SPRAT

THE JOURNAL OF THE G QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

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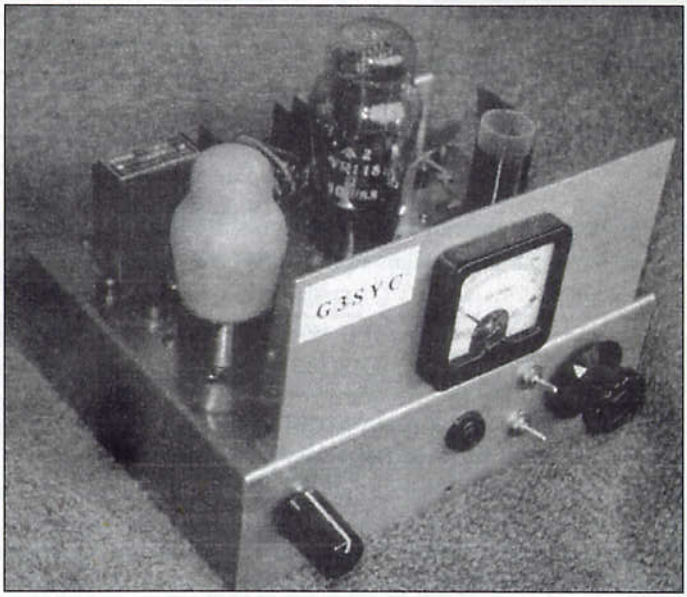

The G3SYC Battery Valve Transmitter

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SSB & Data News ~ Member's News ~ Club Sales

JOURNAL OF THE G QRP CLUB

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Welcome to SPRAT 116,

The response to the W1FB Memorial Trophy [design a Simple Superhet Receiver] has been very good and I will publish designs over 2 issues, beginning with this one.
The challenge for 2004 is.....

The W1FB Memorial Award 2004

For 2004, the project is to

Design a simple Monitoring or Metering Device of practical use in a QRP Station

Please submit your design to G3RJV as soon as possible, with circuit sketch, all values and brief notes.
The project will be published in SPRAT and the winner will receive an engraved plaque.

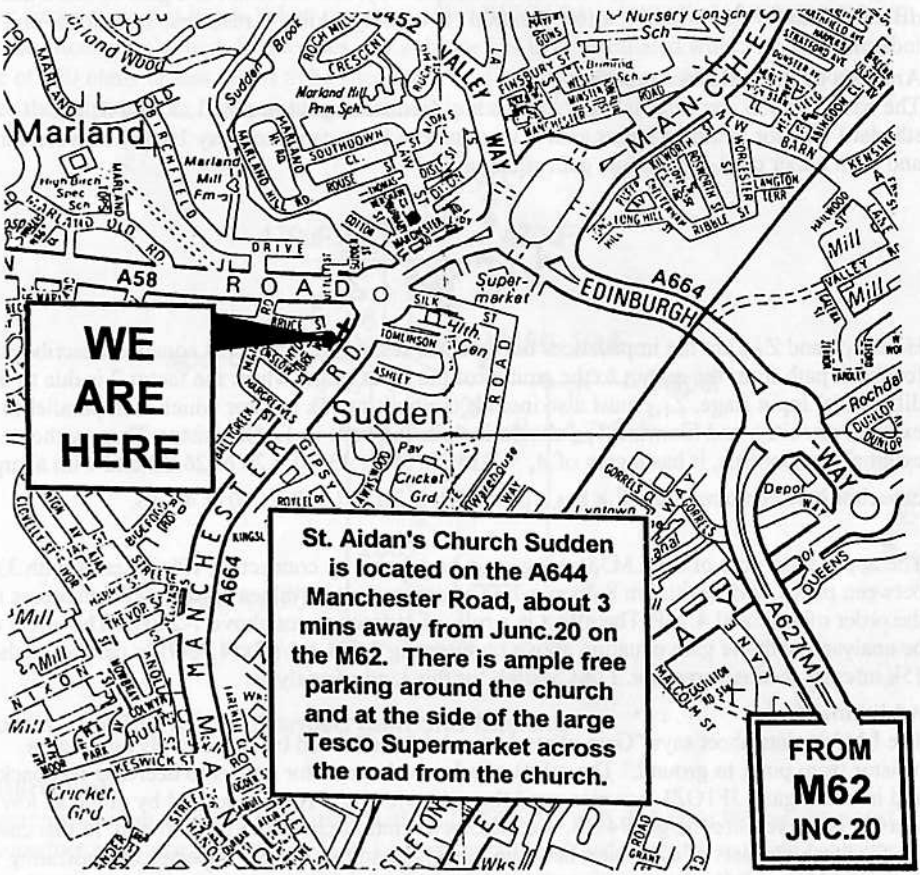
I look forward to your entries

72/3

G3RJV

EDITED BY GEORGE DOBBS G3RJV ARTWORK BY A.W. (MAC) McNEILL G3FCK
Printed & Distributed by G QRP Postal Mailing

THE G QRP CLUB
MINI-CONVENTION
SATURDAY 11th OCTOBER 2003
ST. AIDAN'S HALL SUDDEN ROCHDALE
ADMISSION £1 - DOORS OPEN 10am - TALKIN S22
LARGE SOCIAL AREA - LECTURES ON QRP SUBJECTS
BRING & BUY - SURPLUS - JUNK - COMPONENTS - KIT TRADERS
FOOD & DRINK ALL DAY - INCLUDING THE FAMOUS PIE AND PEAS



LOCAL ACCOMMODATION: The Royal Toby Lodge - Tel: 01706 - 861861.
Oakenrod House : 01706 – 642115 ~ The Norton Grange Hotel : 01706 – 630788
Travel Inn (Rochdale) about 10 min away 01706-299999. www.travelinn.co.uk
Also within close range of the site : Oakenrod House : 01706 - 642115
The Norton Grange Hotel : 01706 - 630788
Couples/families: www.hollingworthlake.com : lakeside guest house - edge of town

Unleashing the LM386

Sverre Holm, LA3ZA, Dæliveien 1, NO 1383 Asker, Norway.
la3za@qsl.net

The LM386 must be one of the most popular audio output amplifiers among radio amateurs, despite having been around for a long time. It can be obtained in both dual-in-line and surface-mount packages and outputs 325 mW in the standard version that runs from 4-12 Volts supply voltage. Its voltage gain of 46 dB is in many cases too little, especially in direct conversion receivers. When I built the Pixie 2 with the LM386 audio stage, it struck me how the sensitivity of the receiver was limited by the audio gain. I asked myself if it would be possible to increase the gain and add some filtering without in a simple way, and the result is a gain of more than 70 dB and an audio bandwidth of a few hundred Hz by only adding 3 resistors, 1 capacitor and an inductor.

Analysis of the LM386 Amplifier

The basic LM386 amplifier is used without any feedback between pins 1, 5, and 8. The standard way for getting a larger gain is to connect a large capacitor (say 10 μF) between pins 1 and 8. In either case, the voltage gain equation is:

$$A_{v,1} = \frac{2Z_{1-5}}{150 + Z_{1-8}}$$

Here $Z_{1\text{-}5}$ and $Z_{1\text{-}8}$ are the impedances between the respective pins. This equation describes the feedback path from the output to the emitter of the input stage, where the factor 2 is due to the differential input stage. $Z_{1\text{-}5}$ must also include the built-in 15k resistor which is in parallel to external circuitry, and likewise $Z_{1\text{-}8}$ should include the built-in 1.35k resistor. Thus, without external components, it has a gain of $A_v = 2 \cdot 15k / (150 + 1350) = 20$ or 26 dB and with a large capacitor between pins 1 and 8 it has a gain of $A_v = 2 \cdot 15k / 150 = 200$ or 46 dB.

The application note of the LM386 suggests a bass boost by connecting 10k in series with 33nF between pins 1 and 5 with pin 8 open, while a common set of values among radio amateurs is in the order of 2.2k and 4.7nF. The effect is a roll-off at frequencies above 1-2 kHz. The effect can be analysed with the gain equation above by inserting 2.2e3 + 1/(j2πf4.7e-9) in parallel to the 15k internal feedback resistor. I use Matlab for this kind of analysis.

Additional Gain

The LM386 data sheet says "Gain control can also be achieved by capacitively coupling a resistor from pin 1 to ground." The effect of a low value resistor here is to decrease feedback and increase gain. JF1OZL has measured the gain with various resistors and by going as low as to a 3.3 ohms resistor, he got 74 dB, see http://www.intio.or.jp/jf1ozl/LM386.htm. In this case, the feedback consists of a division between the Z1-5 and the Z1-gnd impedances, indicating that the gain is found from the equation of an inverting feedback amplifier:

$$A_{v,2} = \frac{A_0}{1 + A_0 \dfrac{Z_{1-gnd}}{Z_{1-5}}} \cup \frac{Z_{1-5}}{Z_{1-gnd}}$$

The approximation is in the case that the open-loop gain, A_o, is much larger than the closed-loop gain, A_{v2}. This will give a gain of 15000/3.3 = 4546 = 73.2 dB which is close enough to JF1OZL's measurement. Such a high gain requires careful circuit layout with attention to ground loops and proper decoupling, or the amplifier will oscillate. I have measured a gain of over 80 dB in a well-decoupled circuit, but then the amplifier is at the verge of self-oscillation.

High Gain and Filtering

The two ideas above can be combined in order to get both a high gain and high frequency roll-off. Further, if the circuit between pin 1 and ground is a series resonance circuit, the bandpass characteristic can be made even sharper. An inductor of 1 mH will resonate with the 100 µF capacitor at about 500 Hz and is fine. The problem now is that the gain will drop so much at the higher frequencies that it gets below the value of 9 which is the stability limit for the LM386. To limit the attenuation at high frequencies, the inductor has to be paralleled with a resistor and a value of 220 ohms or less seems to be adequate. A potentiometer in series with the inductor makes the gain variable. The resulting schematic is shown in Fig. 1.

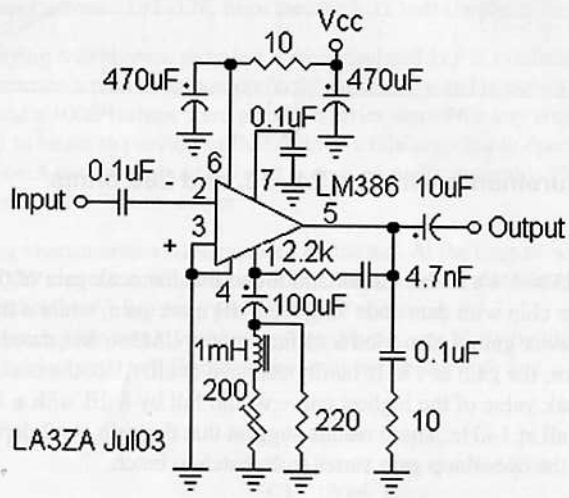


Figure 1. LM386 with enhanced gain and filtering

Measurements

Measurements were made for this circuit with an LM386-N1 with date code 99 from National Semiconductors at a supply voltage of 9 Volts, no output load, and no input coupling capacitor. In this circuit, the DC resistance of the 1 mH inductor of about 2 ohms, and the equivalent series resistance of about 0.5 ohms of the 100 µF capacitor play a role and must be accounted for. The upper curve is with no series resistance except for those of the inductor and capacitor, the middle curve is with a total resistance of 10 ohms, i.e. 10-2-0.5=7.5 ohms series resistance, and the lower one is for the pot at its maximum value of 200 ohms.

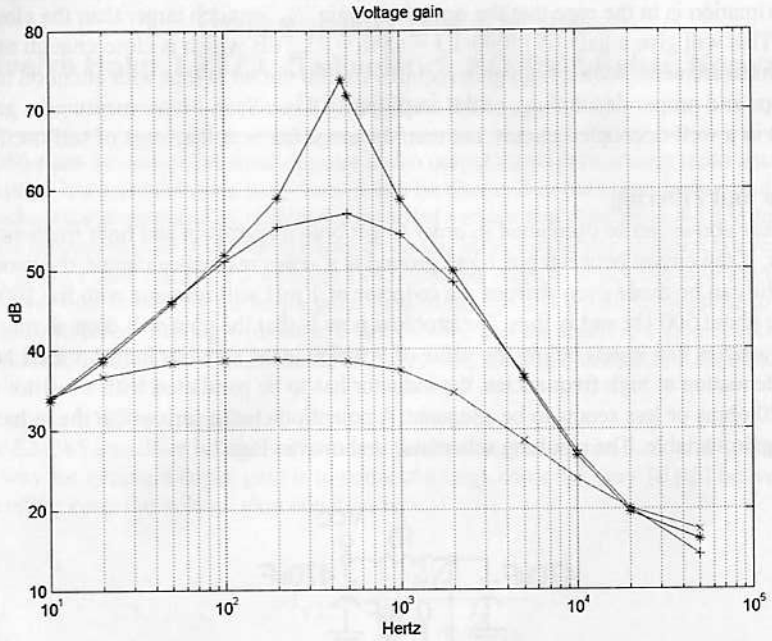


Figure 2. Measurements with R = 2.5, 10, and 200 ohms

Discussion

I tried different LM386-N1's in this circuit and found that the peak gain of the highest curve would vary. Another chip with date code 99 gave 2 dB more gain, while a third one with date code 92 had 7 dB lower gain. I also tried a surface mount LM386-M1 dated 93 which had 5 dB less gain. In all cases, the gain at 1 kHz hardly changed at all. Also, the peak gain is sensitive to output load. The peak value of the highest curve would fall by 8 dB with a 32 ohm load, while hardly changing at all at 1 kHz. These results suggest that the gain, Av,2 depends on the open-loop gain, and that the open-loop gain varies from batch to batch.

The muting of the amplifier by means of pin 7 (SPRAT no. 113, Winter 2002/3, pp18-20), is still possible, but only if pin 7 is connected to Vcc. Grounding of pin 7 will only mute the amplifier in the basic 26 and 46 dB circuits, while the amplifier of Fig. 1 will instead output a low-level low frequency noise.

I also tried to find the gain equation for the circuit in Fig. 1 and my guess was $A_v = A_{v,1} + A_{v,2}$.

However, this equation overestimates gain by something like 8 dB except for the peak of the highest curve. Maybe some readers who are more into the inner workings of this amplifier can come up with a better equation.

In summary, addition of a few components to the basic LM386 amplifier results in a response which is fine for CW reception with a peak in the 500 Hz range. The amplifier also has enough gain for a direct conversion receiver with a passive mixer like the Pixie 2, that it in many cases it can drive a loudspeaker. Hopefully, the circuit can benefit other direct conversion receivers also.

The G3SYC Battery Valve Transmitter

Brian Booth G3SYC, 39 Park Lane, Pontefract, West Yorkshire WF8 4QH

I regret to announce the death of G3SYC, on September 8th. as this article was in the final stages of being added to this issue. Brian was a dedicated QRP operator and home constructor and will be missed by all of us who knew him personally

The only battery valves ever possessed by a youthful G3SYC, circa 1944, were a triode HL2 and a beam tetrode KT2 both being 2 volt filament types. These were built into a regenerative receiver typical of the times. When a conversation with Harry, G3NGX, led to the sudden acquisition of the same types again, the problem became what to do with them? Sixteen years earlier I had been a very keen 80m QRP operator (before being overwhelmed by the wonders of the new 6m band) and still had my 80m CW crystals. So another CO/PA transmitter it was to be.

Only the basic circuit is shown, on/off, antenna changeover, keying relay etc. arrangements are left to the reader. The main "HT" supply of 120 volts is derived from a convenient mains power supply and the 2 volt filament supply from a LM317K from the shack 12 volt supply.

Anode and Screen keying was chosen, so unless a well insulated key is available, a keying relay should be used. In practice a reed relay was perfectly satisfactory and removed the HT from the key. A 0.01uF capacitor and a 100R resistor were placed in series across the key contacts. The oscillator tuning circuit needed to be set to provide sufficient drive while keep stable operation. The PA KT2 on "dip" drew about 6mA and gave about 0.5 watt output. A really venerable PM22? pentode drew about 13mA and gave about 0.75 watt output.

Good RST and keying characteristics have reported on the air. At the time of writing there have not been the number of QRP stations anticipated on 80m. Perhaps this is due to the greatly increased noise level on the band since my last long period of QRP operation.
It is not anticipated that anyone would rush to emulate this rig, any likely builder should bear in mind that these valves are ancient and even if sold as new may be feeling their age.....

Parts List

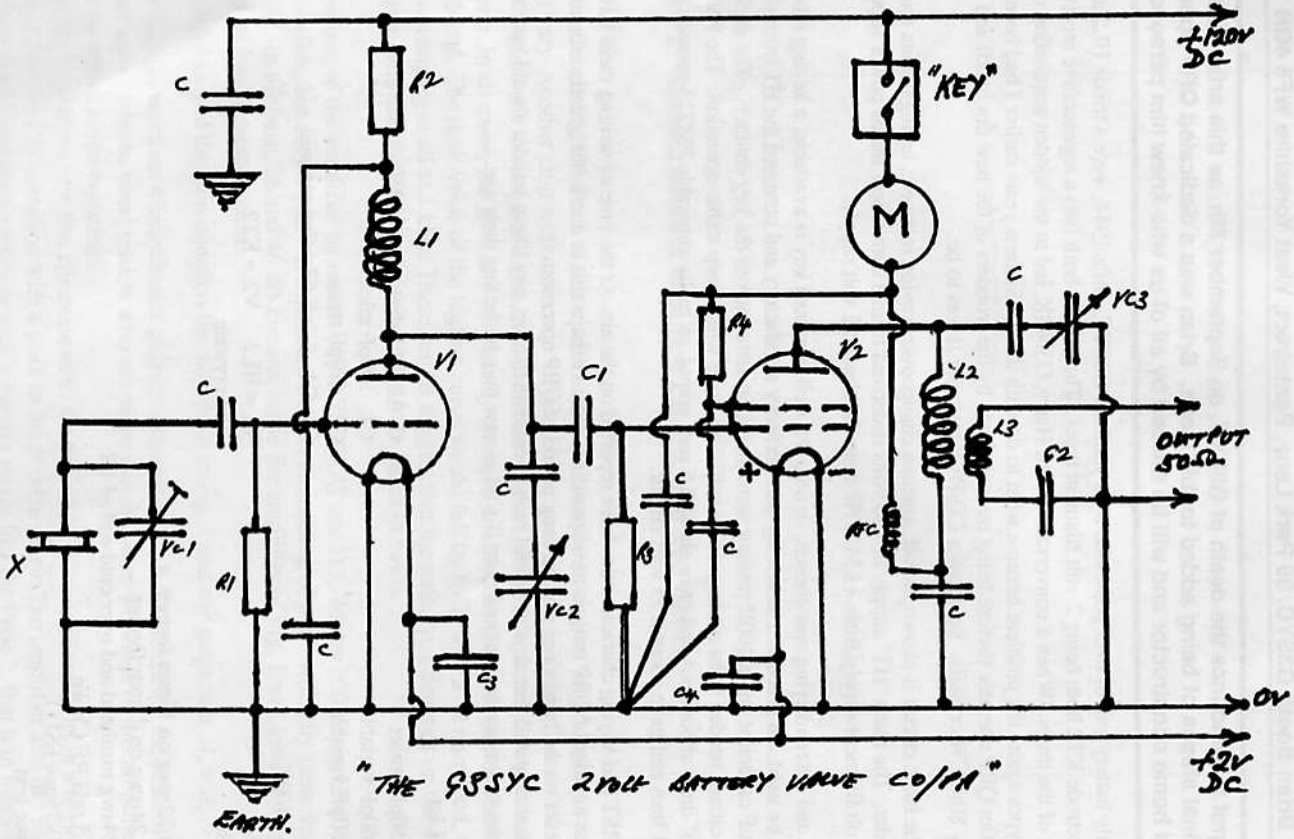
VC1 50pF preset
VC2 60pF variable
VC3 150pF variable

R1, R3 100K
R2 3K
R4 1.8K

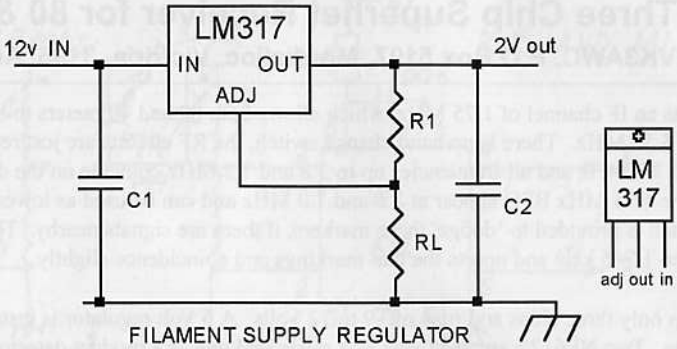
L1 55t 32 swg on 16mm former
L2 60t 24 swg on 21mm former
L3 7t 24swg insulated and over cold end of L2
RFC 2.5 mH RF Choke
Meter 0-25mA FSD
Key – see text

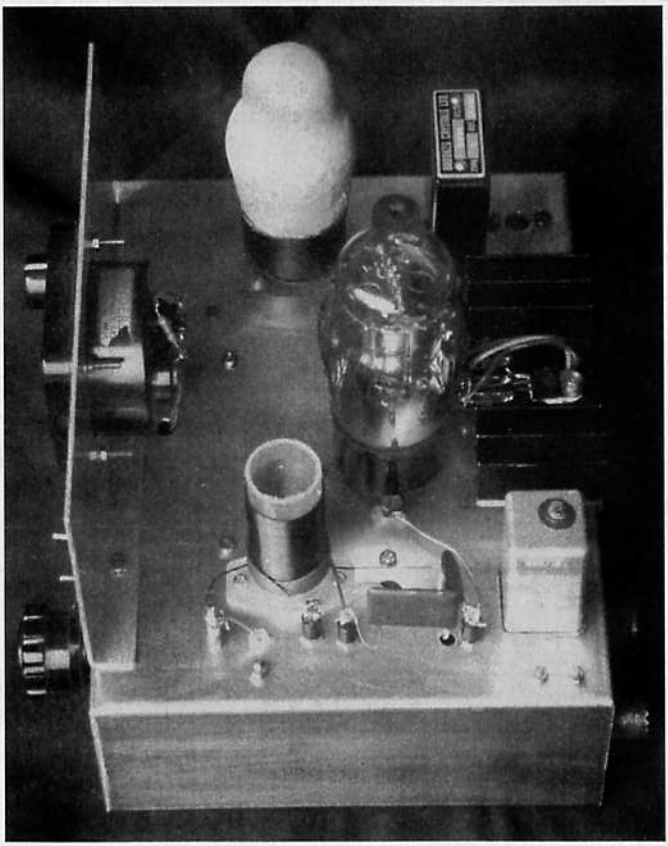
C All 0.01 disc ceramic 250v
C1 100pF mica
C2 470pF mica
C3, C4 0.1uF 63v disc ceramic

V1 = HL2 V2 = KT2
80m crystals



"THE G8SYC 2 VOLT BATTERY VALVE CO/PA"


LM317
12v IN
IN
OUT
ADJ
2V out
R1
C1
C2
RL
LM
317
adj out in
FILAMENT SUPPLY REGULATOR



WIFB MEMORIAL ENTRY

A Three Chip Superhet Receiver for 80 & 40

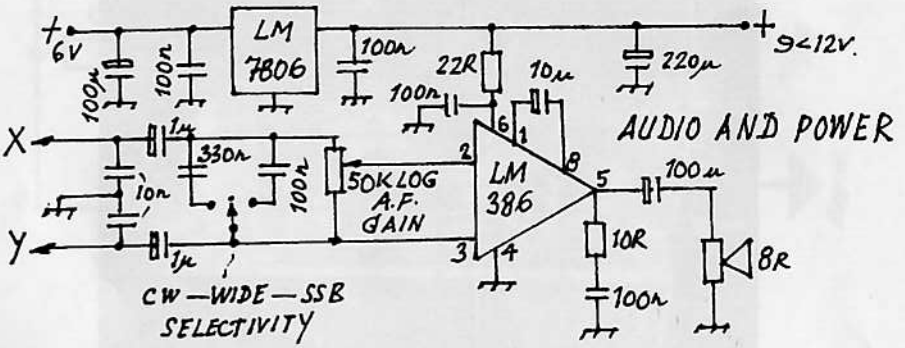
Bill Currie VK3AWC, P O Box 5197, Mordialloc, Victoria, 3195, Australia

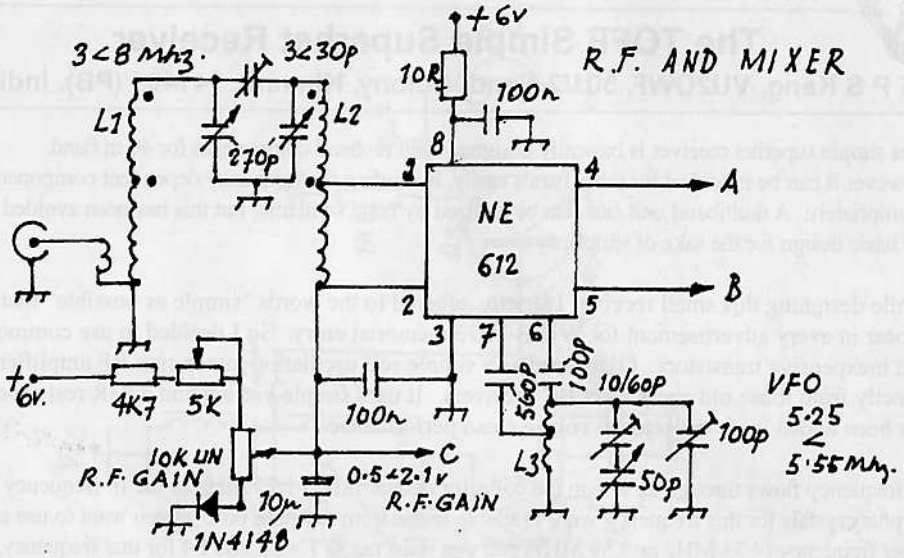
This receiver has an IF channel of 1.75 MHz, which allows both 80 and 40 meters to be tuned with a VFO of 5.25 to 5.55 MHz. There is no band change switch, the RF circuits are just retuned to 3.5 or 7 MHz. 3.5 and 7.0 MHz and all frequencies up to 3.8 and 7.3 MHz coincide on the dial. Harmonics of the 1.75 MHz BFO appear at 3.5 and 7.0 MHz and can be used as lower band edge markers. A switch is provided to 'dodge' these markers, if there are signals nearby. This lowers the BFO by 5 kHz to 1.745 kHz and upsets the dial markings and coincidence slightly.

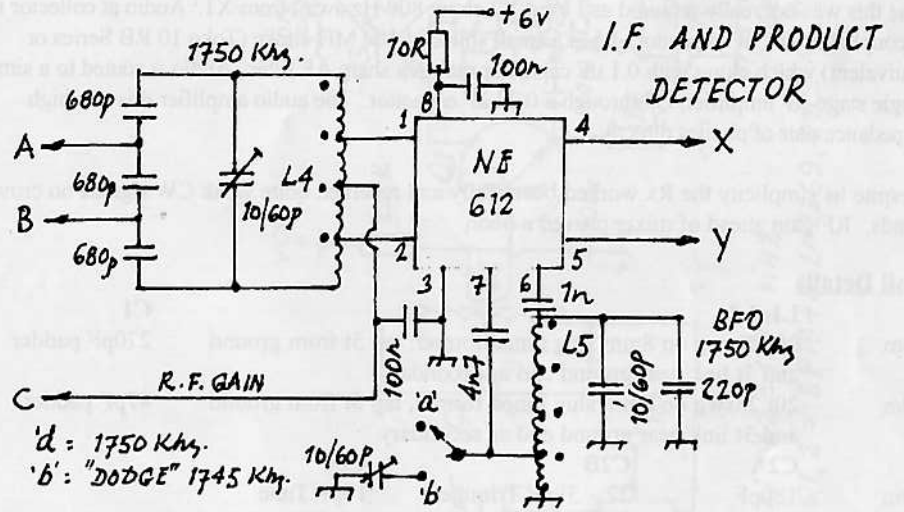
The receiver has only three chips and runs off 9 to 12 Volts. A 6 Volt regulator is installed for the RF and IF stages. Two NE612's are used, one as a mixer and one as a product detector. The gain of these stages can be adjusted with the RF gain control. This varies the bias on pins 1 and 2 of both the 612's. Cut-off is 0.5 Volt, normal is 1.2V and boost is 2.1V. Surprisingly, there is no (repeat, NO) change of frequency of the VFO or BFO when the RF gain is adjusted.

Due to the boost function and push-pull coupling there is sufficient gain to drive an LM386 output stage directly. This will give plenty of speaker volume on most signals. An audio gain control is fitted for those really loud signals. A three position selectivity switch is provided to lop off a few highs for SSB or CW.

All 5 coils are wound with 28# wire on Amidon T50-2 iron dust toroids.
L1, L2. Preselector, 3-8 MHz. 40T (20T bifilar). L1 has 6T primary.
L3. VFO, 5.25-5.55 Hz 30T tapped at 10T.
L4, L5. IFT & BFO, 1.75 MHz. 72T (18T quadrifilar).




R.F. AND MIXER
3<8 Mhz.
3<30p
L1
L2
270p
+6v
10R
100n
8
1
4
A
NE
612
2
5
B
3
7
6
100p
560p
10/60p
VFO
5·25
<
5·55Mhz.
+6v.
4K7
5K
100n
10K LIN
R.F. GAIN
C
0·5<2·1v
R.F. GAIN
L3
100p
50p
10µ
1N4148


I.F. AND PRODUCT
DETECTOR
+6v
1750 Khz.
10R
100n
680p
A
680p
B
680p
L4
10/60p
8
1
4
X
NE
612
2
5
Y
3
7
6
1n
BFO
1750 Khz
L5
100n
4n7
10/60p
220p
C
R.F. GAIN
'a'
'd' = 1750 Khz.
'b' = "DODGE" 1745 Khz.
10/60p
'b'

WIFB MEMORIAL ENTRY

The TOFF Simple Superhet Receiver

K P S Kang, VU2OWF, 301/2 Nandi Colony, Khanna, 141401 (PB). India

This simple superhet receiver is basically designed with on hand components for 40 m band. However it can be modified for other bands easily, by scaling the frequency dependent components appropriately. A multiband unit can also be realized by band switching but this has been avoided in the basic design for the sake of simplicity.

While designing this small receiver I strictly adhered to the words "simple as possible" that appear in every advertisement for W1FB-Prize memorial entry. So I decided to use common and inexpensive transistors. Q1 is used as a simple self oscillating mixer cum RF amplifier, directly from those old age pocket BC receivers. It uses simple biasing and a 33R resistance has been added in its collector to ensure clean performance.

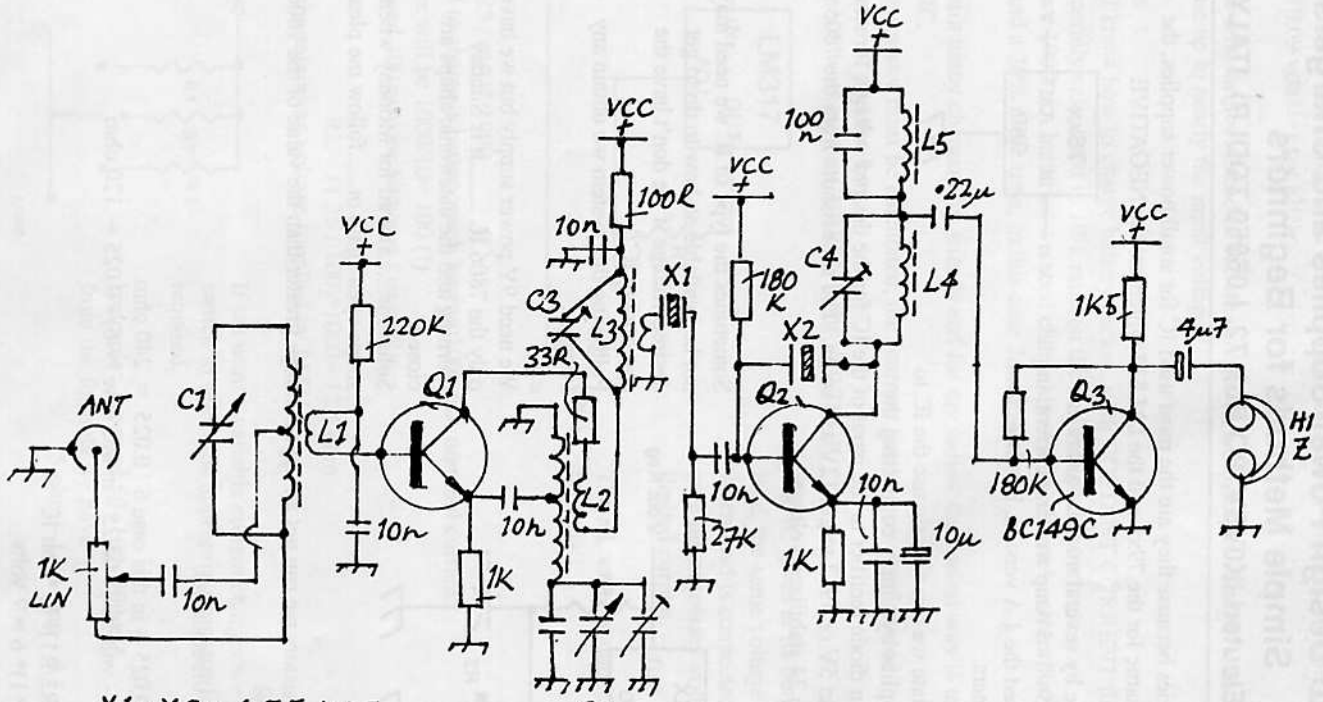
IF frequency flows through an IFT in the collector circuit. I used 1.75 MHz as the IF frequency as surplus crystals for this frequency were available to me from my junk box. If you want to use some other frequency (4.33 MHz or 3.59 MHz) etc. you must use IFT's L3 and L4 for that frequency. For L3 and L4 I simply removed the in-house tuning capacitors at the bottom of common 455 KHZ IFT cans and added external 68pF trimmers for C3 and C4. As the original tuning capacitors were some 180 pF for 455 KH2, the present arrangement worked beautifully on 1.75 MHz IF. X1 is the only crystal used for IF filtering. Despite simplicity it worked beautifully. Q2 works as an IF amplifier cum self oscillating BFO mixer. Minor BFO adjustment is possible with C4 but in my case this was not really required as I used X2 about 800 Hz away from X1. Audio at collector is decoupled by 0.1 uF capacitor. L5 is a small shielded 100 MH choke (Toko 10 RB Series or equivalent) which along with 0.1 uF capacitor makes a sharp AF filter. Audio is routed to a simple single stage AF amplifier, Q3 through a 0.22 uF capacitor. The audio amplifier drives a high impedance pair of phones directly.

Despite its simplicity the Rx worked beautifully and received quite weak CW signals on crowded bands. RF gain ahead of mixer proved a boon.

Coil Details

	L1, L2	C1
40m	20t 28swg on 8mm slug tuned former, tap 5t from ground and 3t link near ground end as secondary	270pF padder
20m	20t 28swg on 8mm slug tuned former, tap 5t from ground and 3t link near ground end as secondary	47pF padder

	C2A	C2B	C2C
40m	180pF	22 – 39pF Trimmer	10pF Tune
20m	47pF	22pF Trimmer	10pF Tune



X1 = X2 = 1·75 MHZ

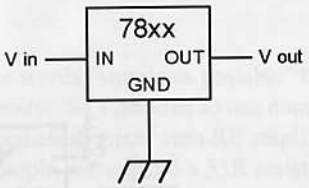
Q1, 2 = BF194B, 2N2369, ETC.

How to Design Power Supplies and Chargers
Simple Methods for Beginners

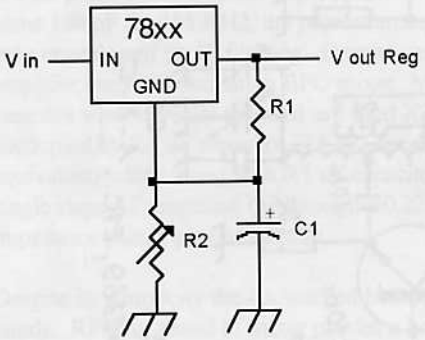
Marco Eleuteri IK0VSV, PO Box 72, I-06059 TODI P), ITALY

I use the 78xx series because they are the most used IC for small power supplies, the formulas are the same for the 79xx and the LM 337 which are for NEGATIVE VOLTAGE.

The ICs are made by several manufacturers in three versions, 0.5 - 1- 5 Amp working current, in the examples I used the 1 A version, but there is no change for the others.



The data sheets state we can directly use the IC to design power supplies by simply connecting the input voltage from diode rectifier to the input of the IC for the desired voltage, for example we use 7805 to get 5V or 7912 to get 12V and so on. The series starts from the 7805 up to 7824 type, 5 to 24 stabilized voltage.



Sometimes the type of IC we need may not be available so how to do to get desired voltage if we don't have the appropriate IC?
Following this system we obtain any voltage .
e.g.
We need 9V power supply but we have only the 7806 IC .....it is Sunday morning and the electronic shops are closed.
Solutions.....a) wait for Monday when the shops open again or.....follow me please!!

b) Adding two resistors we can get an upper voltage greater than the value of the 7806 which is 6 V only!

How to calculate the resistors.

a) R1= Volt IC/ 0.025 - in this case 6 / 0.025 = 240 ohm
b) R2= (volt out - volt IC) / 0.025 - in this case (9-6) / 0.025 = 120 ohm
verifyng.....
c) Volt out = ((R2/R1)+1) *Volt IC
so ((120/240)+1)* 6 = 9 Volts

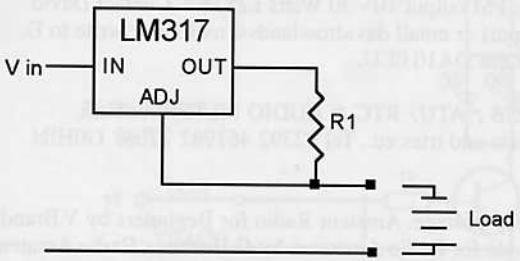
The above formula is useful if we don't have the resistor values and we will try some others: if I have 220 ohm for R1 and 150 ohm for R2 how much is the voltage at the IC's out ? 10.09 volt (try it!!!)

If we use a linear pot instead of R2 we can get variable output voltage starting from nominal IC's value up to nearly the input voltage.

Chargers

It is well know how to charge battery packs....with COSTANT CURRENT for a long time, generally calculated in 10/1 ratio on the nominal pack's current.
If we have 1000 mA batteries we need charge them with 100 mA current for 10 hours...and a 20% more time, in this case 2 more hours.

I have built many chargers for friends and for my radios, the easiest way is to use the LM317 IC.
Only one resistor must be calculated, the "current limiting resistor" placed in series between the IC and the load.
Note: we are working on CURRENT not VOLTAGE

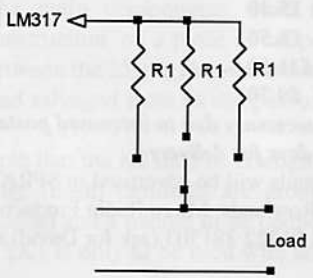


The IC gives at its output, without load, the same voltage as the input, when load is connected, the IC will give the necessary voltage with limited current.

The RL value is obtained by formula:

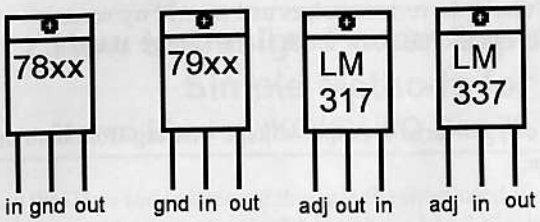
RL= (1.25 / mA)* 1000
We need to charge a battery pack having 1000 mA nominal current?
The time will be 1000/10= 100 (!)
so we need 100 mA for 10 hours (or not?)

RL = (1.25 / 100)*1000= 12.5 ohm
(1.25 is the minimum voltage supplied by LM317)



If we want a variable current charger we can use a switch to select the appropriate resistor for the current required.

Example: we need 50- 100- 300 mA,
from the formula we have
25 ohm - 12.5 ohm - 4.1 ohm.



Regulator Pinouts

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

FOR SALE: FT817, I year old, only used as base station as owner now has no transport. So, as new, with charger and rechargeable cells etc. Only 40 QSOs. £420. Phone 07796007458 [Jeff]

FOR SALE: Clear PTFE sleeving to fit snugly over 24 SWG wire. Does not melt or distort at soldering iron temperatures. £3 for 2 metres or £10 for 30 metres P&P free in UK. G3TLZ QTHR or e-mail: mervyn.w@ntlworld.com.

FOR SALE: Pair of small Poky Toky handhelds on 143 MHZ £14 the pair. Pocket analogue Multimeter good £3.50, scruffy £2.25. Maxon SR214 70cm low power hand held £15. Standard 2m 30Watt Power Amplifier. Input 0.8 - 3 Watts FM output 10 - 30 Watts £25 ono. Contact David Rowlands G6UEB on 01322-381303 (after 7pm) or email davidrowlands@mail.ru or write to D. Rowlands 7 Broomfield Road Swanscombe Kent DA10 0LU.

FOR SALE: CW K2 built working! with SSB , ATU, RTC & AUDIO FILTER unbuilt. The lot for £600 OVNO!!! prefer buyer collects and tries etc. Tel 02392 461982 Tom G0HIN (Hayling island Nr. Portsmouth)

FREE BOOKS, ideal for novices: you only pay postage. Amateur Radio for Beginners by V.Brand; Introducing QRP by D.Pascoe; The Morse Code for Radio Amateurs by G.Benbow; Radio Amateurs Examination Manual by G.Benbow; The Novice Licence Student's Notebook by J.Case; RAE Revision Notes by G.Benbow; How to Pass the RAE by C.Smith. Contact Chris, M3ERE either on 'phone 0151-924-1525 or email: c.g.gibson@liv.ac.uk.

Micro Radio Products

A range of economical easily built projects on Tripad circuit board. This offers advantages on cost. The current range is shown below:- *New Regenerative 80m Rx now available!*

RB001 Regenerative SW Broadcast Radio	**£10.40**
RB002 AF Amplifier	**£5.40**
RB003 MW Radio	**£8.50**
RB004 80m SSB/CW Regenerative Receiver * New *****	**£11.50**
RB005 Boosted Short Wave Crystal Set (Aprox 6 - 15 MHz)	**£9.70**

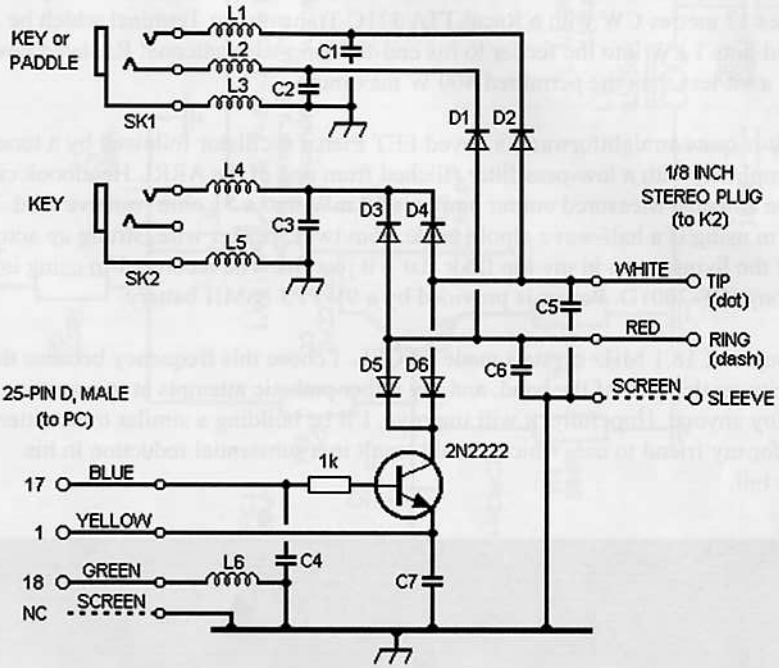
Post & Packing £1.75 for up to 2 kits (Increase unfortunately necessary due to increased postal rates.) Cheques payable to D.Rowlands. Please allow up to 28 days for delivery.

Other radio and electronics projects kits are being developed. Details will be advertised in SPRAT when they become available. For details, please send SAE to D Rowlands, Micro Radio Products Dept. GQ 7 Broomfield Road Swanscombe Kent DA1 0 0LU Tel 01322 381303 (ask for David) after 7pm or Email to Microradio@Telco4u.net mentioning SPRAT.

Keying the Elecraft K2 from a PC

Steve Rawlings GW4ALG, 14 The Paddock, Chepstow, NP16 5BW, UK

When operating CW contests with the Elecraft K2, I use the 'SD' computer logging program (DOS version) on an old Toshiba T1850 laptop PC. The Elecraft RS-232 interface provides rig control, while the computer interface shown below is used for keying the K2 from the parallel port of the laptop (as well as combining keying inputs from my hand key, and a paddle).



C1-C7: 0.01 mF (10 nF) D1-D6: 1N4148 L1-L6: 330 or 470 mH choke
SK1-SK2: 1/4 inch stereo socket (fitted with 1/8 inch reducer, as required).

The main components were mounted inside a small plastic project box, using 'ugly construction' on a piece of copper clad board. A 1.5 metre length of screened cable was used between the 25-pin D connector and the project box, and the keying lead used a 2-wire screened lead salvaged from an old pair of stereo headphones.

Note that the K2 may be configured to 'auto-detect' a straight key input when the 'tip' (dot) and 'ring' (dash) terminals are grounded simultaneously. This permits both a straight key (via diodes) and a paddle to be connected to the same keying lead. C1/C2/D1/D2 are not required if SK1 is only to be used with an external paddle.

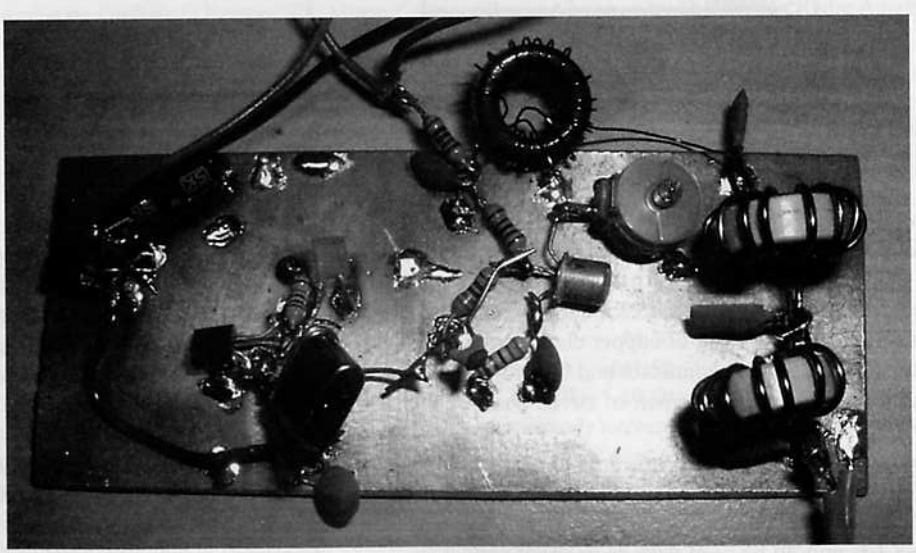
17 metres QRP CW Transmitter

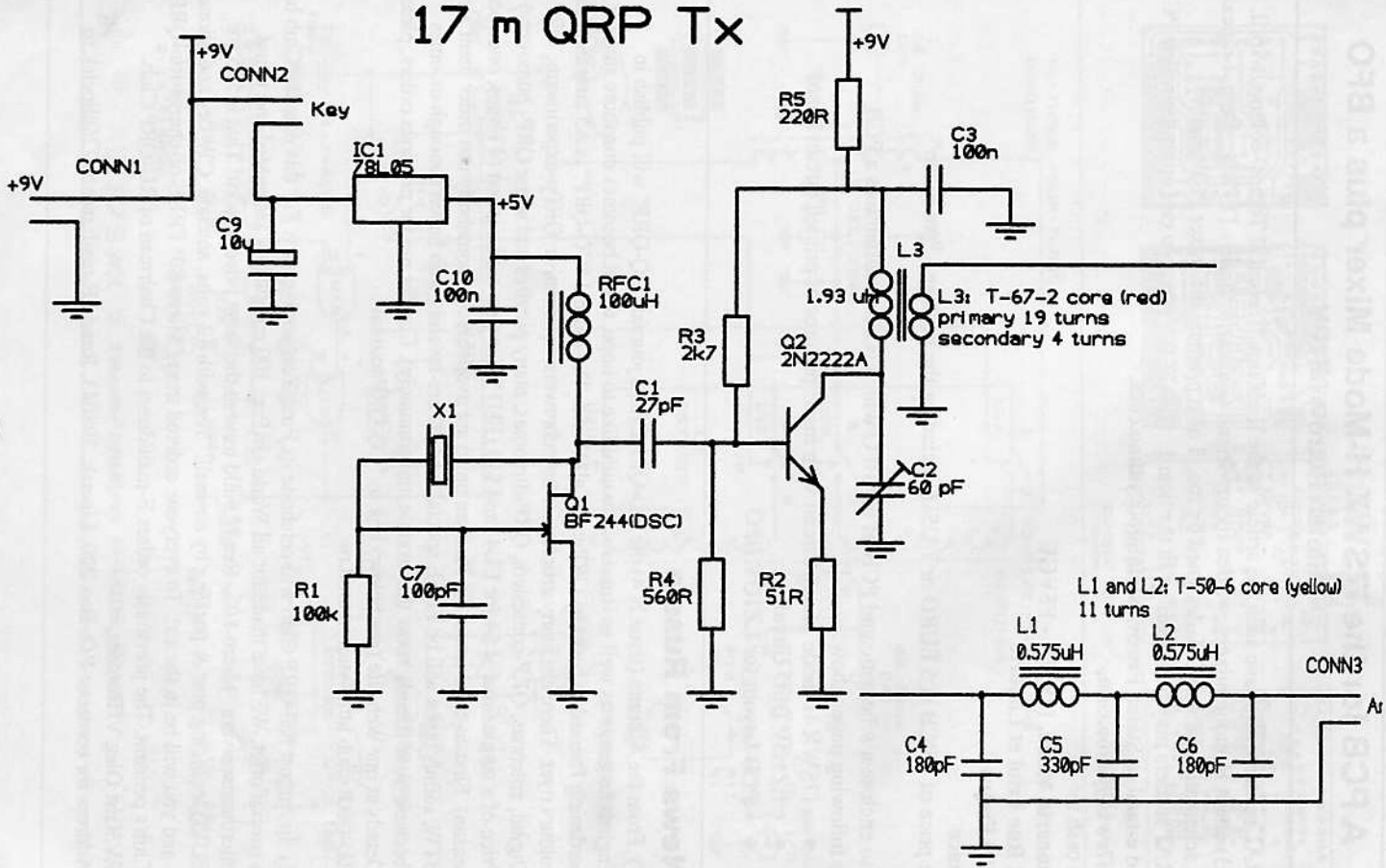
Leon Heller, G1HSM, Flat 5, 36 Chapel Park Road, St. Leonards-on-Sea, East Sussex TN37 6UH.

To celebrate my access to the HF bands without having to pass a Morse test, I quickly built up this little 17 metres QRP CW transmitter, primarily so that I may communicate with a friend of mine who is a denizen of Eastbourne, about 12 miles away from my QTH in St. Leonards-on-Sea, East Sussex. The aforesaid friend (a collector of Racal military radios) mainly uses 17 metres CW with a Racal TTA 371C Transmitting Terminal which he has rebuilt, and puts 1 kW into the feeder to his end-fed long-wire antenna! Radiated power is, of course, a bit less than the permitted 400 W maximum.

The circuit is quite straightforward, a keyed FET Pierce oscillator followed by a tuned Class A amplifier, with a low-pass filter (filched from one of the ARRL Handbook circuits) feeding the antenna. Measured output power is 60 mW into a 51 ohm resistive load. The antenna I'm using is a half-wave dipole made from twin speaker wire, strung up across the corners of the living room in my top floor flat – it just fits. The receiver I'm using is my ancient Sony ICF-2001D. Power is provided by a 9V PP3 NiMH battery.

I had a couple of 18.1 MHz crystals made by QSL. I chose this frequency because there is little activity on this part of the band, and my rather pathetic attempts at transmitting Morse won't annoy anyone. Hopefully, it will improve. I'll be building a similar transmitter (and a receiver) for my friend to use, which should result in a substantial reduction in his electricity bill.




17 m QRP Tx
+9V
CONN2
Key
CONN1
+9V
IC1
78L05
+5V
C9
10u
C10
100n
RFC1
100uH
+9V
R5
220R
C3
100n
L3
1.93 uH
L3: T-67-2 core (red)
primary 19 turns
secondary 4 turns
R3
2k7
Q2
2N2222A
C1
27pF
X1
C2
60 pF
Q1
BF244(DSC)
R1
100k
C7
100pF
R4
560R
R2
51R
L1 and L2: T-50-6 core (yellow)
11 turns
L1
0.575uH
L2
0.575uH
CONN3
C4
180pF
C5
330pF
C6
180pF

A PCB for the I7SWX H-Mode Mixer plus a BFO

Stefan Petrov, LZ1OV

SPRAT readers may have seen the article in the RadCom 'Technical Topics' column (April, 2003) about H-mode mixers, written by my friend Giancarlo Moda - I7SWX. Here, I repeat that schematic and its PCB, designed by me. I also produce the mixer PCBs here.
SPRAT readers may be interested in the board. Here is the way you can order the mixer PCB.
Send e-mail to Stefan Petrov, **stefangp@yahoo.com,**
cc: **i7swx@yahoo.com,**
and cash to:
Giancarlo Moda, I7SWX - F5VGU
302 Rue Priol et Laporte
83600 Frejus
France
The price of 3 PCB is 5 EURO or 7 USD, including the postage - "par avion"

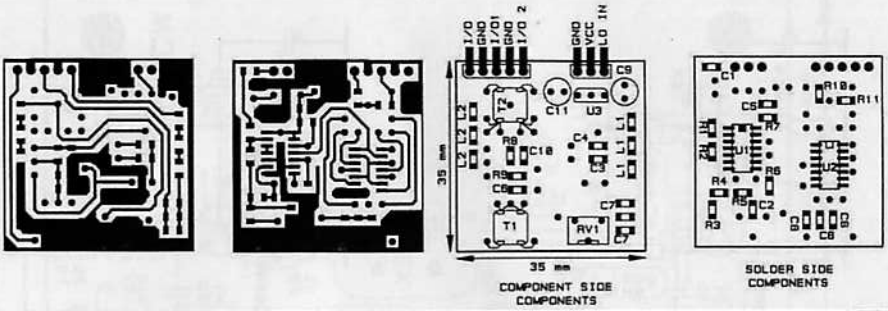
I also enclose a schematic and PCB of my BFO which is also available as a PCB.
The following pages show:

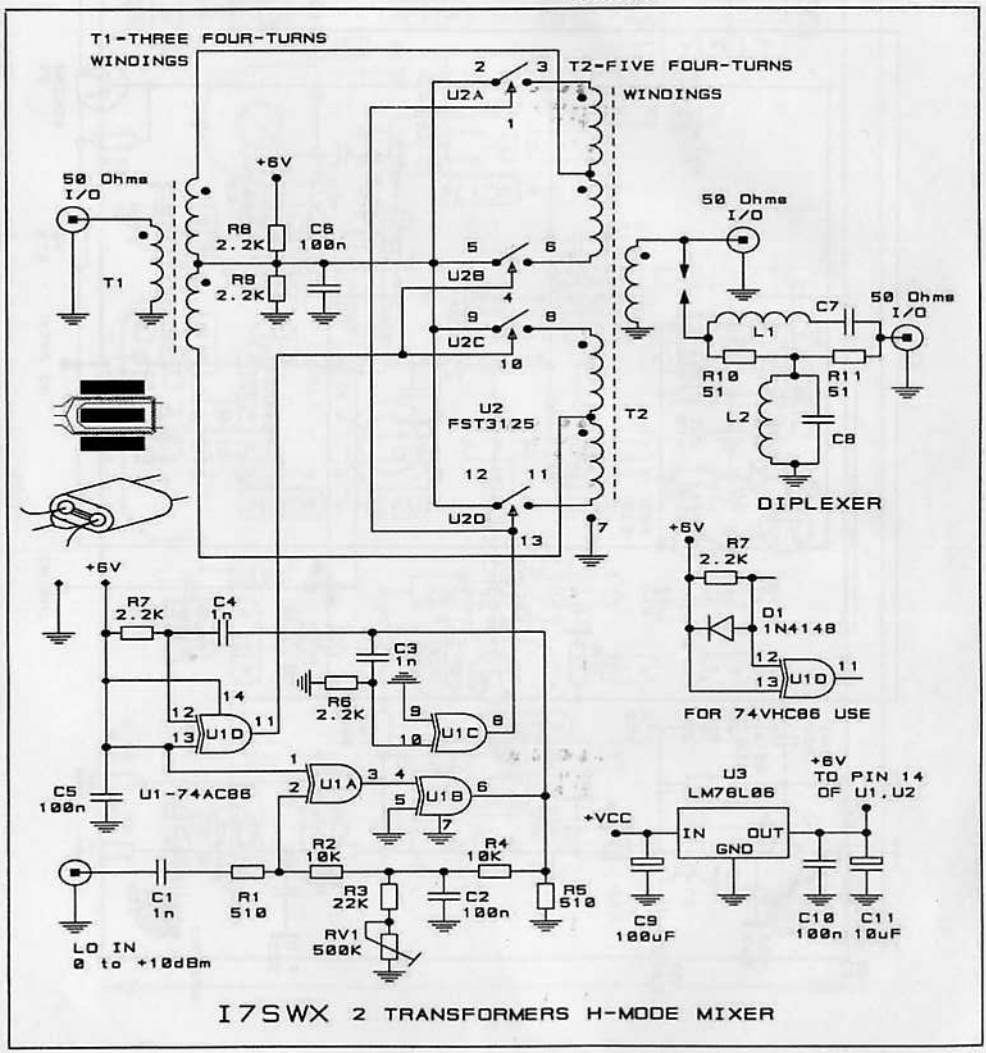
- I7SWX H-mode Mixer Circuit with insert pictures of printed circuit board
- LZ1OV BFO Circuit
- PCB Layout for LZ1OV BFO

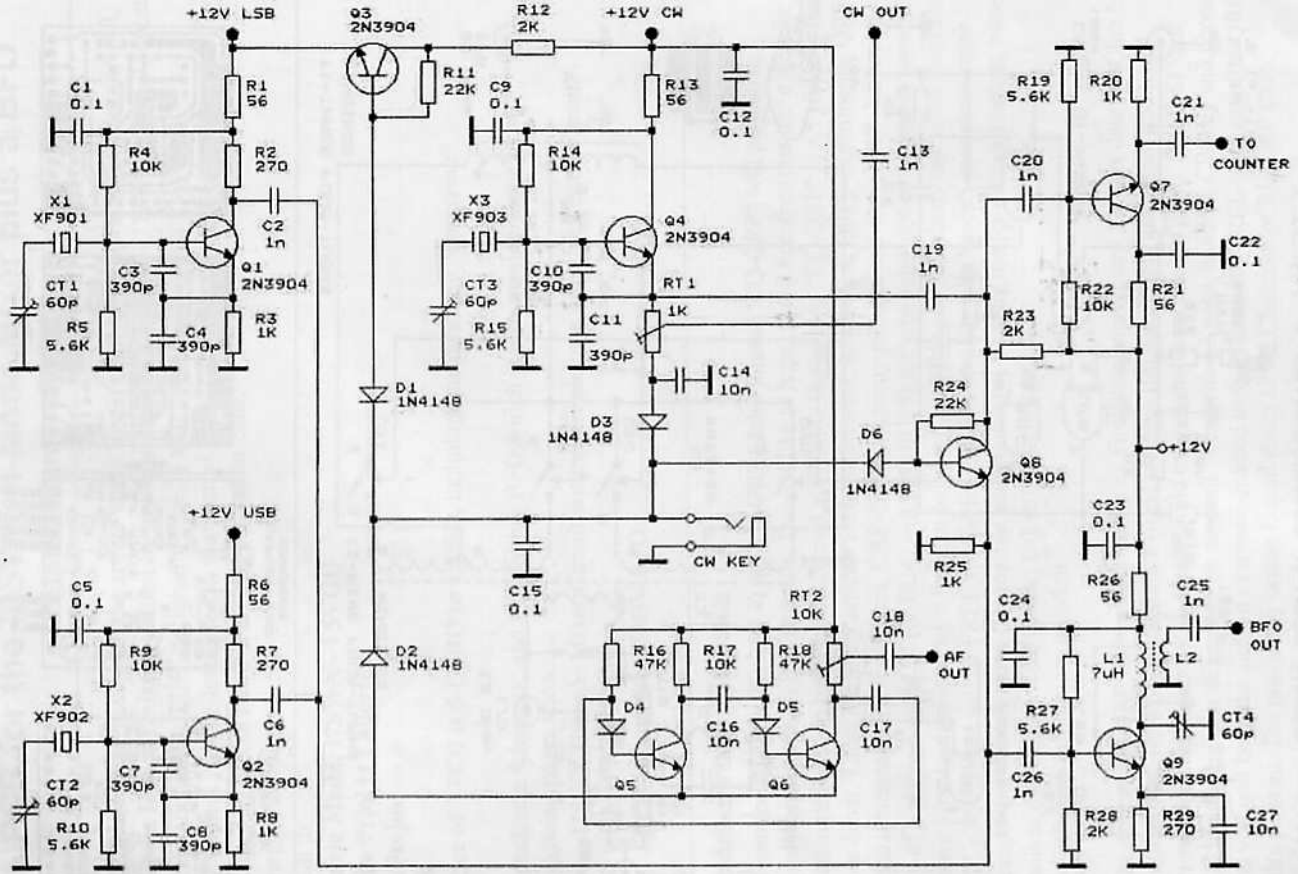
News From Russia

1) From the Autumn (issue N 4) the RU-QRP Club's journal "CQ-QRP" will publish in English language as well as Russian. I would like to hope, that it becomes one more step for hardening friendship between QRPers of all World. The journal "CQ-QRP" is A5 size and has a colour cover. There are many articles for homebrewers, schematics, QRPp-experiments, QRP-Digital, antennas, QRP-contesters, QRP-diplomas, many pictures and some QRP- humour :-) Price of a single issue is $4 (or EU4) and $15 (EU15) for year subscription (4 issues, once per season). First-to-third issues (in Russian only) are available and somebody can order them also. BTW, some copies will be FREE special for QRPers-invalids who haven't enough incomes (because your friends know this trouble, unfortunately). Contact me for previous orders, please. Details at our Web site (see below) link to "CQ-QRP journal".
RU-QRP Club http://ruqrp.narod.ru

2) In August RU-QRP Club will celebrate its First-Year anniversary. For this date the Club has a special offer. We have made for all World QRPers 100 completely assembled and tuned microtransceivers "Micro-80". Ready build trcvr at the same price of a kit! That is $15 (or EU15) including post & packing by air-mail. Yes, with 12 volts, antenna, CW-key and phones - and you will be in the air! To everyone ordered trcvr "Micro-80" FREE-of-charge RU-QRP Club's pennant. The previously orders E-mail direct to the Chairman of RU-QRP Club.
RV3GM Oleg V. Borodin.
Address for contacts: P.O. Box 229, Lipetsk, 398043, Russia E-mail: master72@lipetsk.ru


I/O
GND
I/O1
GND
I/O 2
GND
VCC
LO IN
35 mm
35 mm
COMPONENT SIDE
COMPONENTS
SOLDER SIDE
COMPONENTS


T1-THREE FOUR-TURNS
WINDINGS
T2-FIVE FOUR-TURNS
WINDINGS
50 Ohms
I/O
+6V
R8
2.2K
C6
100n
T1
U2A
U2B
U2C
U2D
U2
FST3125
T2
50 Ohms
I/O
C7
L1
R10
51
R11
51
L2
C8
DIPLEXER
+6V
R7
2.2K
D1
1N4148
U1D
FOR 74VHC86 USE
R7
2.2K
C4
1n
C3
1n
R6
2.2K
U1D
U1C
C5
100n
U1-74AC86
U1A
U1B
U3
LM78L06
+6V
TO PIN 14
OF U1,U2
+VCC
IN
OUT
GND
C9
100uF
C10
100n
C11
10uF
R2
10K
R4
10K
C1
1n
R1
510
R3
22K
C2
100n
R5
510
RV1
500K
LO IN
0 to +10dBm
I7SWX 2 TRANSFORMERS H-MODE MIXER


+12V LSB
Q3 2N3904
R12 2K
+12V CW
CW OUT
C1 0.1
R1 56
R11 22K
C9 0.1
R13 56
C12 0.1
R4 10K
R2 270
R14 10K
C13 1n
R19 5.6K
R20 1K
C21 1n
TO COUNTER
C20 1n
Q7 2N3904
X1 XF901
C2 1n
X3 XF903
Q4 2N3904
C19 1n
C22 0.1
CT1 60p
C3 390p
Q1 2N3904
CT3 60p
C10 390p
RT1 1K
R22 10K
R21 56
R5 5.6K
C4 390p
R3 1K
R15 5.6K
C11 390p
R23 2K
C14 10n
D1 1N4148
R24 22K
D3 1N4148
D6 1N4148
Q8 2N3904
+12V
+12V USB
C23 0.1
CW KEY
R25 1K
C5 0.1
R6 56
C15 0.1
RT2 10K
C18 10n
R26 56
C25 1n
C24 0.1
BFO OUT
R9 10K
R7 270
D2 1N4148
R16 47K
R17 10K
R18 47K
AF OUT
L1 7uH
L2
X2 XF902
C6 1n
D4
D5
C16 10n
C17 10n
R27 5.6K
CT4 60p
C7 390p
Q2 2N3904
Q5
Q6
Q9 2N3904
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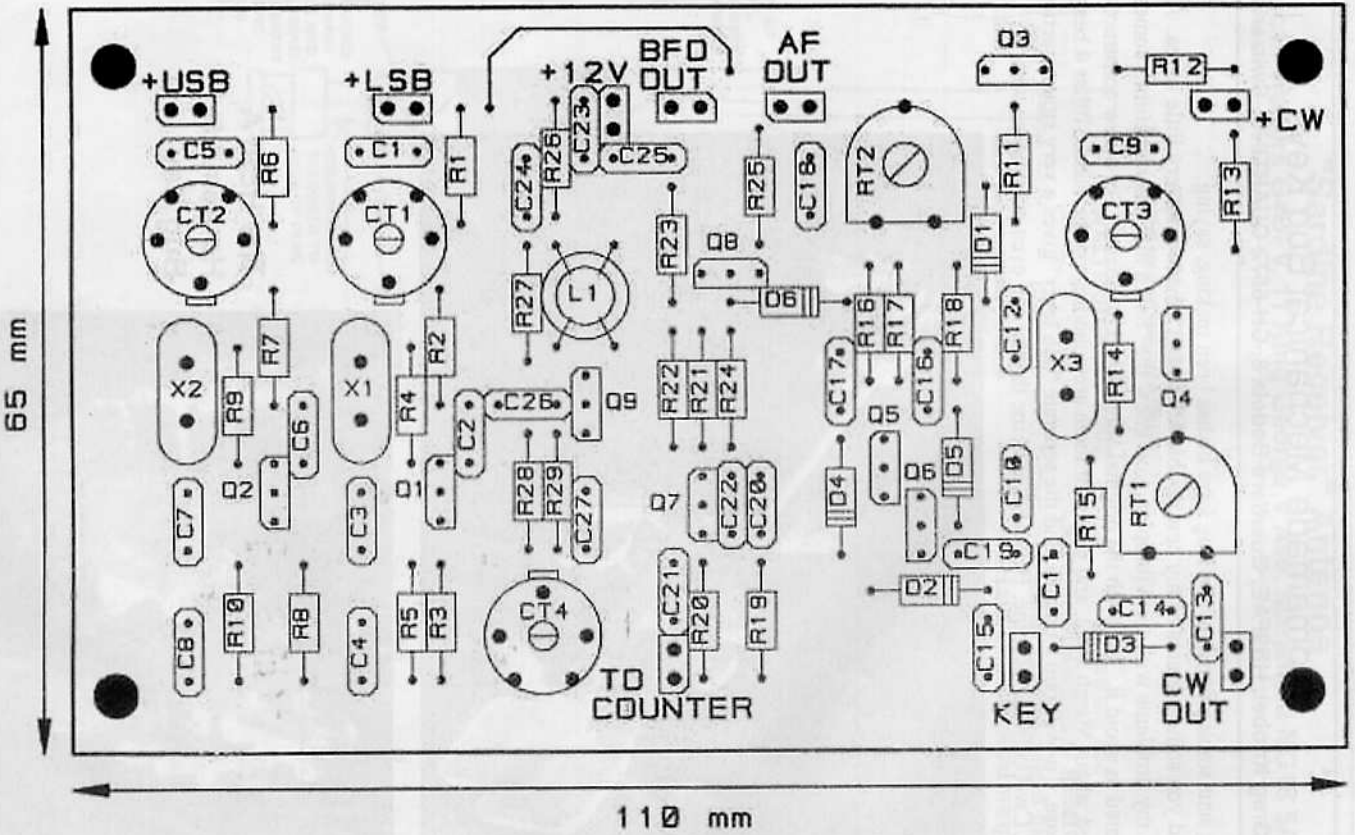
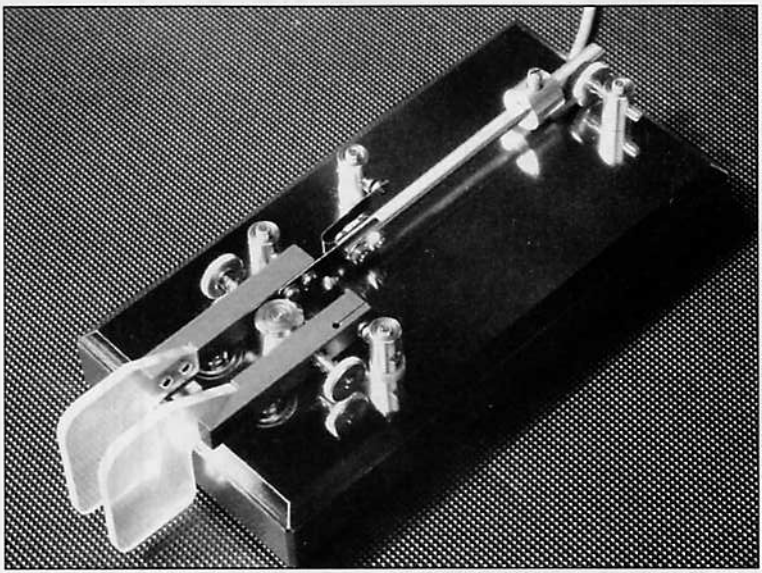
R10 5.6K
C8 390p
R8 1K
R28 2K
R29 270
C27 10n

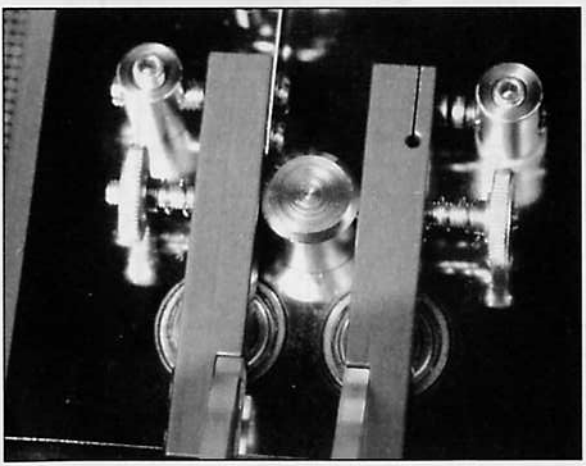

+USB
+LSB
+12V
BFD OUT
AF OUT
+CW
TO COUNTER
KEY
CW OUT
65 mm
110 mm

Homemade Mechanical Bug Keys

Greg Knobel, HB9FAE, Quartiere Bedola 8, CH-6572 QUARTINO, Switzerland

Greg sent some pictures of the Bug keys he has been making, saying…..
I send you some pictures of my new double lever bug, I made it in very little series. All started from my problems with the Vibroplex, you know the "half a dit" that sometimes comes out, and I wanted to avoid it. But with the original Vibro I had no chance. So, a new construction started, about March 2002, and now 4 of them are sounding on the bands. It has 4 bearings in the base, Cu-Wolfram Contacts, and the separate "dah lever" gives a very smooth action. A very good Cw-Op friend of mine, HB9AFZ, told me that he can even go squeeze with it.

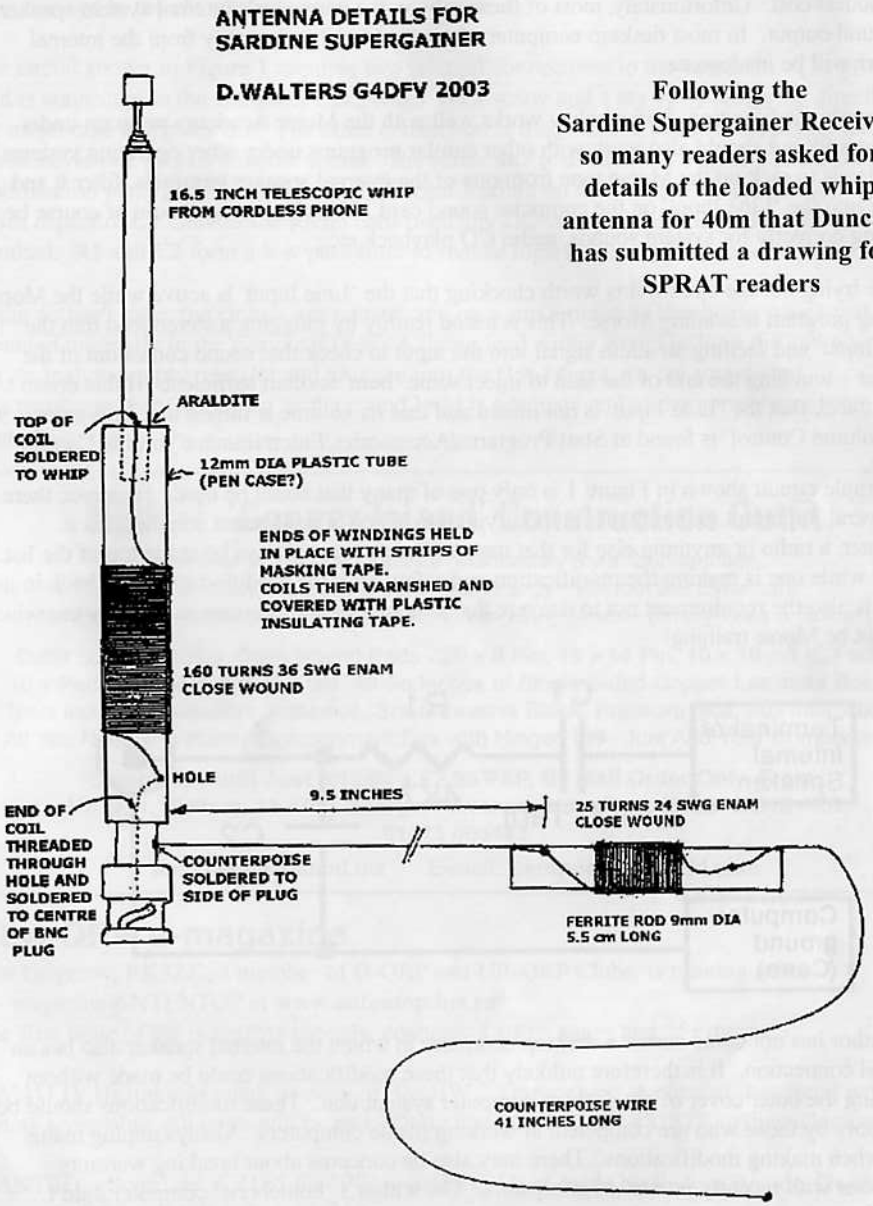




The HB9FA Homemade Bug Key

"Sardine Receiver" Antenna

Duncan Walters G4DFV, 11 King George V Ave. Mansfield NG18 5AA



Following the Sardine Supergainer Receiver, so many readers asked for details of the loaded whip antenna for 40m that Duncan has submitted a drawing for SPRAT readers

Using Computer Morse Training Programs

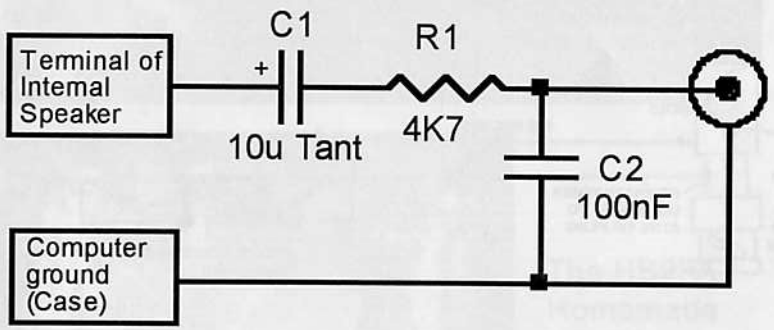
Harry Brash, GM3RVL, 5 Hillview Drive. Edinburgh. EH12 8QW

There are several excellent Morse training programs available for downloading from the internet at a modest cost. Unfortunately, most of these rely on the computer's internal system speaker for sound output. In most desktop computers the sound level and quality from the internal speaker will be inadequate.

The simple modification shown below works well with the Morse Academy program under Windows 98 but should also work with other similar programs under other operating systems. The idea is to pick up the Morse tone from one of the internal speaker terminals, filter it and feed it into the 'Line Input' on the computer sound card. The sound card should of course be working correctly for system sounds, audio CD playback etc..

Before trying out the circuit, it is worth checking that the 'Line Input' is active while the Morse training program is sending Morse. This is tested readily by plugging a stereo lead into the 'Line Input' and feeding an audio signal into the input to check that sound comes out of the speaker – touching the end of the lead to inject some 'hum' is often sufficient. If this doesn't work, check that the 'Line Input' is not muted and that its volume is turned up. In Windows 98, the 'Volume Control' is found at Start/Programs/Accessories/Entertainment/Volume Control.

The simple circuit shown in Figure 1 is only one of many that could be used. However, there are several important requirements in modifying any piece of equipment whether it is a computer, a radio or anything else for that matter. Safety must always be at the top of the list. Safety while one is making the modification and safety after the modified system is back in use. There is also the requirement not to damage the computer or compromise its primary use which may not be Morse training!



The author has not come across a desktop computer in which the internal speaker also has an external connection. It is therefore unlikely that these modifications could be made without removing the outer cover of the desktop computer system unit. These modifications should be made only by those who are competent at working inside computers. Always unplug mains leads when making modifications. There may also be concerns about breaking warranty conditions with recently purchased computers. The author's 'homebrew' computer didn't suffer from the latter concerns!

The internal speaker in a desktop computer is not usually driven from a linear audio amplifier. It is normally driven from a digital source and the waveforms on it may appear quite complex on an oscilloscope although much of this will be digital 'noise'. As a first safety check, it is worth using a testmeter to measure the voltage on the internal speaker terminals relative to the computer chassis. This should be +5V or less. It is likely that neither side of the speaker will be connected to the chassis.

The circuit shown in Figure 1 requires two internal connections to the computer. The ground lead is connected to the computer case, either via a screw and a tag or by soldering directly to the metal case if appropriate. The other connection is made to one of the loudspeaker terminals – whichever one gives a suitable signal. The series 4k7 resistor R1 in Figure 1 ensures that the modification is unlikely to cause any significant loading on the internal speaker driver. The series capacitor C1 isolates the sound card from any DC voltage which is present on the speaker terminal. R1 and C2 form a low pass filter to reduce high frequency components in the signal.

In the author's case, the circuit was constructed on a small piece of Veroboard which was mounted internally in the computer case. A flying lead with a stereo jack on the end was taken out through an empty rear slot and plugged into the 'Line Input' on the sound card.
The results are very satisfying as the sound level is adequate and under normal computer control.

New QRP e-magazine

Igor Grigorov, RK3ZK, a member of G-QRP and UR-QRP Clubs, is running a free e – magazine ANTENTOP at **www.antentop.bel.ru**
The first issue of the magazine is ready, containing 100+ pages and 25+topics.

WANTED: Heathkit Manual, or copy of, for HW-7 Transceiver. A copy of the circuit would be just as acceptable. All costs will be met. Doug Hotchkiss 01489-481537. g4beg@bigfoot.com

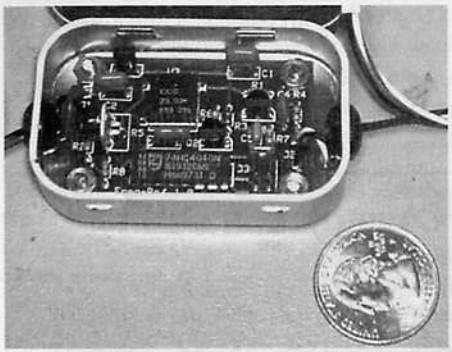
WANTED – Board ref WR165 for "PW seven" (VFO) as made by Badger Boards. Owen Davies G4VPF QTH–R 01283 544212

The W8DIZ Frequency Reference Kit

Graham Firth, G3MFJ (G-QRP Club Sales)

As some of you may have seen on the American Internet mailing list, Diz, W8DIZ, has recently announced a new kit, a simple frequency reference kit. This is based on a 20MHz Temperature Compensated Crystal Oscillator (TCXO). The output is coupled, via a single transistor amplifier, to a binary divider – to give 10, 5 & 2.5MHz outputs which are fed through another single transistor stage to isolate the output from the chip. The whole thing is powered from a 9v battery through a miniature 5v regulator – the whole thing draws some 25 mA. There is a fine tune control on board so the oscillator can be made zero beat with WWV, or some other standard frequency transmission.

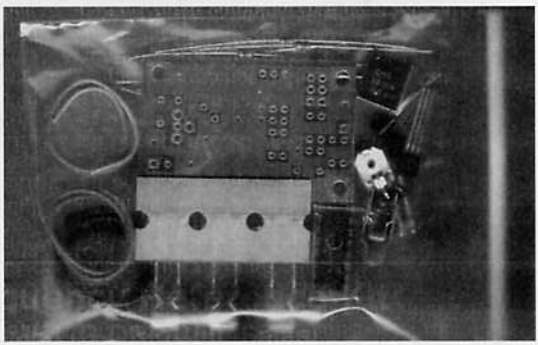
When I saw this, I thought "what a good idea" & after consultation with George, I bought a number of kits for club sales. Here are a couple of pictures of the PCB fitted into two sizes of Altoids tins.



Above – as built by NØJRN
right, as built by G4WIF.

The kit is available from Club sales and consists of a double sided PCB, the TCXO and all other components and assembly instructions. You supply a suitable box & a PP3 clip.

The price is £10
plus postage/packing
(UK - 30p; EEC – 60p; DX – 80p).
Check with the Club Sales ad on the back page for methods of payment



ANTENNAS - ANECDOTES - AWARDS

Gus Taylor G8PG 37 Pickerill Road, Greasby, Merseyside, CH49 3ND

"THE NOBLE ART OF HOOKUP"

As a youngster and teenager G8PG was an avid reader of the famous magazine for boys called "Chums" with its wonderful adventure yarns and articles on many subjects. It also had a regular wireless feature written by "5YM" (probably E.H. Robinson, G5YM of Pirbright, Surrey). This was the great age of home construction, much of it experimental, and one article was entitled "The Noble Art Of Hookup" in which 5YM described a baseboard with a bakelite front panel and a smaller bakelite terminal strip at the rear.The front panel was pre-drilled with holes for mounting capacitors, resistors and switches, and six terminals were permanently mounted on the rear panel. Sound familiar ? Turn to page 8 of the last edition of SPRAT and you will see how Steve, GW4ALG, has brought the idea into the 21st century. My only argument with Steve would be over the term "Ugly Construction". Hooking up a circuit to test ideas and theories goes back to the days of Hertz and Marconi (see the pictures of the latter's Signal Hill RX) and it would be nice to retain this terminology. Whatever the terminology, a good hookup board is great for trying out new ideas quickly and Steve is to be congratulated on his version.

STICK 'EM UP LADS !

Following some recent outside work on the G8PG QTH it became necessry to replace the two hooks which support the house end of the station tuned loop antenna. Although the broken hip is now well repaired, climbing ladders and drilling holes was not a good idea. So a visit was made to the local d.i.y. store.This resulted in the eventual purchase of a large container full of " Unibond Multi-purpose No More Nails Super Strength Instant Gap Filling Adhesive", an adhesive which can bond wood, plastic, brick,metal,glass,ceramics and plaster according to the makers. To test it, two three by one inch wooden blocks, each with a cup hook screwed into the centre, were prepared, and then stuck to the outside of the house using the Adhesive. One was attached to plaster and one to plastic. They both bonded at once, and were then left for 24 hours according to the makers instructions. The house end of the antenna was then attached to the hooks and we were in business, the adhesive holding the wooden bocks in place with no trouble at all. This seems to be a very safe adhesive in use. It will not stick your fingers together, and any on your hands is easily washed off. If readers know of similar bonding adhesives, please let us know.This request includes overseas readers who may have local products.

THOUGHTS ON SUNSPOT CYCLES

Let us start by going back to the Palaeolithic age of man, three million years ago. The sun rose and set in those days

just as it does now, and presumably sunspot activity followed the 11 year cycle. If we divide 3 000 000 by 11 we find that during the period there will have been 272727 sunspot cycles, a massive total ! If we now turn to the scientific recording of sunspot activity (by the Zurich Observatory) we find that this has only taken place during the past 254 years, covering 23 cycles. This equates to 0.008 percent of the 272727 cycles. The use of the ionosphere for hf working dates roughly from 1923, and covers roughly 7 cycles (actually 7.2). This equates to 0.0025 percent of the total number of the 272727 cycles. Our actual practical experience of sunspots and hf operating is thus only a minute fraction of the number of times the sun has run through its cycle and certainly not enough for serios scientific evaluation. If we return to the Zurich figures, we find high and low spots of activity as shown below.

Century	Lowest sunspots	Highest sunspots
1700s	7	141
1800s	0	147
1900s	1	200 plus

We can thus see that during our first 80 years of hf operating we have the best sunspot levels so far recorded, but that we may well now face much more difficult conditions. On the other hand we may get even better conditions at the next maximum. Data to forecast accurately what will happen just does not exist. (On a personal note, current conditions seem similar to those when G8PG was first licenced on 31 May 1937.)

MORE ON THE PRE-TUNED CO-AXIAL STUB ANTENNA

Many thanks to Brian, GoGSF, for some interesting correspondence about this one. One major discovery here is that in the quarter wave version (7 MHz with the version described in our last issue) maximum current occurs not at the base of the antenna as one would expect, but at the free end. We had been testing the antenna as a sloper, with the free end only about 2m high,so it was immediately raised to a height which made the whole antenna horizontal. This produced a big improvement in results. This discovery is very significant if one considers the use of the antenna as a quarter wave vertical, as it means one will have lots of current high above ground. It has not been possible to test a vertical version yet, but we hope to do so in the future. Despite the poor conditions tests over a fairly short period produced 7 MHZ QSOs with 11 European countries plus Kazakstan, while 14 MHz produced 12 European countries plus USA and Asiatic Russia (the grand total of DXCC countries was 24). Seems to be an idea well worth experimenting with further.

MARK OF A CHAMPION

In a letter accompanying his latest big Award application George, GM3OXX, says that far from being a problem recent short skip on 14 MHZ allowed him to work a number of new members who he might otherwise not have heard. Surely the mark of a champion is always to be able to turn any circumstance to his advantage !

YOU CAN COUNT YOUR OWN COUNTRY !

An overseas member recently wrote to ask if he could count a contact with his own country for the QRP Countries and Two-way QRP Awards. The answer is yes, you can provided your country appears in the DXCC countries list.

WHERE HAVE ALL THE QSLs GONE ???

Several members have written to complain about the increasing difficulty in obtaining QSLs for Award applications. As anyone who has read the Radio Amateurs' Code will know, the QSL is always regarded as the final courtesy of the QSO, so let us all try and extend this courtesy to any fellow amateur who asks us to QSL.

WHERE HAVE ALL THE ANTENNA IDEAS GONE ???

Not a single antenna idea or design has been received since the last issue of SPRAT, a situation which never existed previously. So please let me have your ideas and suggestions. On the credit side, advice has been given to several members, including an antenna improvement suggestion which resulted in a very happy Geordie, 2EoASG working his first W.

AWARD NEWS

Sincere congratulations to all the following Members.

QRP COUNTRIES. 50 GW3VLU. 24 G3JFS.

WORKED G QRP CLUB. 1460 GM3OXX (see previous page). 880 G8PG, 100 G4TTY, 25 G3JFS.

TWO-WAY QRP. 10 G3JFS.

ARE YOU READY FOR WINTER ?

As this is beig written the U.K. is sweltering in some of the highest temperatures ever recorded, but soon winter gales, snow and frost will be upn us, so now is the time to overhaul your antenna and its supports. Are your guys in good condition abd securely anchored ? Would it be worth adding another set and giving your mast an extra 20 mph wind protection ? Are your halyards in good condition and strong enough ? If you use pulleys are they well greased ? If you use rings are they large enough to let the halyard run freely. Are your antenna wires in good condition ? if you use co-ax feeder are all joints really waterproof ? Have you got a safety link in your insulator chain which will break first if your antenna is subjected to too much strain ? Checking now can save you a horrible wet,cold job next January !!

CORRECTION. Last Edition. W7CNL.Read 80 countries not 100.

COMMUNICATIONS AND CONTESTS

Peter Barville G3XJS e-mail: g3xjs@gqrp.co.uk
40 Watchet Lane, Holmer Green, High Wycombe, Bucks HP15 6UG.

Firstly, the solution to the puzzle in the last issue about the name CZEBRIS: "CZEBRIT" was the name used to represent the "CZEchoslovakBRITish" Contest when Czechoslovakia was one country. Since then of course, the Czech Republic and Slovak Republic have come into being, and so now the "CZEchBRItishSlovak" Contest is appropriate. My thanks to those members kind enough to point me in the right direction – and, of course, there's no need to change the name of the event.

INTERNATIONAL QRP DAY 2003

An unusual entry this year came from Pete (MM3ECN) and Dick (GM0BPS) in the form of an all PSK31 log. Using the callsign MM3ECN/P, they were operating from near Fintry, Stirling (IO76wb) using an IC-703 running 5 watts to an inverted vee antenna. As others found, band conditions were not very favourable on the day, and the going was very slow indeed. They weren't helped by having to suffer considerable power-line noise, but at least they gave it a go and (no doubt) had plenty of fun scoring a total of 15 points. Valery (RW3AI) was plagued with thunder and rain static, limiting his time on the air, but scored 12 points. Harry (LZ1BB) used his FT817 at 5W output and a 20m longwire 4m above the ground. He tuned it on all bands, including 50mHz, with a home made Z-match tuner. Harry's score of 27 points includes 10 resulting from qso's on 6m, which (referring to the rules shown on page 28 of the Members Handbook) is not included. However, even when those points are deducted from his score, Harry still made sufficient qso's on the HF bands to qualify as this year's winner. Runner-Up Certificates go to each of the MM3ECN team.

EUCW QRS PARTY

Valery (RW3AI) has kindly sent me the results of this event, which I can supply to anybody wishing to send me an ssae, or email. He also points out that his was the only entry under the banner of the G-QRP-Club!

THE WQF QRP PARTY.

Oleg (RV3GM) has kindly supplied details if this event, devoted to the revival of the World QRP Federation (WQF).

All QRP operators, and QRP clubs around the world, are invited to participate.

Dates:	1st Saturday in January (3 January 2004)
Time:	0000z to 2400z.
Participants:	All licensed Amateurs QRP only. Single-Op only.
Bands:	160, 80, 40, 20, 15, 10m.
Frequencies:	Around usual QRP frequencies.
Modes:	CW, SSB, Digital in accordance with licence.
Call:	CQ WQF TEST.
Power:	CW/Digital – 5W O/P. SSB – 10W PEP O/P

Exchange: RST (RS)/ name of your QRP Club/ your member number.
Non QRP Club Members - RST (RS)/DXCC Country /Power.
Eg.: 579/RuQRP/001 or 599/GQRP/4690 or 589/Rus/5w.
NB! Each participant can represent only one QRP Club.

Scoring: QSO with same Continent (DXCC) - 1 point.
QSO with different Continent - 3 points.
The same station may be worked on different Bands or Modes.

Multipliers: 1 multiplier point for every QRP Club per band.

Final Score: Sum of QSO-points multiplied by sum of multiplier points of all bands used.

Logs: Columns: UTC, Call, exchange sent, exchange received, multiplier points, QSO points. Separate log sheets for each band are required. Cover sheet: own call, name/address, rigs/antennas and power used in the contest, final score claimed, statement that the Contest Rules have been observed, operator's signature.

Deadline: Deadline to send Logs - 30 days after Contest date. Check logs are welcome as well as any comments by participants. Only paper logs and comments are welcome!

Contest Check: In 2004 - RU-QRP Club, in 2005 - G-QRP Club, in 2006 - QRPARCI etc...

Address: RU-QRP Club P.O. Box 229, Lipetsk, 398043, Russia.

SWISS HTC QRP SPRINT

I received details of the September 2003 HTC QRP Sprint too late for inclusion in the last SPRAT, but it is worth noting that it is an annual event, held on the 2nd Saturday of September, 1300-1900z. There are 3 categories: VLP, QRP and QRO.

WINTER SPORTS

As I compile the column in the middle of August Winter Sports seems quite a way off, but (as you read these words) but there's not too long to wait for our favourite event (26th December)!

Please let me have items for inclusion in the next SPRAT by the beginning of November.

As always, have plenty of QRP FUN. 72 de QRPeter

JOIN US FOR THE G QRP CLUB WINTER SPORTS
26th December to 1st January
Work as many other QRP Stations as you can find!
Use the International QRP Calling Frequencies;
CW:
1843, 3560, 7030, 10116, 14060, 18096, 21060, 24906, 28060
SSB:
3690, 7090, 14285, 21285, 18130, 24950, 28360 kHz

Send Logs, Comments, Stories to Peter, G3XJS at the address above.
This is not a contest but a "QSO Party", although the G4DQP Trophy will be awarded to the operator thought to have contributed most to the event.

.....QRP NEWS.....

Slow Morse Transmissions - Ian Keyser G3ROO

There are group of us who have decided the best way of promoting CW with the demise of the Morse test is to provide help with beginners first QSO's. This will also provide a source of slow Morse for those starting to learn.

In the early evening, whenever possible, we will try to spend half an hour looking for slow CQ calls between 3560 and 3580 KHz and answering them. The system will be based on the Farnsworth method of 12 WPM character speed with spaces to reduce the word count to a minimum of 5 WPM. My winter Slow Morse transmissions on Kent South repeater will cease this year and my time will be spent on 80m QRP segment from about 1830 GMT. Others will have their favourite times and will no doubt post them on the G-QRP list.

If you hear us chatting at 5WPM please interrupt us with BK to which we will reply QRZ? and one of us will break off and have a QSO with you. If you do not hear anyone please call CQ at 5 WPM, or the speed that you wish to other operator to reply, as we will be tuning the segment of the band looking for you.
I intend to start my operating in early October as the nights draw in, so hope to QSO soon!

New G QRP Club Representative in Netherlands

Peter Halpin, PE1MHO / M3ECN, has passed the job of Netherland's representative to Erik, PA3GVF. **Our sincere thanks to Peter for his many years of service to the club.**

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In overleg met Pete Halpin heb ik het verzamelen van de lidmaatschapsgelden op me genomen. De contributie voor het jaar 2004 moet overgemaakt worden op postgiro 295504 t.n.v. E.C. van Wette te Enschede. De contributie bedraagt 10,- en moet onder vermelding van call ***en*** G-QRP lidmaatschapsnummer op tijd gestort worden, zodat ik op 30 januari 2004 de gelden kan overmaken. Gelden die te laat naar mij worden overgemaakt en/of niet voorzien zijn van call en lidmaatschapsnummer worden onder aftrek van 1,- teruggestort. **Dit geldt voor iedereen! Alleen overboekingen in Euro's worden geaccepteerd.**
Voor meer info: bel Erik PA3GVF 053-4339887 of e-mail: PA3GVF@amsat.org

The Board of Directors of QRP-ARCI is pleased to announce that with effect from 1st January 2003 the President of QRP- Amateur Radio Club International is to be **Dick Pascoe G0BPS.** Dick has been heavily involved in QRP for many years and has served as a member of the BOD for the past four years as well as serving as Vice President since 2001 Dick is well known in QRP ham radio and will be the first non American President of QRP-ARCI. The Vice President is Ken Evans W4DU also a long serving member of the BOD.

Not Much Luck - I have not had much luck in recruiting help for the RSGB HF Convention QRP stand and display. The venue is the Britannia Country House Hotel, Didsbury, Manchester, and the QRP Forum and Stand is on Saturday 1st November. So far... only one firm offer of help! I would be pleased to hear from any members who could come along and support the club on that day. Details of the event are carried at http://www.rsgb.org.uk/hfc. If you can help, please let G3RJV know as soon as possible.
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SSB & Data Report

Dick Pascoe GØBPS. Seaview, Crete Road East. Folkestone. CT18 7EG
Tel 01303 894390 – Email gØbps@gqrp.com

First the 'good' news; all the class 'B' amateurs in the UK now have access to the full HF bands. It appears that there is now no distinction between he old class 'A' and class 'B'. Many other countries are dropping the Morse requirement I am glad to say not because I dislike CW but I am firmly in the camp that feels it is not the modern way to enter the hobby. This can only be good news for the HF bands but probably very bad news for the VHF and UHF bands. As the 'old B's' vacate VHF and UHF to join in on the HF bands and widen their scope the upper bands are likely to fall by the wayside and slide out of the 'ham' spectrum.

However, for those that didn't have to learn Morse to gain their licence there is still the opportunity to get further afield than SSB by using one of the data modes available such as PSK31, even RTTY and still have great fun. (All this can run beside you as you learn the code, you will won't you?). Just because CW is not a requirement does not mean that it will vanish, we shall continue to use it when required.

Brian GØNSL is a 100% ssb operator with 5 watts, he have never had any problem working DX, often breaking pile-ups, so far 258 DXCC countries confirmed, so it works Rig is a TS-130V (1984 vintage,) modded the ALC line to give 5 watts 40m -10m Antenna is a 40m full wave horizontal wire loop, diamond shape, 8m AGL. It is good to hear the M3's about the bands.

Darren MW5HOC was in the Midlands helping his club do VHF NFD running 400 Watts on 2, 4, 6 and 70. There was a tremendous feeling of power when running the 144 MHz station. It was great knowing that he would get heard first time every time, he loved it! He also took along his FT-817 and Sandpiper MV10 portable antenna, set the 817 up on a camping table for something to do on the Saturday evening during the BBQ period First of all he worked into GM on 40M and then worked into
EA on 20M. This got other people's attention and before long the 817 and my little antenna were very popular. Various people had a go and most came off with a different view on QRP operation. A couple of guys worked well into Europe on various bands, and one was quite pleased with working YU on 5 watts he then pointed out to him that the rig was set to 2.5 watts to conserve the batteries.

On 2147 UTC, 13 July **Rick M1RAL** made contact with Igor 4K5D in Orfu, Azerbaijan using PSK31, and into the log went my first contact using this mode. He writes: "For those members who like me have recently been troubled by propagation difficulties, I would definitely recommend having a go with digital modes. They may be pleasantly surprised by he results".

W2AGN writes: Today I was messing around with an old SB104 my Dad built a long time ago. Got the receiver working, and was fiddling with the drive. I didn't even have the jumper in back for the "High Power." I was on 10M SSB, and kept hearing 7X4AN calling CQ. He worked a few, but no pile up. As I was just messing around, I gave him a call, just using the driver, about 1 watt...and he answered and gave me a 53 report! Amazing! Something to do while snowed in.

Charlie Wardale wrote: "After many months of gathering components together, I've finally had the time to put together a 40m SSB transceiver using the excellent design from VK3XU

book and had my first QSO today with an M0 in Birmingham, what a thrill it is to have a 2-way QSO on home built kit. Incidentally, as part of my test kit I built the RF probe from the also excellent publication, "Simple Test Equipment for the QRPer". This enabled me to find my mistakes straight away and rectify them easily."

Dick's Latest QRP Book **"The History of QRP 1949 – 2003"** by Dick Pascoe G0BPS
Full details of the past and present clubs worldwide and the people involved.
Available now for just £11.00 including UK shipping
(Non UK buyers £12.95 or $20USD)
Also available, all including UK shipping:
Introducing QRP £6, Pascoe's Penny Pinchers £5.

PSK31 Interface

Ready to go, you just add your mic plug. Full details are given and also provided is a CD of useable PSK31 programmes and other useful Ham programmes too.
All this for £19.99 inc UK postage. Send your cheque payable to R Pascoe to;
Seaview House, Crete Road East. Folkestone. CT18 7EG

Two Way QRP QSL Labels and Blank G-QRP QSL Cards

QRP Labels: Black Lettering on Gold with Club Logo : 200 labels £2. Post inc.
Blank QSL Cards: You complete your address and call. Blue lettering on white card, 5.5" x 3.5". 100 cards £4. Post inc. Sample from : **M.L. Prickett [Max] G3BSK, 260 Haslucks Green Road, 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 in 1975) is dedicated to low definition and mechanical forms of ATV and introduces radio amateurs to TV at an inexpensive level based on home construction. NBTV 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 mini cassette 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 £5 (or £4 plus a recent SPRAT wrapper) to Dave Gentle, G4RVI, 1 Sunny Hill, Milford, Derbys. DE56 0QR, payable to "NBTVA"

Amateur Radio in a Lovely Place

G3RJV has a Wooden Lodge situated in the Dyfi Valley in central Wales close to the Irish Sea and in the Snowdonia National Park. It has recently been completely refurbished with a large living area, conservatory, double bedroom, twin bedroom and a double bed sofa in the living area. Naturally there is a small amateur radio station with a QRP HF transceiver and a 2m multimode transceiver……ready to operate. [G0ORG worked T44, PY and TZ recently]
Leaflet with details and prices for 2004 - write to G3RJV or email g3rjv@gqrp.co.uk

MEMBERS' NEWS

by Chris Page G4BUE

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G4EHT was the guest operator at **ZC4ESB** in April and worked QRP stations amongst his pile-ups. Bill has just bought a dedicated QRP rig, a FT-817 and is very pleased with its performance with his all indoor antennas (small doublet on the HF bands and 40m). His first QSO was with an RX9 station in Perm on 40m. **GMØAMR** is QRV with 5w on 5MHz with a FT-102 and a homebrew transverter to 15m and had his first QSOs with **VO1MRC** on 20, 22 and 23 December. Stuart is using a W3EDP in the loft (first 40 feet from the rig to the loft is straight and the rest is wound none inductively around the rafters) and a homebrew Z match and says, "5MHz is a good band for QRP but it si a pity it is not used more often". **PE1MHO** and **GØBPS** were QRV during the International QRP day (17 June) from a Scottish Loch at Gartcarron as **MM3ECN**. **MI5MTC** was QRV with an HW8 in a caravan and an antenna of 38 metres of light flex wire 9 metres up in a tree coiled round the top of a **G3CWI** pole and through a skylight end fed to ATU earthed to the caravan chassis, by Derrynane Beach in southwest Kerry in August. Mick made 16 QSOs, half QRP, including **MWØKWV/P** also in a caravan in Bangor with a K1.

Congratulations to **M3RAL** on passing the RAE and becoming **M1RAL**. Rick experimented with digimodes, in particular PSK31 at 5w, in August and found the results, "Encouraging, the most notable QSO being with Igor, **4K5D**, in Baku, Azerbaijan, on 20m while operating indoors with a FT-817 and Miracle Whip antenna. For those members that haven't tried PSK31, I can certainly recommend this mode, especially when working QRP in demanding conditions. It's amazing what it can pull out of a heavy noise floor". After a long absence, **G3ROO** is QRV again with a FT-817 and a quad at 70 feet and worked VK, JA and numerous Ws in August. **2E1RAF (GØTAK)** is using a 'low profile' antenna farm consisting of a nest of dipoles in the roof space, a G5IJ loop about 80m long one metre AGL, and a very thin 5MHz dipole in a horizontal vee formation. Roy has worked around Europe with QRP and also to USA.

To celebrate his access to the HF bands with the recent change in the UK licence regulations, **G1HSM** built a little 17m CW transmitter, primarily to QSO with his friend **GØUGD**, a few miles away and who prefers 17m and CW with a QRO ex-military Racal rig he has rebuilt. Leon's transmitter is a 18.1MHz crystal oscillator followed by a tuned class A amplifier 92N2222A), giving about 100mW output. He will be adding a class C stage (ZTX1053A), which should give about 2w. The supply is a 9V PP3 battery and the antenna is a simple dipole made from twin speaker cable which just fits across the corners of his living room. The receiver is a Sony 2001D. As Nigel (his friend) is only home at weekends, Leon would like someone in the southeast UK to make some tests with me him as "None of the local amateurs seem interested in QRP operation".

G4IKR finished building a 20m CW receiver based on the Advanced Superhet Mainframe in **W1FB**'s *QRP Notebook*, just before Christmas. David made the crystal filter from G-QRP Club crystals and had to 'degrade it slightly' to get a 250Hz bandwidth! He also uses a **W1FB** design for his transmitter with outputs of 3 and 10w. David also built a quarter-wave ground-plane with four radials but will change it because unbalanced antennas do not perform well in Cornwall due to the high earth impedance from the granite there. Despite that, he made some VK QSOs in the Commonwealth Contest with it, with XW in the Asian Contest and many UA and W stations.

HB9DRV mentions *Mapper* which is, "An amateur radio mapping program. Of interest for QRPers is the ability to define your home locator and then see the distance to another locator in miles/watt or kms/watt. You can print maps over multiple sheets of paper and it integrates with PSK31 Deluxe and also works stand-alone. Station locators can be sent via a Windows message, and if anyone wants more information, then just

The shack of Juan, XE3/EA5XQ.

contact me". Simon also mentions *Ham Radio Deluxe* which (at 9 August) is a free technology preview from his Website <www.hb9drv.ch>. He says, "It supports Icom rigs in general but especially the latest IC-703 and turns an excellent little rig into a terrific big rig".

EA5XQ was QRV from Monterrey in 2002 as **XE2** and **XE3/EA5XQ** with his GQ-40 and then an FT-817 that he bought in Texas where he was QRV as **W5/EA5XQ**. He was back in Spain in June and in August planned to be QRV as **EA2/EA5XQ** from Frias de Albarrac. Juan says, "I'm enjoying QRP". **ON4MGY** thanks the stations he worked while he was QRV from Normandy as **F/ON4MGY/P**. Nic says, "Not many QSOs were made, but the ones I made were very nice, eg T99C on 10m with 3w SSB with an ATX walk-about and about 120cms high portable antenna". **PA3CRC** entered the *Original QRP Contest* for two hours on 6 July and worked three members in his 12 QSOs but was disappointed not to hear any UK QRP stations QRV. Gert says, "I think, like me, many QRPers are homebrewers and do not have much time to cultivate good CW ears".

Juan's QTH when he was QRV as W9/EA5XQ from St Charles (near Chicago).

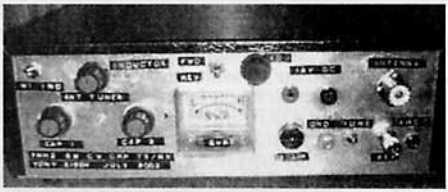
Juan with his magnetic loop antenna which he used as XE2/EA5XQ in Monterrey during 2002.

During the last two weeks of May **M5AEF** was QRV from the Messinian Gulf area of Greece as **SV3/M5AEF** with a FT-817, telescopic whip antenna and a dipole for 20, 17 and 15m dipole. Robin made 24 CW and SSB QSOs with 19 DXCC and says, "A valuable lesson I learnt was not to waste time calling CQ, especially as the band was poor. I was appalled by some poor operating practices by some Europeans, I thought the idea of calling CQ was to make contacts, not to disrupt other people's contacts!". **W3BH** was QRV from Cairo at the beginning of July as **SU9AM with** 500mW. Jim was QRV 14060kHz and worked **G3XJS** and **GM3OXX** plus some two-way QRP into JA. **CU2JL** recently moved to London and will be QRV as **MØBHR** from the Kensington/Chelsea area. Bill would like to hear from any members in the area and of any amateur radio stores and clubs.

ZL2RVW (G4RVW) is using a dipole from his new QTH and does not have his beam any more. Phil works into Europe with 5w quite often but has not been getting replies to his 'CQ G-QRP' calls. He is building the K2. At the beginning of August **WA6HHQ** announced the release of the open source code for the DSPx processor used on the KDSP2 board for the K2. Eric said, "Our hope is that those of you who are interested in experimenting with DSP coding will be able to add new features to the KDSP2 and make them available to other KDSP2 owners via this page <http://www.elecraft.com/KDSP2/sourcepage.htm>. Its also an excellent way to learn more about DSP programming".

M1RAL will be spending extended periods on business in Grenoble, France and plans taking full advantage of the CEPT agreement to be QRV with a portable station. Rick <m3ral@btopenworld.com> would appreciate any advice on operating portable in France. **GWØVSW** was planning to be one of four Sea Cadet instructors training in Gibraltar 15/29 August and to be QRV CW and SSB mainly QRP with an FT-817 and dipoles on all bands as **ZB2/GWØVSW/P**. Sea Cadet and Naval training was to take priority, so Carl was expecting to be QRV early morning and late evenings. **G3CWI** planned to be QRV 40m CW 9/17 August from Welsh summits in the Brecon Beacons National Park for SOTA.

EI5EM's latest CW QRP homebrew effort is a 40m superhet based on the NorCal 40-40 covering 6998 to 7062kHz and added 5w amplifier and tighter IF and audio filtering (see below). It has its own SWR meter and ATU and Tony has added RIT, a Curtis Iambic memory IC (500 characters memory) and an LCD frequency counter. By the beginning of August, he had made



Front and back (below) of EI5EM's new rig.

over 100 QSOs with it, including many on two-way QRP with members. **RV3GM** says the RU-QRP Club have created a new page *The World QRP Exchange* for the free exchange between QRPers of components, equipment, instruments, literature and any items of interest to QRPers, see <http://ruqrp.narod.ru/exchange.htm>.

K5KVH was QRV as **W5TQ** (Austin ARC) and introduced local amateurs to very large wire antennas and CW and SSB QRP operation during USA Field Day in June. A 1250 feet horizontal loop was used on 20m, a 660 feet loop on 80, 15, and 10m and a 330 feet loop on 40m. Stuart says, "The 40m station gained the most contacts, while the 20m station was plagued with balun problems, and having the east and west sides of the 1250 feet loop too close. We proved that an omni-directional gain loop must be square or other symmetric form to cover the areas needed in Field Day, which are all of the Western Hemisphere and DX. The 40m station even worked Hawaii on 40m SSB, showing the great range a large loop can offer. Each loop was only 20 feet high, as that was all the reach our ladder had!". **GØEBQ** has not been so QRV as he is not allowed outside antennas but decide to do something about. Nigel writes, "I had previously used a half-sized G5RV with my trusty Z match but read up on the theory of the G5RV and concluded that there should be no reason why a quarter size version shouldn't work on 10 and 20m. I had some thick hi-fi speaker cable which I split for two 12.75 feet tops leaving eight feet joined as the feeder. I got zero SWR on my 10m converted CB box and called **CE4ATS** who came back with a 57 report! This was with about 4w. I was so shocked that I didn't think to try on the low power setting!".

Congratulations to **G3YMC** on being the leading G in the QRP CW Section of the 2002 ARRL 10 Meter Contest with 115,584 points, **GW4ALG** just pipped him with 115,784 points for the leading UK station. Dave made 125k points in the ARRL CW Contest but **GØDCK** beat him with 223k points to take fourth place in the QRP DX Section. **GØFUW** was QRV for two weeks from Les Luc Sur Boulogne as **F/GØFUW/P** with the "Newly acquired FT-817 and a hastily constructed half-size G5RV hung off a fishing pole in inverted vee fashion. I worked ten European DXCC including several on two-way QRP despite some dreadful propagation conditions. I found the FT-817 to be a very nice little radio and excellent for the /P holiday shack. Even the non-radio family members thought so when it came to news time on the BBC World Service!".

MØBST writes, "Dieter, **DL2BQD**, and the Schwedt group in the far eastern side of Germany, initiated the idea for a small CW transceiver and kindly supplied some nice compact boards, the etching was done by Dietmar, **DL7BZE**. Apart form the Schwedt members, Tom, **DL4NSE** (Dieter's son); Ken, **MØRZZ**, and myself have also been constructing. As time permitted over the summer I've slowly been putting together a 15m version and although still lying without case in a tangle of wires, it works. I have made a couple of QSOs already (EA and ZS). It is a good the design that can be easily re-tooled for a lower band. A 20m version is also now working in Schwedt. The project has become known as the Y19 TRX on account of the DARC district locator". **RV3GM** has finished his new *Ural* transceiver, an all band and all mode DDS, 200mW to 5w variable output. It has given Oleg the opportunity for QRP-PSK experiments and during one week he worked 14 DXCC on 20m with a dipole using PSK31, HELL, RTTY and MFSK. **GW4ALG** went 'bicycle portable' on 30 and 40m with the K2 and a doublet in June (see photograph below) and worked several stations, including QRPers **G3ZWL**, **ON5EX** and **OZ6XR**. In July, Steve tried 'bicycle portable' on 2m 1000 feet ASL and made 45 CW and SSB QSOs with a five element Yagi and nine feet mast. He has built the Elecraft ATU kit into his K2 and says, "It does a great job of tuning my G5RV antenna (plus balun) on all bands".

Finally, the old master **GM3OXX** has changed his antenna. The doublet has gone and George has put up a horizontal 402 feet loop. He says, "It dips nicely at 2.5MHz and worked out spot on, using the formula 1005/frequency gives the length in feet, bang on - 402 feet. But more to the point, it works like magic, though the bands are not great, I worked WAC in the first week. The 30m DX list is really good and I then worked Ben, **CT4CH**, using his new FT-817. Later in the evening I worked **VO1TA** and then heard Ben work him. Ben told him it was his first 30m QSO across the pond so he is having great fun with his new rig. I also tried out the loop on 80m and worked **W1MK** after about ten QRZs from him. He was running a kW to a four-square. I then moved to 40m and heard him again, so I tried again and after lots more QRZs, got him again. Oh yes, still only using one watt here".

Let me know how your autumn goes, by 20 November please, and don't forget to keep the pictures coming. If you are reporting by ordinary mail, then please address it to me at 312 Quail Avenue, Sebring, FL 33872, USA as we plan to spend the autumn in Florida again and I will be doing my column for SPRAT from there.

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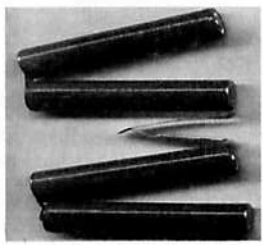

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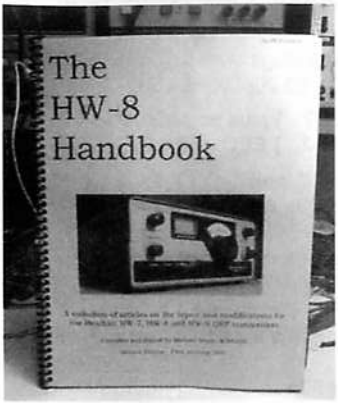

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