



SPRAT

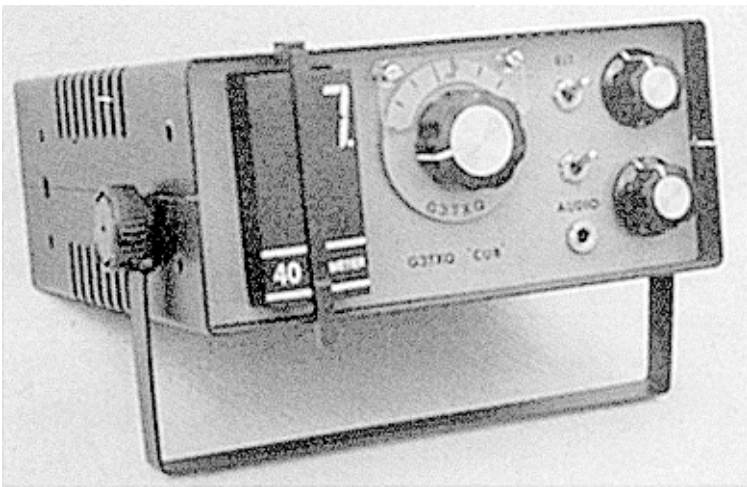
THE JOURNAL OF THE G-QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

ISSUE NR. 79

© G-QRP CLUB

SUMMER 1994



THE G3TXQ CUB - WHAT A GOOD IDEA

The CUB is a Multiband CW Transceiver Designed and Built by Steve Hunt, G3TXQ, using the plug-in modules from the Ten Tec Scout to cover 160 - 10m including superhet receiver switchable 2.4/1KHz bandwidths, AGC, RIT, ring mixer front end

INTERNATIONAL SPECIAL

NORCAL-40 TRANSCEIVER - MINICOM SUPERHET - OK2SBJ TRANSCEIVER
THE THREEFER - VALVE TRANSMITTER & RECEIVER - GOSLING ANTENNA
SUNNY TRANSMITTER - AUDIO S METER - NICAD CHARGE CONTROLLER
LM386 ANTI-HISS - QRP NEWS - ANTENNAS•ANECDOTES•AWARDS
COMMUNICATIONS FORUM - NOVICE NEWS - VHF REPORT
MEMBERS NEWS - MINI-CONVENTION - YEOVIL REPORT

JOURNAL OF THE G QRP CLUB



© G QRP CLUB

**St. Aidan's Vicarage,
498 Manchester Road**

Rochdale, Lancs.

OL11 3HE. England

Telephone and FAX : 0706 - 31812

Internet : g3rjv@gqrp.demon.co.uk

Rev. George Dobbs G3RJV

EDITORIAL :

QRP IS INTERNATIONAL

In the 20 years since the G QRP Club was founded, QRP has grown from a small specialist group within the hobby to a large International grouping of radio amateurs. It would seem that wherever there is amateur radio, QRP is alive and well.

To mark the international nature of QRP, this Special International Issue of SPRAT features articles from overseas. We lead with three articles, from the VK CW Operators QRP Club, the OK QRP Klubu and the recently formed, and very fast growing, Northern California QRP Club (NorCal). There is also a contribution from the QRP ARCI Quarterly. All evidence of the lively nature of QRP and the continuation of the fine traditions of home built equipment. Most of the success of NorCal seems to be due to its publication and production of the excellent NorCal-40 Transceiver, now to be followed by the multi-band Sierra

The next issue of SPRAT is number 80 - marking 20 years of the G QRP Club. It cannot possibly be that long ago !

Have you got a special construction article for our 20th year ?

You don't have to be a technical author. I can work the text from notes and Mac does wonders with all sorts of drawings.

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

THE NORCAL 40 TRANSCEIVER

Wayne Burdick N6KR 74 Elm St. San Carlos, California. U.S.A.

The NorCal 40 was the first club kit project of the Northern California QRP Club and this article is reprinted from their journal QRPp. Information about the club and a partial kit of the NorCal 40 are at the end of the article. The full kits are no longer available.

Specifications

Numeric values given are typical; your results will be slightly different. All measurements were made with a 13.0V supply and 50 ohm load at the antenna.

General

Size	2.2" (H) x 4.6" (W) x 4.5" (D)
Power Requirements:	10 to 15 VDC; reverse-polarity protection
Receive:	15mA typ.; increases at high volume levels
Transit:	200mA typ. at 1.8 watts output
VFO operating frequency:	2.085MHz nominal
Turning Range:	Any 35 to 40 KHz portion of 40 meters
Drift:	25Hz total from cold start at 65°F

Transmitter

Output:	500mW to 2.0W, adjustable
Load Tolerance:	70 - 80%
Transmit offset:	brief operation into high SWR
Transmit offset:	500-700Hz
T-R (transmit-receive) delay:	200 milliseconds

Receiver

Sensitivity	Better than 0.5uV for 10dB S+N/N
Selectivity:	400 Hz @ -6dB, 1.5KHz @ -30dB
I/F/:	4.915MHz, 4-pole Cohn crystal filter
RIT Range:	+/- 2KHz at center of VFO tuning range
Audio output impedance:	8 to 32 ohm (headphones only)

General Description

The NorCal 40 is a compact 40-meter CW transceiver optimised for ease of assembly and use. It is particularly well-suited to portable, battery powered operation, having very low receive-made current drain. To make assembly as easy and trouble-free as possible, all components, including the controls, connectors, and the case parts are mounted on a single printed circuit board. There is virtually no chassis wiring. Alignment is reasonably simple, and can in some cases be done with no test equipment, or with only a separate transceiver that covers the 40-meter CW band.

The receiver is a superhet, providing good sensitivity, selectivity, and freedom from 60-Hz hum pickup. The 4 pole crystal filter offers a good CW bandwidth, and a simple AGC circuit is used to keep strong signals relatively constant. An RF gain control is provided to attenuate extremely loud signals. The conversion scheme used results in a stable, low frequency VFO (variable-frequency oscillator), operating at about 2 MHz. See Circuit Details for more information.

Operating features include RIT (receive incremental tuning), solid-state T-R switching, transmit signal monitoring, and variable power output up to about 2 watts.

A Bit of Theory

The NorCal 40's receiver is a single-conversion superhet. U1 (see schematic, sheet 1) mixes incoming RF at 7.000MHz with a nominal 2.085 MHz VFO signal to produce an IF (intermediate frequency) of 4.915MHz. This IF frequency is constant; i.e., for an RF signal of 7.100MHz, the VFO is set to 2.185MHz, and the difference frequency is still 4.915MHz. Note the internal oscillator of U1 is not used as the VFO, because large signals at the input might pull such a VFO's operating frequency.

The 4.915MHz IF frequency was chosen for a couple of reasons. First, inexpensive crystals are available at this frequency. Second, it is a low enough frequency that a narrow crystal filter (X1-X4) can be constructed without special test equipment.

After passing through the crystal filter, the 4.915MHz signal is fed to the product detector, U2. The on-chip oscillator of U2 forms the BFO, using a crystal frequency about 700Hz higher than the centre frequency of the crystal filter. The resulting output of U2 is a signal in the audio range. This type of receiver provides "single-signal" reception, in that a signal will only be heard on one side of a station's zero-beat (0 audio frequency).. This means half as much QRM compared to a direct-conversion receiver.

The output of the product detector is kept relatively constant by Q2 and Q3, the AGC/ mute transistors. Q2 and Q3 are JFETs, and their resistance increases as their gate voltages go more negative. D3 and D4 rectify the output of the audio amplifier, U3, to provide a voltage that is about 0.5 volts with no received signal, but goes as low as -3 volts when a loud signal is present.

When the transmitter is keyed, Q4 (see sheet 2 of the schematic) conducts, providing +8V from the voltage regulator, U5, to the transmit circuits. Transmit mixer U4 mixes the VFO signal with the signal from its on-chip oscillator to provide an output at the operating frequency.

Note that crystal X6 (transmit mixer) is the same type as X5 (product detector), but operates at a lower frequency due to L5. Ideally, you want X6 to operate at the centre frequency of the receiver's crystal filter, so that when you transmit, your signal will be very close to that of the station you're listening to. X5 operates higher than this to provide an offset and hence an AF note of 700Hz that you can hear when transmitting.

Q5, Q6, and Q7 amplify the transmitted signal to about 0.5 to 2 watts, depending on the setting of R13. C45-C47 and L7-8 form a 5-element low-pass filter that clean up Q7's class-C output wave form. The output from Q7 is a solid 2 watts, but you can get 3.5 watts with this circuit if your substitute an MRF237. (Don't try this at home, but Bob Warmke has tweaked the circuit so much that it now puts out 5 watts.)

The receiver's RF input is obtained at the pickoff point between C44 and the lowpass filter. This signal is routed to U1 via C1 and L1 (sheet 1), which form a low-loss series-resonant circuit. When transmitting, Q1 is saturated, shunting nearly all of the transmitted signal to ground before it gets to U1, and effectively making C1 a small part of the lowpass filter.

The VFO is a fairly standard Colpitts type. D8 is a hyper-abrupt junction varactor diode, which just means that it has a wide capacitance range. R17 controls the voltage applied to D8 and hence the VFO frequency. U6 switches in RIT control R16 during receive if the RIT switch is on.

Unique Circuit Features

Receive Mixer: The usual input transformer with a 2-turn primary has been eliminated in favour of capacitive coupling (C2/C3). This allows the use of a cheap inductor (L2). Note that the rig has been optimised for fewest unique components; an example of this is that L1 and L2 have the same value. Light coupling to U1 provides good isolation from the input tank, minimum input signal into the NE602, and adequate signal strength on 40 meters.

LF: In case you hadn't noticed, there is no IF amplifier. It really isn't needed since the '602 has plenty of gain at 7 MHz and because gain control has been moved to the AF channel (see below). As anyone who has used an MC1350 IF amp with NE602s can attest, that's more gain than you really need for a 40-meter receiver, and it adds about 15mA of current drain, not to mention 10 or so components.

Crystal Filter: The coupling to the input and output of the crystal filter is simple and effective: L-networks provide a small amount of selectivity while transforming the high impedance of the '602s down to around 400 ohms. This matching technique provides as flat a pass band as transformer coupling does, but without toroids or IF cans (note, again, those cheap 15uH inductors). The small loss in using the '602s single-ended isn't missed much at this IF frequency.

AGC/Mute: Q2 and Q3 form a balanced version of the usual AF-thump mute circuit, and double as moderate-range AGC elements. The balanced configuration is used to take advantage of the balanced input to the LM386. The gate bias network (R5 R6 D3/D4) sets the gate voltage such that, with no signal, the FETs are at about their minimum Rds of around 150 ohms. As the AF level increases, C29 acquires a negative DC voltage, pulling the gates lower and increasing Rds up to 1M or more. Only a few microamps of current are required for this circuit.

You still have the usual thumps associated with AF-derived AGC; however, since the detector is working into such a high impedance, C29 can remain fairly small, and the response time is better than many such circuits. Also, there is a limit to the size of signals that Q2 and Q3 can pass without distortion - hence the RF gain control. D1 was added to keep the AGC time constant from affecting the mute time constant, and vice-versa. C29 is non polarised because the DC voltage at that point can be positive or negative. That same capacitor is the used elsewhere in the rig where a small-value electrolytic is called for- even though a polarised electrolytic would work - again in the name of minimising unique components.

AF Amp: This LM386 circuit is similar to others, except for the arrangement of R8 and C26. Usually, you use a 20 ohm resistor and .05 cap to ground from pin 5 to kill any high-frequency instability. There is also often a need to remove both internal LM386 noise and input noise using low-pass filter components. Here, we kill two birds with one stone by arranging R8 and C26 as a low-pass filter. C27 is quite a bit larger than C26, so not much is lost at the headphones. R8 sets both the volume level and the frequency response in this configuration, which works pretty well. For example, high-quality headphones typically have both good efficiency and good high-frequency response, so R8 will be set for around 50 ohms, which lowers the gain and removes a good deal of hiss.

TX Mixer: This is a conventional circuit, except for C32, which has the effect of reducing the harmonic content from U4 and reducing the VFO shift induced by U4 when it turns on. By the way, did you notice yet another 15 uH inductor (L5)? There's also one more that we'll let you find, for a total of six!

TX Buffer/Driver: Q5's gate circuit saves one component by providing DC bias through L6 and R10 rather than using capacitive coupling and a separate 100K resistor. The value of R10 is a compromise, chosen to look like a small coupling cap at AC, and yet still isolate that gate from L6 to improve DC bias stability. Q5 and Q6 form a minimum-component source-follower/driver, and the usual emitter-bypass cap isn't needed because Q6 has plenty of gain at 7MHz.

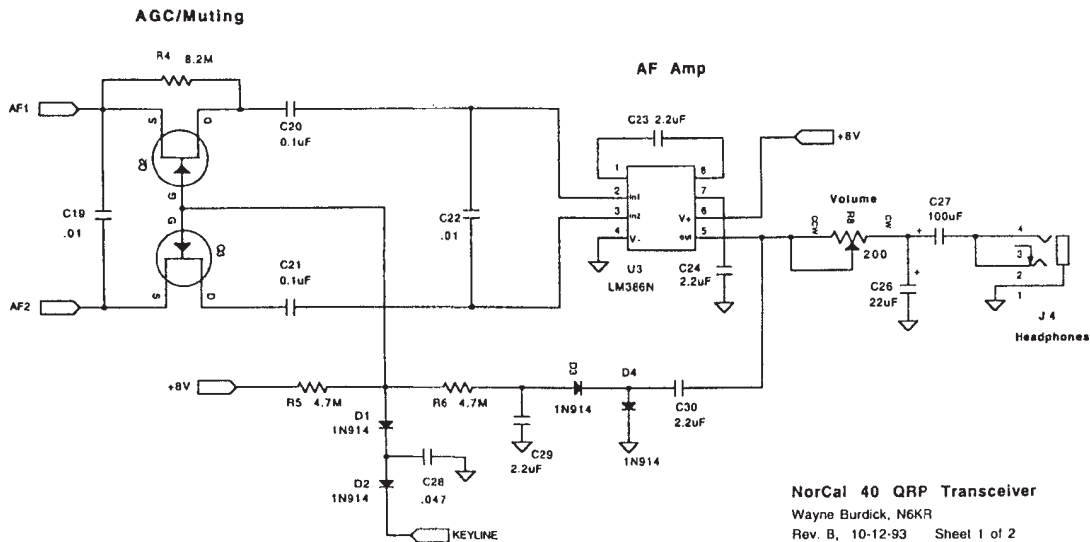
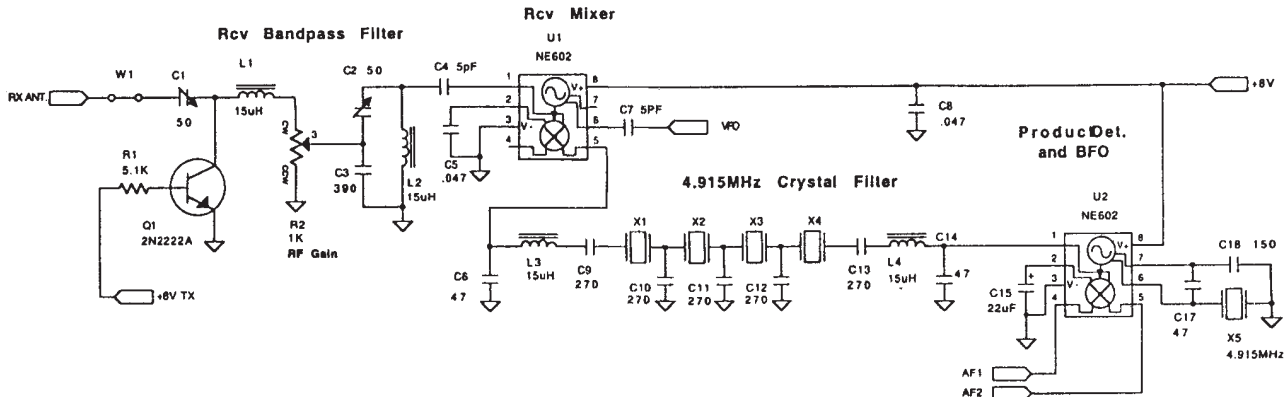
RIT and VFO: D8 is a very high-capacitance device (50 to 150 pF). That, combined with the non-linear resistance/rotation curve of R17/R20, and the relatively small value of C49, results in a fairly linear frequency tuning range. R16 is 10% of the size of R17, so if the VFO range is 40kHz, the RIT range is about +/- 2kHz. Comparator U6 drops in a fixed resistor, R15, during transmit or when S2 is in the "OFF" position. The RIT range increases as you turn the VFO knob CCW with this arrangement. That has the beneficial effect of giving you over +/- 2.5 KHz near the bottom end of the band, useful when you want to call DX stations up or down.

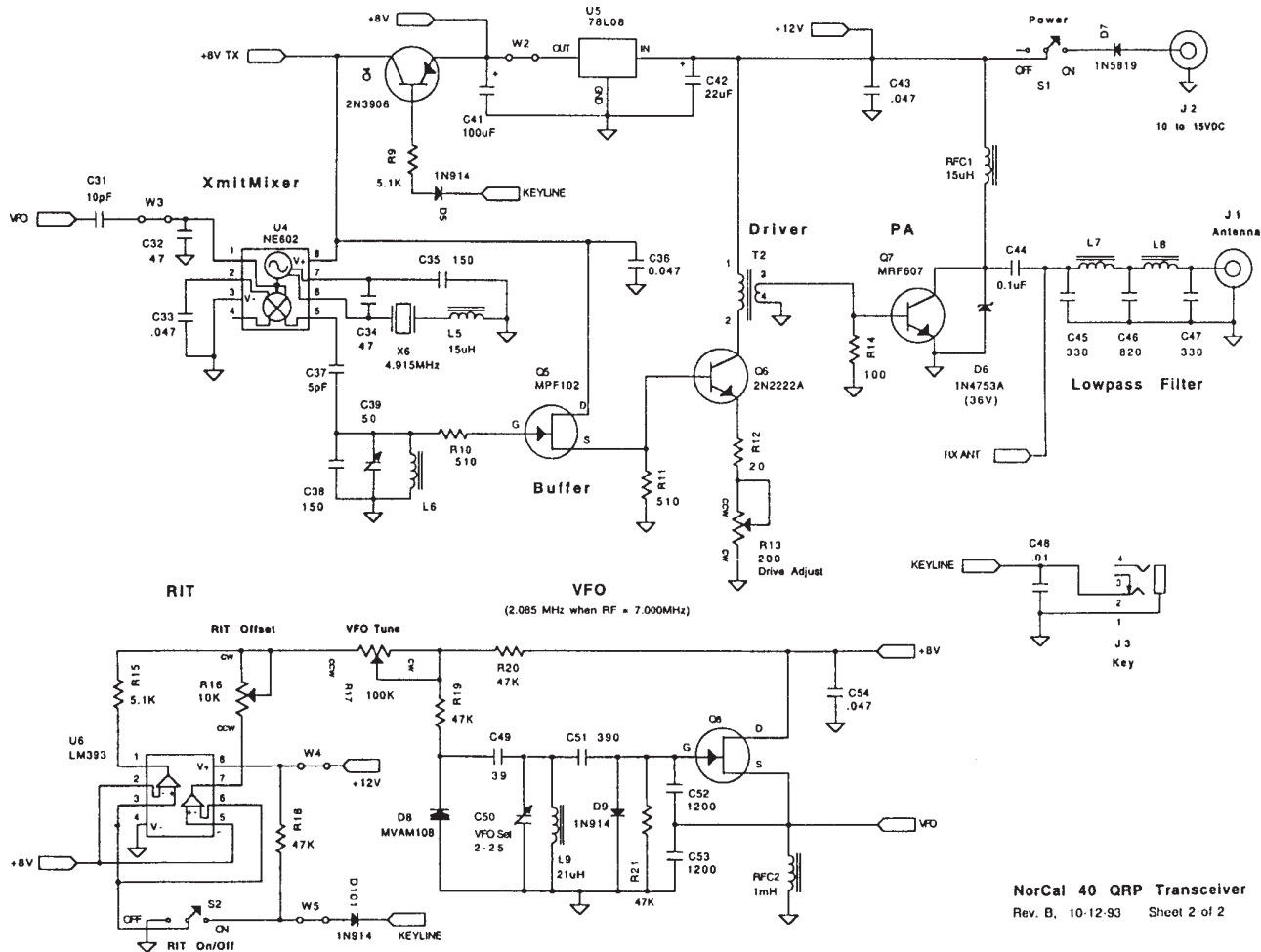
Performance

The NorCal 40's best characteristic is that it is quite stable: the VFO doesn't budge, and the driver and power amplifier don't oscillate, at least in my experience. spurious output from the transmitter is -40dB or so below the fundamental. The keying is very clean, although it is a bit fast - about 1 ms rise and fall time. Some QRP theorists think this "hard" keying is an asset for a low-power signal. You can add an 0.27uF capacitor from the junction of D5 and R9 to ground to shape the keying wave form a bit.

As for the receiver, it is quite sensitive and has adequate headphone drive. The crystal filter works well, as does the RIT. The most interesting feature of the receiver is the AGC, filter works well, as does the RIT. The most interesting feature of the receiver is the AGC, which works fine for moderately-loud signals. It does get swamped by REALLY loud signals, but hey - that's why there's an RF gain control. The NE602 front end has all of the usual problems associated with that device, but the simplicity, low current drain, and low drive requirements make it a good trade-off in a rig like this.

I have heard the phrase "fun to operate" or thereabouts from a number of people. To me, that's the best indication of the rig's performance





NorCal 40 Partial Kit

The Northern California QRP Club is selling partial kits for the NorCal 40 CW Transceiver. The rig was first offered as a complete kit, but now the club has moved on to other projects. Several hams have contacted us and requested the hard to get parts for the NorCal 40. So, we have decided to offer the NorCal 40 partial Kit. It includes the silk-screened PC board, custom case with drilled front and rear panels, standoffs, special screws, MVAM 108 varactor diode, and a 27 page instruction manual. The manual gives a complete parts list with sources for all parts. The rig is very easy to build, in fact several first time kit builders have been successful.

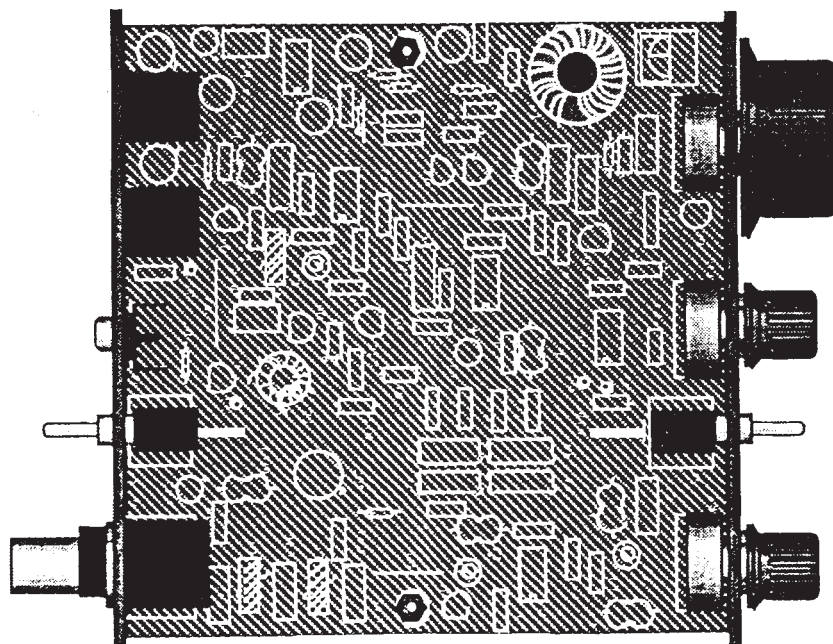
**The NorCal 40 Partial Kit is available in the UK for £15 + £1 postage from:
Ian Wye, G0OKY, New House, Hook Road, Amcofts, Scunthorpe. DN17 4AZ
Cheques : G QRP Club - Please send an Address Sticker with Order**

The Northern California QRP Club

The NorCal QRP Club was formed in June of 1993 with the purpose of exchanging information and fellowship for and about QRP. There is no charge for membership but to receive QRPP, the Journal of The Northern Californian QRP Club, you must pay \$5 a year (in the USA). The club is open to overseas members and the subscription fee is \$15 (QRPP sent Airmail). Payments may only be made in US FUNDS Please send your NAME - CALLSIGN - FULL POSTAL ADDRESS [+ Internet or Packet Address if you have one] together with the fee [\$5 in the US - \$15 DX] to

Jim Cates, WA6GER, 3241 Eastwood Road, Sacramento, CA 95821. U.S.A.

Please make any Checks or Money Orders payable to 'Jim Cates' - not Norcal



THE NORCAL-40

THE MINICOM SUPERHET RECEIVER

Basil Dale VK2AW

From LO KEY the Journal of the VK CW Operators' QRP Club

CONCEPTS

An Outline of a simple minimum components receiver for amateur communications was given in LO-KEY No. 35 September 92 (1). This receiver is based on articles in QST (2) and SILICON CHIP (3) but uses the Motorola integrated circuit 16-pin MC3357 instead of the 18-pin MCX3359. The MC3357 contains a mixer, an oscillator which can be configured with external components as a Colpitts, a Hartley or crystal controlled, and five stages of IF (limiters). The other features of the chip, the quadrature detector, audio stage and squelch are not used. An on-chip audio filter is available and details are given in case its use is desired.

The MC3357 has been around for many years in use in quality FM receivers. It has one advantage over the MC3359 - there is an output from the IF (limiter) stages at pin 7 and this is important for the purposes of this receiver.

Four versions of the receiver (dubbed "MINICOM" = MINimum number of COMPONENTS) can be suggested:

1. CW/SSB superhet for any amateur band, 455 KHz IF using a Murata or similar ceramic IF filter (or two or more in series) or multiband using plug in or switched mixer and oscillator coils.
2. Dual band CW/SSB superhet, no switching, for 3.5 MHz and 14 MHz using a 9 MHz crystal ladder filter and 5 MHz on-chip oscillator (band imaging);
3. CW/SSB superhet for any single band, 9 MHz crystal ladder filter and suitable oscillator frequency e.g. 2 or 16 MHz for a 7 MHz receiver, or a multiband receiver using plug-in coils or switched coils for mixer and oscillator.
4. General coverage AM receiver for short-wave listeners, 455 KHz IF using single Murata or similar ceramic filter and a diode AM detector. Mixer and oscillator tuning could be 300 to 400 pF capacitors to give extensive coverage over desired bands.

These are very simple but effective receivers with a minimum component count.

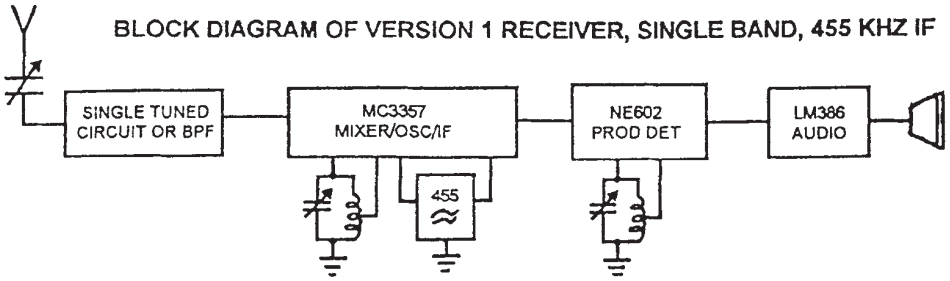
CIRCUIT DESCRIPTION

The desired signal enters the mixer at pin 16 via a trimmer capacitor (adjusted to give the optimum signal level) and a coupling coil. Both the 3359 and 3357 ICs are susceptible to over load from strong HF signals particularly when connected to a resonant antenna or antenna via ATU. The mixer is coupled internally to the on-chip oscillator, which uses the Hartley design, by an external tapped coil. This is a stable oscillator and the capacitor across the coil (main tuning) is selected to give the required frequency coverage. Details of coil winding and capacitor values are not given, as individual constructors will have their own preferred components. The Hartley oscillator is preferred to the usual Colpitts with fixed capacitors, as these have to be changed for each frequency if a multiband receiver is required. The simple approach is to use a tapped coil (25% of total turns from ground end is usually satisfactory).

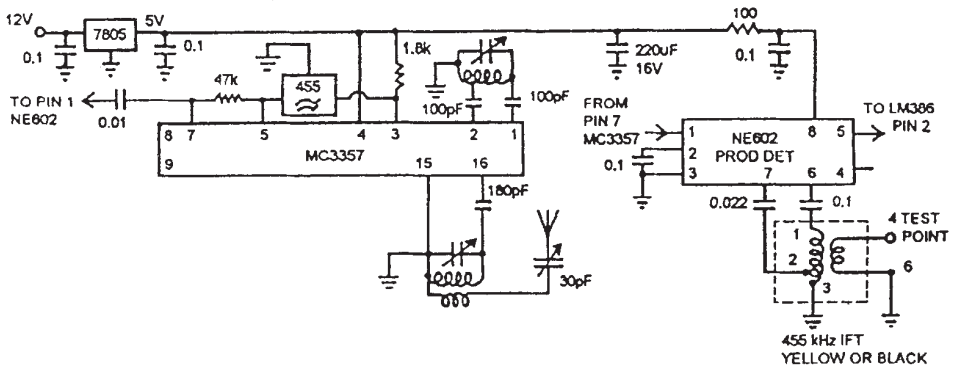
The mixer output at the intermediate frequency (IF) is taken from pin 3 to the IF filter, the output of which connects to pin 5 which is the input to the five stages of IF. The IF output at pin 7 enters an NE602 product detector/BFO for CW/SSB versions or a diode for the AM version. The NE602 circuit is the standard configuration, using, in the oscillator, either a 9 MHz crystal or a miniature IF transformer (455 KHz version). An alternative for the 455 KHz version is to use an orange 2-pin ceramic resonator (Tandy Electronics) or similar which will oscillate at 455 KHz. Audio output from the 602 is taken from either pin 4 or 5 to the LM386 audio IC. When using 455 KHz IF, the gain of the 5 stage limiter is reduced to prevent overloading from strong HF signals by omitting the by-pass capacitor from pin 6 of the MC3357.

The gain of the LM386 audio IC may also be reduced if required by omitting the usual 5 uF to 10 uF capacitor between pins 1 and 8, as the overall gain of the 455 KHz version is adequate. A speaker or phones may be used. If an audio filter is desired, one is available on the 3357 (circuit shown) or a Bessell filter centred on 700 Hz (as per Reference 4) can be applied to the two inputs of the LM386.

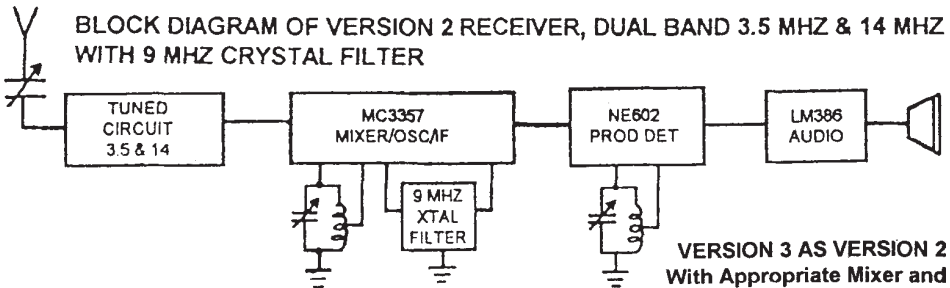
BLOCK DIAGRAM OF VERSION 1 RECEIVER, SINGLE BAND, 455 KHZ IF



CIRCUIT DIAGRAM OF VERSION 1 RECEIVER

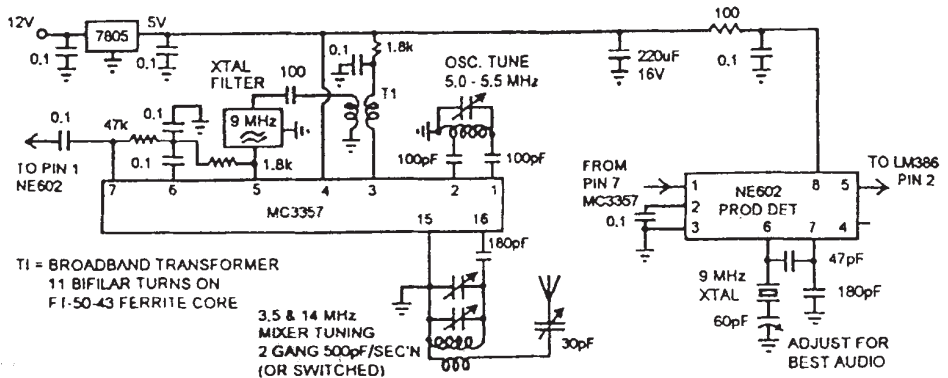


BLOCK DIAGRAM OF VERSION 2 RECEIVER, DUAL BAND 3.5 MHz & 14 MHz WITH 9 MHz CRYSTAL FILTER



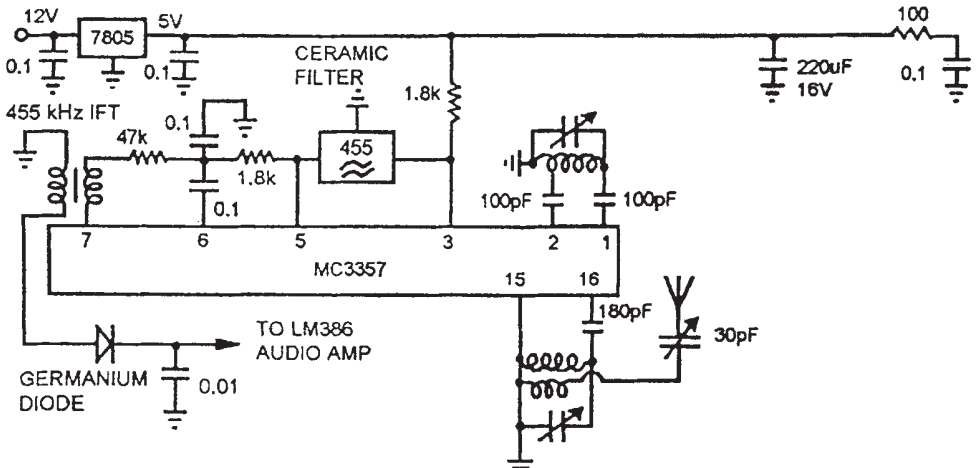
VERSION 3 AS VERSION 2
With Appropriate Mixer and Oscillator circuit constants

CIRCUIT DIAGRAM OF VERSION 2 RECEIVER



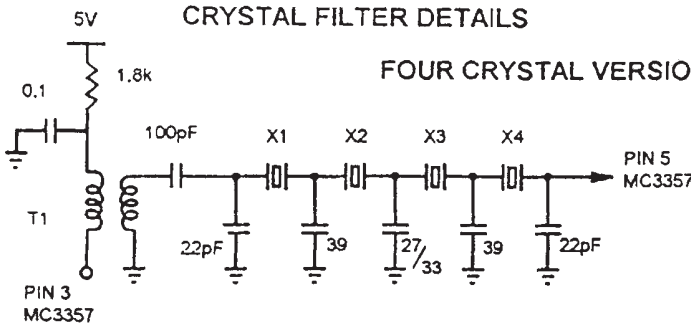
**VERSION 4 RECEIVER -
GENERAL COVERAGE AM RECEIVER FOR SHORT WAVE LISTENING**

This version has not been built. The schematic diagram would be the same as Version 1 but with the additional circuitry around pins 5,6 and 7 (bypassing pins 5 and 6 with 0.1 uF capacitors to give increased gain) and connecting pin 7 of the MC3357 to a diode detector. The NE602 is omitted and as this has a gain of 15 db it may be necessary to increase audio gain with an extra stage. A suggested circuit is shown:



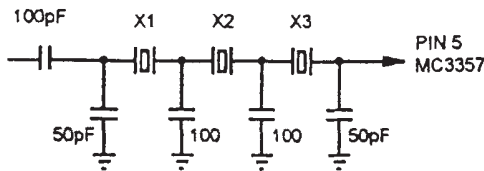
CRYSTAL FILTER DETAILS

FOUR CRYSTAL VERSION



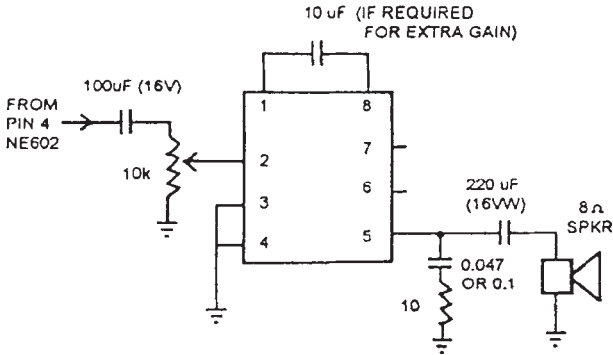
X1 - X4 = 26 680 kHz
USED ON FUNDAMENTAL
8 893.5

THREE CRYSTAL VERSION

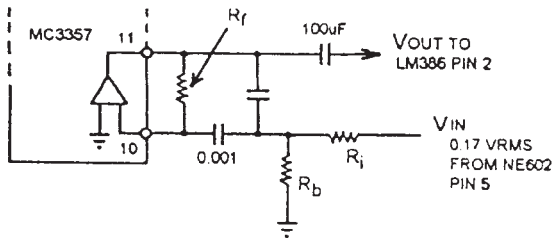


X1 - X3 = 27 135 kHz
USED ON FUNDAMENTAL
9 045 kHz

LM386 AUDIO STAGE USED FOR ALL VERSIONS

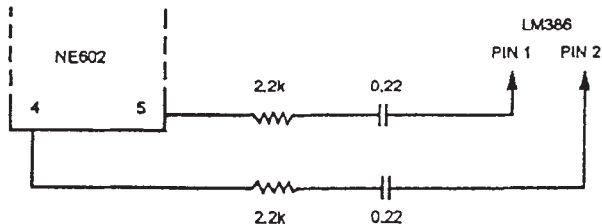


OPTIONAL AUDIO FILTER (USES MC3357 - SEE REFERENCE 2)



For a Q of 8 and gain of 8 at 700 Hz
 $R_f = 1.8$ megohm $R_i = 110k$ $R_b = 7.5k$

ALTERNATIVE OPTIONAL AUDIO FILTER (USES NE602 - SEE REFERENCE 4)



VK CW OPERATORS QRP CLUB : Applications or information about membership to Kevin Zietz, VK5AKZ, 41 Tobruk Ave. St. Marys, SA 5042. Australia.
 Subscriptions : VK: \$A10, ZL: \$A12, DX: \$A14.

CRYSTAL FILTER

For many years, the half lattice or full lattice type crystal filter was predominant in amateur literature. Commercial filters were (and still are) expensive and home-made filters of these types using surplus crystals required considerable work in construction and adjustment.

The advent of the ladder filter has superseded other types for amateur receivers and transmitters. It is simple to construct and requires no adjustment.

Colour burst TV crystals on 3.579 MHz and 4.33 MHz and computer crystals are readily available. Three or four crystals are required for each filter with another two for use as upper and lower sideband in the BFO. There is now no reason to avoid the use of crystal filters in receivers and SSB transmitters built by home constructors.

MIXER AND OSCILLATOR TUNING

If only a small band of frequencies needs to be covered, the input tuning capacitor can be replaced by a suitable bandpass filter as in the G-QRP Club "Sudden" receiver. Iron powder toroids such as Amidon T-50-2 and T-50-6 are suitable for both mixer and oscillator circuits. If constructor preference is for slug tuned coils, these may be used provided good construction practice is observed.

CONSTRUCTION

Several methods of construction are available. The MC3357 can be mounted on a 16-pin PCB. Alternatively, dual 20-pin IC Boards (Tandy), which can be separated, have been satisfactory. The components are mounted on the copper side of the boards. The 3357 can be mounted on one board and the NE602 and LM386 on the other. If more space is desired, DSE Prototype Boards or Plug-in IC Boards could be considered.

Crystal filters can be mounted on a small piece of single-sided board, isolating pads being created with hacksaw cuts across the board. Crystals can be soldered direct to the board, using a heat sink when soldering the pins.

All the boards can be mounted at the bottom of a simple "U" chassis, the front panel taking the mixer tuning capacitor (if used), the main tuning (oscillator) capacitor, audio gain control, on-off switch and a LED indicator. On the rear panel can be mounted an RCA socket for antenna input and suitable power connectors.

POWER SUPPLY

Requirements are modest being 5 volts regulated for the NE602 and MC3357 and 6 to 9 volts for the LM386. Some versions of the 386 will accept 12 volts (LM386-N2). A 5 volt regulator should be used in preference to a zener, as the latter can be noisy in receivers.

(National Semiconductor data:

Operating Supply Voltage ranges are 4 - 12 V for LM386N-1 & LM386N-3 and 5 - 18 V for LM386N-4)

Step by step construction notes are not given, as assembly and soldering of components is straightforward. The results obtained from this simple design should provide the constructor with a receiver suitable for amateur and short-wave listener requirements.

REFERENCES

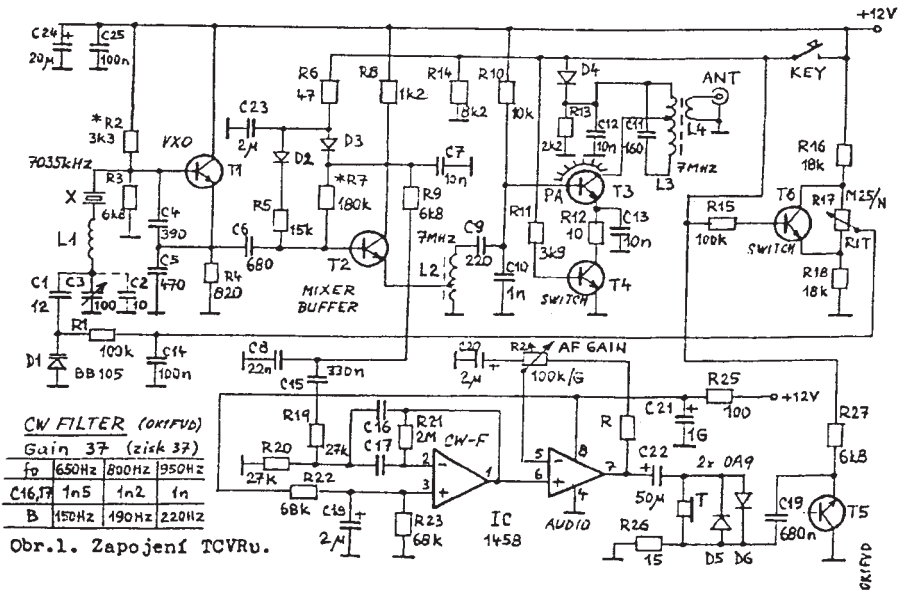
1. Receiver Notes, B Dale, MC3357 and MC3359 Experimenting.
2. The SIMPLEceiver, Bruce O. Williams, WA6IVC, QST September 1986.
3. 40 Meter Receiver, Garry Cratt, VK2YBX, Silicon Chip, Dec. 1989.
4. Simple SuperRX, Bruce O. Williams WA6IVC, 73 Amateur Radio April 1991.

7MHz QSK QRP CW TRANSCEIVER

Jaroslav Bik, OK2SBJ - From OK QRP INFO, Spring 1994

The TCVR utilizes a D.C. RX and the input of the PA is around 1W at 12V, or up to 3W at 24V DC supply. VXO is tuned by capacitor C3 and has an RIT circuit. VXO DC bias and RF output is adjusted by means of R2. **RX** - the signal from antenna is fed trough L3C11 circuit, open T3 and circuit L2C9C10 to T2 which serves as mixer. From the collector of T2 AF signal is fed into an active AF filter and AF amp. R7 is adjusted for best RX sensitivity. The table in Fig.1 gives components values of the AF filter for different centre frequencies and 3dB BW. **TX** - in key-down condition the DC bias of T2 is changed trough D2 and D3 and this transistor now eorks as a buffer stage (emitter follower). RF voltage on L2is adjusted by R5. T4 is the PA keying tranzistor. PA (T3) works in class A. The voltage fed trough R15 opens T6 which disables the RIT, and via R27 the side-tone monitor is enabled (T5). In this circuit T5 works as a relaxation oscillator. The circuit diagram really shows T5 connected correctly - however not all transistors will work heve, T5 should be selected (BC 109 or similar should work). Side-tone volume is set by R26. The autor built this TCVR on double side PCB where one side serves as ground. The transistors are common RF type, PA has a heat-sink. Suggested type: T1,5,6, - BC 108, BC237, 2N3904, T2 - 2N2222, BFY50, T3 - 2N3553, T4 - 2N2222 (Ic = 800 mA), D1 - BB105, D2,3,4 - 1N4001, D5,6 - 1N34 etc.

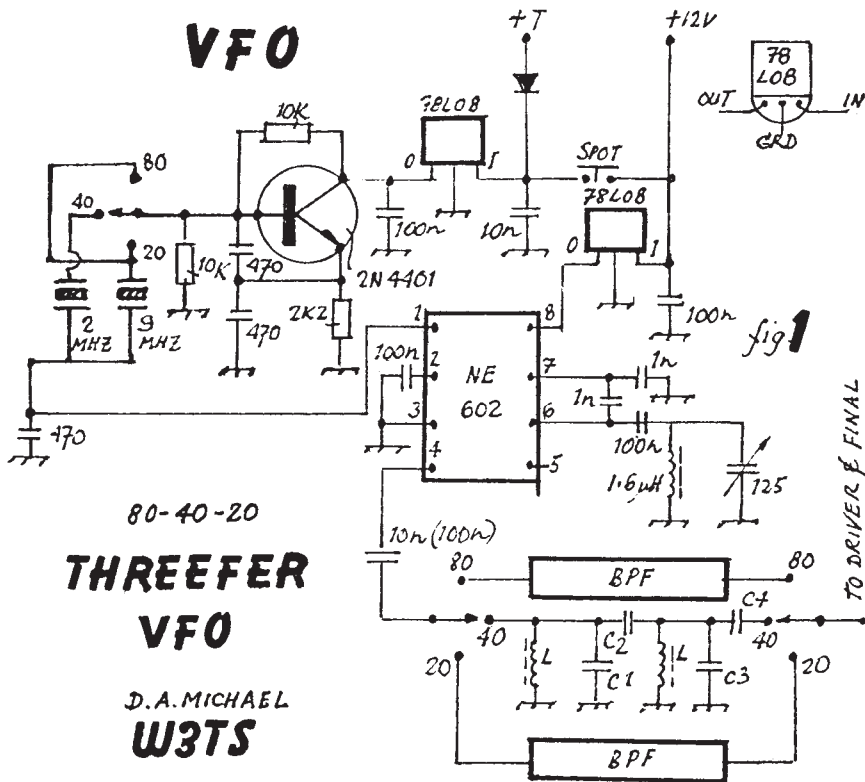
(transl. OK1CZ)



OK QRP CLUB Subscription is 15 IRCs per year or £5 or \$US 10 or 15DM.
 IRCs sent in a letter to OK1CZ are preferred. Please do not send cash in a letter.
 Use cheques or Eurocheques (add 10%), payable to "Petr. Doudera".
 Petr Doudera, OK1CZ, U1. batterie 1, 162 00 Praha 6.

THE THREEFER : THREE BAND TRANSMITTER

Mike Michael W3TS P.O. Box 593. Church Lane. HALIFAX PA 17032 USA



The Threefer transmitter is an easy way to get a VFO controlled transmitter to run on three bands

THE VFO SECTION

This crystal mixer VFO board uses the internal oscillator of an NE602 on 5 to 5.5MHz to mix with 2 crystals to produce a signal on 3 bands. A 9MHz crystal provides the 80 and 20m signal and a 2MHz the 40m signal. A Band Pass Filter is added to the output for each band. The inductors for these filters are wound on Toko 10K formers.

BW	BAND	L	C1	C2	C3	C4	10K Coil	OUTPUT
0.5MHz	80m	5uH	350p	40p	200p	160p	19 turns	-12dBm
0.5MHz	40m	1.3uH	390p	22p	300p	82p	10 turns	-13dBm
0.9MHz	20m	0.6uH	210p	10p	160p	47p	7 turns	-14dBm

Note : If VFO is leaking through or there are big spurs below or above 14MHz, replace the NE602 - It has blown ! (All spurs on all bands - -35dB or better)

THE DRIVER / FINAL SECTION

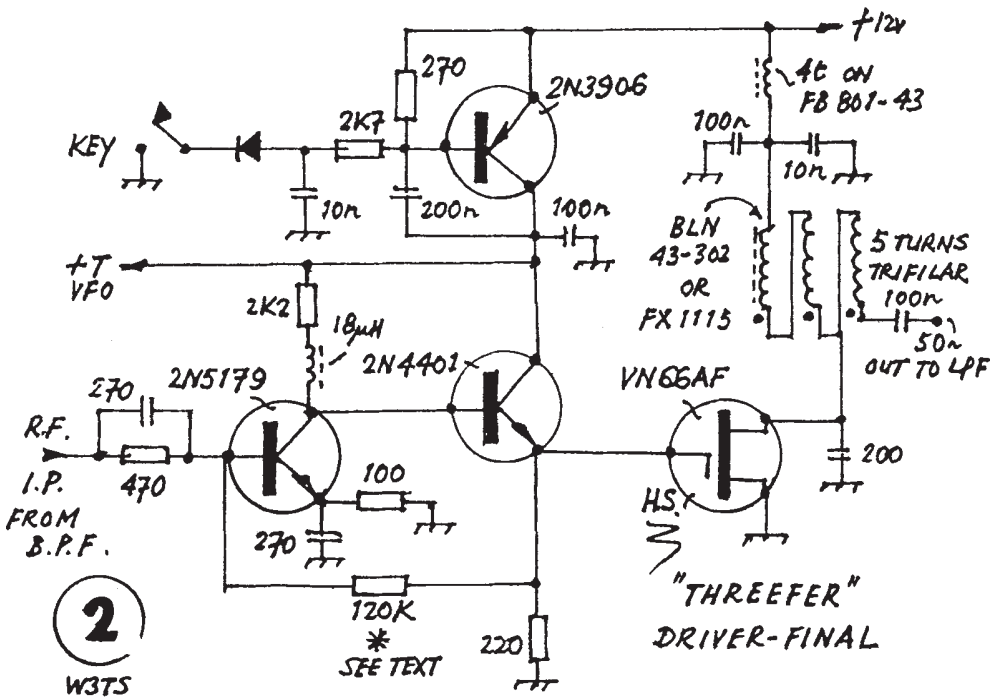
This circuit began life as a modification to the LCK Transceiver (SPRAT 60)

*The 120K Feedback Resistor:

Put in a 200K trim pot (set to maximum resistance) then adjust toward zero ohms and measure output power. Set pot for maximum output. Take out and measure. Put in a fixed resistance of that value. In my unit it was 120K

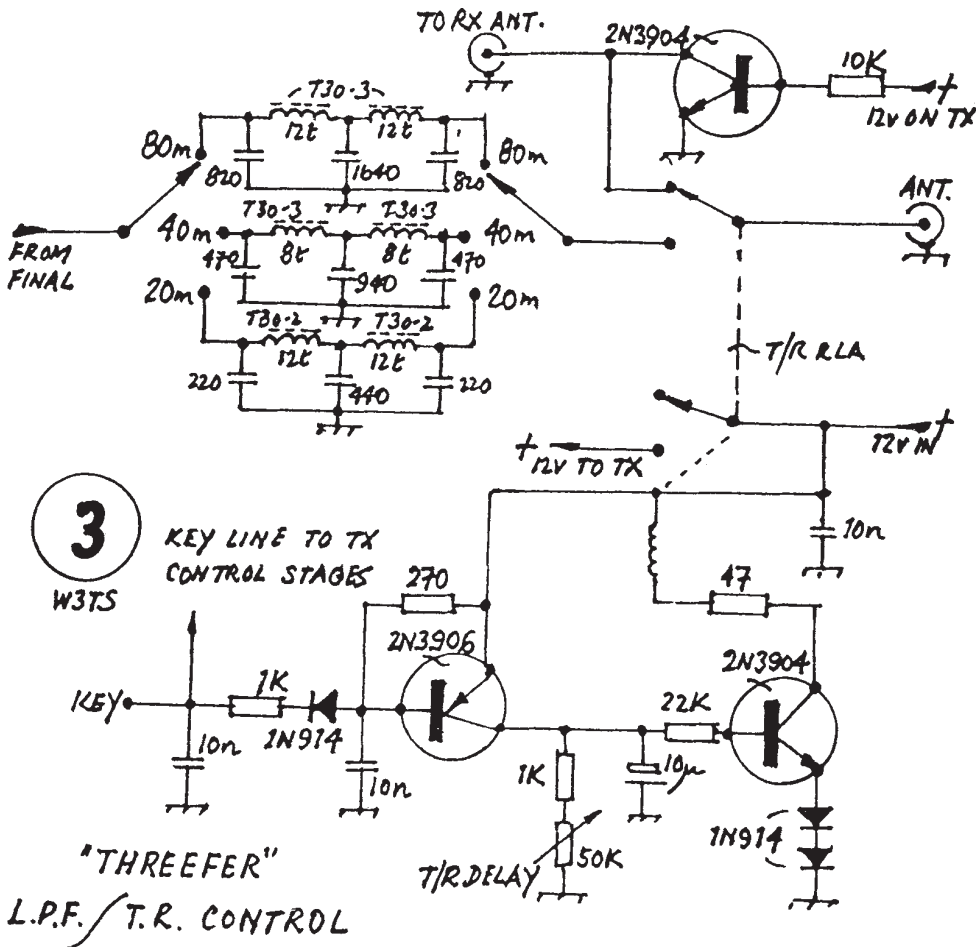
AT 13.8 Volts:

BAND	POWER OUT	CURRENT	POWER IN	EFFICIENCY
80m	3.4 watts	380mA	5.2 watts	65%
40m	3.4 watts	380mA	5.2 watts	65%
20m	2.5 watts	310mA	4.2 watts	60%



LOW PASS FILTER and CHANGE-OVER SECTION

There are switched Low Pass Filters for each band. The change-over circuit is semi-break-in operated from the key with a 50K variable potentiometer to control the "hang time" of the transmit receive change-over. This can be adjusted to suit keying speed. The transistor on the receiver antenna input is biased to protect the input circuit of the receiver.



Follow Up to W8MVN QRP Antenna Tuner (SPRAT 78)

Not shown in the circuit : Resistors in the SWR Meter are 33 ohms.

If using with Open Line add 4:1 Balun to output.

The Winding Information for the switched inductors : All on T50-2 Cores

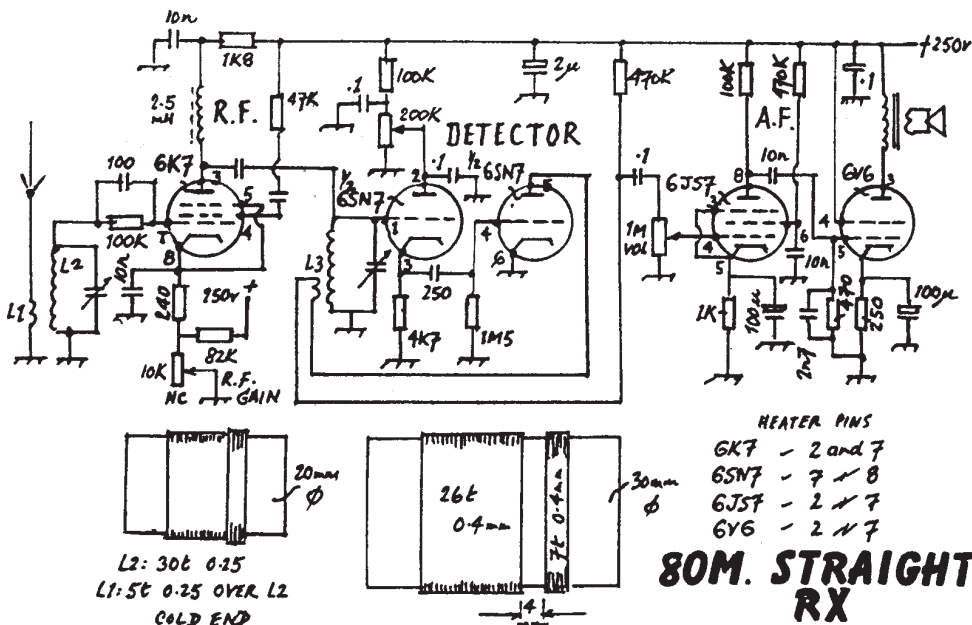
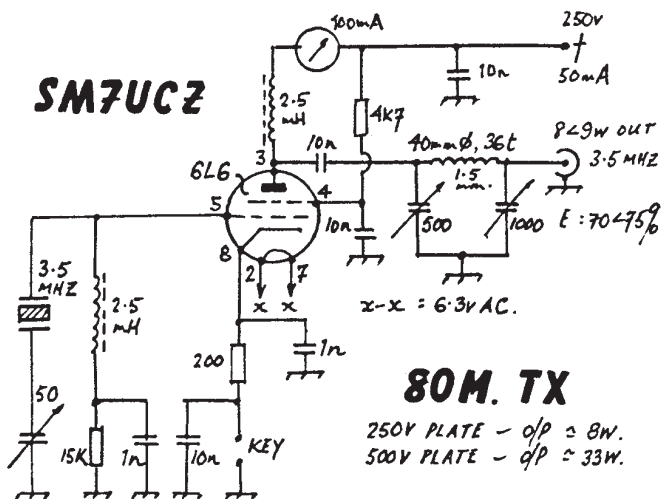
<u>L in uH</u>	<u>Turns of 26 gauge wire</u>	
8	29t	
4	26t	
2	20t	
1	14t	
0.8	12t	Spread evenly
0.4	8t	to occupy
0.2	5t	two-thirds
0.1	3t	of core

A VALVE TRANSMITTER and RECEIVER FOR 80m.

Johnny Apell SM7UCZ Ekedalsvagen 11. S 373 00 JAMJO. Sweden

Some of the members who attended the Rochdale Mini-Convention last October will recall the fine "vintage style" equipment build by Johnny, SM7UCZ.

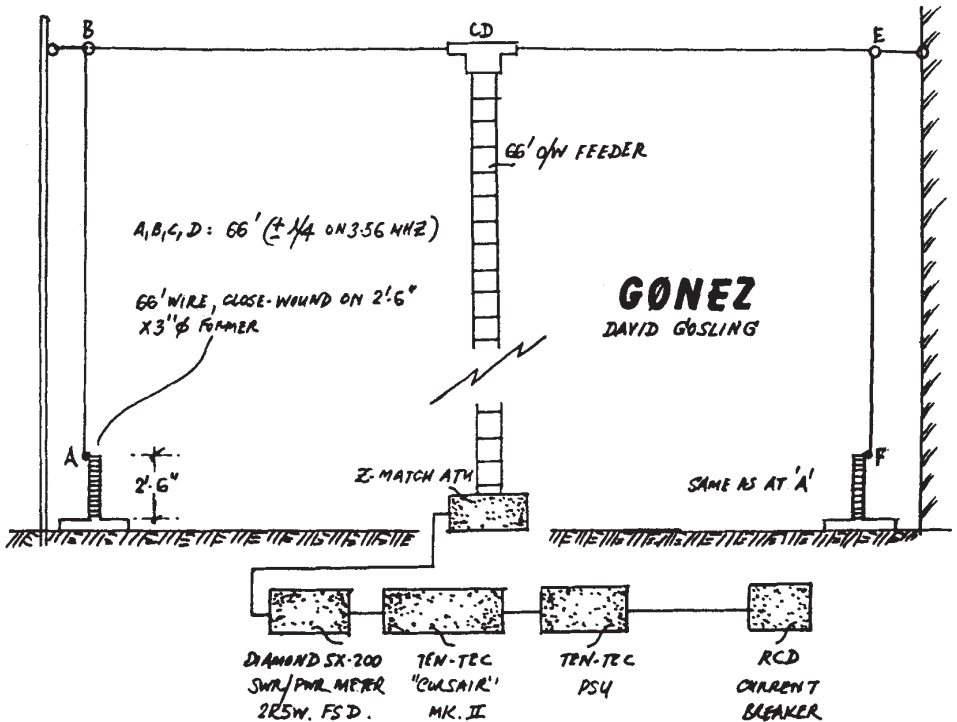
Shown here are the circuits for a 3.5MHz transmitter and receiver using valves and built by Johnny. Please remember to use components rated at the appropriate high voltages when attempting to build these circuits.



THE GOSLING 8 BAND SMALL GARDEN ANTENNA

David Gosling, G0NEZ, 31 Semphill, Hemel Hempstead, HP3 9PF

My version of this antenna consists of a 66ft wire section, bent into a U-shape, and two end-loading coils each consisting of 66 feet of insulated wire wound on a 2 foot 6 inch length of 3 inch diameter plastic pipe. The antenna is fed via a suitable length of open wire feeder which is coupled to the rig via a z-match ATU of the type described in the "Radio Communications Handbook". The end loading coils are made in the same way as any other coils, and should be protected by a layer of good quality plastic tape. Both they and the main span of the antenna can be made from multi-strand insulated wire, which is easy to work with. The 66 foot U section is the biggest that will fit into my small garden. If you can make the antenna longer and higher, find your surplus wire by taking turns off the loading coils. Add them if you garden is smaller. With the arrangement shown, good results have been achieved on all bands 3.5 to 28 MHz. (Editorial note: "rf in the shack" be encountered on any band, it should be possible to cure it by switching in a few extra feet of open wire feeder when operating on that particular band.)



THE G QRP CLUB ANTENNA HANDBOOK

THE COMPLETE COLLECTION FROM SPRAT - HAVE YOU BOUGHT YOUR COPY YET?
 SPECIAL MEMBERS PRICE £4.50+£1.43pp EUROPE £4.50+£2.24pp US/IDX \$14 Surface
 Mail Order from : Shoreham Copy Centre, 3 John St. Shoreham-by-Sea, Sussex. BN4 5DL
 Please make out all cheques to "G QRP CLUB"

THE SUNNY 40m. TRANSMITTER

Cook, G4XHE, 3 Pyecombe Ct. Cuckfield Clo. Bewbush. Crawley

Having recently built a new ATU for QRP use, it was decided to build a 40M Tx to make some use of it. Various published designs were looked at, but none really fitted the bill. It was therefore decided to start from scratch.

The design spec. was for a transmitter that could be used with any stable receiver, having about 2 watts of output and without the oscillator running during receive periods and so blotting out the station being worked. Finally there had to be an antenna change over already mounted on the board, and be able to net onto the Rx without transmitting. No sidetone has been provided as the output is monitored on the receiver.

The only PA transistors available were the BFY50 and BFY51. Obtaining 2 watts of output from one of these is a tall order and relies on very efficient matching between the driver and the PA. The transformer comprising of L1 and L1A must be wound correctly to obtain the full output. Every effort has been made to ensure that the tx can be duplicated without problems but this component is the one exception.

In the end best results were obtained using a surplus ferrite core with 7 turns on the primary and 1 turn on the secondary. It has been estimated that the output impedance of the driver is in the order of 250 ohms and this needs to be matched to around 5 ohms at the input of the PA. This will require a turns ratio of 7:1. The other consideration is that reactance of the primary should be at least 4 times the impedance e.g. 1000 ohms. In fact it was found that a primary with an inductance of 40 uH giving a reactance at 7 MHz of around 1775 ohms worked the best of all. If no surplus core is available then it has been calculated that a 49 turn primary and a 7 turn secondary on a T50-3 core will do the trick.

It was also found that the output varied a little depending on the output device used. Don't be tempted to change the driver to a BC107/8/9 or 2N2222 as these just do not work as well as the 2N2369A.

The oscillator is of the Pierce variety and gives a very stable signal even though it is being keyed. With the circuit as described VC1 will move it about 2 KHz, should a larger swing be required than an inductor of about 40 micro H can be put in series with the crystal and VC1. This has been tried with a variable inductor and moved the oscillator about 5KHz.

The output has a low pass filter which starts to cut off at about 8 MHz and it should be on order to change the capacitor values slightly to make use of what is in the junk box.

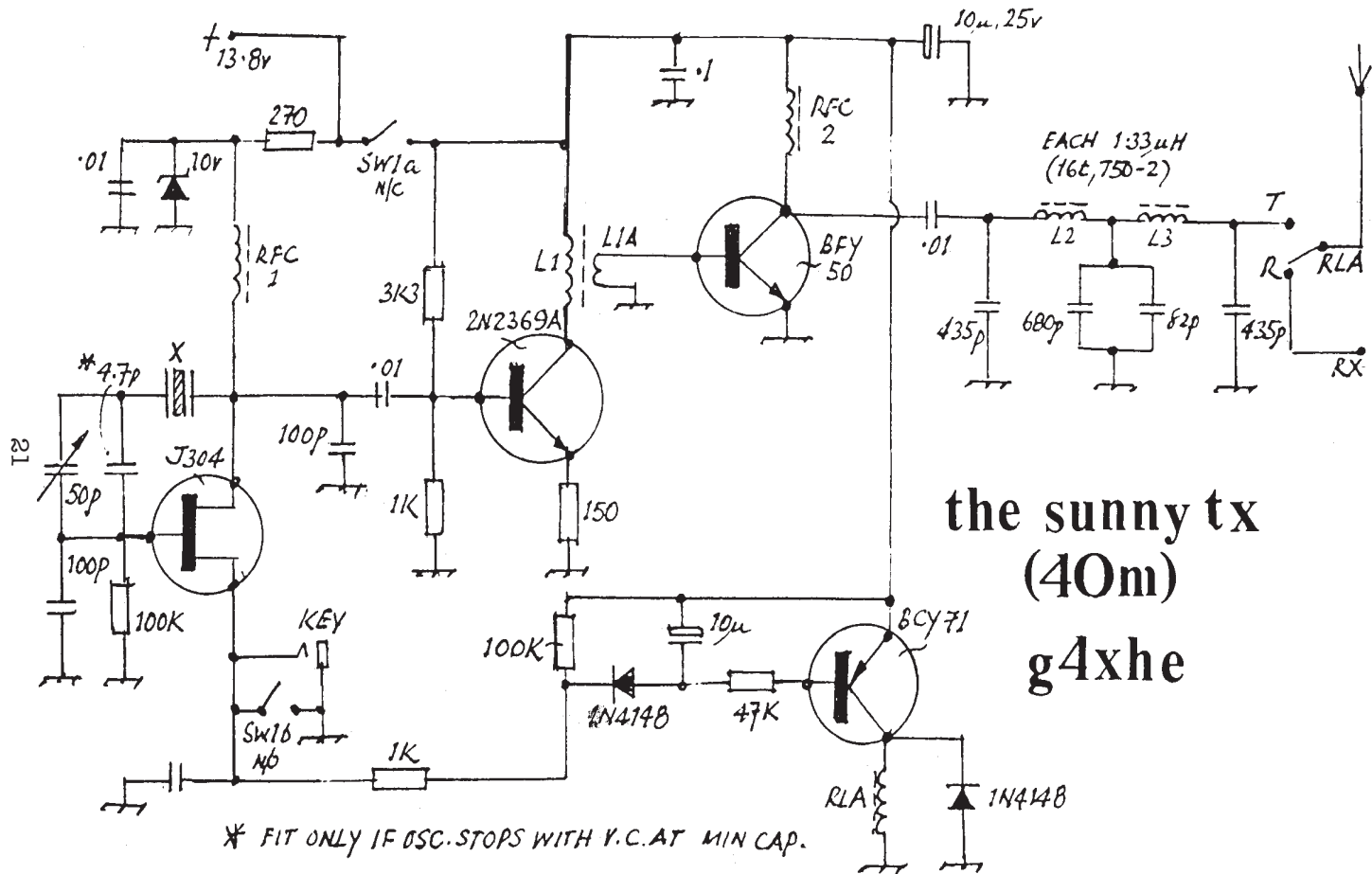
The board is double sided, top being used as a ground plane. All connections to earth are made to this. All the rest of the components are quite straight forward except the relay which was purchased from Tandy, cat number 275-247 and the RF Chokes 1 and 2 which are 9 turns on a ferrite bead.

The Sunny has been used on air during tests and around 20 stations in 5 different countries have so far been worked most with good reports, using a 45 ft long wire. It should also be suitable for battery use, around 500mw is possible at 9v. But in this case it will be necessary to lower the value of the zener diode stabilising the oscillator. Full output should be obtained at 13.8v.

Why is it called the Sunny? Well simply because operating QRP has brought a little sunshine into my enjoyment of amateur radio.

Announcing the NorCal Sierra QRP Transceiver

NorCal - see lead article in this SPRAT - have produced the Sierra Multiband QRP Transceiver Kit. A little larger than the NorCal-40, the Sierra also uses single board construction but adds plug-in band modules for every band from 160-15m. The VFO covers 150KHz of each band with a variable capacitor and built-in 8:1 drive. The Kit AVAILABLE TO MEMBERS ONLY sells at \$160, with each Band Module at \$25 (plus \$10 postage for non-USA orders) Details of the club are on page 8 of this issue of SPRAT.



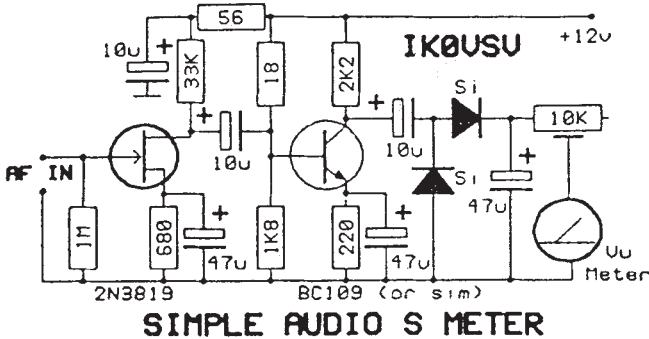
the sunny tx
 (40m)
 g4xhe

A SIMPLE AUDIO "S METER"

Marco Eleuteri IK0VSV Via Paola Rolli. 18-06099 TODI (PG) Italy

Usually direct conversion receivers do not have an S meter. This is a simple audio "S Meter" which can be used to read the relative audio strength of a signal.

Naturally the audio S Meter is not as useful an instrument as an AGC S Meter but in many situations it is better than nothing. With a bit of practice it is possible to determine "S points" by referring to strong or weak signals and a nice meter improves the front panel !



CONTROLLED CHARGE SYSTEM FOR NICAD CELLS

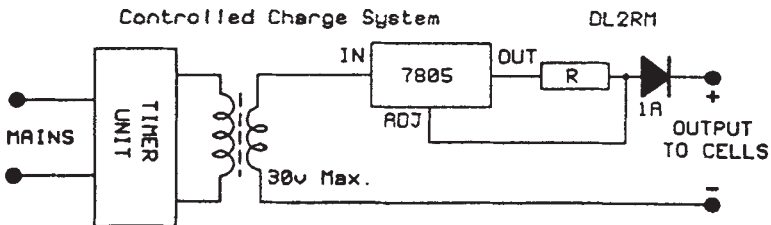
Rudi Wolf DL2RM Titusstrasse 19, 84032 Aldorf/NDB, Germany

The circuit shown above is used to prevent Ni-Cad cells overheating towards the end of their charge. The 7805 IC is used in the constant current mode. The value of the series resistor, R, is found by the formula

$$R = \frac{5V}{\text{charging current}}$$

The charging current must not exceed 1A. The charging cycle is controlled by a mains timer switch connected in the AC input lead to the charging unit. The following cycle is recommended.

8 hours charge - 2 hours off - 2 hours charge - 2 hours off - 2 hours charge - 4 hours off - 2 hours charge.



FOR SALE or SWAP: VHF Power Amp Mod. BGY32. 66-88MHz, 12v, in 100mW, out >18w. Zin and Zout = 50 ohms. I am looking for projects with SMD, Spectrum, Analyzer, wobulator. PA3ADJ, SZOCHOWSKI, JEPENHOF 10, 6584BP, MOLENHOEK. HOLLAND

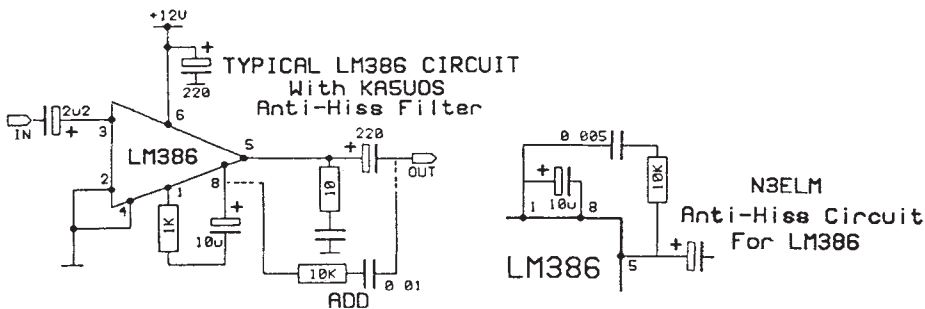
ANTI HISS IDEAS FOR LM386 AUDIO AMPLIFIERS

Dave Redfern N4ELM and Don Kelly KA5UOS
From the QRP Quarterly (QRP ARCI) January 1994

The LM386 is a very popular audio amplifier chip. However, nothing is perfect and it produces a hiss, most noticeable when the audio is cranked up on a quiet band or with the antenna disconnected. On a noisy 40m band it is no problem, but when the band is quiet the effect can be disappointing when trying to listen for a weak station.

Don Kelly, KA5UOS, suggests a simple but effective modification in the Oklahoma QRP Group Newsletter. A portion of the audio output, pin 5, is fed back to pin 8 to cancel the hiss. Don writes, "I have used it with several of my receivers; in each case I was satisfied with the results. I was especially pleased when I used the mod in a receiver which cascaded two LM386s. The hiss had multiplied, but the filter provided much improved audio output. It requires only a 10K resistor and a 0.01uF capacitor. The drawing shows a typical circuit with the added components."

Dave Redfern, N4ELM, offers a slightly different version of the LM386 hiss reducer. Dave writes, "To eliminate some of the hiss in the audio stage (of an MFJ-9020 Transceiver) I installed a 0.005uF capacitor and a 10K resistor in series between pins 1 and 5 of the LM386 audio chip."



TWO QUICK TIPS:

A Sidetone Fix from G3YCC

Recently I was faced with a problem with a superhet transceiver. The RX section is on all the time, monitoring the TX note. Despite all my efforts at muting the RX, I could not reduce it to a comfortable level for sidetone - except by turning down the AF gain control. So why not do this automatically? So, using a pair of spare relay contacts, I switched a suitable value resistor into circuit across the AF gain pot. The value I used was 15 ohms, but it may be better to use a preset. there are more elegant ways but QRP is the Mother of Invention!

MFJ 9040 AGC Fix from K4ADL

The factory setting of the MFJ9040 AGC pot gave too much hang, characters disappeared after a burst of noise. By turning the AGC pot clockwise I was able to eliminate the effects of slow AGC. But the more you advance the pot the worse the key clicks on transmit and receive. About midway between factory setting and fully clockwise is a good compromise. Plus - I also gained some sensitivity.

EXCHANGE: Two immaculate VIBROPLEX BUGS for GPO Double Current Key in similar condition.
Also keys and Paddles for trade. Wyn. Tel: 0978 - 756330



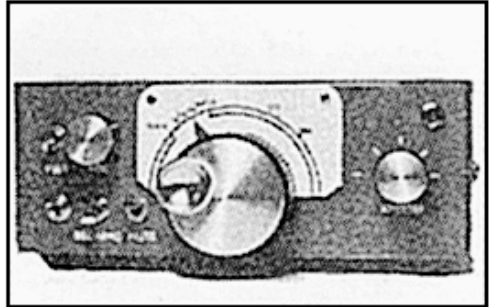
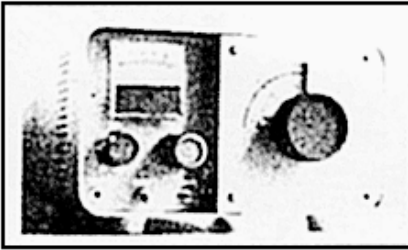
QRP NEWS ITEMS

THE G QRP CLUB IS NOW ON EMAIL VIA INTERNET
CONTACTS CAN BE MADE VIA G3RJV AT

g3rjv@gqrp.demon.co.uk

G3RJV logs on to Internet late every (almost) evening and is pleased to accept
News, Club related Mail and Items for SPRAT

Hambrew has it! Kit reviews and simpler projects for beginners, and schematics, etching patterns, "ugly-style" and cookbook-type projects for the more experienced! Hams all over the world are joining the fast-growing Hambrew readership ranks. Many are contributing! Articles by famous names in the ham community, like Doug DeMaw, W1FB, Fred Bonavita, W5QJM, Bruce Williams, WA6IVC, and others! Kit and rig designers share their knowledge with readers in an easy give and take format that really is appealing!



hambrew

FOR AMATEUR RADIO DESIGNERS AND BUILDERS

- Kit Reviews • New Products • Transmitters
- Receivers • Antenna Tuners • SWR Bridges •
- Transceivers • QRP • Filters • Test Equipment
- Existing Equipment Mods •
- Free Classified Ads To Subscribers ••
- Case and Cabinet Building • Antennas
- Component Info. • Building Techniques

Published Quarterly: \$20/yr (domestic), \$25/yr (Canada, Mexico), \$35/yr (International)
Back, Sample Issues \$6/ea. mailed first class
Back, Sample Issues \$8/ea. International

ENQUIRIES OR SUBSCRIPTIONS TO:

HAMBREW, PO BOX 260083, LAKEWOOD, CO 80226-0083. U.S.A.
VISA/MC ORDERS ACCEPTED - Toll Free in the USA : 1-800-5-HAM RIG



**STOP PRESS : FOR UK DETAILS
WATERS & STANTON 0702-206835**

THE QRP PLUS TRANSCEIVER The New Fully Synthesized All Band 160-10m. CW/SSB QRP Transceiver By Index Laboratories

G3RJV brought a QRP PLUS back from Dayton and is currently evaluating it for review. So far it looks very good indeed ! Watch this space - and RadCom ! UK importation is expected shortly. In the meantime details can be had from: Index Laboratories, 9318 Randall Drive NW, Gig Harbor, WA 98351-2118. U.S.A. Tel: 206-851-5725

THE G QRP CLUB MINI-CONVENTION 1994

SATURDAY OCTOBER 15th

St. Aidan's Church Hall, Manchester Road, Rochdale, Lancashire
Admission £1 - Doors Open at 10am - Talkin on S22 from 9am



A "Real Radio Convention"

with Lots of Social Space and Full Lecture Programme

Bring/Buy/Swop - Surplus/Component/Kit Traders - Home Built Equipment

Food and Drink Available All Day Including the Famous Pie and Pies

LOCAL ACCOMMODATION GUIDE : ALL WITHIN 5 Mins OF THE SITE

Oakenrod House : 0706-42115 The Midway Hotel : 0706-32881

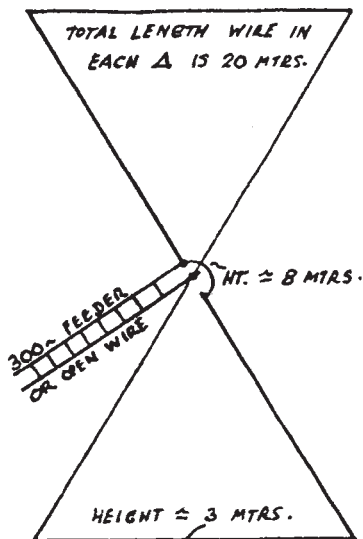
Norton Grange Hotel : 0706-30788 The Albany : 0706-369606

ANTENNAS - ANECDOTES - AWARDS

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

THE G3FZG PYRAMID ANTENNA was erected by Tony Treanor in the loft of his bungalow as shown in Figure 1. The maximum height was 8m and the minimum height 3m. The two triangles were each made from a 20m length of wire, and the feed was via 300 ohm line and a balanced Z-match (open wire line can also be used). It is very important to connect the line as shown in the Figure, as connecting it in this way ensures largely omni-directional radiation. The length-to-width ratio of the triangles can be varied within reasonable limits. The triangles shown allow operation 3.5 to 28 MHz; larger triangles could improve 1f band operation. (Editorial note :Tony first set himself the goal of QRP WAC with this antenna, which he achieved. He then attempted QRP DXCC and from January to May 1993 worked 57 countries. His untimely death then robbed us of a keen QRP operator. This information is published in memorium.)

THE UP-AND-OUTER REVERSIBLE BEAM IS THE BRAINCHILD of Lutz Bergner, DL2HRP (Wittenbergerstr 64, O-4504 Muhlner, Germany). Looking for a simple, low angle radiator for 14 MHz he decided to try the W9SCH Up-and-outer. The vertical leg was secured to a branch in a large tree with the aid of a hook lifted on a fishing pole. As required by Rockey, the horizontal leg was trimmed for fairly low swr, then the swr was further lowered by adjusting the height of this leg above ground. Rockey says the antenna is omni-directional, but Lutz found his favoured the direction in which the horizontal leg was pointing. It



G3FZG PYRAMID (TONY TREANOR) ANTENNA

Figure 1

really worked, however, providing QRP SSB QSOs with W,VE,NL7,JA,EA9 etc. He then had the idea of using two up-and-outers and a suitable phasing network to provide a reversible beam. The tree was big enough to take a second up-and-outer behind the first one, so it was erected and tuned for minimum swr. A phasing network with plug and socket connections for beam reversal was also installed, as shown in Figure 2. By changing the phasing the beam can be made to fire east or west as desired. Contact was soon made with W6,YN,VK etc, the VK being the first in 8 years operation. Tests with G8PG showed that reversing direction produced a back-to-front ratio of about 15 dB. Not bad for such a simple array!

BYRON WEAVER, WU2J , HAS BEEN EXPERIMENTING WITH HALF WAVE ELEMENTS BENT INTO THE FORM OF A SQUARE. Although a back-to front ratio of some 12 dB could be obtained when using a second element as a director, forward gain was only 0.5 dB over a dipole. But Byron has another goodie up his sleeve for a future SPRAT.

THE DAYS OF JUNK SHOPS FULL OF CHEAP MILITARY SURPLUS GEAR ARE NOW LONG GONE, BUT THERE ARE STILL SOME INTERESTING ITEMS AROUND. For example Joe, ON5LJ, talks of a very useful double superhet, the back end of which is formed by one of the famous ex-WW2 Luftwaffe EZ6 receivers. Covering 150 to 1,200 kHz, this receiver has an if of 130 kHz (including a crystal filter), making it ideal for the back end of a highly selective receiver. As with most German WW2 equipments, only one type of vacuum tube is used (RV 12P2000). This pentode tube has its electrodes suitably strapped to provide operation as a triode or as a diode when so required. The receiver is housed in a square metal casewhich seems to have been Luftwaffe standard, as I have seen a very nice 3-6 MHz transmitter similarly housed. One wonders if these were the German equivalents of the famous American Command equipments ? Moving forward several decades, Rudi, DI2RM, is having lots of /P fun with an all solid state, synthesised rig which used to belong to the now-defunct DDR Army. It provides either 5 or 15 watts of CW/SSB/AM. Using it, Rudi has been learning a great deal about counterpoises and so-called "artificial earths". We hope to look at this area in a future issue. Finally, our spies tell us that another member is the proud owner of a French made 3 to 29.9 MHz fully synthesised CW/SSB solid state rig which seems to be similar to the PCR320 used by the British Army. Apparently some South American soldiers left it on an island a few years ago !

THE BITER BIT ? We understand that one of the leaders of the minority shouting so vocally for the cw limit to be raised to 400 watts finds that he is unable to use that power because of the EMC problems he causes his neighbours. Maybe there is some justice in this world after all !

LES, WN2V HAS RETIRED and moved to South carolina where he promises to erect some big sky wires soon. Look out for those big signals on the QRP frequencies.

WANTED. Pair of phones for Class D Wavemeter, and circuit for WS11. J. Lesuisse, ON5LJ, 3, Rue de la Passerelle, 4031 Angluer Liege, Belgium.

CHELMSLEY TROPHY 1993. Our apologies to Vlad, UA9YC, news of whose third place was omitted from our last issue, Izwinite tow Vlad !

AWARD NEWS

CORRECTIONS TO OUR LAST ISSUE. The new QRP Master should have read GoNEZ not GoNEW, and in QRP Countries GoLFX should have read GoLXX. Sorry gentlemen !

QRP MASTERS. Hearty congratulations to I3MDU and HB9DAX who join the Worshipful company.

QRP WAC. W2JEK, GOKZO.

QRP COUNTRIES. 100 EA1CYL (All with 1w or less of cw/ssb. Nice work !); 75 I3MDU,HB9DAX; 50 G3CIO; 25 G3BPM.

WORKED G QRP CLUB. 600 GoIFK; 440 G3INZ; 400 G4XVF; 360 G4VXJ; 280 G4RGN; 260 GOKCA; 200 WN2V; 160 HB9DAX. 140 G3BPM; 120 GOKZO; 80 I3MDU, G3ZHE; 60 G3XJI, G4EIB;40 GoTHA;20 GoRVT.

TWO-WAY QRP. 30 HB9DAX; 20 W2JEK,GoMOU, G3BPM;10 G3JHC,DL7UKT.

Congratulations to all the above.

CW NOVICE AWARD. So far over 300 of these Awards have been issued to cw beginners in 20 countries and 5 continents so it seems to be fulfilling its purpose. A typical comment from a recipient is " I soon overcame key shyness and began to enjoy real amateur radio. Now virtually all my activity is on cw ".

WILL THE MANY CONTRIBUTORS OF ITEMS ON ANTENNAS PLEASE NOTE THAT WE HOPE TO WORK THROUGH THEM AS AND WHEN SPACE PERMITS.

THE QRP ARCI 1,000 MILE / WATT AWARD

The 1,000 Mile Watt Award is sponsored by QRP ARCI. It is awarded for contact(s) with another amateur whereby the lowest power used by either station divided into the great circle distance yields a number greater than or equal to 1,000 miles/Watt.

There is a \$2.00 fee or 10 IRCs for this award. [UK members please send extra - G3RJV]

For proof of QSO, a photocopy of the QSL card and a signed statement by a witness to the card(s) validity accompanies payment. If the contact is with another QRP ARCI member, then if that individual gives you his/her member number, that will be proof of contact and copy of log entry with power levels will be satisfactory.

Send applications to:

Chuck Adams, QRP ARCI AWARDS CHAIR, 830 Waite Drive, Copper Canyon, TX 75067-8581.

Previously there had been a 30 day slack period due to overlap in mail to previous awards chair. Hopefully this will now cease and a one week turn-around should be appropriate.

To help speed up this award and alleviate work on my part, I'd appreciate the inclusion of long and lat for both stations. Usually in an atlas this information is given in form of degrees-minutes-seconds. I prefer decimal number where long = degrees + minutes/60 + seconds/3600 and the same for latitude values.

You may apply for the award any number of times. I don't know who has the record now for the most number of KWM (K miles/watt) awards.

Text from Chuck Adams via Internet

COMMUNICATIONS FORUM

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

1994 CZEBRIT QRP WEEKEND REPORT

Despite rather below average conditions this event produced 30 logs from 8 countries and 2 continents. The star turn was the appearance of FM5CW/qrp, who worked QRP stations G3XJS, G3YHF, G4JFN, G4MQC, G0KZO, G3ILO, G0TDK, G14PCY, G8IB, G0MOU, G4JZO, G6PZ, EI3HY, F6KFFV, ON4KAR, ON4OV, DL7VBM, and DK6NV, plus PP7 and many W/VE QRPers. All this with 5W to a G5RV! Not surprisingly his score of 182 points gave him first place, followed by Bob, G4JFN with 156 points in second place, and OK1FLD with 132 points in third. Other scores for G QRP Club members were as follows (calls checked against 1994 Handbook). OK1DKR, 92, EA3EGV 74, OK2BMA 62, G3KKQ 62, G8PG 62 (check log), OK1CZ 50, OK5SLP (OK QRP HQ) 44, G0KZO 32, G3ESP 26, OK1DZD 24, DK5RY 20, GW4KUS 16, G0OXT 12, G3MCK 11, G3KCJ 6. We were really delighted to have our first XYL participant in the shape of Eva, G0KZO, who is still walking around on a pink cloud after receiving her FM5CW QSL! The G3KCJ score may seem low until one realises that despite being confined to operating on 3.5 MHz with an antenna only 2m high he still managed to work two OK stations, an SP and an ON. At the other end of the scale Bob, G4JFN did his usual great job. As for FM5CW, we thank him for giving so many European members a new country, and hope to see him again in the Europe for QRP Weekend and the Winter Sports. To all others who took part we say many thanks for participating in an event which shows real international amateur co-operation both from and organising and an operational point of view. We hope to see all 1994 participants and many more members of both Clubs active next year. (Report prepared by OK1CZ and G8PG).

RSGB HF CONVENTION

This popular event is again being held near Windsor on 7 - 9 October, full details appear in Rad Com. For the first time we will be having a stand there on the 8/9. **Are there any members who will be visiting who can spare a couple of hours for stand duty?** This is not an arduous job and the bonus is that you do meet many QRP friends. **If you can support the Club in this way please let me know the dates and times you can give.**

YEOVIL FUNRUN

As usual QRP Convention was a first class event. Was it really the tenth? How time flies. The FUNRUN also lived up to its reputation as being a civilised way of meeting a lot of members on the air in a fairly short time. The overall winner was G3BPM with G4DDX as runner up. G3BPM also won the 40m section, there was a tie for second place between G4JFN and G3MBN. In the 80m section there was a tie for first place between G0LKX and G4DDX, G0LKX being declared the winner, the runner up being G3BPM.

G4ELZ was awarded a special prize for being the highest score using very low power 100mW. Special mention must also be made of G3KCJ who was active running 50mW.

QU-R-PE

This splendid magazine is produced by Miguel EA3EGV for the Spanish QRP Club. It is very similar to SPRAT in size, content, and spirit. The current issue gives a most useful method for finding the impedance of coax cable. Measure the inner/outer capacity of a known length of coax, then:

$$Z = 50 \times \text{length in cm}$$

capacity in pF

Alberto, EB3CWZ says this is accurate to 5 - 1%, in other words you can now tell if that un-marked length of coax is 50, 70, or 92 ohm coax with confidence.

CEPT and Portugal

According to G3KJX, Portugal anticipate implementing CEPT T/R61-01 sometime this year. Potential visitors are advised to check the current status with the RSGB.

HELP KW-204 If anyone can help with a manual and schematic please contact:

Helmut Boehm DL2ECL, Kuhstr. 53, 42555 Langenberg. Germany

He will be happy to refund expenses.

PY QSL Bureau

GOKZO tells me that the PYQSL bureau only works for incoming cards. Hence if you need one badly it could be worthwhile to QSL direct with SAE and 2 IRCs.

IARU

I have heard that they intend to appoint an ad hoc committee concerned with "Morse code; the issues and a proposed solution". Does anyone have any further details?

DEADLINES

As SPRAT is published quarterly my deadlines are very early. I am delighted to give advance publicity to QRP operations but must have the information very early. My next deadline is **August 10**.

WE REGRET to announce the deaths of Norman O'Brien, G3LP, member number 3384. and Stan Eastaugh, G3AJV, member number 8119.

RSGB HF CONVENTION : VOLUNTEERS WANTED FOR CLUB STAND

Contact G3MCK - See Communications Form in this issue of SPRAT

TWO WAY QRP SKEDS WITH SOUTH AFRICA:

Dave Gemmell ZS6AAW has suggested that during the next two major ZS QRP Events:

QRP Mini-Stakes (31st July) and QRP Christmas Party (4th December) South African QRP stations will be listening for European QRP stations around 12H00 - 18H00 SAST [2 hrs behind GMT] on the International QRP Calling Frequencies. Further details or skeds can be had from Dave Gemmell, ZS6AAW, P.O. Box 77, Irene, 1675. South Africa.

CORRECTION TO GERMAN BANK ACCOUNT NUMBER FOR G QRP CLUB RENEWALS

The number [23292-672] in SPRAT 77, page 24 is wrong.

The CORRECT NUMBER is : 232491-672

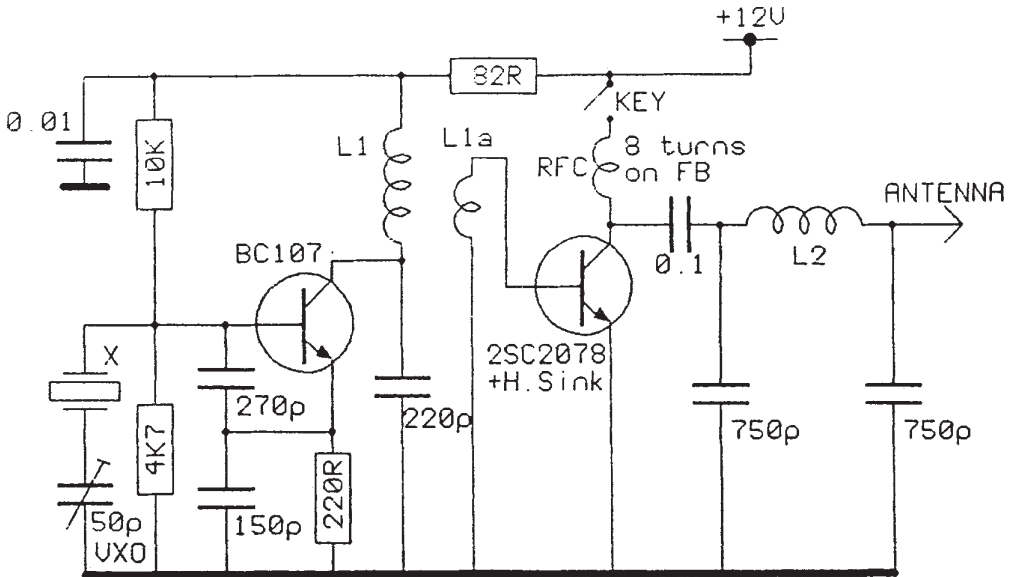
HF Data Modes on QRP?

Mark Palmer, G00IW, is interested in contacting members with any "hands on" experience of HF Data Modes using QRP - Pactor etc. Please contact Mark at 28 Westfield Rd. Caversham, Reading, RG4 8HH.

SINGLE SIDED PCBs made to your design. All Fibre Glass. SAE for details : Gary Fisher, 6 Totternhoe Road, Dunstable, Beds. LU6 2AG.

FT243 CRYSTALS FOR SALE : £2 each or £30 the lot (19) inc. P+P. 3510, 3512, 3520, 3523, 3530, 3534, 3545, 3552, 3560, 3585, 7008, 7008, 7010, 7018, 7020, 7034, 7027, 7038, 7040.

Colin Turner, G3VTT, QTHR or 0622 - 739936.



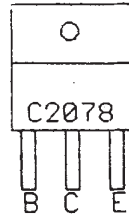
L1 = 38t 26swg on T50-2

L1a = 5t over L1 26swg

L2 = 22t 22swg on T50-2

RFC 8t 32 swg on Ferrite Bead

G4RAW TAG 80 TRANSMITTER



ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS-ADS

FOR SALE : MJF GRANDMASTER II CONTEST MEMORY KEYER and Bencher Iambic Paddle Key on black base. £120. Geoff 0761-431198 [North Somerset]

FOR SALE: HEATHKIT HW9 WITH WARC BANDS. A nice QRP HF Transceiver with no modifications except dial lights which can be removed easily. With manuals, Diagrams and copy of the Hot Water Handbook. £225. Tel: 0454 - 615793. Pete, G4GSA.

FOR SALE: KENWOOD TS520SE with Daiwa CN4510 SWR Meter. £300. Mrs. Harrington, 061-643-6035

FOR SALE: LAKE DTR7 £100, ATU2 £50, PM20 Power Meter £25. Steve, G4MPK, Tel: 0372-375514

FOR SALE : ICOM IC-3, 430MHz FM Transceiver. Handheld 49x103x35mm. Price negotiable. Gerald Herman, 171 Ferrers Close, Coventry, CV4 9RG.

FOR SALE: Reversible DC Motors - 190 volt 13HP, Signal Injector, Transistor, Eagle International Model IT1.1, AEC Power and SWR Meter, Western Safety Antenna Switch, 4 way + earth, Collectors Item - Early Avo Minor Test Meter with Leather Case, Howes 6 Meter RX Converter. All items in Good condition, some new. Offers: Eric G3FK, QTHR.

VHF MANAGER'S REPORT

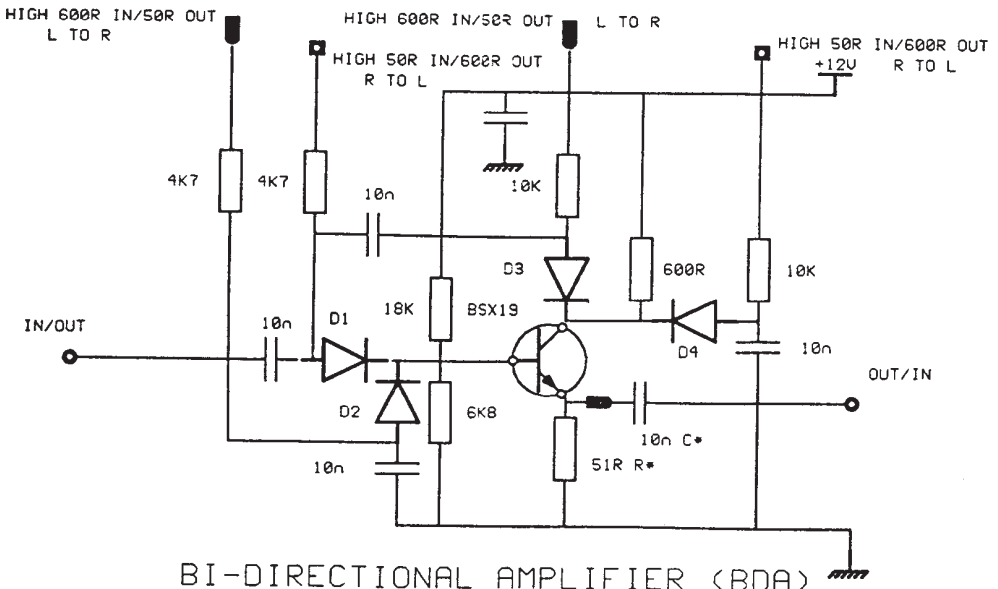
John Beech, G8SEQ/VK2XYD,

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

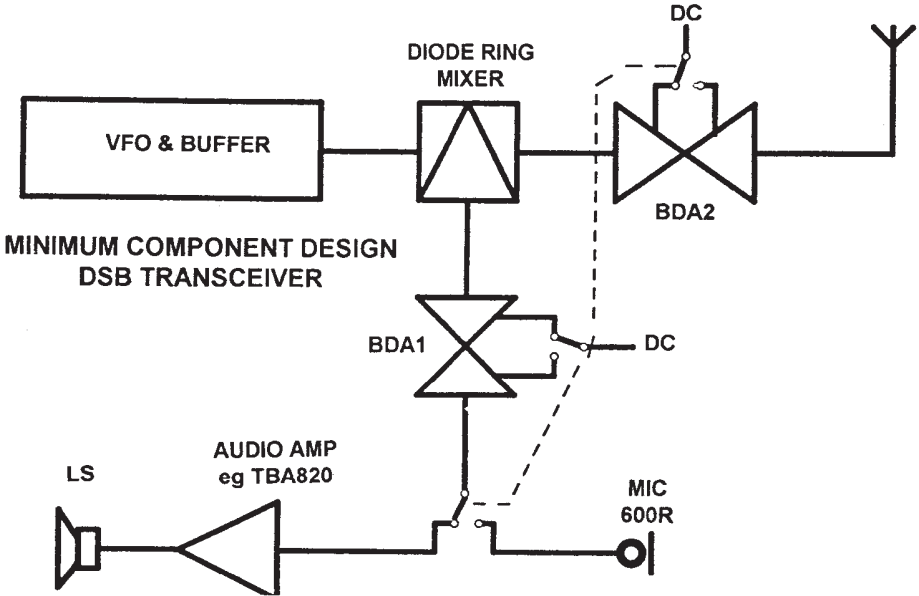
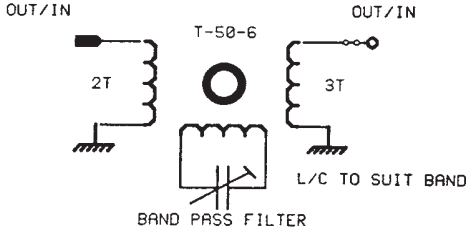
BI-DIRECTIONAL AMPLIFIER:

This circuit was designed to go between a mixer and crystal filter in a transceiver. The mixer impedance was around 50 ohm and the filter impedance was around 600 ohms. This amplifier uses a single RF device to amplify signals passing in either direction and performs the impedance transformation as well. In one direction it acts as a common emitter amplifier and in the other it acts as a common base amplifier. This is achieved by diode switching the RF signal path through the amplifier, using capacitors for DC blocking. It is also possible to switch the amp using relays, but this is somewhat cumbersome. The diode switched version takes up less board space, has lower power requirements and is cheaper than the relay version.

There is a possibility that this type of amplifier could be used as a transmit output stage AND a receive pre-amplifier in a QRP rig, in which case it may be preferable to relay switch. This could be useful in a minimum components design. I haven't had chance to try this as yet but it would appear that a BDA between the mixer and antenna, using 600 ohm feeder would work. If a device such as a 2N3553 or 2N3866 is used then about 1 W of Tx RF will be obtained for about 100 mW from the mixer. Ian G3ROO has used these devices for high level Rx pre-amps in some of his designs, so there should be no problem on receive. This set-up of course allows the same mixer to be used on Tx & Rx. As luck would have it, Dave KE9ED from Erie, whom I met at Dayton, wrote to me enclosing an article on a Bilateral Transverter, by Fred Brown, W6HPH. This turns out to be an HF to VHF transverter, which uses a high level mixer to produce 100mW O/P on Tx & straight in on Rx. The mixer used is a new one on me; it is a modified quad diode ring, with an RF bypass capacitor/bias resistor in the ring and a capacitive centre tap for the local oscillator drive. This design is for a 14 MHz to 50 MHz transverter which would no doubt benefit from a BDA between the mixer and antenna (with suitable modification to the output filter of course.)



FOR TRANSMIT APPLICATIONS
 USE THIS OUTPUT CIRCUIT
 AND 2N3553 TRANSISTOR
 (REPLACES R* & C*)



MINIMUM COMPONENT DESIGN
 DSB TRANSCEIVER

Chris Rees

G3TUX

The GRP Component Company
 PO Box 88 Haslemere Surrey GU27 2RF
 Tel. 0428 641771 Fax. 0428 661794

Stockists of:

- ✓ C M Howes Communications Kits
- ✓ Vargarda VHF/UHF Antennae
- ✓ Components for "Homebrewers"
- ✓ Jones Morse Keys & Paddles

SEND AN S.A.E. TO BE ADDED TO OUR MAILING LIST

MEMBERS' NEWS



by **Chris Page G4BUE**

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

Tel/Fax: 0903 814594.

Packet: **GB7VRB** or via the **DX PacketCluster**

Following the comments from members in the last SPRAT about the Ten-Tec SCOUT transceiver, I have received several more and will summarise them here. If I receive further information and comments I can combine them into a dedicated article for SPRAT about the SCOUT. **G4PAC** has the 10 and 40m modules and after six weeks of use is "more than pleased with its performance". Peter says there is a hiss when the volume is turned right down but it either ceases or is drowned out by the signals when the volume is increased. He suggests a mod of an extension spindle to enable the power to be varied from underneath. He says the IF filter is "very good" and "my old FT101 MkII has been a long time friend, but I can say once I have a full set of (band) modules, it will fade to a distant memory! I for one am very pleased with its 'no frills' and ease of use." Peter has been having difficulty in obtaining further band modules from both UK Ten-Tec stockists, Nevada Communications and Waters & Stanton, who told him they are having difficulty in getting them from Ten-Tec.

G4FSN has the 80 and 160m modules with his SCOUT and after three weeks says he "likes the Scout very much, especially the multi-function front panel meter, the tune switch, the full CW break-in, the built in electronic keyer and the variable bandwidth filter, which is ideal for CW and can help a lot on SSB as well." Eric says he became aware of a very slight hiss on top of the received audio from the built in speaker a few minutes after switching on, but would not call it excessive or obtrusive. It is more noticeable on a

quiet band and completely disappears on a busy band. He suggests that HB9AQT (SPRAT 78) might find his listening through phones could be improved by attenuating some of the audio at the phone socket as there is really too much there! Eric uses a 1K resistor in the phones lead which makes the audio perfect, with no hiss. He says that "altering the RF power through the hole in the bottom of the case is no problem, especially once you have learned the knack of quickly finding the preset inside the case with your trimming tool. Band changing by extracting one module and inserting another is likewise a quick and simple operation". Finally Eric says that the more he uses the SCOUT the more he likes it. He is planning to take it out in the car this summer, and would certainly buy one again.

GWÖDLN agrees with HB9AQT and **G4FMH** (SPRAT 78) and lists the very loud hiss, difficulty in adjusting output power and the IF filter being poor on CW as the bad points of the SCOUT. On the positive side Ger lists the built-in keyer, the digital readout and the nice size for mobile use. In a further report **G4FMH** suggests the powerful audio output of the final stage is probably intended to overcome the external noise when the rig is used in mobile mode in a motor vehicle. Bill says he appreciates the extra gain when he uses the SCOUT in his car with only a G-Whip antenna. He confirms his most serious criticism is the difficulty in adjusting the power level but says "I am reasonably satisfied with the performance of the Scout bearing in mind its relatively low price. My old Argonaut 515 is quieter but it is QRP only and requires a power meter, keyer and external keyer."

GÖTYM sent a copy of the review of the SCOUT by Mike Bryce, WB8VGE which appeared in the March 1994 edition of *73 Amateur Radio Today* published in the U.S.A. Tim was struck by two of Mike's comments. First he says, "While God knows QRP is fun, beginners in ham radio should have the benefit of 50 watts to get their feet wet.". Mike says that he cannot recommend the QRP version of the SCOUT to a "first-time ham". Tim says this is hardly in the QRP spirit and is certainly unnecessary. I know there are many members (especially here in the U.K.) who agree with Tim and who found that a simple QRP rig was their only way into amateur radio when they started. Second, Mike says "You can turn down the power of the Scout to QRP levels, but you'll end up losing transmitter frequency", and Tim wonders what this means. An RF amplifier stage is designed to work at a specific impedance for its preferred power level for maximum efficiency. If the power is changed (especially from 50 to 5 watts) then the impedance also changes reducing the efficiency. This was very important

when QRP power level was measured by RF input as the greater the efficiency of the PA stage then the greater the amount of RF sent to the antenna. Now that QRP power is measured by RF output, then (apart from the environmental issue of wasting energy), whether your 5 watts of RF output is derived from 10 watts input (50% efficiency) or 50 watts input (10% efficiency) is academic. (I use an attenuator in the antenna line of my Argonaut 535 to reduce the 5 watts output to milliwatt levels, and even microwatt levels with the Argonaut output set to 1 watt. This is clearly a good example of using the Argonaut inefficiently, but in a different sense to PA [in]efficiency, in that the majority of the RF output is disappearing into the resistors of the attenuator!)

The April 1994 edition of The Quarterly, journal of the QRP ARCI in the USA, contains an article 'A Six Pack of Ten-Tec Scout Modifications' by N2MNN. Steve describes modifications he has made to obtain a sidetone spot, easier adjustment of the sidetone volume control, the ability to transmit a continuous carrier from the in-built keyer, easier RF output power adjustment, a very slow AGC option and an external audio filter which Steve says "the performance of the Scout's variable IF filter is quite good, but when it is used with the new audio filter performance is outstanding." The QRP Quarterly is a superb QRP magazine which is published four times a year for members. Information on membership of the ARCI QRP can be obtained from KG5F in the USA or from Dick, G0BPS in the U.K.

2E0ADM found conditions on 40m improved in the middle of May. He has now worked 36 DXCC and 6 WAS on the band. Les has also been active on 50MHz (only U.K. contacts) and built a Cirkit DSB and CW transceiver for 160m. **SM0GKF** uses between 200mW and 5W SSB and since August last year has been European prefix chasing with 1W - 65 worked so far. Rune has just received a QSL for his 1W 20 metres QSO with VK5FOX and has also worked JA, S2 and ZS8MI, all on SSB. Look for Rune between 14250 and 14310 where he is very QRV. **IK0VSV** reminds members that Italy has only been allocated the 10.100 to 10.110 portion of the 30m band. Marco also reports that Italy has a maximum power limit of only 10W on 50MHz!

W1FMR worked 12 stations, including two others using NorCal 40 rigs, from a hotel room while on a recent trip to Arizona. Jim was using his own NorCal 40 rig to a 44 feet random wire from the hotel window. What is the NorCal 40 rig you ask? When **K16DF** was on the plane going back to California from last years Dayton, he was discussing the great weekend they had had and all the area QRP clubs that were springing up in the

USA. By the time their plane had landed in California, Doug and his friends had formed the Northern Californian QRP Club. This year at Dayton Doug was able to boast a membership of 450. I think the amount of interest in QRP in Northern California even surprised Jim! The NorCal 40 is a small 40m 2W CW single conversion superhet. It was a NorCal club project and appeared in Vol 1 No.3 of the Club's journal. Membership of NorCal QRP Club is free, but \$5 (US) and \$15 (overseas) is requested to cover the cost of mailing the quarterly magazine. Details from Jim Cates, WA6GER, 3241 Eastwood Road, Sacramento, CA 95821, USA. **SEE ARTICLE IN THIS ISSUE : EDITOR**

G4OIM has been having lots of fun with 2W to a loft mounted quad loop antenna on 20m. He asks if any members have tried the T2FD antenna, as he has made several versions from G3BDQ's book but finds they don't work on the frequency for which they were designed, but are better on higher frequencies! His 20m version works very well on 10, 6 and 4m but not on 20! **PA0RBC** also uses an indoor antenna, a 15mm diameter pipe magnetic loop which is one metre square for 20 and 40m. His 40m transceiver is a homemade optimised 1.5W with an SBL-1 mixer. Roeland has worked many DL and UK stations with it. His 20m transceiver is similar to the MFJ9020. **G3JES** has built about half of a three band receiver which he hopes to run his 50MHz converter through, and then build a QRP transmitter in it.

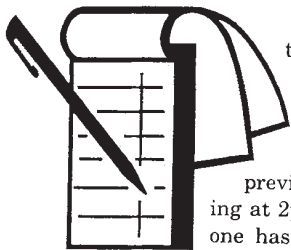
HB9ANW (G3OQF) took part in all four of the Swiss HF Contests in 1993 using 2W CW and DSB to a 50 metres end fed wire between 6 and 10 metres high. Dick's transmitter is based on the Bren but has six bands and a keyed driver/PA, whereas his receiver is his own simple phasing design using two SBL-1 mixers side by side. Even with QRP he made it into the Swiss HF Champions List! Dick finds the 160m band particularly friendly and works out to a distance of 1000Kms on CW. He mentions the next Swiss QRP Party in Matzingen on the 18th September and can supply details to anyone interested. Talking of parties, don't forget our annual Summer QRP Party here at "Alamosa" on the 6th August, details elsewhere.

G4RBP hopes to be in Taiwan in July and August as part of his university studies. Brod will be taking a QRP rig with him and hopes to operate QRP from BV. He may stay for a couple of days in Hong Kong on the way to and from Taiwan, in which case he will be QRV on 20m with his VS6BP call. Please let G3XJS know if you hear Brod on from either VS6 or BV for his QRP DX news service.

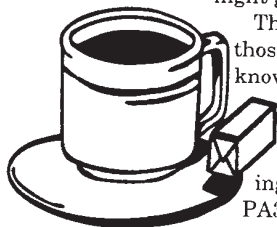
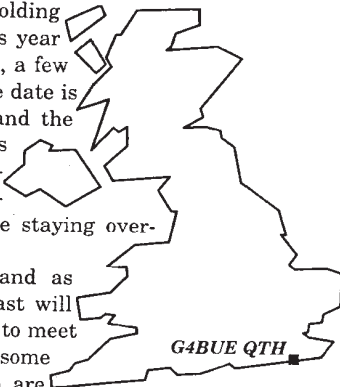
Let me know how your Summer goes, by the 20th August please.

72 & 73. Chris

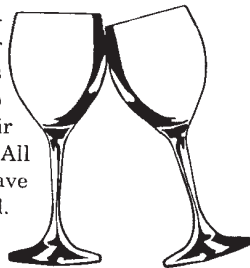
THE 1994 SUMMER QRP PARTY



Pam and Chris will be holding their Summer QRP Party this year at their QTH in West Sussex, a few miles north of Worthing. The date is Saturday 6th August 1993 and the routine will be the same as previous years. That means starting at 2pm and finishing when everyone has gone home or those that are staying overnight go to bed!



This will be the eighth party and as those who have attended in the past will know, it is an excellent opportunity to meet other Club members as well as some of Chris's local amateurs, who are interested in QRP, DXing and contesting. K8DD, AC8W, KA8AMX and regular PA3BHK have already got their names down. If you have built something you want to



show off or can't get to work or want to put on the air with Chris's HF yagi, then bring it along. All items of homebrew are welcome. If you have anything you want to sell, bring it along as well.

You are asked to let Pam or Chris know you intend going so they can make sure there is enough food and drink to go round. If you live some way away and want to stay overnight, some sleeping accommodation is available on a first come and first served basis. Telephone Pam and Chris on 0903 814594, drop them a line (see Members' News) or send a message via the DX Packet Cluster or the ordinary packet to Chris @ GB7VRB.



THE SOMERSET RANGE OF KITS

Novice 160m DSB TCVR.....	£50
Tiny Tim 80m phone superhet TCVR.....	£75
YEOVIL 20 & 80m CW & SSB TCVR.....	from £130
YEOVIL 50 page Manual.....	£5
Frequency Counter.....	£49
QRP Booster Linear, HF and MF.....	£45
Construction Club for HOT IRON newsletter.....	£5

**SAE for Details to : Walford Electronics,
Upton Bridge Farm, Long Sutton, Langport,
Somerset. TA10 9NJ. Tel: 0458 - 241224**

**SPECIAL G QRP CLUB OFFER : Order £40 of Kits and Receive
One Free Year of Construction Club Quarterly HOT IRON**

The 10th Yeovil QRP Convention

A Report by Peter Burridge G3CQR

A brilliant May Morning and a promise of meeting other Amateur radio construction and QRP devotees drew a record crowd of well over three hundred to the Yeovil club's 10th QRP Convention.

Formally opened by Dr Dick Biddulph, Chairman of the RSGB technical and publications advisory board at 10am there followed the first of a programme of talks:

'Low angle propagation' by Rob Micklewright G3MYM and after a short break, 'Conversion of the 'Marland' TX into a Transceiver' by Derek Alexander G4GVM.

Then came the lunch break when our visitors retired via the Foyer where Bob G4JFN plus XYL Anne and Robert PA3BHK with their fine QRP stand and the RSGB Bookstall was located, to the Hall with selected Traders selling components, Kits, and QRP related goods. Or to the Food hall where 'Jane' our 'Tip Top' caterer was almost overwhelmed by the demand for her excellent Home-made Cornish pasties, sandwiches, Salads, Cakes etc. also during this Break the adjudication by Mike Smith G7DDS of the Convention Challenge contest, the winner was G3PVH who used a valve and a transistor plus eight other components and a 6 volt battery to make a receiver which converted our 100uv 50 ohm signal into an audio output of 460mv across our 10k ohm load. The other entries were equally ingenious and interesting, the programme number draw for prizes generously donated by our Traders was made before 2pm when the next talk:

'Practical VFO building' by Mike Grierson G3ISO, followed by a discussion: 'The RSGB, Your national radio society', conducted by Dick Biddulph G8PDS and John Forward G3HTA, much feedback was generated and no doubt the comments and suggestion will be relayed to HQ!

Finally we had the presentation of awards, by Dick Biddulph, for the Fun-Run Morse contest held on each evening of the preceding week and the placing were:

80 metre band 1st GOLKX 2nd G4DDX 3rd G3BPM

40 metre band 1st G3BPM 2nd G3JFN 3rd G3MBN

the overall winner was G3BPM

G4LEZ consistently used only 100mW output power throughout the week and obtained 9th position overall.

A Trophy (an etched circuit of the Yeovil club's famous 1954 skywave point contact Transistor transmitter, mounted on a plinth) was presented to the construction challenge winner G3PVH

Postal Fun-run results: 80m 1st G3DYY 2nd G0OGN 3rd G4ZLX. 40m 1st G4DYY 2nd G0OGN 3rd G0KZO. Overall Postal winner G3DYY. Check Logs from: G0LSY and DL2BQD - Thank you. Final comments before the close of the Convention at 5pm indicate that it was a very enjoyable and interesting day - well worth the visit. The Yeovil club thank all who gave us so much help, support and publicity, making the event another great success.

WANTED WANTED WANTED WANTED WANTED WANTED WANTED WANTED

WANTED: B2 PA Board Knobs "Anode Tuning" and "Aerial Matching". The brass skirts from broken knobs would do! Ian Huggart G3JQL, 22 Alnwick Rd. Newton Hall, Durham, DH1 5NL.

WANTED: Sources for the supply of the following : 2N3553, 2N5520, 2N5521, BLY33, and ceramic resonators : G3FCK, QTHR or Tel: 0635 - 40750

INFORMATION-WANTED: Borrow or photocopies for the setting up of the Diamond CP5 Vertical Antenna and circuit diagram for Tech TE-22 Audio Generator. Expenses met. Tel: 0708 - 250578.

WANTED: Manual and circuit for Heathkit RC Bridge Model C-3U. Also Howes CVF20 VFO, CSL4 Filter in kit form or ready built. Larry, G4HMY, 5 Barn Croft, Gt. Wyrley, Walsall, WS6 6BH.

WANTED: Circuit details and instructions for MFJ Versa Tuner II, Circuit details for Realistic Scanner Pro 2002 Model No. 209116. Source of supply for spares for AR30/AR40 rotator made by Cornell Dubilier. In particular the wirewound track for positioning potentiometer. Jack G2BCY 091-265-4780.

Hands kits for RF constructors

TCV cw tcvrs 3.5/7/14/21

A much improved version of the popular NE602 style transceiver.* 3 Pole RX input filter* opt RF pre-amp* high grade xtal IF filter* 7watts out*separate fet vfo and buffer* conventional audio derived agc* active af filter* AF or RF sidetone. from £85

RTX ssb/cw tcvrs mono or multiband 3.5-50 mhz

High spec hf transceivers *accepts club SHOWA 6 pole xtal filter* power control to 16 watts* SL6440 switching mixers modules from £30

RTX-AMP 1.8-30mhz linear amp

up to 16 watts output* conventional double sided pcb with silkscreen component id* temp compensated bias* on board switching. module kit £35

RX1 3.5/7/14 ideal beginners superhet with xtal filter **TX1** 1.8-30 monband vfo controlled 7 watt cw transmitter. **3TX** /3.5/7 upmarket 1.5 watt 3 channel xtal transmitter

Kits for you own RF Projects ATU/ AGC/VFO'S/ 6 BAND MIXERS inc bpf for tx,rx and vfo/LPF mono or multi/PRE-AMPS etc

Our full illustrated catalogue is available for a 1st class stamp or 2 irc's

Hands Electronics Tegryn Llanfyrnach Dyfed SA35 0BL Tel 023977427

THE ANTENNA EXPERIMENTER'S GUIDE

(ISBN 0-9516024-0-3) by Peter Dodd G3LDO

200 pages and 120 illustrations on experimenting with antennas.

Includes material not previously published.

Building and using simple RF test equipment.

Measurement of antenna element and feeder resonances

Measurement of impedance; the noise bridge & 3-meter method.

Electric & magnetic field strength measurements.

Antenna adjustment and performance measurement.

Modelling of HF antennas at VHF & polar diagram plotting.

Using computers in measurement and modelling.

Experimental antenna and mast construction.



£8.90 (£7.90 to Sprat members) 80p P&P UK.

Overseas, £1.20 surface mail, £3.00 air mail

Equivalent currency or credit card



From: 37 The Ridings, East Preston, West Sussex, BN16 2TW

Tel 0903 770804

A NEW SERVICE FOR RADIO AMATEURS AND SWLs

from

ADUR VILLAGE PRESS

ADUR

THE SMALL ORDER

VILLAGE

SPECIALIST

PRESS

The Radio Amateurs' Printer (Chris Page, G4BUE)

SAE for
more
details to:-

- QSL cards at competitive prices and in low quantities
- 'No Obligation' offer to design your own QSL card
- New high quality call sign visiting cards
- Design your own log book - QRP number, power, etc.
- Letter headings, club magazines and news letters

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



Christopher J. Page - Member of The British Printing Society and The Association of Hot Foil Printers and Their Allied Trades. VAT 620 5819 54

RIG BROKEN OR NEEDS ALIGNMENT?

Commercial/homebrew equipment aligned. Commercial rigs and equipment repaired.
Ten-Tec repair specialist, spare parts ordering service available.

Adur Communications

Phil Godbold G4UDU, Tel. 0903 879526 (West Sussex) for details (inc evenings and weekends)

NOW AVAILABLE : OAK HILLS RESEARCH QRP KITS : RING FOR DETAILS

Q UALITY R ADIO P ROJECTS

Modules to build dc receivers,
cw transmitters and
transceivers, ssb receivers,
transmitters and transceivers,
audio notch filter, hf gdo,
hf noise bridge.....
All modules available
separately.

FROM

JANDEK

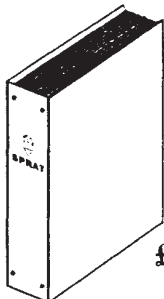


Crystals for QRP calling
channels, ferrite and iron dust
cores, SEI toroids for Sprat
61 wattmeter, components,
special offers, friendly service
from a fellow amateur.....

Derek G3ZOM G-QRP 3091

Send ssae (9"x4" min) for details and prices to:

6 FELLOWS AVENUE, KINGSWINFORD, WEST MIDLANDS, DY6 9ET.



SPRAT BINDERS

Holds 12 editions of SPRAT but can hold more with additional wires (10p each) due to larger spine (44mm). Covered in high quality black balacron with gold blocked logo. Matching binders available to hold other A5 magazines. Also matching A4 binders for Rad Com, PW etc and USA size for ARCI Quarterly, CQ, QST, etc.

**£3.75 each inc VAT,
plus £1 postage**

ADUR VILLAGE PRESS

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



Christopher J. Page - Member of The British Printing Society and The Association of Hot Foil Printers and Their Allied Trades. VAT 620 5819 54

Morsum Magnificat

Of interest to all CW operators, veteran and novice, this unique Bi-Monthly magazine provides an invaluable source of interest, reference and record relating to the traditions and practice of Morse.

Available only by Postal Subscription, sample copy £2.20, or send for further details to

Morsum Magnificat, 9 Wetherby Close, Broadstone, Dorset, BH18 8JB. Tel: 0202-658474

DC TRANSCEIVER KITS

Single Band Kits for	3.5, 7, 10MHz	£40 each inc post
	14, 18, 21, 28, 50MHz	£55 each inc post
Three Band Kit for	3.5, 7 and 10MHz	£60 each inc post
(PCBs and construction notes only for above at £10 inc post)		
White Rose 50 to 28MHz Transverter Kits £25 (PCB only £5)		
Overseas members add £5 for postage. Cheques "John Beech"		
JOHN BEECH, G8SEQ, 124 BELGRAVE RD. WYKEN, COVENTRY, CV2 5BH		



SOLAR PANELS

SMALL SCALE SOLAR AND WIND POWER

Sun and Wind Power at Affordable Prices

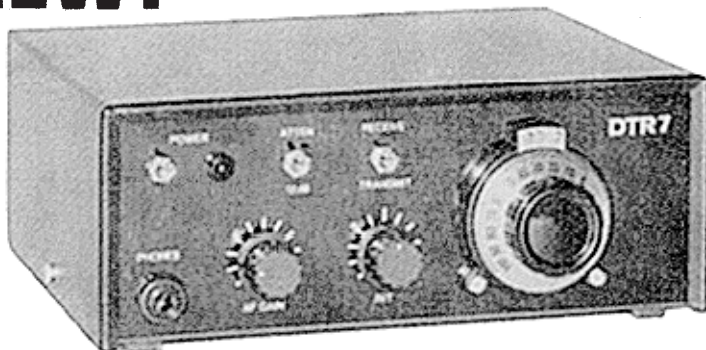
**For Information and Prices of Solar Panels, Wind Chargers
and other Associated Products. Send an S.A.E. to**

BOB KEYES, GW4IED

4 GLANMOR CRESCENT. NEWPORT, GWENT. NP9 8AX

10% REDUCTION ON ASI PANELS TO CLUB MEMBERS

NEW! DTR7 - 40m CW TX-RX



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

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

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

ALL COMPONENTS AND HARDWARE INCLUDED

£87.50 (Kit)

£140 (Ready Built)

NEW! PM20 POWER METER for QRP

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

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

£19.50 (Kit)

£28.75 (Ready Built)

For full details of our kits, send SAE to

LAKE ELECTRONICS
7 MIDDLETON CLOSE, NUTHALL, NOTTINGHAM NG16 1BX



OR RING ALAN, G4DVW. ON 0602 382509



KANGA PRODUCTS

*New from Kanga a great boon to the builder
the **AMATEUR BAND SYNTHESISER**
A design from Ian G3ROO and seen in RadCom
our semi kit of parts is only £54.95*

The ideal way to build anything is to start with a kit of parts, we have a range of almost 50 kits for you to choose from. Some of the newer ones are....

Other new kits are the **Six Metre Converter and Transmitter**, as seen in Radcom by Ian G3ROO (no relation to our 'ROO!) The converter provides a signal on your 10m multimode from 50MHz.

The **Transmitter** gives up to a massive 100mW out on 50MHz, CW only of course, but what fun!

Our new **IAMBIC KEYS** is so small it fits in the palm of your hand. With on board relay it will key any rig. The **KIRSTA Keyer** is just great. Ideal to build inside that QRP rig too.

The **COMB CALIBRATOR** provides an output on 10KHz, 100KHz, 1MHz & 10MHz each one identified by a tone. A boon to the builder and only £15.25.

We still have all those old favourites too, the **SUDDEN** Receiver, the **LCK Superhet Receiver**, the **Kanga Crystal Set**, the **Nicky TRF** and of course the **ONER**. A total of 5 different Receivers.

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

We have a large selection (almost 50) kits for you to enjoy. Many items of test equipment such as the **Transistor Tester**, the **Two Tone Oscillator** and many other simple kits such as the tiny **DC - DC converter** and **Light Operated Relay**. And many more....

Send a Sprat sized SAE for our free catalogue to
KANGA PRODUCTS, Seaview House
Crete Road East, Folkestone CT18 7EG
Tel / Fax 0303 891106 0900 - 1900 only please
Remember, we are closed on Mondays