DM 8.50 (about £3.70).

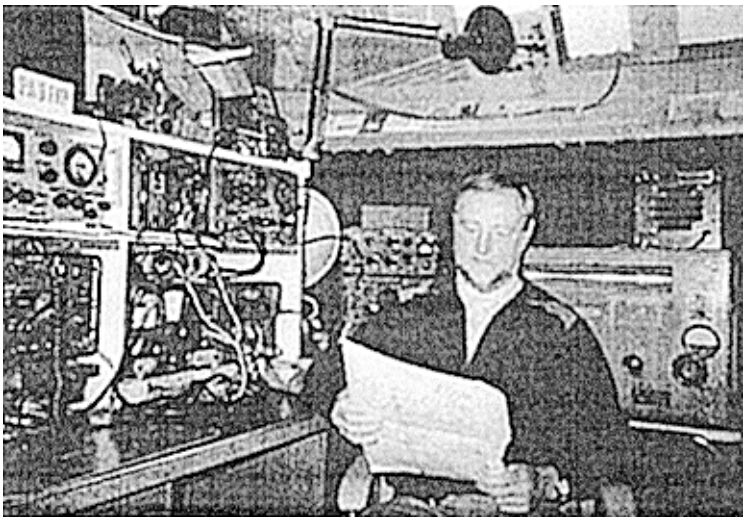
G4APO would like to contact anyone who has had experience changing the electro-luminescent backlight on the Argonaut II. Rowland's has given up and Ten-Tec told him a new device will slide in between the PCB and the glass LCD panel but it looks a very tight fit to him. **G4EDX** is experimenting with the PIC16C84 micro-controller from Arizona Microchip. John is not using an assembler as he says if you want to know a chip inside and out, "you need to grab it by the ones and noughts". A possible application of the chip is for a digital frequency display for a QRP transceiver such as his NorCal 40.



Frans's home-made simple series-parallel circuit (Mac Coy) ATU. The plug-in coils are from the 610 set, (see PAØFKP overleaf).

GØRDO will be QRV on ±14052kHz until the end of January as **GØRDO/MM** while working as a

musician on board the *M/S Southern Cross* travelling to VK. John wants QRP QSOs with members and will be using his Howes kits to a G whip on the deck of the cruise ship. For most of January he will be QRV daily between 0400 and 0700z while cruising out of Sydney visiting VK2L, FK8, 3D2 and YJ. He is offering a free boomerang to any member who works him from VK! **DJØPJ** was planning to be QRV again in December as **FY/DJØPJ** after his initial November date had to be postponed. Check for Dave around 14060kHz during the European evenings and 18080, 21060 and even 10116kHz depending on conditions.



Frans, PAØFKP, in his well equipped shack.

For the last two years **PAØFKP** has participated in the Dutch Surplus AM net at 1000z every Sunday on 3705kHz. Frans has always used a WS62 set with 2 watts output and the Australian A510 portable set with an output of 100mW. He also uses a home-brew 12 valve 80 metre CW transceiver, mostly QRP but occasionally up to 35 watts from a 1625 valve, with a home-brew PSU, ATU and inverted vee antenna, and has worked world-wide with it.

G4UDG (telephone 01782 560218) has a Yaesu FT101G and YO100 monitor scope for sale, both with manuals and in very good condition for £250 the pair. Chris also has a 250Hz filter for the FT901 for £50.

OK1CZ was QRV from 3V8BB at the end of September and made over 2000 QSOs, including 10 with two-way QRP. Peter also QSOd a number of QRP stations while he was using QRO on 80-20 metres. **G3NTM** has used a Mizuho MX-14S for a couple of years and his 2 watts SSB has worked most of Europe on 20 metres. He recently worked VO1WET who QSL'd direct by airmail the same day. Trevor also has the 10 watt linear to go QRO when the bands are poor (most of the time!), and finds it all great fun. He will be QRV from Adelaide as **VK5WTB** between 17 February and 8 March on 14060 and 14285kHz.

G4JZO challenges the first reported two-way QRP OX to G QSO between G3XJS and OX/G3WUX in July 1996 (SPRAT 88), and says he worked OX3XR in the 1991 Winter Sports. Martyn says he has never heard another OX station since, let alone worked one! **GMØBCA** also worked OX/G3WUX in the summer and when Terry sent his QSL to David, told him he is planning another trip in 1998. **G4HUT**, referring to the 'fish-fone' reported by **PA3BHK** (SPRAT 88), thinks it may be Danish, as he heard Swedish or Danish calls being mentioned at the beginning of October. David is only QRV with QRP on 80 metres after getting rid of his SSB linear, and is enjoying it.

ON5LJ is receiving a lot of interest in his homebrew replica of the Whaddon Mk.7 'Paraset' WW II transceiver, which is featured on the nice coloured QSL card that Joes uses for QSOs made with the rig. He thinks he may have mislaid some letters from members fasking or information about it and asks them to write again if they have

not recieved a reply. Joe has made 130 QSOs in 21 countries with the 'Paraset' on 80 metres.

Finally, June and I wish you a very happy New Year and hope that QRP DXing on the HF bands will be better in 1997 with the solar flux figures increasing as the new cycle gets under way. Let me know how your winter goes, and please keep the photographs coming, by 20 February, please.

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

FOR SALE: Icom 735 Tcvr. Boxed as new (little used) plus Kenwood PS430 for above - £550 ovno, 35ft Tilt Over Mast - £30 ono, Codar QRP Station : AT5 Tx , T28RX, PSU 250/s, PR30 Rf Preselector, RQ10 Q Multiplier, all with circuits, offers invited. Diawa Low Pass Filter 500w CW, as new - £20. Jon Picken G4TJP, 25 Essex Rd. Four Oaks, Sutton Coldfield, B75 6NR. Tel: 0121 - 308 - 2430

FOR SALE : CODAR AT5 TX with matching Codar PSU, spare valves and original Codar instructions. Offers please to G3AIO - QTHR or 01892-822836.

FOR SALE: HEATHKIT HW-8, factory built + HW8 PSU + manual. No mods excellent condition. KW VESPA II + original PSU + manual very clean VGWO, no mods, KW202 HF Receiver + manual, no mods, virtually mint. Prefer Buyers Collect, but sensible cash offers to include post and package + ins otherwise. Ray 2E1CQL, 01604 - 24468, Northampton QTHR

CLOSING DOWN STATION : Have gear for HF, 6m, 2m, 70cm. Please ring for details to Pete, G1SFS, 0117 - 963 - 3306 (Bristol)

FOR SALE: Spectrum Analyser, large valves £50, Telequipment Scope S32A £30. Wanted EMI Scope M101 Circuit. D. Griggs, G0IPT, 5 Collinwood Ave. Muswell Hill, London. N10 3EH.

FOR SALE: QRP STATION. HW9 with matching ATU and power/swr meter. No mods, all manuals. £250. GW4KUS. 01792 - 466383.

FOR SALE: BC221-AF with calib. Book, internal mains PSU £30, 13.8v 7A PSU £30, TF975 antique Marconi absorption wavemeter £60, or offers Carriage extra. Roy Smith, G0IWU, 01628 - 667136.

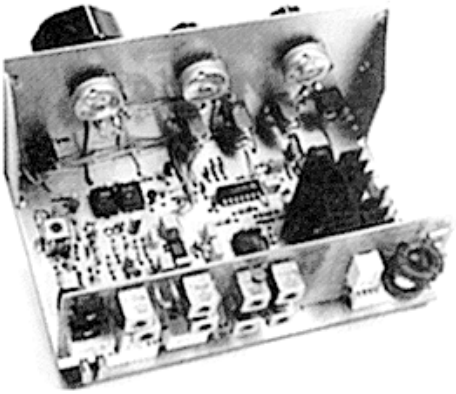
WANTED: Video Pattern Generator for TV Servicing needs, or circuits to build one, solid state or valve. Anything considered. Info please to Richard. 01376 - 584478.

WANTED: FDK 70cm Transverter expander Model 430 c/w instruction book. Parabolic Dish 18" c/w Feedhorn for 10ghz. John GW7WFI. Mid Glam. Tel: 01443 - 834055.

WANTED: Circuit and any information on the MIZUHO MX2, 2M SSB/CW TTX : Albert Crook, G4AYS, 153 Hawthorn Cottages, Shortheath, Swadlincote, DE12 6BL.

WANTED : Commercial Transceiver at reasonable price by disabled member. G0CJM. R.Lee Jones 161 Barrowcliff Rd. Newby, SCARBOROUGH. YO12 6EZ. Email : tj@cix.co.uk

WANTED: Information and help with small diameter Magnetic Loops. Please contact Bill, G4LQO, 18 Llewellin Close, Upton, Poole, Dorset. BH16 5QY.



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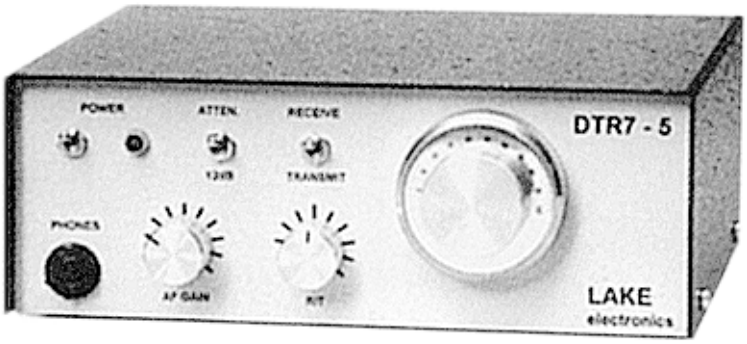

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(For a completely independant assessment and an objective comparison with other QRP rigs, see Peter Hart's review in November 1995 RADCOM.)

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