

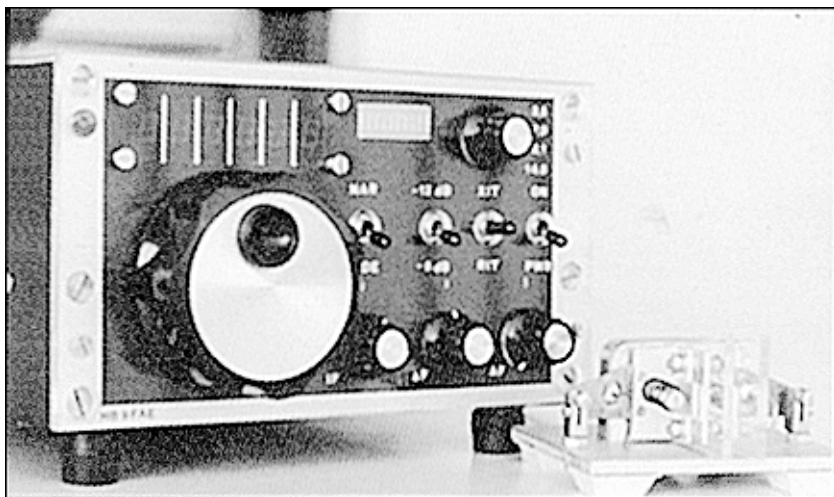


SPRAT

THE JOURNAL OF THE G-QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

ISSUE NR. 95 | © G-QRP CLUB | SUMMER 1998



4 BAND CW TRANSCEIVER BASED ON THE HANDS GQ SERIES
Built by HB9FAE - Information will appear in a later SPRAT

**ROCHDALE CONVENTION - HB9ABO KEYER - WIDE RANGE VXO
GADGET DSB MODULE - VOLTAGE INDICATOR - STEREO FILTER
21MHz VXO TRANSCEIVER - GILBERT CELL MIXER EXPERIMENTS
ELBC40 RECEIVE MODULE - TUNE UP AID - LOUDER EP2 - NORCAL20
ANTENNAS-ANECDOTES-AWARDS - NOVICE FUN - TWO QRP EVENTS
COMMUNICATIONS & CONTESTS - NOVICE NEWS - SSB COLUMN
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JOURNAL OF THE G QRP CLUB



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Rev. George Dobbs G3RJV

EDITORIAL

Dear Member,

During the preparation of this issue I had a visit from John and Wilma Ford of Shoreham Copy, the SPRAT printers. John has been printing SPRAT for at least a dozen years and it was a pleasure to meet him for the first time. Together with G3PDL, G0BXO and G3MFJ, we discussed the more efficient printing and mailing of SPRAT. In future Shoreham Copy will be responsible for the distribution, as well as the printing, of SPRAT. We also hope to work towards the improvement of the printed copy but that may be in future issues. Although this issue is the first in which I have presented it camera ready at actual size rather than the former twice size. This should improve scanned images. It may also make this issue slightly late because of the time spent converting to the new format.

Members are still invited to submit items for SPRAT in (almost!) any format they wish. I can take sketches and handwritten notes or receive text in most PC formats. If in doubt rich text format (.RTF) always seems to work well. Diagrams need not be in the final form - Mac does a wonderful job - but please mark all values of components. Text should be brief as I try to cram as much into each issue as possible. What about telling us about your current project?

Enjoy Summer.

72/3

G3RJV

**EDITED BY GEORGE DOBBS G3RJV ARTWORK BY A.W. (MAC) McNEILL G3FCK
PRINTED BY SHOREHAM COPY, 4 Hyde Square, Upper Beeding, Sussex BN44 3JE**



THE G QRP CLUB MINI-CONVENTION

SATURDAY 24th OCTOBER 1998

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An Electronic Keyer for the Home Brewer

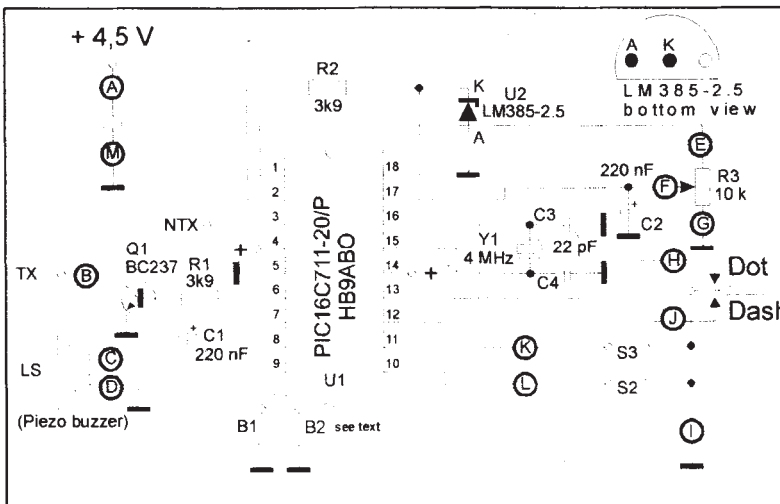
by Urs Hadorn, HB9ABO, Im Rietli 1, CH-8154 Oberglatt

What are the capabilities of the keyer?

The circuit operates either in the standard keyer operating mode with a fixed dot/dash ratio of 1 to 3 or in the command mode. This command mode enables the user to locally enter operating parameters. (*Locally* in this context means, that user entries as well as reactions from the program are audible on the local "speaker" (a piezo buzzer); the keyer output being disabled in this case). Keying speed can be set between 30 and 284 cpm (characters per minute). The setting range of the speed potentiometer can be adjusted to any subset of this range; eg. from 70 to 130 or from 56 to 60 cpm. A text of up to 35 characters can be stored and transmitted upon pressing a button.

The circuit

The microprocessor U1 is the kernel of the circuit (fig. 1). All the functionality of the keyer is defined by its burnt-in program. The terminals of the printed circuit board are marked with circled letters.



Inputs

The program gets its information and commands from the following inputs:

- U2 and R2 form a precise reference voltage of 2.5 V. This reference is used to measure the battery voltage. U2 looks like a Zener diode. In fact it is an integrated circuit which emulates an almost perfect 2.5 V Zener diode.
- From the setting of R3 the processor reads the desired keying speed.
- Y1, C3, C4 are components of the integrated crystal oscillator
- Dot and Dash are the contacts for the respective levers of the keyer paddle. The program is able to operate in "squeeze" mode, i.e. both contacts can be closed independently of each other.
- The momentary push buttons S2 and S3 are used to enter certain commands
- The wire jumpers B1 and B2 can optionally be fitted. They control the behaviour of the complementary keying signal NTX. If this signal is not being used, then B1 and B2 can be omitted.

Outputs:

- The processor IC as such would be able to directly key most of today's transceivers. For safety reasons, however, its keying output is protected by Q1 and R1 from the adverse conditions, that sometimes exist on a ham's work bench.
- The signal NTX at pin 3 of the processor is complementary to the keying signal at pin 6. (see construction).
- LS is a small piezo buzzer, that optionally produces a side tone. Its main purpose is to communicate the reactions of the processor to the user, which are not meant to go to the transmitter.

Operating instructions

S2 triggers transmission of the stored text. Any motion of a keyer paddle immediately stops transmission of the stored text. A stored text can be transmitted locally for verification by pushing first S3 then S2. If there is no text in the memory, the program reports *gru* via the side tone.

Pressing S3 sets the command mode. The program reports with *r* that it is ready to accept a command. A command consists of a letter or of pushing a button. If an unknown command is entered, then the program asks *?* and expects another command. The command mode is left after completion of the dialog, or at latest 9 seconds after the last manipulation. The command dialog is being conducted at the speed actually set.

Commands and text remain stored for as long as the battery is connected.

The individual commands:

E The actually set speed is being continuously reported until a switch or a keyer lever is activated.

<S2> The stored text is transmitted locally. (e.g. to check the text after entering into memory)

U The program sends the battery voltage with a resolution of two digits after the decimal point. Accuracy: A/D converter and computation yield an accuracy of about 0.8 %. This value is increased by the deviation of the reference voltage of U2 from it's nominal value of 2.5 V. For practical purposes this means that the battery voltage is indicated with a comfortable accuracy.

T The program reports that it is ready to store text into memory by sending *grv*. Storing ends after S2 is pressed or after 35 characters have been entered. Spaces have to be included into the character count. For instance storing *cq cq de g3rjv/grp g3rjv/grp pse k* takes up 34 memory spaces. The program acknowledges this with *qsl*. After an intermission of more than 9 s storing is ended too. In this case, *qsl* is omitted, however, the text is stored in memory.

R Sets the speed for the right stop of the potentiometer. During this command the speed is being transmitted continuously; and during this time it can be altered with the potentiometer over the full speed range of 30 to 284 cpm. The command is ended by activating a lever or a button. The speed set at the moment of ending the command is from now on defined to be the maximum speed, i.e. the speed set when the potentiometer is at it's right stop.

In case this newly set maximum speed is lower than the previous minimum speed, then the minimum speed is set equal to the just established maximum speed. This means that the whole speed range is now limited to one only value. Thus it is assured that the speed at the right stop is never lower than that at the left stop. After initial switch on the speed at the right stop is equal to 284.

- L Sets the speed for the left stop of the potentiometer. What has been said for the R command is valid accordingly for the L command. However, right/left and maximum/minimum have to be swapped.
But what happens, when by mistake too high a value has been set for the minimum speed? (Too high here means a speed too high for the operator to handle). Suppose the original speed range was 70 to 125 and that now the minimum speed has been set by the L command to 284. The speed range is now 284 to 284; further commands have therefore to be entered at this speed. To avoid this deadlock an alternate L command has been provided: Instead of sending the letter L the pushbutton S3 can be pressed.
After initial switch on the speed at the left stop is equal to 30.
- D Option Double contact (= *squeeze*)
The program reports *qrv* saying that it is ready to accept one of the figures 0 or 1. The figure entered is acknowledged by *qsl*. 1 switches on the option, 0 switches off the option. After initial switch on all options are set off.
Option D set to 1 means that dots and dashes are being transmitted alternatively when both paddles are pressed simultaneously. So for instance the letter C or a period can be sent by just two motions of the paddles.
If option D is switched off then the lever pressed **later** rules whether dots or dashes are sent, when both contacts are closed. Letters like X or P can therefore be keyed by just two lever motions.
An investigation of all morse characters reveals a slight advantage for the option D switched off. But most probably personal preference for one or the other method is more important than statistics.
- S Option Dot/Dash memory
Command entry and state after switch on see command D.
When option D is switched on a dot is stored, when the dot contact is closed during the transmission of a dash. And a dash is being stored, when the dash contact is momentarily closed during transmission of a dot.
The stored element (a dash or a dot) will be transmitted immediately after completion of the current element. This option is helpful mainly in cases when the operator's keying is "ahead" of the set speed.
- M Option monitor
Command entry and state after switch on see command D. Switches on or off the side tone. The side tone is a square signal of 488 Hz, which is available at pin 7 of U1. The command dialog always goes via the side tone: it can not be branched to the transmitter output.

Power supply

Power consumption is often a major issue for the QRPer. During keying at a supply voltage of 4.5 V the current drawn is around 2 mA.

Nine seconds after the last manipulation the processor switches itself into the sleep mode. In this mode the current consumption of the whole circuit is far less than 1 μ A: an ON/OFF switch is therefore not necessary. The processor is specified for an operating voltage of 4.5 to 5.5 V. However, tests with dozens of units revealed that this circuit operates fine down to a supply voltage of around 2.3 V. When the battery voltage drops to less than 2.8 V, then the program warns the user by sending *ubat <voltage>* every time before changing into the sleep mode. Although normal operation is still possible even below this threshold value, it is advisable in this case to change the battery occasionally. If saving space and weight is

important, then a battery consisting of 3 AAA cells (IEC LR61) is sufficient. With such a battery continuous operation of more than 500 h with plenty of spare is possible. Mains operation is problematic because all stored data is lost when the power is switched off. To avoid this, an auxiliary battery with a minimum voltage for data retention of 1.5 V could be used.

Construction

For project design and for my personal unit I avoided the chore of designing a PCB layout. Instead I used standard predrilled lab type board. Fig. 2. shows the parts arrangement. Although this design might not deserve a special prize for beauty, it is nevertheless suitable for a quick and flawless reproduction. The holes have a diameter of 1 mm and the grid raster is 0.1 in. The vertical lines indicate the centre of the copper strips; the holes are situated at the crossings of the lines. The points where the conductors are to be interrupted are marked with X.

The 3rd Terminal of U2 is not used; it can be cut off.

Fig. 3 shows a commercial PCB layout designed by Cemeq AG of Sax, Switzerland.

To protect the circuit from RF influences it has to be built into a screened box and the output to the transmitter should be fed through an RF choke.

For those who would like to provide for a tuning switch (key down permanently) it is possible to add the switch S1 connected from the keyer output to ground.

Putting the circuit into operation

After initial application of the supply voltage, the circuit sends once the speed actually set via the side tone. If this is the case, further tests are not necessary; otherwise there is an error somewhere in the circuit: Current consumption after switch on should be in the order of 1 to 5 mA. At pins 15 and 16 of U1 the oscillation of 4 MHz should be detectable. (Current as well as oscillation cease 9 s after the last manipulation).

Building the circuit into a transceiver

The signals TX and NTX can be used to realize a click free transmit/receive switching. (QSK). Fig. 4 shows how the keying signal TX is chronologically embedded into the NTX signal. t_p is the length of a dot, t_v is the adjustable delay time between TX and NTX. NTX could be used to mute the receiver and to switch the antenna relay, while TX would key the transmitter. Pin 3 (NTX) has an open drain, pin 6 (TX) has an internal pull-up resistor.

The processor outputs are able to sink 100 mA. The voltage to be keyed may, however, not be higher than the supply voltage of the processor.

The delay time t_v can be adjusted by means of the wire jumpers B1 and B2 as follows:

B1:	B2:	t_v :
open	open	0 ms
wired	open	1 ms
open	wired	2 ms
wired	wired	3 ms

As can be seen from Fig. 3 the delay time influences the dot/dash ratio as well as the keying speed. Because the speed indication refers to t_p , it becomes less accurate at speeds above 200 cpm when delay times of 1 to 3 ms are used.

Parts list:

R1, R2 3.9 k Ω
R3 10 k Ω linear potentiometer
C1, C2 220 nF tantalum
C3, C4 22 pF ceramic
U1 Microprocessor PIC16C711-20/P

U2 2.5 V voltage reference LM385Z-2.5
Q1 BC237 or similar
Y1 Crystal 4 MHz
PS piezo electric buzzer e.g. type Star QMB-06

A PROGRAMMED PIC16C711 CHIP CAN BE OBTAINED FROM:

Mick Hodges G4OPE, 40 Ennersdale Road, Coleshill, BIRMINGHAM. B46 1EP

For £10.00 - Cheques to M. Hodges.

PCB and Veroboard layouts are available from G3RJV - for a stamped addressed envelope marrked "Keyer".

Conclusion:

Since initial publication of this circuit in spring 1997 several hundred units have been built. There are no known bugs or errors. Yet propositions for improvements and experience reports from users would be most welcome to me. Of course there is no warranty that this will lead to an improved version: All pins of the processor are used; the program memory of 1024 words is filled to 99 %. Any additional internal variables would definitely reduce capacity of the text storage. If under these circumstances a new program version would nevertheless be possible, then users would have to buy this by acquiring a new processor. The type used for U1 can be programmed only once.

NEW SITE FOR G3YCC WEBPAGE

Maintained by Frank G3YCC GQR P 042 (email g3ycc@g3ycc.prestel.co.uk)

QRP Web Page: <http://www.homeusers.prestel.co.uk/g3ycc/>

G QRP CLUB WEB SITE

Tony, G4WIF, has re-built the web site on Btinternet at

<http://www.btinternet.com/~g4wif/ggrp.htm>

HEATHKIT WEBPAGE

A very comprehensive site site by Dale, KB9JJA, which includes a lot of Heath material, a posting board and over 1200 amateur radio links can be found at:

<http://users.accessus.net/~dwentz/kb9jja/heathkit>

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by attaching a "Two Way QRP QSO" label to your cards. Black lettering on gold with club logo. 200 labels £2 inc post (overseas plus 30p) For Order Form (or to order now) M.L. Prickett, G3BSK, 260 Haslucks Green Road, Shirley, Solihull, West Midlands, B90 2LR. Cheques: M.L. Prickett. (The G QRP Club benefits from each order.)

N.B.T.V.A.

The Narrow Bandwidth TV Association (founded 1975) is dedicated to low definition and mechanical forms of ATV and introduces radio amateurs to TV at an inexpensive level based on home-brew construction. NBTVA should not be confused with SSTV which produces still pictures at a much higher definition. As TV base bandwidth is only about 7kHz, recording of signals on audiocassette is easily achieved. A quarterly 12-page newsletter is produced and an annual exhibition is held in April/May in the East Midlands. If you would like to join, send a crossed cheque/postal order for £4 (or £3 plus a recent SPRAT wrapper) to Dave Gentle, G4RVL, 1 Sunny Hill, Milford, Derbys, DE56 0QR, payable to "NBTVA".

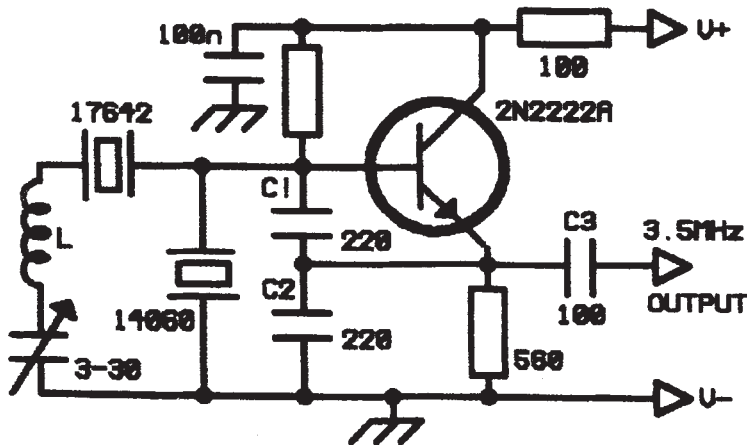
Wide Range Crystal Control on 80m

Walter Farrar G3ESP, 1 Barnsley Rd. Ackworth, Pontefract. WF7 7BS

The problem with trying to pull the frequency of an 80 metre crystal oscillator is that it can be moved only 2 or 3 kHz. With higher frequency crystals can be moved much more, so why not take two high frequency crystals, one fixed and one variable, mix them and by subtraction get a low frequency generator with a large swing?

The circuit shows it can be done quite simply (K.I.S.S.). The crystals were on hand, and gave a basic difference of 3582 kHz. As wired up, I can tune from 3509 to 3587 kHz! The output was rock steady and drew 7.5mA from a 9-volt supply battery. The transistor oscillates on two frequencies simultaneously, and the difference is taken from the emitter. This is only the bare bones of the system, which will need filtering to remove the undesirable mixtures produced.

Other crystals would give other outputs: For example 8.8633 and 8.9985 MHz (together available for about a fiver) should prove ideal for the new band 135.7 to 137.8 kHz.



G3ESP WIDE-RANGE UXO

V+ up to nominal 12 volts (13.8V)

C1, 2, 3 are all polystyrene

L = 44 turns 0.4mm enamelled CU wire on T68-6 (9.1uH - one could try a 10uH choke)

Any HF transistor should work if a 2N2222 is not available

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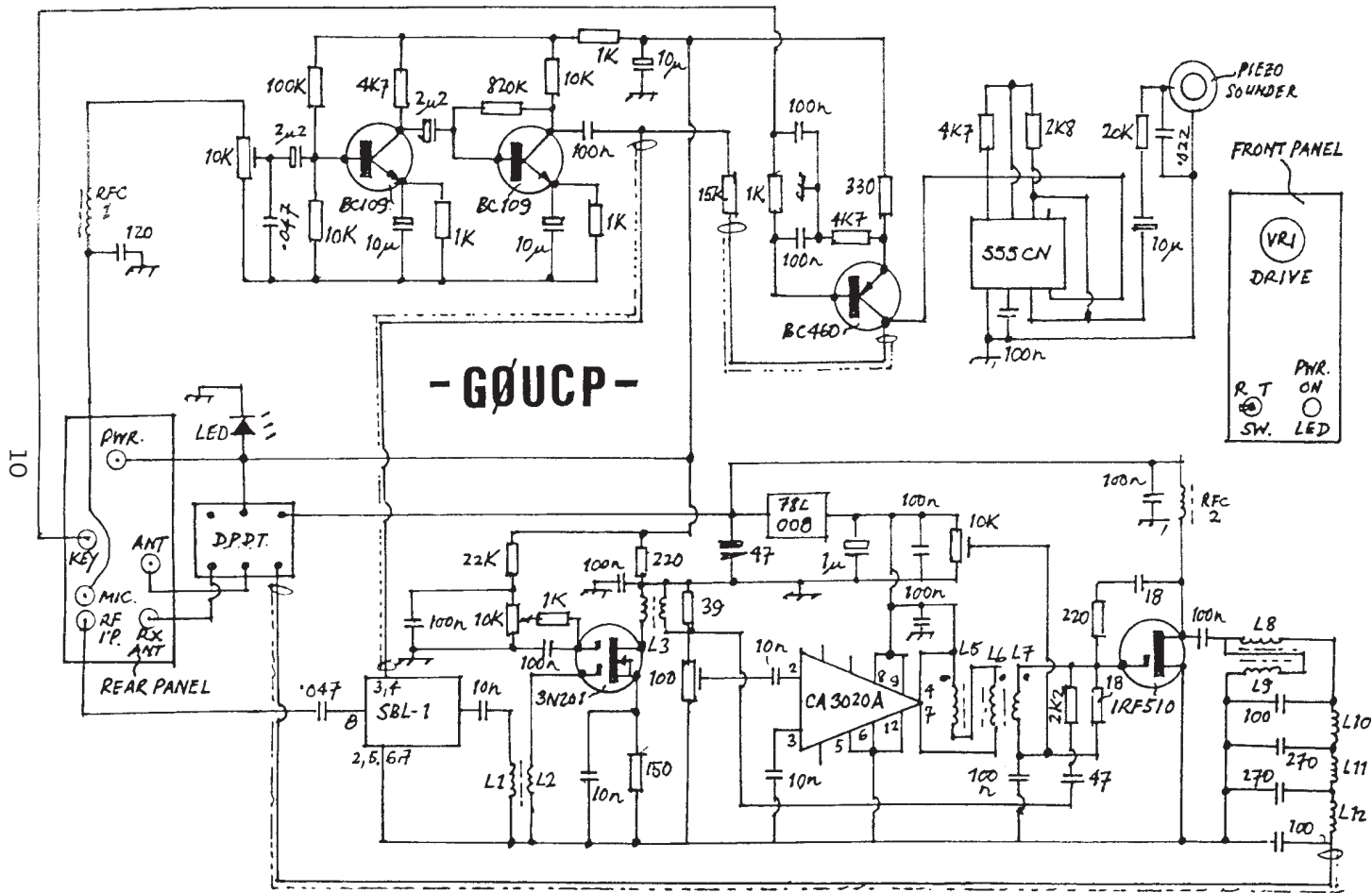
MC1350 at £2.25 each
inc. postage in the UK

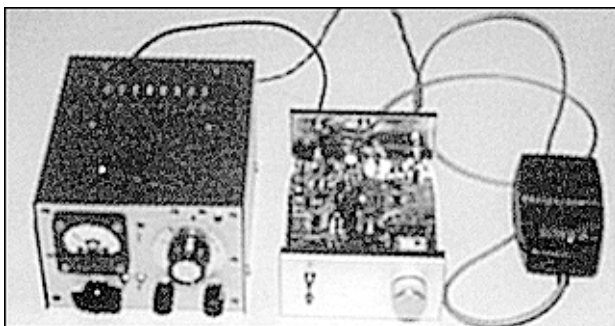
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Please note - the NE602 chips are branded SA602AN types





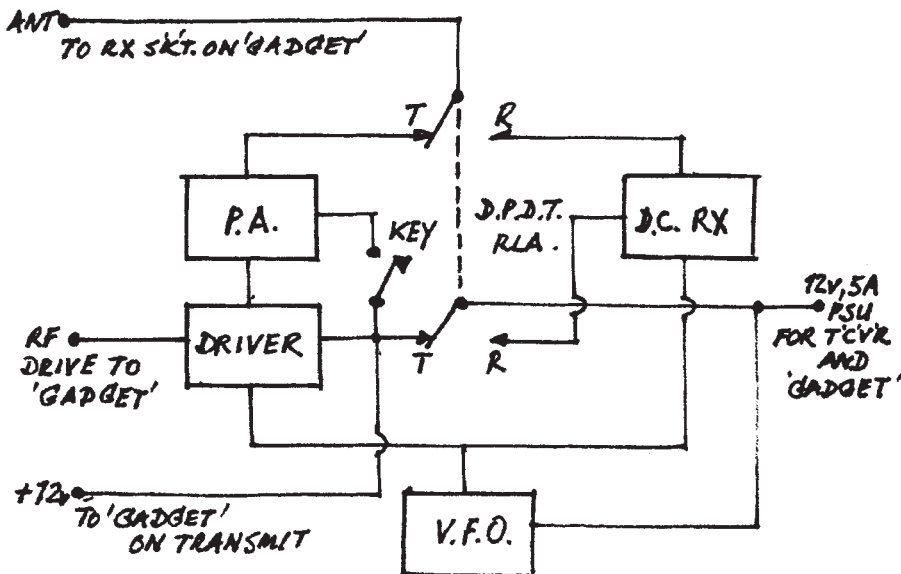
THE GADGET
[3.5 TO 18 MHz]
DSB/CW MODULE
 John Seagar G0UCP
 2 Waterford Rd.
 Oxtou, Birkenhead,
 L43 6UT

This device is neither elegant nor original but it has

been tested on 17 20 40 and 80 metres and it produces up to 5 watts DSB or CW. Don't worry about the DSB aspect - most people don't notice (and when told some have failed to find the second sideband).

It is a module and is used with a separate CW transceiver. The Gadget includes a microphone amplifier, modulator, driver and linear PA and needs no adjustment between bands. A low pass filter is built in for the highest frequency in use and the others can be added as required.

The advantage of DSB is that DC receiver and modulator work at the signal frequency so that all that is needed is a pure and steady RF signal to feed to the RF input port. On the prototype this was provided by a synthesised VFO but a simple VXO would be fine and an old signal generator perhaps the ultimate in versatility. CW comes from keying a PNP switch which unbalances the SBL-1 and produces a sidetone from the sounder in the box.



Changeover is shown in the above diagram . The Gadget gets its power when the transceiver is turned to transmit and a second relay would fix everything, but as you can see the Gadget goes for its own manual changeover with a somewhat underused DPDT switch - is this foolishness or arrogance? The front panel is far from cluttered. Apart from using shielded connecting links, no special screening seemed to be necessary, but it is best to use a balanced

antenna to avoid RF leaping about inside. An 80 metre dipole loads equally well on 17m where 5 half wavelengths present a 50 ohm load and there is good low angle radiation.

No major problems were encountered with the linear amplifier though the CA3020A was rather jumpy until the neutralisation was put in and the output line transformer is probably far from optimal. An early problem with the modulation was due to an unsuitable connector to the power supply. Since this was fixed people have been quite complimentary about the audio.

The circuit is derived from projects by G3VTT and PA3BHK and Solid State Design and actually has bits of G3RJV's Marland transmitter built in.

The original model used the Cirkit linear PA after the driver stage and with 5 watts pep on 18 MHz contacts were made with 4 continents on 'phone last August, the best being with LU4 when an RS 55 was received. The present 'single ended' IRF510 stage has had a 59 report from St Petersburg on a Saturday morning with between 2 and 3 watts on the Stockton power meter so it seems to be adequate. Work continues. So far I have yet to meet another DSB station on the air.

THE GADGET: INDUCTORS

RFC1/RFC2 = 9 turns on a ferrite bead

L1/L2 = 2 turns prim., 10 turns sec. on 2 ferrite beads

L3/L4 = 10 turns prim, 2 turns sec. on 2 ferrite beads

L5/L6 = 5 turns bifilar, L7 2 turns on 59-610001101

L8/L9 = 6 turns bifilar on 59-61001101

L10/L12 = 14 turns on T37-6

L11 = 14 turns on T37-6

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Shipping cost in the US is \$5 for the first volume and \$3 for each additional volume shipped at the same time. Total cost for all 5 volumes shipped in the US is \$117.

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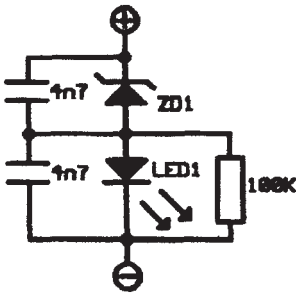
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A Low Battery Voltage Indicator

Ha- Jo Brandt DJ1ZB Eichenweg 7, Fronthenhausen, D-84160, GERMANY



In a German components catalogue I have found a special "no name" red LED with a diameter of 5 mm, especially designed for the indication of low battery voltage in 3 volt portable equipment. The LED contains a CMOS circuit which can withstand up to 10 volts of supply power. Above the threshold voltage, the circuit draws just 5 μ A (microamperes) to save battery capacity. As the supply voltage drops to about 2,5 volts, however, the LED will light and draws a maximum of about 8 mA. With the supply voltage decreasing further, the current and the light intensity will also decrease.

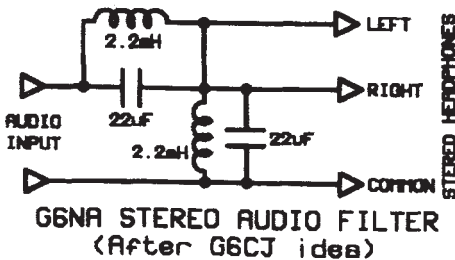
To use this "intelligent" LED for higher supply voltages, a zener diode may be placed in series. However, a small additional bypass current is needed for proper operation. A resistor of 100 kOhms in parallel to the LED will work for low power zener diodes, but a smaller resistor may decrease the hysteresis between the voltages where the LED lights or extinguishes. The dissipation of the zener diode must be sufficient to cope with the maximum current of 8 mA set by the LED. But this will be no problem with usual supply voltages up to 15 volts or so. The small number of components will make it also very easy to fit this circuit into existing equipment.

With a 6,8 volts zener in series, the LED will light up if the supply voltage drops to 9 volts or less. This threshold must be set according to the minimum voltage necessary for proper operation of the equipment, with allowance of some decrease in output power, of course. The capacitors shown in the diagram are just for EMC purposes to prevent the threshold of the circuit from being shifted by r.f. pickup, likely to happen in transmitters and from nearby aerials.

A Stereo Audio Filter

H.C. "Spenny" Spencer G6NA

Tilshead, Tom's Field, Langton Matravers, Swanage, Dorset, BH19 3HN



Several readers have asked about the Stereo Audio Filter that Spenny uses on the end of his Sunset Transceiver (SPRAT 94). The arrangement that Spenny uses is shown on the left and is based on the "stereocode filter" ideas of Dud Charman, G6CJ.

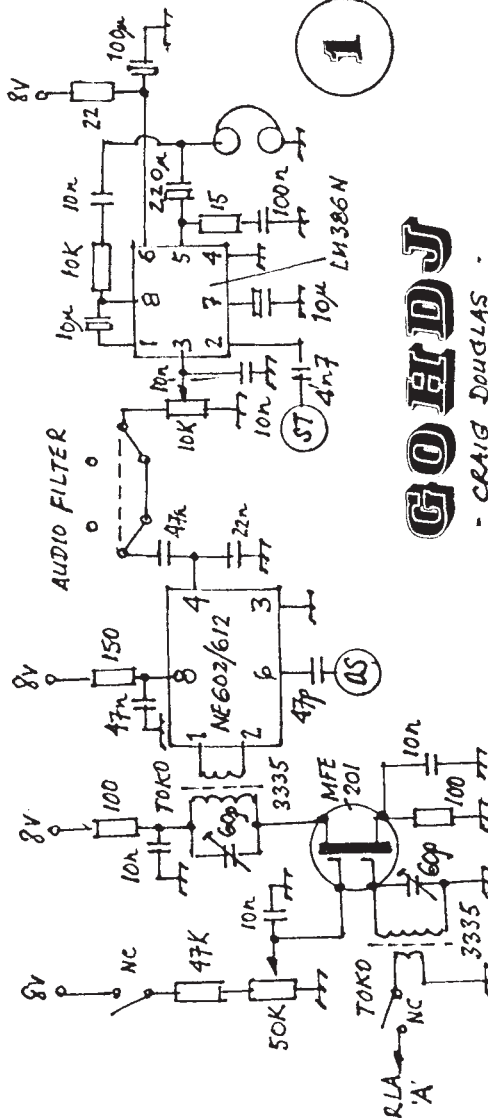
It produces a simulated "left to right" effect when tuning through CW signals. Those who have tried the idea claim that discrimination of signals is made easier by this effect which gives a "rounded" sound to the signals.

SHIMIZU SS105S

Does anyone have a good photograph or print of a Simizu SS105S Transceiver? I want to scan an image. Any offers please to G3RJV.

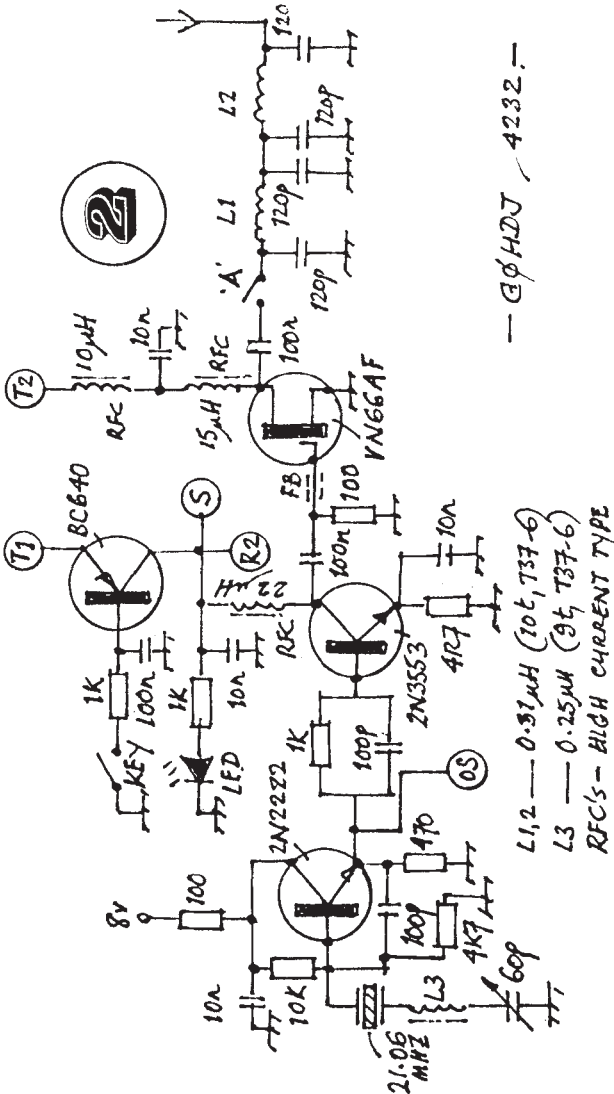
A Simple 21MHz VXO QRP Transceiver **Craig Douglas G0HDJ**, Threave House, Blind Lane, Barton St David, Somerton, Somerset. TA11 6BW

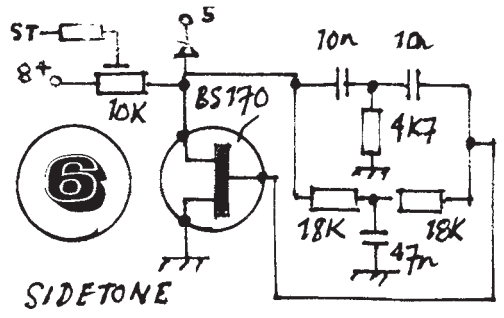
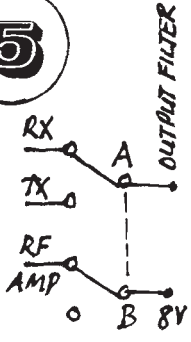
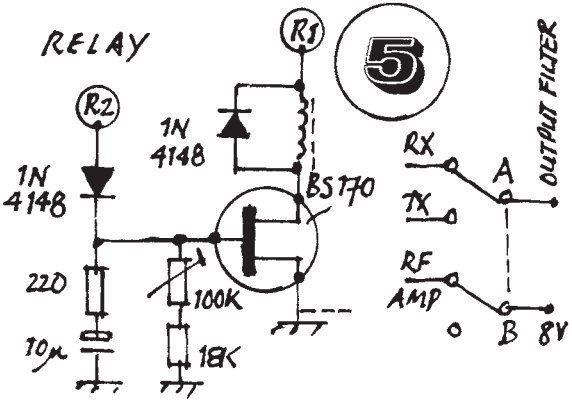
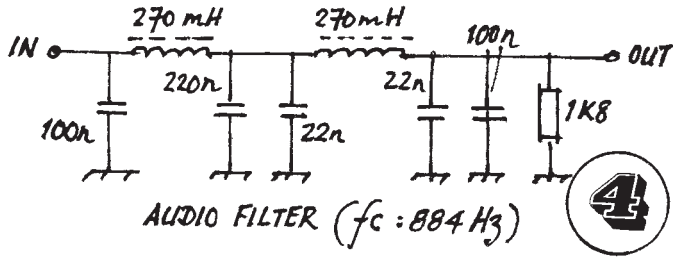
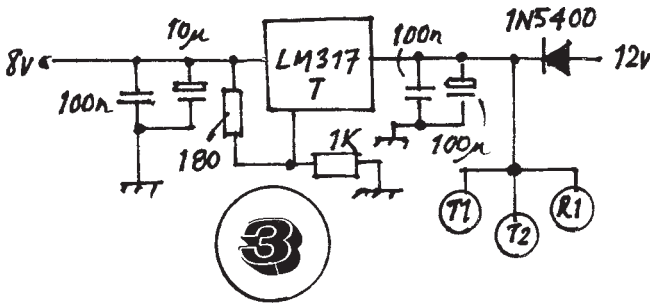
The Idea for this transceiver originated from G3XBMM's 'Pipit' (Sprat 53 page 12). I thought I would throw a few 'chips' at it but nothing is ever that simple! The final design is based on: standard modules (if such a thing really exists) found in 'Sprat', 'Solid State Design for RA', trial and error! and from knowledgeable help and advice from Tim Walford, G3PCJ.



Successful contacts have been made. The first time the key went hard down a UA3 answered my CQ - an historic event for me (my antenna is a 40M doublet zigzagged about the loft). Power output is about 1.5W from a 12V battery supply. It never ceases to amaze me how successful one can be with simple, low cost, low poser equipment. All my HF equipment is home-made and QRP. Construction and operating is indeed a pleasure and rewarding.

The parts are all standard from the usual suppliers/junk box - crystals, I have 21.06/05/.04/.03 MHz, are the expensive parts. I have a PCB circuit layout but mine tend to be rather large/spaced out for easy access to soldering iron and solder sucker!





Experiments with Gilbert Cell Mixers

Ian Braithwaite G4COL, 28 Oxford Av. St Albans, AL1 5NS

I was disappointed when I heard that the SL6440 high level mixer IC was being discontinued. This was based on the Gilbert Cell arrangement of long-tailed pairs and gave a high dynamic range by virtue of its low distortion as measured by a high third order intercept point (TOIP), stated on the data sheet as typically +30dBm.

Although this was achieved at the expense of a supply current of 50mA, the Gilbert Cell is handy to interface to and the low local oscillator power requirement reduces the need for supply current elsewhere in the receiver.

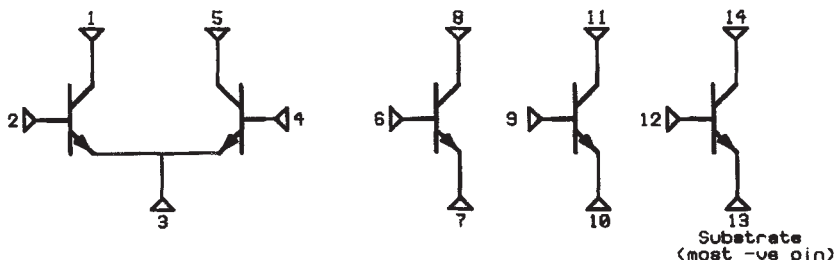
A number of other Gilbert Cell mixer ICS are on the market and in recent years the NE/SA602 has seen much use in homebrew receivers on account of its circuit simplicity, requiring few external components. However, its current drain of a few milliamps goes hand in hand with a rather poor distortion performance, having a typical TOIP of -13dBm. Used with a good input preselector on the higher H.F. bands, there will be few problems, but in Europe on 40 metres on a winter's evening, rather too many signals may be evident! Intermodulation can give the impression to the unwary of a "lively", sensitive receiver, because extra, unwanted signals are being generated within its circuitry.

I decided to try making a decent Gilbert Cell mixer using matched transistor arrays type 3046 that have been around for many years and are available quite cheaply. All my experiments were conducted with an input frequency of 18.1 MHz and a local Oscillator of 3.4MHz, amplitude 2V peak-to-peak, examining the output at 21.5MHz. distortion was found to reach a minimum with a "tail" current of 17mA (supply current about 22mA due to the bias chain). Third order intermodulation measurements are somewhat tedious and prone to error, but I found I was getting intercept point in excess of 20dBm and up to 25dBm, depending on input level.

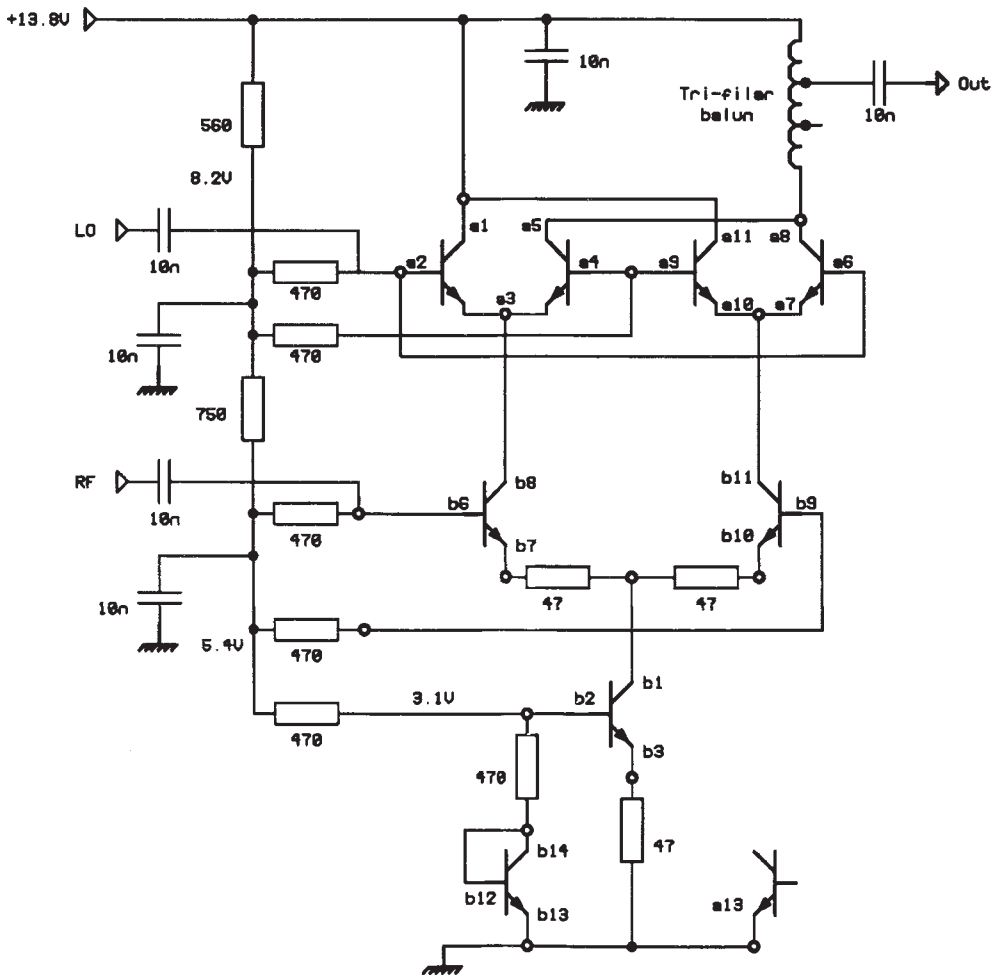
Although this is somewhat short of the performance of the SL6440, it is quite creditable, and I set about seeing how the old faithful 1496 mixer IC would perform at similar currents. The distortion products reached a broad minimum with a current of 11mA per tail (33mA supply current). The TOIP was not quite as good as before, but still around 20dBm. Once the upper transistors are switching properly, this isn't very sensitive to local oscillator level.

There are quite a number of variables to tinker with, so experimenting with these circuits can feel like exploring a very large space. The circuits shown are presented the basis for experimentation, and although I can't guarantee particular results, I confident that they will give a pretty good performance if duplicated - I shall be basing future designs on them. The circuits are drawn to show the full innards of the which makes them look formidable but it does help the interested reader get an idea of how the devices work. Remember that most of the components which would be required for the NE602 are low-cost resistors so the overall parts cost can be less depending on where they are sourced.

3046 INTERNAL CIRCUIT



GILBERT CELL MIXER BASED ON THE 3046 TRANSISTOR ARRAY TEST CIRCUIT



Radio Projects for the Amateur

by Drew Diamond, VK3XU (Reprinted, with permission, by the G QRP Club)

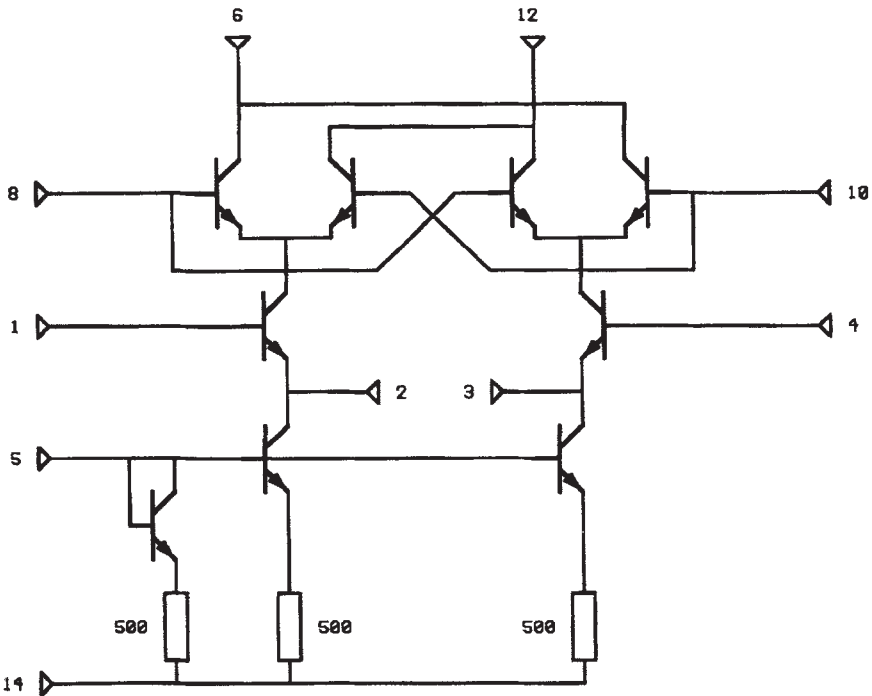
Workable plans for the construction of receivers, QRP transmitters, transceivers, test equipment, and some handy construction hints for the practical radio amateur.

Available for £6.00 (plus UK postage £1, EEC postage £1.75) from :

Ian Wye GØOKY, New House, Hook Road, Amcotts, Nr. Scunthorpe, DN17 4AZ

Please make out all cheques to "G QRP Club" (an address sticker helps)

1496 INTERNAL CIRCUIT



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

FOR SALE: Argonaut 515 complete with 208 CW Filter £275. Or swap for HF transceiver FT101, Trio etc. G3VTI. 01634 - 719703.

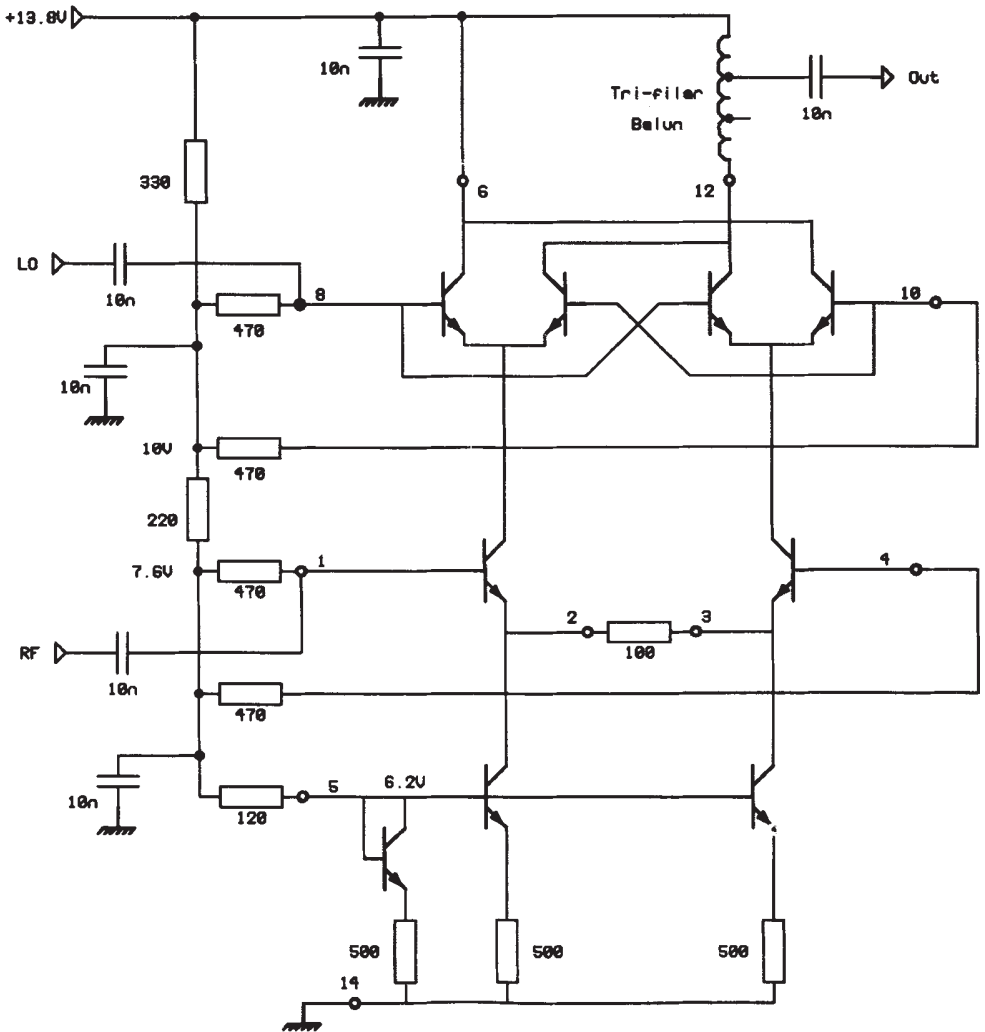
FOR SALE: H/B 40m SSB 10w PEP, works fine £50, H/B 40m CW superhet transceiver, works OK - £40. All inc UK postage, please phone for details: G3YCC 01482 650410 or email g3ycc@g3ycc.prestel.co.uk

WANTED: "Introducing Morse Code" published by PW. Jim Harrison, G0NTR, 43 Churchfield Ct. Walton, Peterborough, PE4 6GB.

WANTED: By Disabled Wheelchair User - Heath HW7, HW8 or HW9, information or modifications.

QRP Notebook by Doug DeMaw. First Edition (blue cover). Your QRP Operating Companion, ARRL. Ring Andy, GM0NWI on 01786 - 813092. Sirling.

1496 MIXER TEST CIRCUIT



ADDITION TO THE ELBC-40 [SPRAT 94] Fred Heusy DJ3KK

page 9 (Switching and Predriver) : add a Z-diode ($U_z = 6 \dots 8V$) parallel to resistor R20 to protect the insulating layer of Q5 (BS170) from overvoltage damage. With our club-project we had to replace 3 of 8 BS170 without the Z-diode. With the Z-diode no further damage occurred.

The ELBC-40 : The Receiver Module

Fred Heusy DJ3KK POB 801, D-25697 Meldorf, Germany
PR : DJ3KK @DB0HES.#SLH.DEU.EU e-mail: m.heusy@t-online.de

The second part of the ELBC-40 article describes the Receiver Module.
 The first part appeared in the last issue of SPRAT.

Parts List RX-Module

DBM MD108, SRA1, IE505 or similar (+7 dBm LO)
 Q1 BFR96, 2N5109, 2N3866 or similar ($I_c = 30 \text{ mA}$)
 Q2/4 2N3904, BC546 or similar (npn), Q3 2N3906, BC556 or similar (pnp)
 TR1/2 T37-43 or simil. 8-10t bifil.
 IC1 TCA440
 LOS 4.7 uH molded choke for IF= 5.068 MHz (5.6 uH for 4.43 MHz-IF)
 C9, 12, 13, 22 tantalum /35V, C10,17 ceramic-caps (NP0)
 C without value 100nF multi-layer-ceramic-caps

Band-Pass Filter

BP-RX	CA/CE	CB/CD	CC	LA/LD	LB/LC	form
80 m	470p	60p	8.2p	2 t	32 t	T37-2
40 m	220p	60p	2.2p	1 t	22 t	T37-2
30 m	150p	60p	1.5p	1 t	18 t	T37-2
20m	150p	60p	1.2p	1 t	13 t	T37-2
20 m	150p	60p	1.2p	1 t	15 t	T37-6

CA/CE multi-layer-ceramic-caps (NP0) - for LB/LC try +/- 1 turn !

XTAL -Filter 8-pole. (designed with W7ZO1-software)

$f = 5.068 \text{ Mhz}$; Xtal-parameter : L_m abt 0.057 H ; Q_u abt 150 000
 nom. BW = 500 Hz , measured abt 450 Hz

X1/X8	X2/X7	X3/X6	X4/X5	CX1/CX9	CX2/CX8	CX3/CX7	CX4/CX5/CX6
fs-offset	fs-offset	fs-offset	fs-offset	100p	220p	150p//150p	220p//100p
+ 17 Hz	+/- 0 Hz	+ 50 Hz	+ 60Hz				

CX1-CX9 multi-layer-ceramic-caps (NP0)

Alignment :

There are only few alignments . First check DC-Voltage at TP1 : 1.7 - 2.0 V

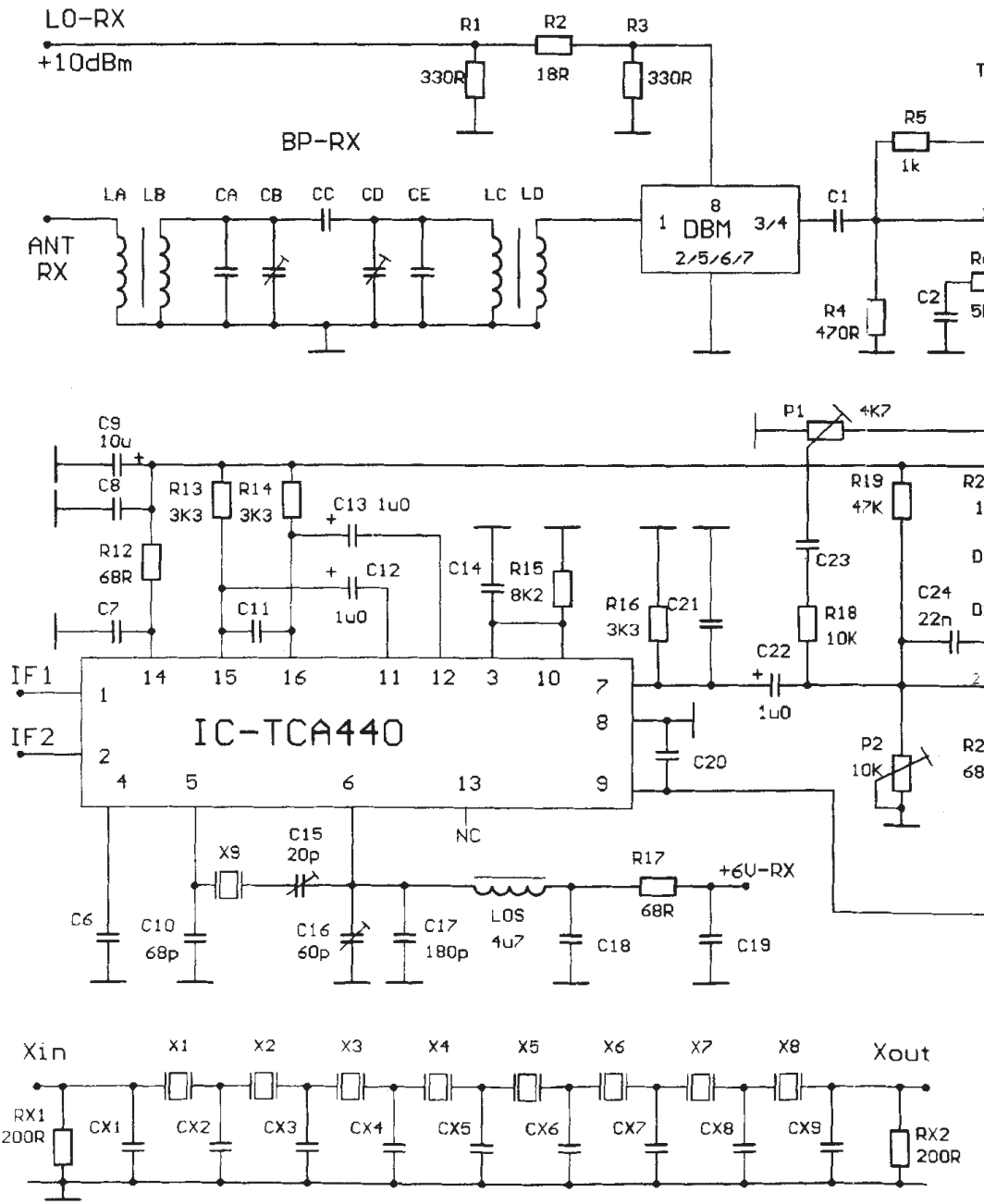
Adjust P2 for abt 3.0 V at TP2.

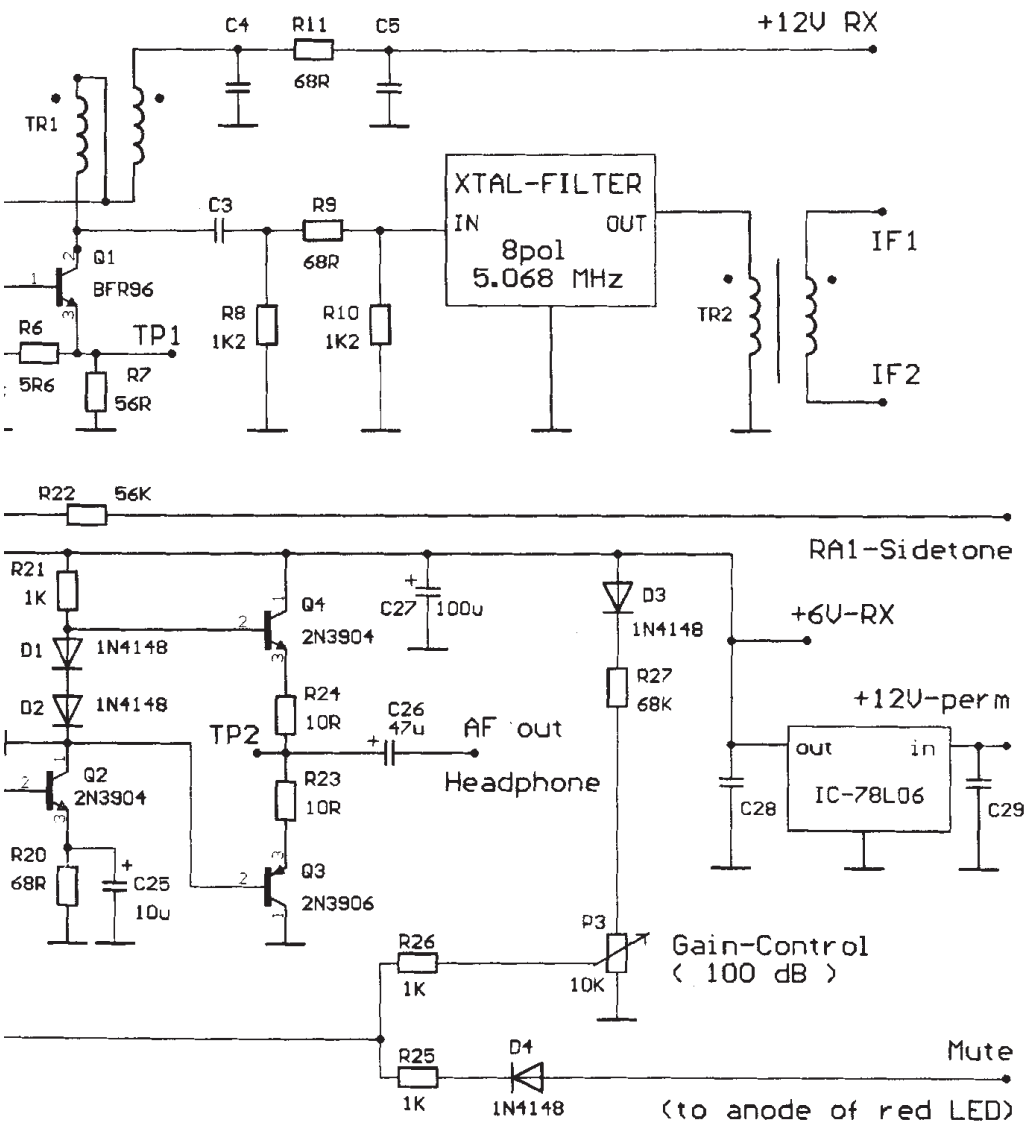
Peak CB and CD for center of CW-band

Adjust C15 and C16 for a good beatnote and P1 for a good sidetone-level.

The TCA440 is a cheap (abt 2.-DM) but excellent DC-RX-chip and an excellent product-detector too. (16pin DIL)

Any other xtal-filter may be used - the if-offset is programmable. It is only necessary to match the filter input to the BFR96 output-transformer.





DJ3KK	ELBC-TRX
March 98	RX-Modul-1

A SIMPLE TUNE-UP AID

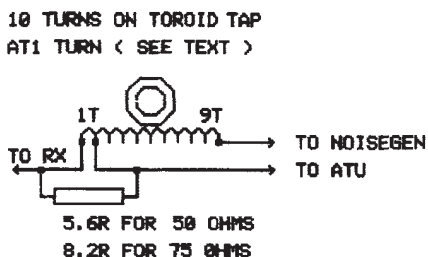
Jack Holstead, G3OZC, 72 Woodlands Av. BLACKBURN. BB2 5NN

The following idea is based on a quiet tuning method, published by G3LHZ in Radcom in May 1981. He developed the idea and built the unit into an FT101, using the 25 kHz calibrator as the tuning signal. It was placed in circuit in the receive leg after the TX/RX relay and so was bypassed on transmit. Such was his confidence in the device that he eventually dispensed with the use of a conventional SWR meter!

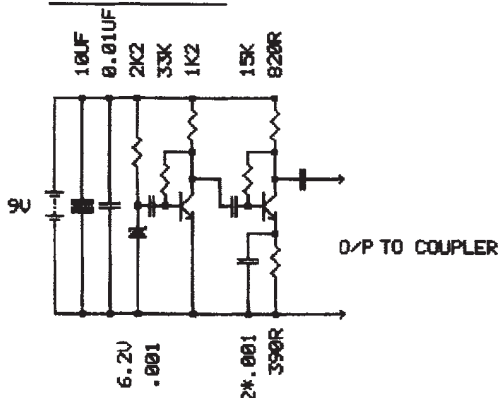
The unit consists of a small directional coupler driven by the calibrator, in use one tuned the nearest convenient calibrator signal, S meter level noted, then the ATU was adjusted for a dip in signal of 3 to 5 S points and that's it!, the aerial is matched.

I reasoned that a noise source would serve as a driver, and that a small self-contained unit could be made for use with any receiver.

DIRECTIONAL COUPLER



NOISE GENERATOR



The unit can be built into a 3 inch x 2 inch x 1 inch aluminium box. Two SO239 sockets were mounted on the lid at one end, the coupler is hard wired between the sockets. The noise gen is also mounted on the lid. The transformer core specified originally was Mullard FX2633, I tried a small Mullard binocular core that is commonly available, and it worked fine. To wind the xformer I wound the single turn with plastic covered hook-up wire (thin), wired this to the 5.6R then added a further nine turns with 30 SWG enamelled.

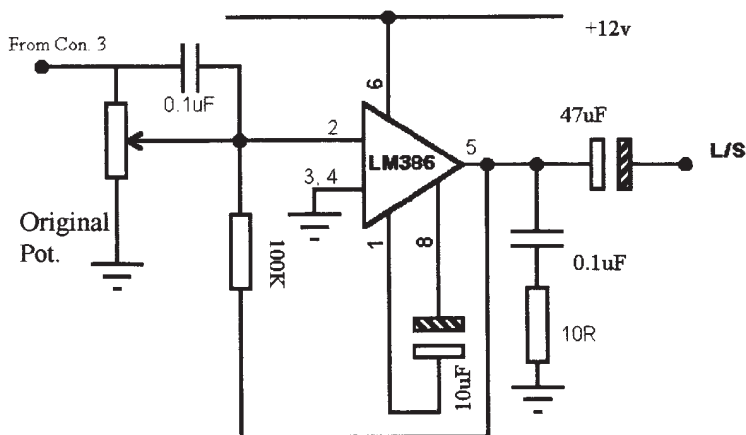
To commission, check the output of the noise gen across the spectrum 2 to 34 MHz this should be reasonably level, falling towards H.F., if you find variable output and oddball dips, the chances are that you have shorted turns in the xformer. This happened with my first attempt, due to the ferrite core scraping the enamel. The only other snag I can foresee is with the resistor. Ideally this should have a value of 5.555 ohms i.e.5019. I splashed out 10p. for a packet of 10 - Oh you spendthrift! !) every sample was high in value when checked on a precision wheatstone bridge, two were over 6 ohms. Any appreciable intolerance here will be magnified by a factor of nine due to the xformer action. It might pay to check before installation and if necessary bridge the 5.6R with a larger value. With 5% resistors values of 750R to 1K would be appropriate.

Results with my unit were quite good, when used with a Matsui MR-4099 World band receiver, a null could be achieved right down to receiver noise, and ATU settings were within a smidgen of those achieved with a Stockton power meter, without radiating an appreciable signal

A Louder Epiphyte 2

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

The Epiphyte 2 is a superb portable SSB transceiver with plenty of audio available to a pair of headphones. When connected to a loudspeaker however, it can hardly be said to fill the room. A rummage around in the junkbox bought forth another of those ubiquitous LM386's and I wondered whether it could be added to the existing one in the EP2 to give it more "wellie". After a little experimenting, I came up with the circuit shown.



Disconnect the two wires going to the volume potentiometer (Connector 4) and replace them with a 470 ohm resistor. Connect the original output (Connector 3), to the input of the amplifier, reusing the original volume potentiometer (shown above). While developing this circuit it was apparent that a great deal of noise was generated internally. While I'm not certain what caused it, placing the 0.1uF capacitor across the volume control suppressed it. Ideas anyone? My thanks to Derry Spittle VE7QK for creating such an effective and adaptable design.

MOTORS FOR DRIVING VARIABLE CAPACITORS

Bill Durham, G3DNE, suggests the use of Grill Turning Motors for rotating variable capacitors in Antenna Tuners, especially for magnetic loop antennas. A source of these is via Sally Healey - Customer Services Manager, Landmann Ltd, PO Box 28, Kidderminster, Worcs. DY12 2EZ. A small motor is available at £3.50 (inc. postage). It runs from a 1.5v battery and has a centre-off/clockwise/anticlockwise switch. A much larger model is available at £20.

FOR SALE: TRIO DM-801 Dip Meter with manual and Accessories, Mint Condx. £50.
GW4KUS. QTHR. Tel: 01972 - 466383.

WANTED: COBWEBB Aerial, prefer in good cond but willing to refurbish. Chris Baker, G4LDS, 5 Curlew House, Alemein Rd., BURNHAM ON CROUCH, Essex. tel 01621 785704 (answerphone) Work 0181 500 1020 x 2321. e-mail: Chris.Baker@KelvinHughes.co.uk

WANTED: Loan or photocopies of circuit diagram and/or manual for DAVCO DR30 receiver. All expenses reimbursed. Malcolm, M0AJL, Tel: 01708-250578. Evenings/weekends or write 137 Heron Way, Upminster, Essex. RM14 1EE. [I have lost my DR30 Manual too! - G3RJV]

TWO QRP EVENTS:



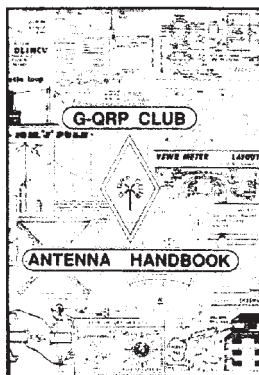
The 14th Yeovil QRP Convention

Yeovil Club Chairman Mike Smith G7SDD welcomes G3RJV to the Dinner on the evening before the YEOVIL QRP CONVENTION on April 19th.

Details of the Fun Run event can be found in the G3XJS Communications and Contests column. This was my first experience of the Yeovil Convention and what a delightful event it is! I can commend it to all GQRP members. I found some good components and "junk"

The G QRP Club German Section Meeting in Pottenstein

50 German G QRP Club members, 3 Austrian and 16 xyls attended the meeting on May 22-24. An impressive programme of lectures included: Kite Carried Aerials [DF6MS], The ELBC Transceiver - SPRAT 94 [DJ3KK], Antenna Experiments [DL6NEE], High Efficiency Short Dipole [DK6SX], EMU Regulations Today [DJ1ZB], 8 Band Portable Loop [DJ7RU], Comparisons of Commercial and Kit QRP Rigs [DL2FI], "The Question Box" [DJ1ZB]. The weekend also included events for the YLs and was, by all accounts, a great success organised as usual by Rudi Dell DK4UH.



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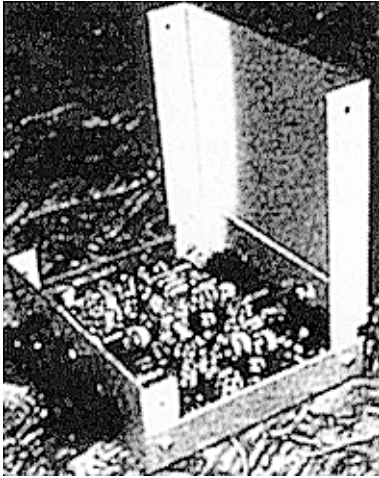
CHANGED YOUR ADDRESS / CALLSIGN?

Changes of address and address corrections to: Graham F Firth G3MFJ, 13 Wynmore Drive, Bramhope, Leeds. LS16 9DQ. 0113 267 1070. Graham.Firth@BTInternet.com

The Australian CW Operators' QRP Club Home Page

Can be found at <http://www.users.on.net/zietz/qrp/club.htm>

The page contains: Introduction, Contests, Inside the latest "Lo-Key", Membership information



THE NORCAL-20 TRANSCEIVER KIT Doug Hendricks KI6DS

The NorCal QRP Club is pleased to announce it's newest kit, the NorCal 20, designed by Dave Fifield, AD6AY. The NorCal 20 is a 20 meter CW transceiver with the following features:

Superhet receiver TUF-1 Mixer for the front end (designed for the harshest European conditions) NOT another NE602 front end.

Variable output power from 0 - 5 Watts VFO controlled, user bandwidth selectable from 10kHz to 200kHz on any portion of the 20 meter band. This means that if you only want your VFO to cover 25 kHz of the band, you may set it up to do so.

Varactor tuned VFO, 10 K pot supplied, but board facilities for 10 Turn Pot

Self Contained Keyer custom designed for NorCal by Embedded Research.

LM380N 2 Watt Audio chip. Easily drives a speaker.

Frequency readout via Audio Frequency Annunciator. A PIC chip is used as a frequency counter with audio output. In the Automatic mode, as you tune the radio, a beep is generated every kHz. Then when you stop, the last two digits of your frequency are announced in Morse code. You may also push a button to generate the frequency that you are on. The manual mode does not have the beeps and you must push the button to get your frequency. Designed by Mike Gipe, K1MG.

Custom clam shell case, made from .090 aluminum. 4.5" x 4.25" x 2.25"

Designed by Bill Jones, KD7S, and made by Doug Hauff, KE6RIE.

All controls, knobs and connectors supplied.

Double sided, plated through, solder masked, silk screened board, commercial quality.

Comprehensive manual, written in the build a section, test a section style.

5 pole crystal filter. 220 board mounted parts, no surface mount.

Full QSK, NO relays. IRF510 Final, 2N4427 driver.

We will sell only 500 of these kits, and orders will not be accepted until Aug. 1st. There will only be one run, and there will not be another. The price is \$95 for the kit, and \$5 shipping and handling in the US, \$10 DX to Canada and Europe, \$15 to Asia and the Pacific Rim. Payment must be in US funds only, and checks made out to Jim Cates, not NorCal. (European members may order from our European agent, Stephen Farthing and the price is 70 pounds sterling.) The kits will be shipped after Pacifcon, with a shipping date of Oct. 20, 1998, providing our parts suppliers ship to us in a timely manner.

The exciting part of this project is that for every kit sold, NorCal will produce a second kit and send it to the G-QRP Club, which will handle distribution to hams in third world countries at no charge to the receiving hams. We will give the kits away! 500 kits sold, equals 500 kits for third world hams. George Dobbs has been selected to handle the distribution of the third world kits because of his extensive network of contacts with hams in these countries.

Here is the address to send your order to when the time comes:

Please send your check and a self addressed mailing label to:

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

European orders may chose to send their order in British Pound Sterling to:

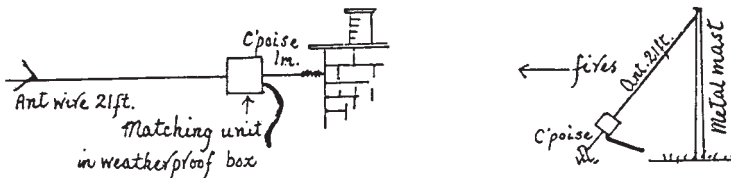
Stephen Farthing 38 Duxford Close Melksham, Wiltshire SN12 6XN

ANTENNAS - ANECDOTES - AWARDS

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

END-FED HALF WAVE ANTENNAS FOR FIXED OR PORTABLE USE FROM G3WQW

F.G. Stewart Sims, 71 Lambley Lane, Burton Joyce, Nottingham, NG14 5BL



Matching unit (really an ATU).

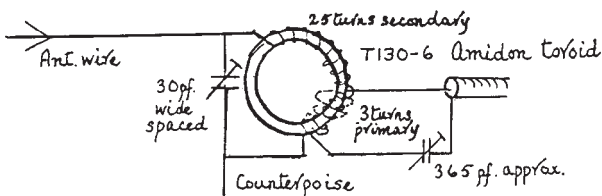
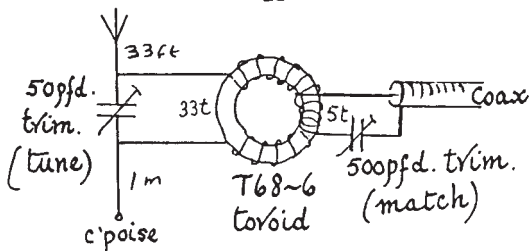


Figure-1.

15m



Winding on Amidon T68-6 toroid:

Primary feed from coax, 5 turns plastic covered

Sec., ant, 33 turns 24 swg. enamel

Figure 2.

20m

These antennas are entirely self-contained in the sense that they do not require an earth system. They give excellent results when erected either horizontally or as slopers. In the latter instance

the main radiation is in the direction of the slope, with a high angle lobe off the back. The windings for the 15m coupler are secondary 25 turns of 16 swg enamelled copper wire and primary 3 turns of plastic covered wire wound over the earthy end of the secondary. The equivalent windings for the 20m version are secondary 33 turns of 24 swg enamelled copper and primary 5 turns of plastic covered wire. For portable use lightweight co-ax can be used for the feeder. The tuner can be mounted in a plastic box which must be fully waterproofed. A clamp or other means of supporting the weight of the feeder must be attached to the box. The favoured direction of the sloper version can be altered by moving the stake supporting the lower end.

THE G3WQW 80m TO 10m SINGLE TOROIDAL COIL Z-MATCH MARK II

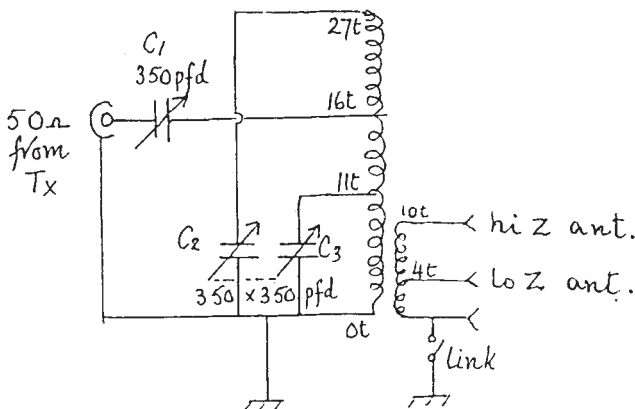


Figure 3.
MK II Z-MATCH

The coil is wound from 20 swg wire on an Amidon T130-2 former. The variable capacitors used were 3-gang, 350 pfd "polyvaricon", with only the required number of sections being connected. 470 pfd types ex old broadcast receivers are another source. The important difference between this version and the MK I described in SPRAT No.84 is the re-arrangement of the the output coil connections which now allow for high and low impedance balanced or unbalanced antennas to be fed via the unit, thus providing a very versatile coupler. With the components specified above it can handle up to 30 watts of rf with no problems.

THANKS STEWART. WITHOUT YOUR INPUT WE WOULD HAVE HAD NO ANTENNA MATERIAL FOR AAA THIS TIME. WE DEPEND ON MEMBERS FOR MUCH OF OUR MATERIAL SO IT IS LITERALLY "NO INPUT = NO OUTPUT". SO LET US HEAR FROM YOU !!!!

HEARTY CONGRATULATIONS TO OUR RESPECTED CHAIRMAN, GORDON, G3DNF, on having completed his half century as G3DNF, and getting on for half that time as our Chairman. Maybe besides its other virtues QRP keeps you young. Certainly as a keen dancer Gordon can still trip the light fantastic with the best of them. Long may it remain so.

THE HONOURS FOR 1997

The Club has Awarded the following for outstanding work during 1997.

THE G2NJ TROPHY to Peter, G3PDL for his long and continuing work in the post of Treasurer. A big Club like ours can only function if its finances are carefully controlled, and that is precisely what Peter ensures.

THE PARTRIDGE TROPHY goes to Jimmy, G3HBN, for his Collapsible 7-21 MHz Loop. This design showed great mechanical ingenuity and its electrical performance can be vouched for by anyone who was in contact with ZB2/G3HBN.

THE SUFFOLK TROPHY goes to Ha-Jo, DJ1ZB for his excellent article "Destroy Subharmonic Resonances in Transistor PA Tank Circuits". This article was of the high technical and engineering standard that we have come to expect over the years he has been associated with the Club.

Sincere congratulations to all three for excellent work.

AWARD NEWS

QRP MASTER. Vitas, LY2FE joins the Worshipful Company. Well Done !

QRP COUNTRIES. 75 LY2FE; 25 VU2NGB, F6BLK.

WORKED G QRP CLUB. 1000 G2DAN (great work !); 620 G3INZ; 460 G4NBI; 280 G3ZHE; 200 G0KZO, 9A3FO; 180 G0THE; 160 G4ICP, G4LQO; 140 GW3VLU; 100 2EoAMW (nice!); 80 F6EQO; DL1HTX, 2E0AOZ; 60 G0UAP; 20 F6BLK.

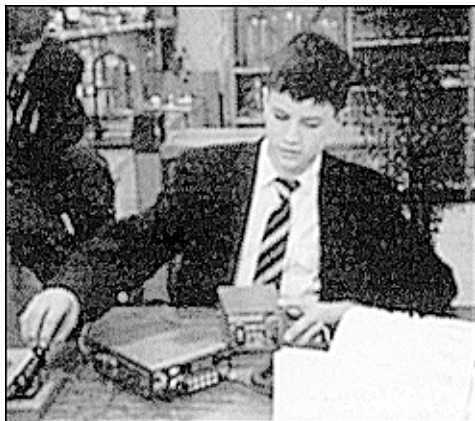
TWO-WAY QRP. 70 G8PG; 30 DL1HTX, G3LSW; 20 GW3VLU, 9A3FO; 10 F6BLK.

Hearty congratulations to all the above.

AUTOMATION GONE MAD is represented by those who, during Contests, use their auto keyers to send CQ TEST de ABC3Y CQ TEST de ABC3Y K followed by a 2 microsecond pause, then a repeat and so on for four or five minutes. Until the very end there is obviously no attempt to listen for replies, and it seems obvious that the operator concerned is simply keeping the frequency busy while he helps the XYL wash up or has a cup of coffee. Apart from being pure bad manners this seems to come under the heading of deliberate interference and is illegal. Nowadays one wonders how some of the Contest kings would get on if they had to do some real operating - doing their own keying, keeping their own log by hand and so on. Once upon a time Contests were supposed to test operating skill, not how much automated equipment the operator could buy to do the job for him. There are some very good contest operators still, but the ratio of bad to good seems to increase year by year. The el-bug can be a wonderful instrument, especially for those of us who have been around for a long time, but its automated version is certainly being regularly mis-used at the moment. Using auto keying to "keep the frequency warm" for long periods is ok for commercials but certainly not for amateur band work.

QRP - What Great Fun for a Novice

Mark Haynes 2E0APH, 34 Pear Tree Mead, Harlow. CM18 7BY



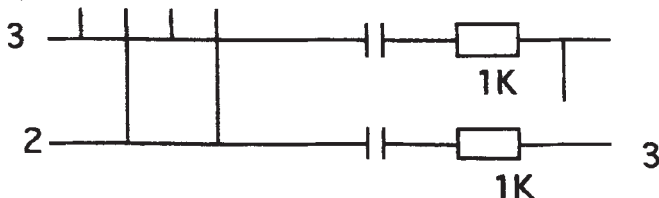
Hi. My name is Mark Haynes and I am 14 years old. I am a person who has discovered the fascinating three letters QRP. It all begun one summer's day in June 1997 when I found out that I could tune-up on 28Mhz (10m). All of the HF gear is my fathers (G3 WRO) and he was at work. I was tuning around and there was a whopping great signal (5/9+24db) from an Italian station. I called him with my 3 watts and, to my amazement, he called me back. He gave me a 5/7.

As time went on, I worked more stations. Here are the countries I have worked with 3 watts to date using my own

callsign 2E0APH [on 21 and 28 MHz] - Italy, France, Hungary, Germany, Poland, Finland, Norway, Spain, Canary Is, Portugal, Sweden, Albania, Russia, Romania, Faroes, Switzerland, Shetland Is, Algeria, Cyprus, Rwanda, Israel, USA, Yugoslavia, Turkey, Brazil, Argentina, Indonesia, Puerto Rico, Uganda and last but by no means least, England. A total of 30 countries and as soon as I get the QSL's, I will be almost a third of the way towards DXCC! It's a great feeling and while I always have great fun in my shack working on 70cms (and 2m under supervision), Dad has to watch out now as I have (with his permission) a spare key to the HF shack!

A couple of weeks ago, I strung out a 66ft long wire for 80 metres. I am working many stations on CW around Europe. So, if you hear me, please call me. I can cope with up to 20 wpm. The photo shows me operating on the key at our school radio club, which I set up last year. To the 'Big Boys', I say, you can keep your linears, give me 3 watts any day! The satisfaction gained far outweighs that possible extra S point!

Improvements to the Gremlinmate Receiver (SPRAT 94)



DK2RS suggests that a resistor (470R) connected from pins 10/12 of the mixer to ground gives more conversion gain.

When trying this, he found no AF output in the Op amp. The reason must be the offset voltage of the mixer (although this has never affected the circuit previously). The cure is to add two capacitors (0.1 ... 1µF) as shown.

COMMUNICATIONS AND CONTESTS

Peter Barville G3XJS, 40 Watchet Lane, Holmer Green,
High Wycombe, Bucks, HP15 6UG.

E-mail: "peter@barville.demon.co.uk" Packet: "g3xjs@gb7avm"

CZEBRIS 98 Results

I am sorry to have to report that only 5 UK entries (half last year's total) were received for this year's event, one of which was the excellent swl log from Bill McConachie. As usual, he seems to have heard just about anything that moved on the bands! Points scored were:

Station	80m	40m	20m	Total
G4MQC	18	62	77	157
RW3AI	32		64	96
G0THX	40	18	10	68
M0ANQ	6	4	10	
BRS88921	72	52	117	241

Stan (G4MQC) is once again the UK winner, and our congratulations go to him. He was using his homebrew 'Taunton' tcvr (4W) to an inverted vee antenna. How nice it would be to see him given a run for his money by a larger number of entries next year! I have no details available of the non-UK entries.

98 SOMERSET HOMEBREW CONTEST Results

I must start by offering an apology for the confusion which arose as a result of slightly different versions of the rules appearing in SPRAT and RadCom. Thankfully this did not affect the overall result, which is yet another success story for Stan, G4MQC, who won the £50 voucher kindly donated by Tim Walford. It was a close battle between G4MQC and G0VIM, who had the same claimed score, but 2 slight logging errors and therefore two points deducted.

All participants found it hard going as conditions were very poor, with a qro contest on the band at the same time. I hope the choice of date for next year's event will produce more favourable conditions, with less qrm.

Points scored were:

G4MQC	50
G0VIM	48
OK1FVD	47
RW3AI	30
M0AYU	26
G3GMS	25
PA3BHK	15
M0AEK	10
G0TUE	Check log
G3XJS	Check log

Ray, G0TUE, could have been the winner, but unfortunately omitted to note the SC serial numbers for each qso and therefore withdrew his entry. To compensate for the rules confusion, ALL log entries (including Ray's) were included in the draw for the filter kit, which was won by Ivan, M0AYU, in his first ever contest.

Tim comments, "After three years this Contest is now becoming firmly established and I should like to thank all the entrants for taking part; it is good to see that the numbers are creeping up and I am especially pleased to see more overseas entries. When highly capable commercial rigs are so

ubiquitous, the pleasure of operating self built equipment running low power has to be experienced to be believed; so I am very pleased to sponsor this event which helps to keep alive the long tradition of self construction fostered by the G QRP Club. I can assure members that it is pure coincidence that the winner happened to be using one of my rigs! I would like to thank the G QRP Club for organising the event and generally making it happen!

Larkana Amateur & SW Listener Club "EP2 CONTEST"

Arshad, AP2AHQ, has kindly sent me details of this contest, which has come about following the efforts of G3RJV and the G QRP Club in sending EP2 kits to Pakistan. Arshad tells me that this is their first attempt at organising a QRP contest, and that they would very much like the opportunity to share the event with stations from other countries. However, being an 80m contest it is unlikely that many stations outside Pakistan will be able to hear the EP2's operated in AP land. He is hoping a similar contest can be arranged, but on 20m, giving a much better chance of contacts into other parts of the world. However, why not give your EP2 an airing around 3694kHz during the contest and work as many stations as you can? There are extra points for working other QRP stations, and additional points for other EP2's, and for non EP2 homebrew stations. You will, of course, earn extra points for using an EP2, or other homebrew equipment.

The EP2 Contest takes place 1000z August 1st - 1000z August 2nd, centred around 3694kHz (ssb of course). You can participate with homebrew or commercial equipment, and there are 2 power categories - 10W max, and 100W max. Even stations (QRP or QRO) they hear but are unable to work will be worth points to the Pakistan stations, so (particularly if you think you will have propagation into AP) please do your best to support this new event. I can supply full details of scoring etc if you send an ssac, but exchange rst/serial number/name/output power/equipment details.

YEOVIL FUNRUN Results

This year there were entries from DL2BQD, F6GGO, ON4KAR and RW3AI, reflecting the widespread support for this event.

The overall Funrun winner was Peter, G3BPM, who also topped the list in the 80m section.

G0FYP submitted a 40m only entry, and was the leading station on this band. Please send an ssac to me (or G3GC) if you require full details of the result.

On the propagation front, the good news is that the hf bands have continued to improve. Some members have been able to work George, ZL4SEA, 2-way QRP cw on 20m. Carl, GW0VSW, has worked him twice using his QRP+ and half size G5RV, which is good going! I was delighted when George came back to my "CQ QRP ZL/VK" call on 14060 one morning - a couple of weeks after I'd worked (using my GQ-20) VK2BO QRP on 14045kHz. The bad news is that 80m for UK contacts during the day has suffered, but perhaps 40m is now the band to try.

I knew I'd omit at least one callsign from the list of Winter Sports entries (SPRAT 94), and it proved to be CT1ETT - sorry Rogerio!

Enjoy your QRP .. the closing date for the next issue is the beginning of August.

SSB COLUMN : Dick Pascoe GØBPS

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

Email : Dick@kanga.demon.co.uk.

via packet to GB7RMS

A few more reports for SSB users this time.

Ron VK3OM wrote telling me he only reads a borrowed Sprat, perhaps seeing his name in print may entice him to join. He likes to chat with his old UK friends and tells me that his 400 watt signal often gains an S9 plus 20dB report. He then likes to drop power, even getting down to just 1 watt and receiving a 5x5 report. Aha, the message is getting through! He has currently worked over 1500 'G' stations on 20 and 15 metres. Ron is QTHR if you would like a sked under his UK call of G4KBB.

Ian G0SVX has been active on 40m with several other club members about 7.055. Usually during the afternoon between 1500 and 1600 UTC. Stations are spread throughout the UK and some great 'ragchews' have resulted. They also intend to continue the chats with an ideas exchange too. Nice one.

Monika DL1NFZ and Deiter DL5NFZ wrote about their success with their mono band qrp rig and just five watts. They love to take their rig on their 'rucksack holidays' They have logged 45 countries with a best DX of W1, 9K2, YI, 4K, 4L, EA9, TF, EZ & 4X. Their difficulty is that on the band not many UK stations are heard or worked because of the deadzone. They do hear GM's G's and the occasional EI. You can try a sked with them via email (krumbach@odn.de).

Carl reports again on his recent two way QRP contact with ZL4SEA on 20m in the early morning. George member number 245 was using just 4 watts. Carl has had trouble finding a decent microphone for his QRP plus for the 'winter fireside SSB sprint' so wound up the IC737a. He has now acquired a 'mic and tried it bagging VE2DOH near Montreal in the process. On 17m he dropped to 2 watts and managed UC2FCI, CT3FT, W1BFA and SP5SS. Fifteen proved more of a challenge getting only 9X0A and WP3A. He broke away from 20m after working FG5FC with just 4 watts to write and tell me all about it.

Thanks to all the reporters and please let me have lots more on your exploits on SSB. If you have a report drop me a line please.

Dayton Report.

The club has had a stand (called a booth over there) at the Dayton Hamvention for many years on and off, George G3RJV and I (GØBPS) have manned the booth together for the past eight years. Missing just one year each during that period. Over the years we have seen the QRP activities change from a simple gathering of like minded folk in one hotels hospitality suite to a full four days of activity including a whole one days technical lectures from experts in their field. Evening events include the ARCI awards banquet, a construction contest and a chance to meet other QRPers in the busy hospitality suite.

The other club members attending for the past three years have been Tony G4WIF and Graham G3MFJ who have decided not to attend next year. A great shame as we have made a good team promoting the club. A gentle reminder now, each of us attending Dayton does so at our own expense. The club pays for the stand but we pay for our own flights etc. This may seem unfair but I think it is well worth the cost for the QRP events alone.

Next year, 1999 we will need help on the stand from a couple of members, it pays slightly less than nothing. The times are from 0800 - 1800 each day (3) and if your in bed before midnight your missing something. It is a very hectic weekend; even getting around the 1000 place flea market can take a whole day.

If you would like to join us at Dayton next year give me a ring for a chat on 01303 891106.
72/3 Dick

NOVICE NEWS Steve Ortmayer G4RAW
14 The Crescent, Hipperholme, Halifax. HX3 8NQ. Tel: 01422-203062

HOW TO WIRE A 13A PLUG

More from Ken G4LKP

"Brown for toast and for cremations

Blue for Neutral, United Nations

The Greens and the Friends of the Earth are brothers

So save your life, and that of others"

Roberta KB9GKX sends:

"I left the cool BLUE sky,
baked RIGHT BROWN"

Bobbi also sends plans and details of a Morse Key she has made. She says that it is an "Alistair Cook" design, neither wholly US nor UK but similar to the US J-38 and the UK W.T. 8 Amp.

Bobbi helps to train novices in Indianapolis

[detailed plans available for a stamped addresses envelope to G3RJV - marked "Morse Key"]

Will G3MPX has sent details of a receiver offset for the Pixie. The circuit uses a relay to switch a varactor diode. Please contact me if you want the information.

Wyn GW8AWT has sent a nice long letter with Novice news from Wales. Wyn is concerned about the influx of the dreaded EU plug - 10A with very thin pins. Well - I agree: a nice big 15A round pin plug ... there was a proper handful !! Wyn also reminds us of the thrill of hearing DX. His novice class have an old RX which pulled in ZL2JR one morning.

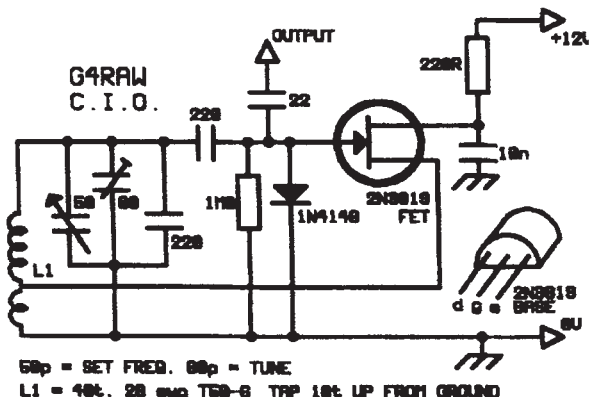
CARRIER INSERTION OSCILLATOR

Last time I gave details of a BFO.

You might like to try a CIO.

This works at signal frequency and puts back the missing bit for SSB and CW. The VFO works at 3.5MHz but the harmonics are effective at 7 and 14MHz.

[layout on an 8 tag board available for a stamped addressed envelope to G3RJV]



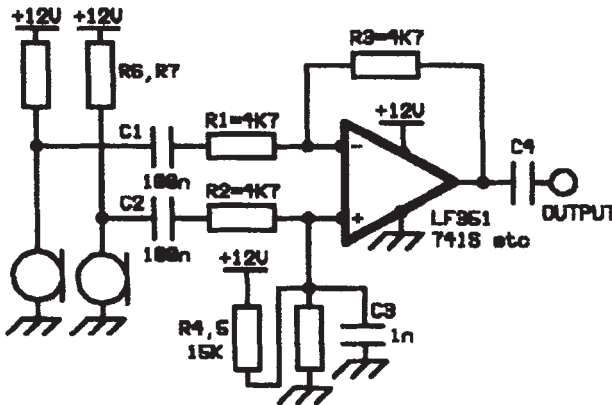
VHF MANAGER'S REPORT

John Beech, G8SEQ 124 Belgrave Road, Wyken Coventry CV2 5BH
Tel. or Fax 01203 617367. Packet Homebbs : GB7COV.

It would appear to be bad news again for constructors. Having seen the demise of the Plessey range of IC's, now wire ended components seem to be under threat. Trying to order a particular type of capacitor from one well known supplier, I was told that it was no longer stocked and the replacement type was also out of stock! A similar thing happened when I tried to order a potentiometer from another company - out of stock, they weren't reordering but I could have them if I was prepared to take 2,000 minimum! Some months ago I found that the wafer switch I use for one particular design had more than trebled in price - and was expensive to start with.

No problem if you want SMD components, but most of the amateurs I talk to that still do a lot of construction cannot see and/or have not got the dexterity to manipulate these components and the next generation of SMD components will be even smaller.

Still - it is not all doom and gloom. In response to a query from a club member I resurrected this circuit for use as a noise cancelling microphone.



NOISE CANCELLING MICROPHONE

Notes:

Omit R1, R5, C3
if dual rail PSU is
available.

Choose R6, R7 values
to suit electret
microphone - omit if
xtal or moving coil
types are used.

R3 is set to give unity
gain - can be adjusted
to compensate for
different mic types.

Circuit will work from
5 to 18 volt supply

Microphone inserts should face in **OPPOSITE** directions

THE EA-QRP-CLUB

The club was founded in October 1993, since then EA-QRP-C has grown gradually, to around 350 members. The main goal is to promote QRP operation and home-building among all amateurs. The Subscription rates are : For Europe: One year 14 US\$, Two years 27 US\$, Three years 40 US\$, Non-European countries: One year 16 US\$, 2 years 31 US\$, 3 years 46 US\$. Payment can be made by Visa or Mastercard. For further information visit the Internet Web Page at: <http://www.eaqrp-c.arrakis.es> or write to: EA3FHC, Miguel Molina, Av- Rio de Janeiro 123 2-1, 08016 Barcelona, Spain. Or e-mail to: Miguel Montilla, EA3EGV, Juan Antonio López, EA8QJ, eaqrp-c@arrakis.es or jalopezd@arrakis.es

MEMBERS' NEWS



by Chris Page G4BUE

Highcroft Farmhouse, Gay Street,
Pulborough, West Sussex RH20 2HJ.
Tel: 01798 815711 Fax: 01798 813054
E-mail: g4bue@adur-press.prestel.co.uk
Packet: G7DXS on UK DX PacketCluster

The Australian based *CW Operators' QRP Club* have launched a Home Page at < <http://www.users.on.net/zietz/qrp/club.htm> >. **VK5AKZ** says the page contains an introduction and has details on contests, the content of the latest *Lo-Key* (the excellent journal of the club, and membership. Kevin says the page is very new and constructive comments are welcome.

The *QRP Contest Community* (QRPCC) is a supra-national network of QRP enthusiasts (140 at present from 12 countries) pursuing the organisation and promotion of QRP contest work successfully since 1992. Since 1996 QRPCC have promoted the annual *ORIGINAL-QRP Contest* and in 1997 the Homebrew & Oldtime Equipment Party. **DJ7ST** sent the results of the 1997 *ORIGINAL-QRP Contest* in July listing 51 entrants in the one watt class and 179 entrants in the 5 watt class and says "this has been the most successful QRP contest ever". The 1998 contest is 1500z 4 July to

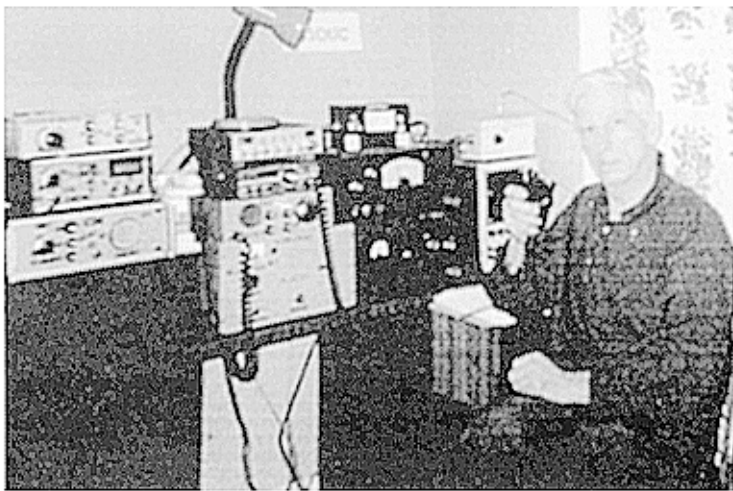
1500z 5 July on 80, 40 and 20m CW only. Full details of the contest and the QRPCC can be obtained from **DJ7ST** (Hartmut Weber, Schlesierweg 13, D-38228 Salzgitter, Germany).

DL2RM was due to be QRV 1/14 June as **IK5/DL2RM** in Tuscany while on holiday with his ex German Army **SEG15D** rig and a Windom or random wire antenna. **G3OUC** frequently uses home-brew QRP sideband equipment to kite antennas operating /P. Pat has built three 'Skyliners' for 160, 80 and 40m from concepts in *Solid State Design for the Radio Amateur*. **HB9ADQ** was worked in the Summer on 160m and many stations worked on 80m with kite antennas. At home Pat built a 5 watts PEP rig for 10m and has worked USA, ZS and OD with it.

F5NZY erected a 164 feet long wire between his sixth floor window and a tree in a garden along the well-known cemetery of Pere-Lachaise. Stephane says "It works very well indeed and I am very lucky in DX, including 9G, JV5, VP2M and a lot of W and AS Russians all with QRP". He also says, "If 14060kHz is often used by our EU members, where are the North American guys? Please do not forget 21060 and 28060kHz".

Because **AC5K** needed to accurately QSY when members called him, he added a digital readout to his Ten-Tec Argosy that he uses for CW mobile. The counter Wes installed was built from a kit by Blue Sky Engineering for about \$41US and he says "It works great". Wes found the kit on the NorCal QRP Internet Web page.

At 2200z 5 June 1996 **EA1CHC** was calling CQ on 14060kHz with his 700mW to a vertical



G3OUC's home-brew station (ex FM rigs). Pat uses a 60ft vertical in a tree for 160m and worked OH and DL 5W PEP.



Javier, EA1CHC, in his shack with his dog Lunes (Monday).

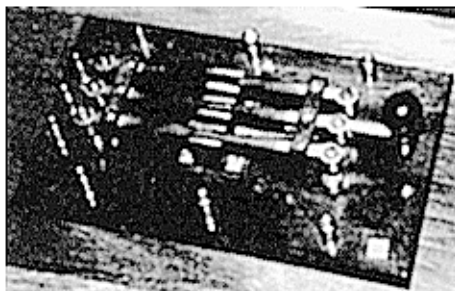
when **ZL4SEA** replied. On 4 May 1998 Javier heard George calling CQ with his 4 watts and called him with 500mW for their second QSO. Javier congratulate George for his "excellent ear". He has been using mW output levels for the last four years and has made 2100 QSOs including 800 two-way QRP and 17 two-way QRPp (mW) QSOs.

G8UYD/2E0AQZ refers to **GM3MXN**'s suggestion (SPRAT 95) to move the 160m QRP calling frequency to 1950 or 1960kHz, and Graham says "Yes. That would be the best thing since the invention of the cats whisker or the bee's knees. I would suggest 1960kHz but that is a personal thing from a humble novice (other hat on). The reason is that I use a mobile whip on 160m with my 3 watts (ish) and certainly at the moment I have it set on 1960kHz - that allows me to get down to 1950kHz and up to about 1975kHz without re-tuning. It would also allow me to work a bit more rather than listening in disgust on 1830kHz ish. Let's start the 'shift to 1960 campaign asap'." **G3NUA** says that although he has not used 160m for sometime, the suggested 1950/60kHz frequency will enable Novice and Class A licence holders to enjoy inter-G working on an equal footing. John says he remembers the thrill of collecting the required 60 QSL cards in the 1960s for the *Short Wave Magazine Worked All British Counties Award*. My problem was that by the time that I had 'made it', the award was no longer available! To what extent I could actively support the venture (1950/60kHz) I do not know, but the suggestion certainly fires my enthusiasm!". He adds that according to the *1997 RSGB Call Book*, 1960kHz is dedicated to DF contest beacons and 1970kHz is the Provisional Novice calling frequency.

N0EB mentions MFJ's quarterly *90's Newsletter* devoted to the MFJ QRP 90xx transceiver and accessories, now edited by Paul, **NA5N**. Bob says Paul's first issue was great, covering the

alignment procedure for the 90xx rigs, and sees the Newsletter as a great 'Elmering' manual for all NE-602 rigs since it was Rick's, **K1QBT**, designs that started it all and is the basis for the 90xx.

F5NZY, <f5nzy@hol.fr>, in Paris would like to "get in touch with member by e-mail for rag-chews about our experiences, antennas, bugs, operating skill etc". Stephane visited Branly's Museum at the end of March and saw one of the keys that Doctor Edouard Branly used for some of his experimentations (see below).



G4VUX had just completed a new crystal controlled 400mW output 80m home-brew rig, called CQ and Mike, **G3ZJJ**, called him with his Lake running 2W. Graham says, "What fun, despite having made several projects over the years, I still get that thrill from the first QSO with a new bit of equipment and I would recommend QRP home-brewing to anyone, especially on a wet Sunday evening!" **G3PTO** had a two-way QRP QSO with Arnie, **CO2KK**, on 21060kHz at 1754z 6 April with 5 5/7 9 both ways. John was using a 33 feet doublet at 34 feet. On 25 March Stephane, **F5NZY**, QSO'd **VK7WR** with 5 watts (529) and then reduced to one watt for a 339 report.

G0KZO and **G4SYC** have written to **VE7NH** about using his FT-990 at 5 watts (SPRAT 94) with a Yaesu approved mod. Eva and Geoff say Martin Lynch & Son can help with the mod if necessary. Eva had QSOs with **P40J** and **KH7N** with QRP but had to go to QRO to QSO **9M0C**. **GW0KZW** is transmitting RSGB sponsored slow and medium Morse practice sessions as **GB2CW** on 3555kHz at 2000z Tuesdays (15-25wpm) and Fridays (5-12wpm). **GW0VSW** worked nine new QRP countries in April with his QRP+ and 4 watts CW to a half size inverted **G5RV**, including **ZL4SEA**, **HP1AC**, **LU9HRP**, **OX3FV** and **T9/G0AYD** all on 20m two-way QRP. Carl also worked **HF0POL** on 30m and **8P9IF** and **ZF1WD** on 40m. He says, "It was nice to work George,

ZL4SEA on 14 April, who answered my CQ call on 14060kHz. My report was 529 and his 339 with QRN. George was using a FT101ZD at 3 watts (which he can get down to 500mW) into a Zoom L.W. Cam, HP1AC, was 549 using 5 watts from his QTH in Panama City and I received 569. Kim, OX3FV was also using a QRP+ with 5 watts into a vertical dipole. Reports both ways were 559”.

Between 23 December and 2 April ON5UP had two-way QRP QSOs on 20m using his MALTA 20 at 2 watts and GP antenna, with ZL4SEA, VK5FE, W7CNL, 7X4AN, EA8QJ, NØUR, RU9AZ and several VE and East Coast USA station. Between 5 and 16 April Andre was QRV from Noirmoutier Island (EU-064) on 40m using a MALTA 40 at 3 watts and half size G5RV 2 metres high and made 117 QSOs, including 91 on two-way QRP.

DL2RM’s neighbour complained about his 10 metre aluminium mast, which he could see while sitting in his garden, and offered to pay half the cost of a new antenna if he took down the mast. Rudi agreed and is going to put a R7000 vertical on top of his garage, he was using a Windom antenna with the balun at the top of the mast. In the meantime he has put up a temporary triangular shaped Windom for the HF bands

on the other side of his house. The ends of the Windom were too long, so he bent them back and it is fed with 75 ohm coax via a T configuration tuner. Rudi says it has “brought a lot of Europeans and DX into my log”.

ZL4SEA says “the 14MHz band opened up quite well in the first week of April, but towards the end the odd magnetic field, magnetic storm closed things down a bit again”. George lists members worked with 5 watts in 1998, mainly between 0545 and 0800z: GØBXO, G4JFN, G3KJX, G4INM (five times), GWØVSW (twice), ON5UP, ON4KAR, GØIEE, LY2FE in April, F6DIZ in February and EA1CHC in May. George says he has answered other members’ CQs on 14060kHz without success, so listen carefully when you call CQ!

GMØNWI is regular listening for members on the QRP QRGs with a IC-706 at 5W and two element yagi at 12 metres. Andy is confined to a wheelchair and QRPing gives him “double the thrill for me, working QRP, and managing to achieve something an able bodied person can do. A big thing for someone in my position”. He would also like to try Milliwatting and asks if anyone knows of a mod for the IC-706 to take it down to milliwatt (QRPp) levels (other than simply reducing the drive to zero)? GM3MXN has

been listening on 136kHz and has heard G3LDO in West Sussex, EIØCF in Malin Head and G3LNP in Herts all on CW weak but readable. Tom is using a TS-440S, Daytong FL3 audio filter at 200Hz and a 100 feet doublet with joined feeders and says “It is good to see that the experimental spirit is still with us”.

As I’ve said before, this column can only exist with your input. Please let me have any snippets and how your summer goes, by 25 August, and keep the photographs coming in, they can be returned if necessary.



The group of French amateurs visiting Branly’ Museum, (front l to r) Pierre Lorain, F2WL; Marion Tournon-Branly (the Branly’s little girl); Pierre-Francois Monet, F5BQP; Henri Van Heffen, F6AXV; (back l to r) Gisele Lorain, F2WL’s xyl; Stephane Collas, F5NZY; Remy Jentges, F6ABJ, (the ‘father’ of French Packet radio, FPAC), and Jean Lacroix, President of ERCOM Engineering, behind F5BQP. (This photograph, and the one of the keyer opposite, was sent to me by Stephane digitally by e-mail, no hard copy! - G4BUE.)

Rig Broken or needs alignment?

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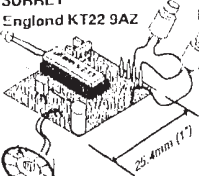
NEW KITS FOR RADIO AMATEURS

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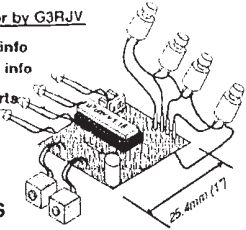
see March 96 RadCom for review of μ Keyer by G3RJV

NEW PRODUCT: μ Beacon - ask for info
NEW PRODUCT: μ DFKeyer - ask for info

Kits include all PCB mounted parts
Full detailed instructions
PIC microprocessor controlled
Small compact size (1" PCB!)
Low cost - easy to build/use



μ Keyer Kit £20.00



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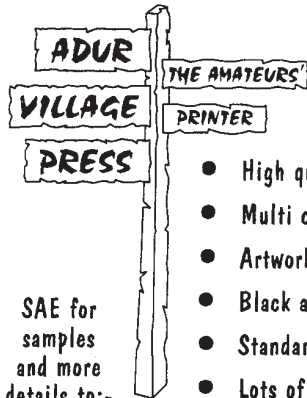
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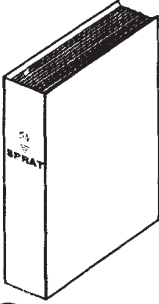
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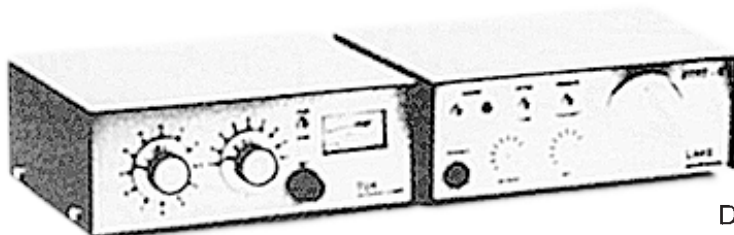
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