SPRAT

THE JOURNAL OF THE G QRP CLUB

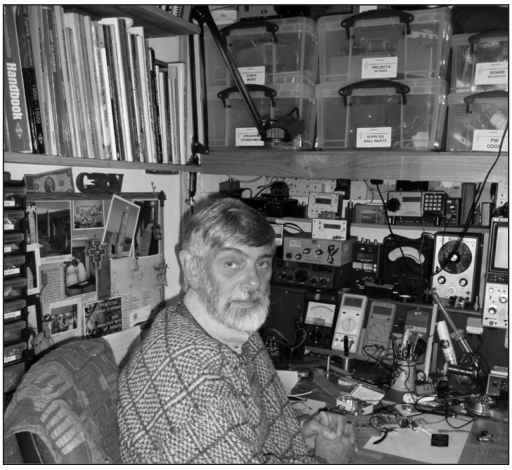
DEVOTED TO LOW POWER COMMUNICATION

ISSUE Nr. 163	© G-QRP-CLUB	SUMMER 2015

RSGB Director and club member, Steve Hartley, G0FUW
with George Dobbs, G3RJV, awarded the Calcutta Key.
(For work associated with international friendship through amateur radio)
Graham Firth, G3MFJ with the Don Cameron, G4STT Award
(For work associated with low power communication in amateur radio)

The Rishworth QRP Convention and Buildathon ~ Signal Injector/Tracer
Ossybox ~ 40m SSB/CW Receiver ~ TL431 Amplifier ~ X1M Review
Awards for Club Officers ~ Use the Wessie ~ RTL2832U R820T dongle again
Modular Transmitter ~ Component Tester ~ Panel Tips~
Communications and Contests ~ Club Awards
Antennas, Valves and Vintage ~ Members News

JOURNAL OF THE G QRP CLUB



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Rev. George Dobbs G3RJV

I have been moved by the kindly words of members as they responded to the news of some awards I received in May (details elsewhere in this issue). I was also glad to see Graham, G3MFJ honoured with an award. Quite a few members give of their time to keep the club as vital as it was 40 years ago. Graham's "Club Sales" are an important part of SPRAT. Graham sources the sometimes difficult to find components that members require to keep their construction projects going. Although members' sales are run as "not for profit" the modest income made has enabled us to keep the subscription low.
Having said that… I am still struggling a little with articles for SPRAT…. The box file is not full ! So, please keep showing and telling what you are doing on your workbench. See the paragraph below about how to submit your material.

72/3

G3RJV

The W1FB Memorial Award 2014/2015

"My favourite weekend project". There are dozens of little construction projects laying around on member's work benches. So …. Describe your favourite little project for other members. It can be original work but I am happy to see existing projects that have been improved or updated.
Please supply circuit diagram(s), full component values and brief notes. A SPRAT formatted page (MS Word) can be supplied on request but any format including hand written may be used.

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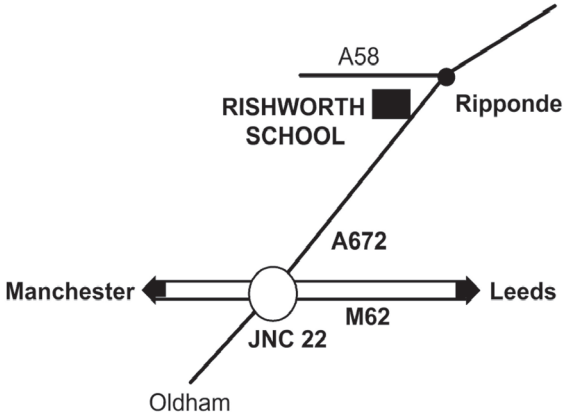
THE G QRP CLUB
MINI-CONVENTION

(in conjunction with the Halifax Radio Society)

Saturday 24th October 2015

The Rishworth School, Ripponden



OPENS AT 10.00am
ADMISSION £3.50
DOORS OPEN 10am
LARGE SOCIAL AREA
LECTURES ON
QRP SUBJECTS
BRING & BUY - SURPLUS
JUNK - COMPONENTS
KIT TRADERS
FOOD & DRINK ALL DAY

WITH THE FAMOUS PIE AND PEAS

The Rishworth School is on the A672 (Ripponden) road from Junction 22 on the M62. [Postcode: HX6 4QA]

Look for the G QRP Sign on the left after you have passed all the sheep!

CONSTRUCTORS EVENING (Friday Evening before the convention) Including a Buildathon to be held at the Premier Inn, Salterhebble Hill, Halifax, HX3 0QT. (Tel: 0871 527 8486) ww.premierinn.com/en/hotel/HALPTI/halifax-south

Our suggestions for local accommodation:
The Premier Inn, Milnrow. Junc 21 on the M62 (Tel: 0871 527 8936) www.premierinn.com/en/hotel/ROCTHE/rochdale
The Malthouse, Rishworth. Almost next door to the school – only 5 rooms (Tel: 01422 822382) www.malthouserishworth.co.uk
The Turnpike Inn, Rishworth, excellent but quite expensive. (01422 822789) www.turnpikeinn.com

Radio Constructor's Evening

Friday 23rd October from 7.30pm

(The evening before the Rishworth Convention)

Premier Inn, Salterhebble Hill, Huddersfield Road, Halifax, West Yorkshire HX3 0QT.

We will also have a social gathering in the same room on the Saturday evening for those who are still at the hotel – to talk radio and QRP

Buildathon
Want to build something but lack experience?
Join our Buildathon on Friday evening.
Our theme this year we are hoping, will be a simple regen receiver. This has still to be finalised, as is the cost, but it will be inexpensive. Bring your own tools if you can.
Book your place with G3RJV or G3MFJ as below.

- **Show and Tell**
  Bring along your favourite QRP projects – show them off and tell us about them. Swap ideas.

- **The Buffet Supper.** There will be a buffet supper on Friday evening as last year. We will make a modest charge for this. On the Saturday, we suggest that those still present eat at the on-site restaurant and there will be free tea and coffee in the meeting room

If you are interested in being part of the Constructor's Evening let George, G3RJV, **(g3rjv@gqrp.co.uk)** or Graham, G3MFJ, **(g3mfj@gqrp.com)** know (postal addresses are also in SPRAT).

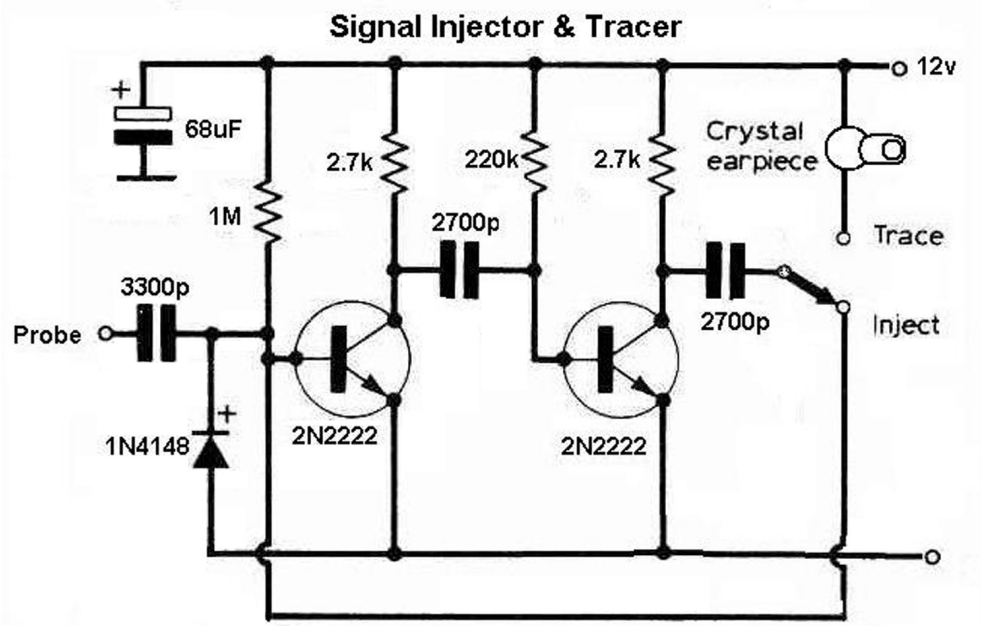
Please note the club has booked every room in the hotel above. There may be limited spare rooms. Please contact Graham, G3MFJ (not the hotel) to check availability.

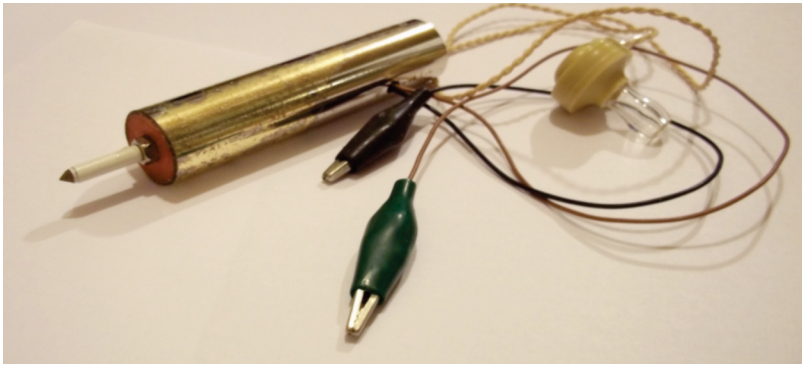
WIFB MEMORIAL ENTRY

Signal Injector and Tracer

Peter Howard, G4UMB, 63 West Bradford Rd Clitheroe Lancs BB7 3JD

Here is a project which can be made in a weekend and is useful for testing projects or general fault finding without resorting to expensive instruments. The tracer is basically a two transistor amplifier with a diode detector. The injector is a multivibrator oscillator that generates a signal that is rich in harmonics. I saw a circuit similar to this many years ago in a Practical Wireless Take 20 feature; but that circuit would deafen you on inject if you didn't remove the earpiece!. The case is a piece of 20mm diameter wardrobe clothes rail. It can simply be made only as an injector by deleting the earpiece, switch and diode.





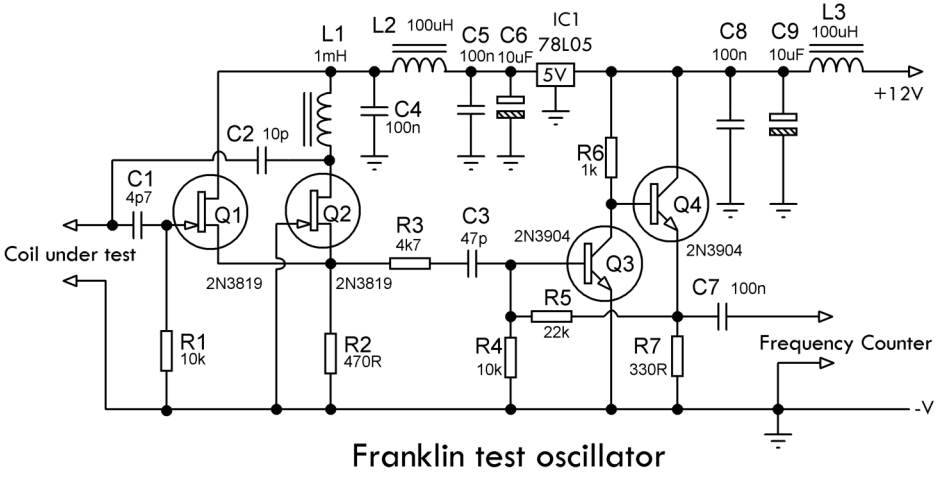
Meet the Ossybox

David Smith. G4COE davecoe@blueyonder.co.uk

A test oscillator based on the Franklin, the article finishes with just using the buffer as a buffer amplifier or a complete vfo with a tuned circuit of one's choice..

An Ossybox is a test oscillator used for checking coils. I use a dip oscillator also known as a Grid Dip Oscillator from the valve era, a dipper can use transistors or valves, this would get me in the ball park, I wanted greater accuracy so I built a Franklin circuit because of it's low capacitance loading on the test coil this not only gets me in the ball park it puts me right on the penalty spot …. no more adding or removing turns or soldering and unsoldering.

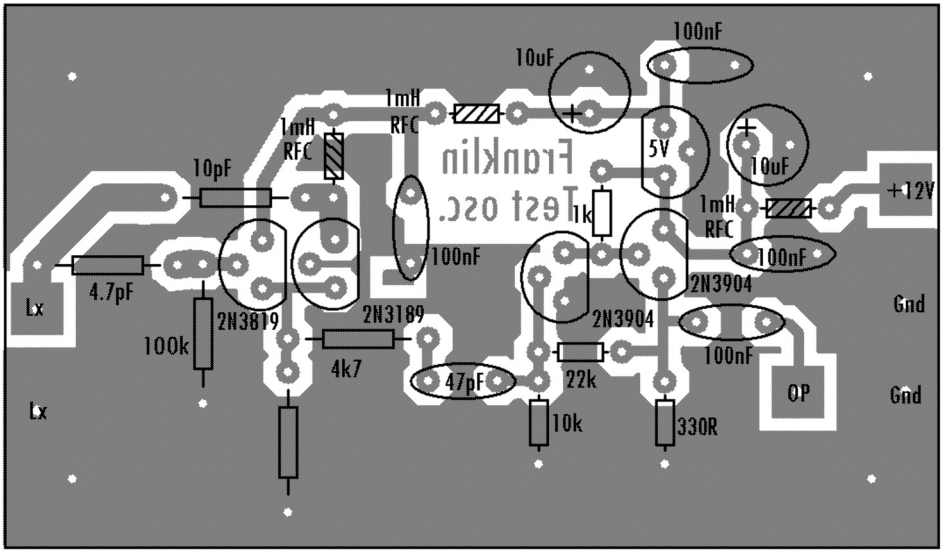
Although 12V is shown there is no reason why one can't use a 9V battery because the oscillator runs from a 5V stabilized supply, either external or internal power sources can be used if a changeover switch is added. The reason a buffer is used is so I can connect a frequency counter without causing its frequency shifting, you could even connect a length of wire instead for loose coupling purposes into a receiver.



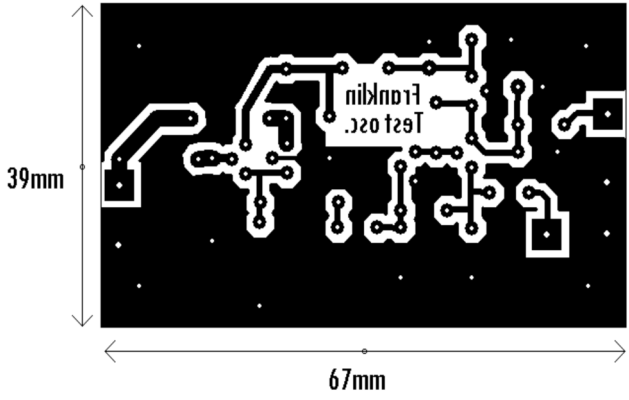
Franklin test oscillator

Its construction is not critical but wiring and rigidity should be considered and leads kept as short as possible, dead bug, PCB construction is up to you, a metal box should obviously be used with suitable connections for the coil or tuned circuit under test.

The buffer including R3 and C3 onwards can be used in any oscillator or VFO circuits wherever a buffer amplifier is required, obviously the regulator and oscillator components are not required - how about adding your own coil and tuning capacitor for a VFO? There three articles in one!



Layout and PCB



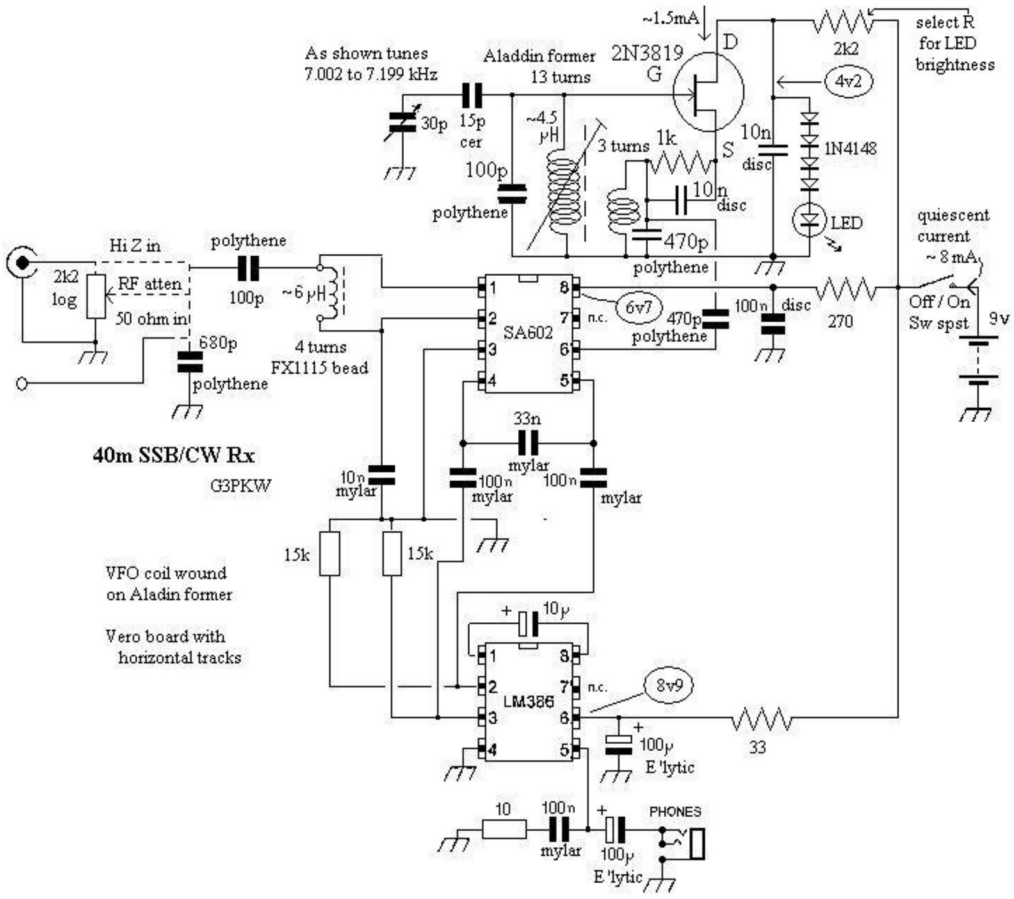
40m SSB/CW Receiver.

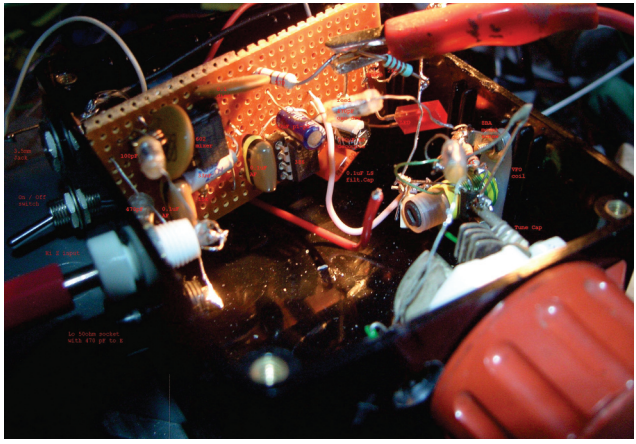
Andy Choraffa, G3PKW, 1 Windsor Rd. Roby, Liverpool. L36 4NG

I decided to build a small pocket rx which I could take on holiday. Light weight and small for air flight and cover 40m and maybe 80m later. I wanted it to be as economical as possible with a small 9v battery. I decided to build a circuit similar to the GQRP club 'Sudden' Rx. I wanted it to be easy to reproduce with common available parts and on Vero-board. I didn't want to start designing a PCB with all the etching procedure. Vero board proved to be quite adequate and no track leakage problems were evident. Initially I changed a few component values from the original design to optimise performance.

Component values for both the 602 Gilbert cell balanced mixer and the 386 AF amp were decided on from my experience and calculations around the original data. These are slightly different from the original GQRP club design. The oscillator circuit in the SA602 was designed for PMR use with a xtal and works well. The design impedances around the SA602 are low as is evident in the 'Sudden' rx. Note the 2 uH as used for the osc coil design, yet 6 uH for the input coil. Both these tuned circuits are operating at 7 megs. I built a VFO around the SA602 but found it was not very reliable in starting. I think this was due to these low impedances which the chip was originally designed around. As I experimented with a xtal which worked well. I could have continued to wrestle building an osc using the SA602. But its lack of purity encouraged me to build a separate FET osc. The spectral purity of the original osc design I found to be poor The 3rd harmonic at 21 megs was only about 12 dB below the 7 meg wanted. It also had some second harmonic at 14meg., about 25 dB down. In PMR use with a xtal this wouldn't be evident or a problem As the xtal osc in those applications is typically an overtone variety. I built a separate FET osc and it started very well with a good clean spectrum. It was very clean with all harmonics at least forty dB down. The FET only needed 1 and half mA at about 4v to operate without any problems. I stabilised the osc supply with a couple of 4148's plus the red Indicator LED. The 2k2 resistor was the highest value to maintain enough LED brightness to be visible. To make the LED brighter a lower value will be needed. The 4148's were in plentiful supply and cheap, but I could have used a single 3v zener in its place. The 602 only needs about 6v at two and a half mA so was fed via a 270 ohm and suitably decoupled. The 386 draws a quiescent three and a half mA so the total drain from the PP3 battery is about 8 mA. The picture of the original prototype shows the rats nest construction after many mods. The FET osc was built suspended around the osc coil assembly as shown The Aladdin former had the thirteen turns held firm by small pieces of heat shrink sleeve offcuts. Then the three turn link was loosely wound over the top. The 15 puff ceramic from the 30 puff air spaced variable gave nice coverage of 40m over the full 180 degrees. This enabled tuning CW / SSB without reduction drive, possible, and just a large red knob sufficed.

*Note the oscillator coil could probably be replaced by a Spectrum 5u3L coil.



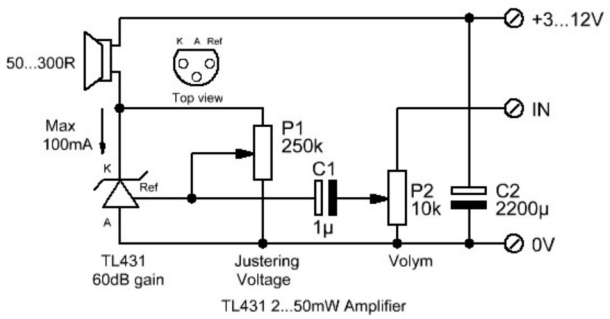


Inside the receiver.

Audio Amplifier using the TL431

Johnny Apell SM7UCZ, Ekedalsvägen 11, S-373 00 Jämjö. Sweden

The TL431 is an “adjustable zener”. After more searching on the net I found this little three-leg device could be used as an audio amp with 60dB gain.
This has to be tested!



TL431 2...50mW Amplifier

Power with 50R speaker

Volt	Vout p-p	Power mW	Input mV	
3.0V	0.9V	2	2.5	
4.5V	2.25V	13	2.5	
6.0V	3.6V	32	4.0	
9.0V	4V	50	4.0	Max current
12.0V	4V	50	4.0	Max current

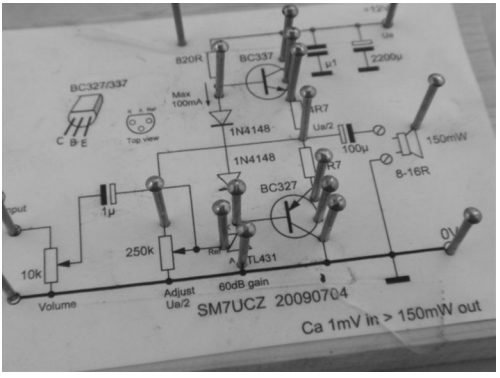
Most circuits used a high ohm speaker in class A, with high power consumption ....50....80mA.
Max 100mA.

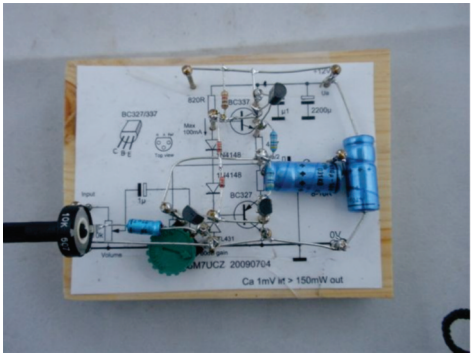
I tested one circuit with complementary transistors in class B.

Now the idle current was about 8mA and full power about 70mA with 150mW out from 1mV in.

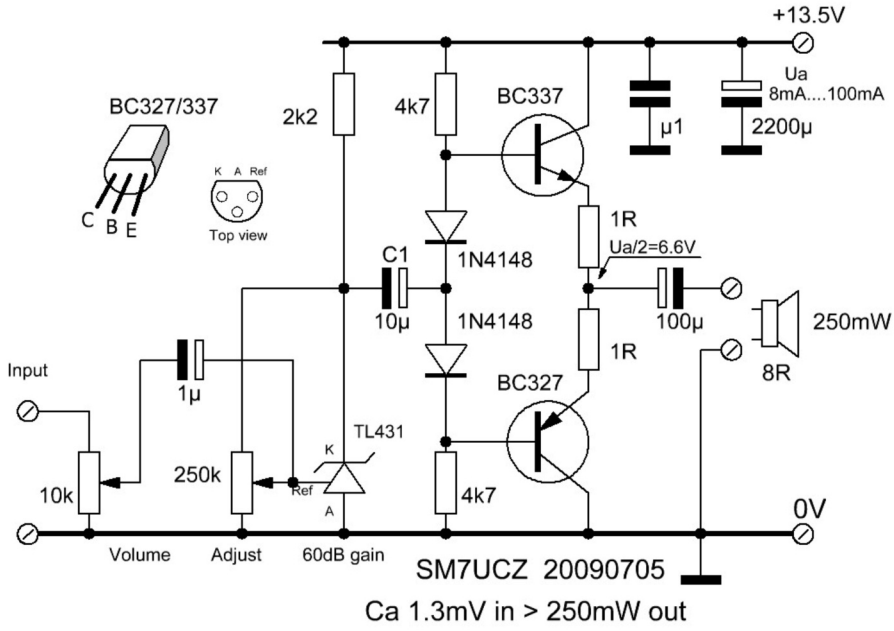
Using a true complementary pair gave a better performance.

1.3mV in gave 250mW out at 92mA in 8 ohm speaker.





I tested the circuit using brass nails and a copy of the circuit pasted on to a wooden board



FOR TRADE: S&S-Engineering TAC-1 for 80m incl. manual, I would like to trade it for an ARK-30 incl. manual. Andy DH5AK, phone: ++49-431-89353, dh5ak@arcor.de

FOR SALE: MLX board and paperwork. White Rose project selection of boards (Rx and Tx), some with components. W3NQN passive audio CW filter. Small number of Denco coils. Some valve holders (inc for 807) and anode connectors. 9 MHz filters 2 of them. 50 MHz receive converter. Some small project kits. A job lot. All for a donation to charity! To be collected or maybe meet somewhere near the M62.
G4HYY - David - East Yorkshire - 01964 612998

Chinese X1M QRP Transceiver

Steve Farthing G0XAR, Jan Verduyn G5BBL and Alan Rowe M0PUB

In 2013 a diminutive Chinese made QRP transceiver, the X1-M was announced in the USA. At the bargain price of around $250 the radio boasted an output of 5 watts CW or SSB on the 80, 40, 20, 15 and 10 meter bands, general coverage receive and, the option of transmitting out of band without a low pass filter. All this in a sturdy case measuring 16x10x4.5 cm and weighing in at 600 grams, including a serial interface for computer control and a microphone, it just had to be the bargain of the year. So, as we could not buy one in the UK we ordered one via a fellow amateur in the USA. However this was not without problems as thanks to an incompetent courier who did not deliver it and sent it back, various bouts of illness and other things it was not until a year later that it arrived.

So having had the radio for a few months now this is our "warts and all" experience of the X1M, serial number 59, one of the first Chinese HF transceivers to come to the Amateur market.

Our first impressions were not very encouraging. The case had clearly been drilled by hand and the packaging was inadequate. the 9 pin computer interface cable, required for computer control and firmware upgrades had been damaged during transit. The manual was a photocopy. We felt that the radio had been home made rather than factory built. Also during testing we discovered some poor soldering on the microphone and the front panel buttons. But we are QRPers well used to making our own radios and we enjoy a challenge. And most of our radios have been "home built"!

Operating the radio, in common with a lot of more expensive sets, requires the use of front panel controls which talk to a microprocessor with readout on a "white on black, 30mm x 16mm LCD screen, which while small and crowded with information, was perfectly readable to all of us, two of who are on the wrong side of 60. However if you have a vision impairment this might not be the radio for you. However you do have the option of operating the radio entirely under computer control should you wish,

The front panel has an AF gain control, and a tuning knob whose rate can be varied from 1Hz to 10 MHz by toggling front panel buttons. The LCD displays all the settings such as mode, frequency, RIT which can be changed by using the front panel buttons one of which can lock the settings.

There is a 3.5mm socket at the front for the supplied microphone, on the back there is a BNC socket for the aerial, our radio came with a slightly deformed one but it worked. Also 3.5 mm sockets for a key, and headphones, an 9 pin CAT connector for computer control and firmware upgrades, and a 5.5 x 2.1 mm coaxial power connector (the one from an Elecraft K2 fits). Internally there are presets for CW sidetone level and RF output for SSB.

The RX is quite sensitive. There is no AGC as standard however there is a kit available to add this. The provision of AGC is a matter of personal taste, and we did not see the lack of it to be a major disadvantage having grown up on radios without it.

ON CW there is no way of altering output power, with SSB it is possible to reduce power by lowering your voice level or distance from the microphone. As there is no ALC or AF limiting provided it is a case of “suck it and see” with your voice level and distance from the mic.

Frequency readout is pretty accurate and SSB selectivity is adequate however strong signals will be heard when tuned to the unwanted sideband.

Jan and Alan carried out some performance testing with the following results :-

Band	Sensitivity uV 10dB Sinad preamp on	Preamp off	RF Output Power Watt CW	Current Consumption Amps
1.820	0.27	0.72	Rx Only	RX 0.51/0.47
3.600	0.27	0.73	5.5	1.46
7.100	0.35	0.8	5.4	1.37
10.100	0.28	0.51	RX Only	RX 0.51/0.47
14.100	0.3	0.67	4.0	1.3
18.100	0.25	0.47	RX Only	RX 0.51/0.47
21.100	0.25	0.6	3.8	1.25
25.100	0.27	0.6	RX Only	RX 0.51/0.47
28.100	0.45	1.0	2.7	1.1

We also discovered that it is vital to keep the firmware (the program that runs in the microprocessor inside the X1-M) up to date. Ours came with a very early version which had some problems with the internal keyer, dashes were only 2 times the dot length instead of three. However later versions of the firmware solved this problem. To update the firmware you need to buy the optional cable and, unless your computer has a serial port, a USB to serial convertor. EBay is your friend here.

After a few months of evaluation and some QSO's in SSB and CW what do we think about this tiny newcomer? Initially there were some teething troubles. but nothing we could not overcome and given the price the radio is pretty good value. It performs acceptably and is reliable. The internal keyed is tricky to use because of varying latency but there is no problem for the straight key operator. The bandwidth in CW mode is considerably wider than a more expensive radio, say the Elecraft K2 at identical output levels, because there is no shaping of the characters whatsoever so keyclicks are clearly audible +/- 6 kHz away from the TX frequency.

Transmission outside of the ham bands, and in the WARC bands is possible, however there is no LPF provision for these frequencies. So if you want to do this you have to make your own. Being able to transmit outside a legally authorised band is a thorny subject. But it could be useful for transvertor users. And also the LOWFER community as coverage starts at 0.1 MHz.

We are concerned at the high current consumption on receive/standby. Half an ampere will soon drain those batteries so we would not recommend it for hikers or SOTA use.

Time moves on and the X1M has been subject to an upgrade and improvement. It is now replaced by the X1M platinum edition and is carried by some suppliers in Europe. As there is no EU type approval this might be in kit form, best to check before hand.

Lastly we would like to say thanks to Paul Maciel AK1P for helping us get the set, Fred Lesnick, VE3FAL, Paul Ross W3FIS and Charlie Vest W5COV for the English User Guide. Members of the Yahoo X1M user group who have answered our questions and been responsible for the improvement of the radio, especially with the firmware.

References :-

1. X1M User manual by VE3FAZ, W3FIS and W5COV
   http://www.qsl.net/ea3gcy/x1m_archivos/X1M%20manual%20english.pdf
2. The X1M_QRP-Transceiver newsgroup at yahoo.com for user experience, schematics, AGC kit info and firmware upgrade files

Awards for Club Officers

George Dobbs, G3RJV, (left hand picture) the G QRP Club founder and Hon. Secretary was awarded the prestigious RSGB Calcutta Key for work associated with international friendship through amateur radio.

Graham Firth, G3MFJ, received the Don Cameron award for his contribution to low power radio communication. Graham is the treasurer of the G QRP Club and is well known for running a specialist sales page in the club journal SPRAT seeking out difficult to source electronic components for the construction of QRP equipment. The trophy is a NorCal 40 metre transceiver sprayed gold; a working QRP radio.

Left picture – the Norcal 40 presented as the Don Cameron (G4STT) trophy.

At the Dayton Hamvention in May, G3RJV received two more awards; The Dayton Amateur Radio Association plaque for Technical Excellence “helping many radio amateurs build their equipment through the art of self-learning and simple construction projects”.
G3RJV also received another glass plaque from the American Amateur Radio Club International recognizing “over 40 years of Exemplary service to QRP”.

The Westminster Goldmine

Mike Rathbone, G3ZII) (mikerathbone@mail.com)

As a follow-up to the piece in Sprat 147 by Geoff, G3YVF may I present the 'Westminster Gold mine. The 'Wessie' was popular in the past but being a rockbound VHF AM rig it is not of much practical use these days, though I keep one crystalled up on 70.26 for sheer nostalgia. They often turn up for sale cheaply at rallies and contain quite a lot of useful parts. The set is made up from separate 'building blocks', some of which can be used on their own for other purposes.

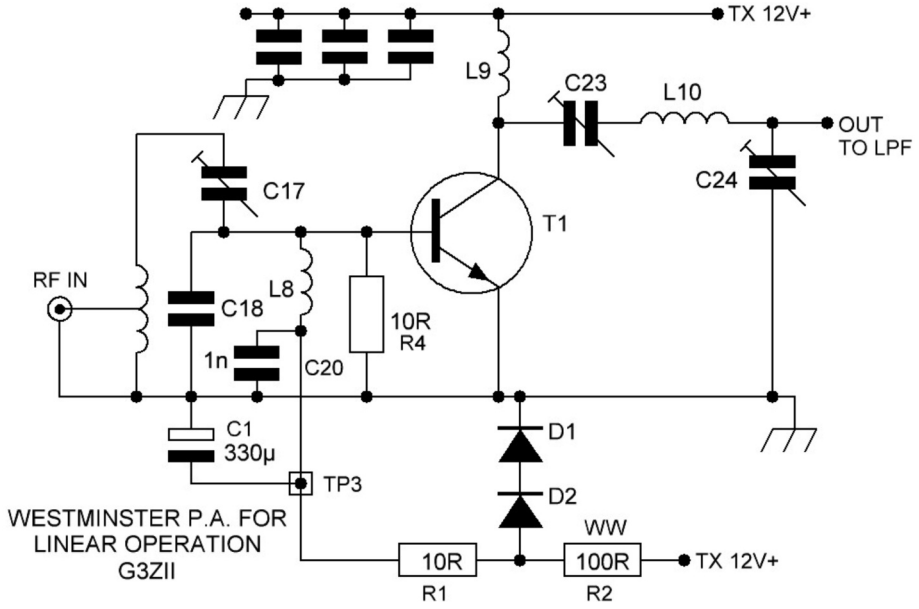
The RX second conversion oscillator board is a Colpitts circuit which will fire up fundamental crystals between 2 and 20 plus MHz. The 39pf cap in series with the crystal may need tweaking to net the frequency and the output will need an isolating capacitor as it is direct from the transistor emitter. There are two identical TX and RX oscillators; (more on a multi-channel set) These will work with overtone Crystals between about 29-45 MHz. The RF boards have lots of coil formers which could be re-wound, there are Audio boards, filters and lots of small value mica and ceramic capacitors.

HARDWARE.

There are lots of useful bits for mechanical construction as well. Plenty of bright finished short 6BA machine screws, and brass mounting pillars. There are pressed into the chassis plate but can be drilled out and the rivet end can be filed flat. The thread extends right through so they will take a screw from either end.

USE AS A 70 MHz TRANSVERTER. (Low band unit)
Some time ago I completed a PW 'MEON' 4 meter transverter unit.
This is a single board comprising the RX circuit and TX mixer and amp' with a TX output of half a watt. I removed all the original wessie circuit except for the power wiring, the power switch and the P.A. board. I also left the output filter, antenna relay and socket in situ. The Meon was mounted under the chassis on the opposite side from the PA to Provide isolation. ransmit drive on 28MHz comes from the low level output of my FT101ZD, only a few milliwatts are needed. I also fitted a power-switching relay wired to the 101s PTT line. Being for AM the PA works in class C so needs 'linearising' for SSB use.

The circuit diagram shows how this can be achieved.
First of all, remove D4, R5 and C16; this isolates the Final transistor from the rest of the circuit. D5 is removed and L8, which is a small choke wound on a ferrite bead is put in its place. R4 is replaced with a 10-Ohm resistor. TP3 can now be used to feed in an external bias supply. (See circuit diagram)



A simple low resistance bias source is provided by R2, a 100 ohm WW resistor feeding two 1N4007 diodes in series. This generates about 1v2 which is fed by R1 to the BLY83 base circuit. The bias is de-coupled at rf by L8 and C20 and at audio by C1.
C16 which feeds the signal from the original circuit is removed and the new RF input goes to a tapping on L7. I used a length of mini co-ax connected to a point three turns up from the earth end. The screen being earthed to the ground plane as near as possible to L7.

The bias circuit is basic and probably a voltage regulator would be a bit more elegant But it seems to do the job. With no drive I get about 40 mA quiescent current and it increases to about 800 mA on full output. The quiescent current does drift up a bit as the P.A. transistor warms up but so far the unit has survived a test of several minutes 'key down' supplying just over 6 Watts carrier into a dummy load and speech duty cycle is of course much lower.

I estimate I am getting about 5 Watts peak out on SSB so it's QRP. OK George?
It is best to peak L7 first with a wave-meter or G.D.O. held near it then applying some carrier drive without the 12 V supply connected to the P.A.

The 12V TX line can then be connected and the output tuning peaked up.
The power output should increase smoothly with the state of the tuning and the carrier input level, any sudden 'jumps' probably indicate instability.

We did get quite a bit of that while trying various ideas but the configuration shown here seems to behave itself.

ON THE AIR.

As luck would have it there was a bit of 'Es' about when I first went on the air and I just managed to catch an EA5 and exchange reports before he dived into the noise.

A few minutes later I hooked up with a fairly local station who gave me a good report on signal strength and speech quality. These contacts being on a 3 element beam. 70MHz is being used by an increasing number of EU stations and as there is very little Commercial equipment available for it you can get about on QRP without competing With high power stations as one does on 50MHz.

Stop Press News.
I have just given this rig a good work-out in the 70MHz trophy contest today, 21/7. Worked stations from Scotland to the Isle of Wight, plus a couple of Italians on spE Not bad for 5 Watts from a QTH almost zero feet asl.

Transformers for QRP Projects

Ken Maxted GM4JMU

The following may be useful to members.
CPC (Farnell) stock small audio transformers at very reasonable prices.
I have used the 600ohm in/out for audio isolation but there are interstage types 10000 ohms in /out and 10000 ohms to 2000 ohm step downs with centre taps.

These would be great for receiver designs that use "driver" transformers, which are getting more difficult to source- even from old radios. The devices are good quality and have pin spacings similar, if not identical to many of the older transistor amplifier transformers. CPC postage is very reasonable (I bought everything I needed for a PSK31 isolation interface, including opto-isolators and jack sockets, for around £13.)

Here is a link to the catalogue section:
http://cpc.farnell.com/triad-magnetics/ty-145p/transformer-audio-0-1w/dp/TF01380 (£2.79). I have attached the data sheet covering the range available, as a PDF (the one on the web is nearly illegible).

When did you last write something for SPRAT? It doesn't have to be high literature – Well labelled drawings can form the basis with a brief description and we can tidy it up for publication.

More Homemade Panel Tips

Bernie Wright, G4HJW. <bernie@earf.co.uk>

I enjoyed reading David's (G4COE) short article in SPRAT 152 on producing home-made panel artwork. Today, anyone with a PC and inkjet printer can produce first rate panels and with everyday materials, as David has shown. Another method that others may be interested in is to use inkjet transparency sheets, and reverse print the required design. A spray coat of silver paint not only seals-in the water based ink, but also results in a really even background - however bad a spray-painter you may be!. Double sided sticky film can then be applied the painted side of the transparency. The result looks really slick - but perhaps a little too shiny for a front panel. Even this can be resolved by applying a sticky-back thin matt plastic sheet to the front - material of this sort is available via ebay.

Actually, there is a made-for-purpose matt finish inkjet printable laminate on the market. In use, it looks identical to the finish that you regularly see on products like Tektronix test equipment and most zerox machines, but unfortunately I've the lost the details of that and cannot find it either on ebay or Google, which is a shame, having used up all the small amount that I had. If I remember correctly, it was not supplied in A4 size but in large rolls, which may explain its apparent non-appearance on the surplus market. If any reader is familiar with this material, I would be very pleased to be reminded of what it was!

FOR TRADE: S&S-Engineering TAC-1 for 80m incl. manual, I would like to trade it for an ARK-30 incl. manual. Andy DH5AK, phone: ++49-431-89353, dh5ak@arcor.de

FOR SALE: MLX board and paperwork. White Rose project selection of boards (Rx and Tx), some with components. W3NQN passive audio CW filter. Small number of Denco coils. Some valve holders (inc for 807) and anode connectors. 9 MHz filters 2 of them. 50 MHz receive converter. Some small project kits. A job lot. All for a donation to charity! To be collected or maybe meet somewhere near the M62.
G4HYY - David - East Yorkshire - 01964 612998

TRADE or SWAP- Heathkit Mohican + Cct.ect.(GWO) Also Australian A510, HF Manpack+Full Kit. I am looking for a WS.38.mk2 but also any other WW2 "manpacks" W.H.Y.? I am in South Derbyshire, can travel,—-Colin Tel. 01332 700222
e-mail= ccb.99@talktalk.net

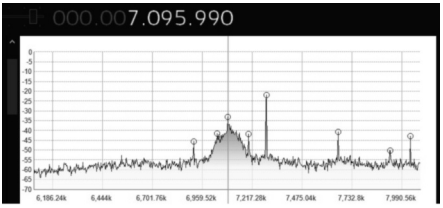
That RTL2832U R820T dongle again.

Tony G4WIF

In the Spring 2015 Sprat Ken G4IIB started this TV dongle madness with a brilliant article showing a simple mod which allowed a cheap USB TV dongle to work on the HF bands.

Without modification the performance fell off below 24MHz. However with the modification, and the use of one of the free software defined radio applications, we can have an all bands radio covering from medium wave up to around 1.7 GHz.

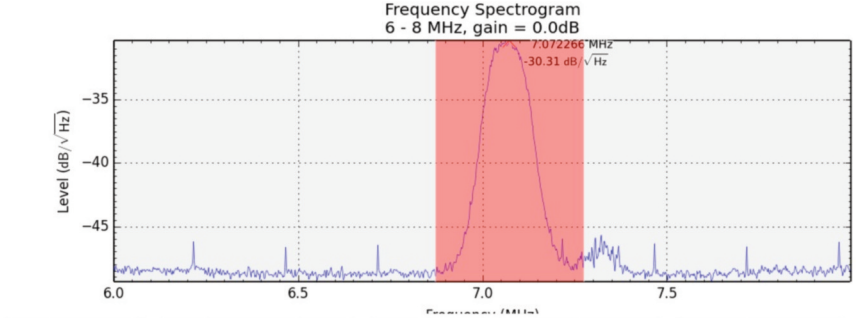
In the same Sprat I wrote how you could use this setup with a homebrew noise generator to get a feel for whether band pass filters etc were working or not. The photo to the right shows just that using the "SDR Sharp" receiving software.



I began to investigate what other test software might be around to use with the dongle and found an excellent free application called "RTLSDR Scanner". The only problem being that I couldn't find a way to use it at HF frequencies using Ken's modification.

With a birthday coming up I treated myself to an HF to VHF converter which is sold specifically for use with these TV dongles. It is called the "Ham it up convertor" from a company called "NooElec". You can buy it through Amazon or EBay for around £35 and it is worth every penny because now HF performance with the dongle is very impressive. For a total outlay of £45 (including the dongle) you can now have a great software defined radio receiver for a price that we wouldn't have thought possible a few years ago.

Using my wide band noise generator I injected a signal into a band pass filter for 40 Metres and scanned it on the new dongle/NooElec converter combination with the RTLSDR Scanner software. This is the test result - which is a great deal improved in terms of information than my original test shown in the Spring Sprat 2015.

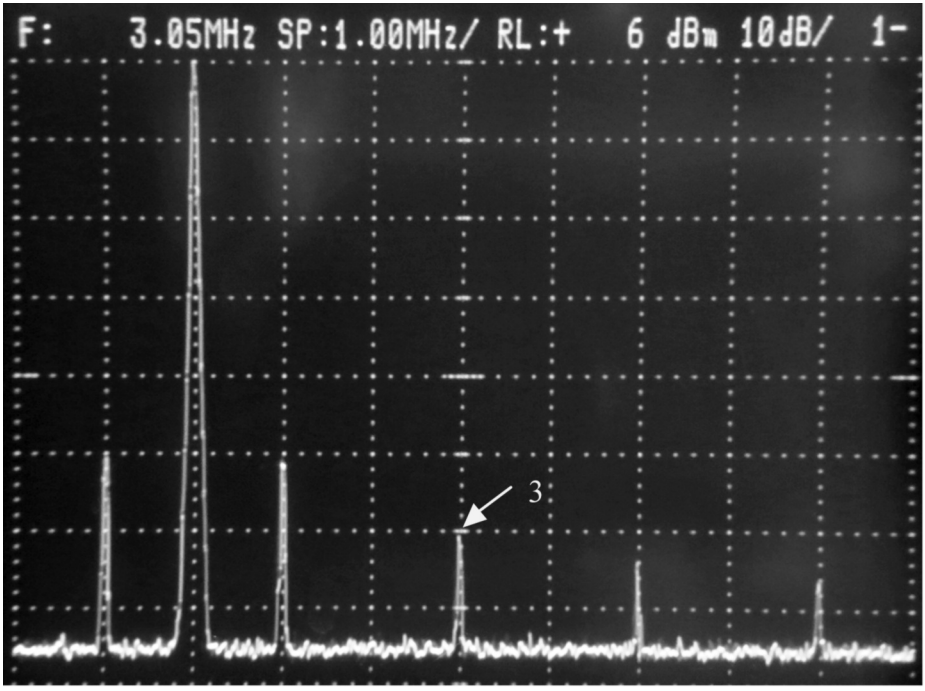


F Start	6.873047	P Min	6.873047	-48.96	Mean	-36.14	-3dB Start	7.019531	OBW Start	6.974609
F End	7.275391	P Max	7.072266	-30.31	GMean	-41.11	-3dB End	7.117188	OBW End	7.160156
F Delta	0.402344	P Delta	0.199219	18.65	Flatness	0.3182	-3dB Delta	0.097656	OBW Delta	0.185547

Now as I wrote previously, I am not claiming that we have a spectrum analyser with tracking generator here and the accuracy of the dB markings may not be massively accurate. However, if you wanted to build a filter from one of the many published designs, and needed to check that it was actually working where it was supposed to, you would get a pretty good indication plus some idea of the bandwidth. Much better at least than you would if you had no test equipment.

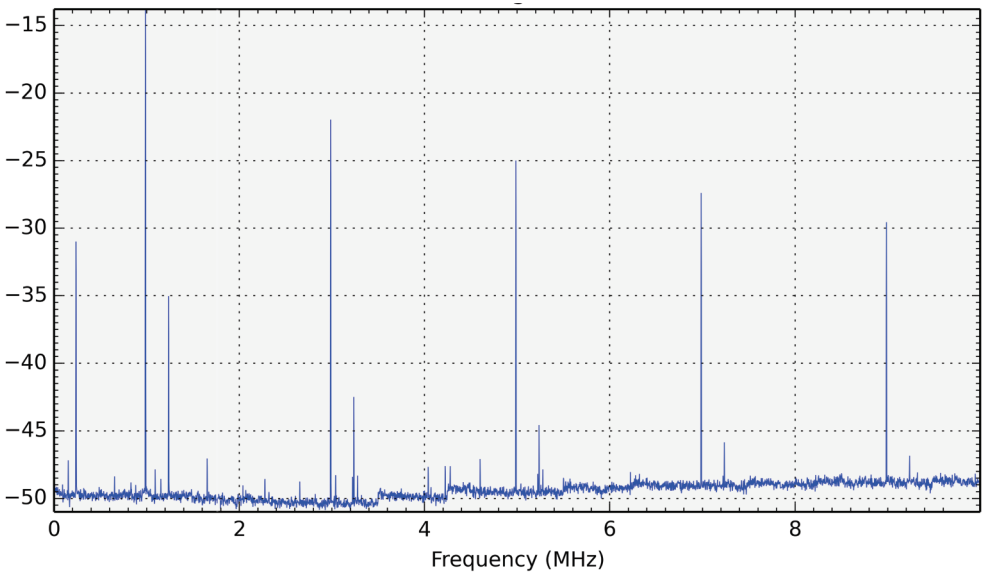
The NooElec converter is well designed and has some good filtering built in for HF reception, but for filter testing using "RTLSDR Scanner" perhaps something simpler, based on an NE602 would serve?

Another experiment I tried was to inject a 1 MHz square wave into the setup and compare it to my spectrum analyser using 40dB of attenuation (in both tests) so as not to overload the converter front end.



[Spectrum Analyser Snapshot]

At the centre frequency of the left hand photo the harmonic at 3 MHz is about 10dB down on the fundamental (each division being 10dB).



[RTLSDR Scanner Snapshot].

In the RTLSDR Scanner photo you can see that the 3 MHz harmonic is about 9dB down. There is a delightful American expression, “that’s close enough for government work”.

You will observe that with RTLSDR Scanner you can get some artefacts such as those shown at 0.15 MHz above each harmonic. I think we can make some allowances for inexpensive hardware and for software that is completely free. Some of the “sproggies” I’ve seen are due to radiated interference from the computers own screen and I’ve had to turn it off while RTLSDR Scanner is sweeping.

With care this setup can show us a little more information about what is going on in our radios and at a great price.

Finally this setup will also allow reception of all kinds of data modes and I have placed a longer description of how to achieve that on the “Sprat” page on the club website. I will also show some more screenshots of some filters I’ve tested there.

Web links: eartoearoak.com/software/rtlsdr-scanner
www.nooelec.com and www.gqrp.com

Component Tester ID10

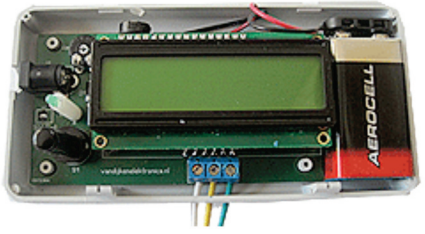
Aren van Waarde, Boslaan 62, 9801HH Zuidhorn, Netherlands

In recent years I have built a few measuring instruments from kits. The last one which I purchased (and my favourite) is the Component Tester ID10. This small device (131x65x25 mm) with a backlit LCD display and three wires with crocodile clips can identify the following components and perform the following measurements fully automatically:

1. Resistors 0.5 Ohm to 50 MOhm (resolution 0.1 Ohm).
2. Capacitors 30 pF to 100,000 uF (resolution 1 pF).
3. ESR (Equivalent Series Resistance) of capacitors (particularly electrolytics, resolution 0.001 Ohm).
4. Inductors 10uH to 10H.
5. Diodes: identification of cathode and anode, forward voltage drop, capacitance (for varicaps), zener voltage (to 5V only).
6. Transistors: identification, pinout, detection of NPN or PNP type and measurement of hFE.
7. FETS, MOSFETs: identification, pinout, detection of N-Channel or P-channel JFET, enhancement-mode or depletion MOSFET.
8. Thyristors, SCRs, triacs: identification, pinout.

The kit is sold with a very nice manual, a professional double-sided PCB with solder mask and position marking of components. The display contrast and the intensity of the backlight are adjustable. The tester can work on an inbuilt 9V battery or an external 5.4 to 15V DC power supply. It is protected against polarity reversal by an inbuilt Schottky diode. All parts are included (even a predrilled cabinet and a power supply plug are supplied). The price of the kit is €39.50 and it was great fun to build this versable tool!

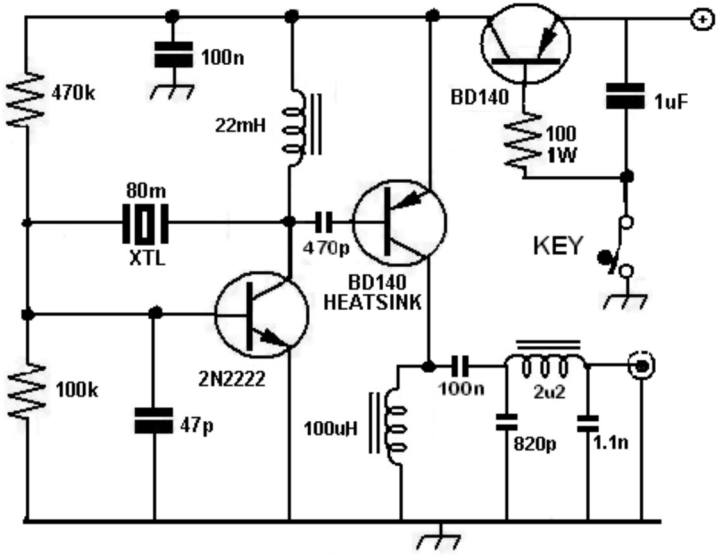
Available from:
Van Dijken Elektronica, Johan van Zwedenlaan 7A, 9744 DX Groningen, Netherlands.
www.vandijkenelektronica.nl.



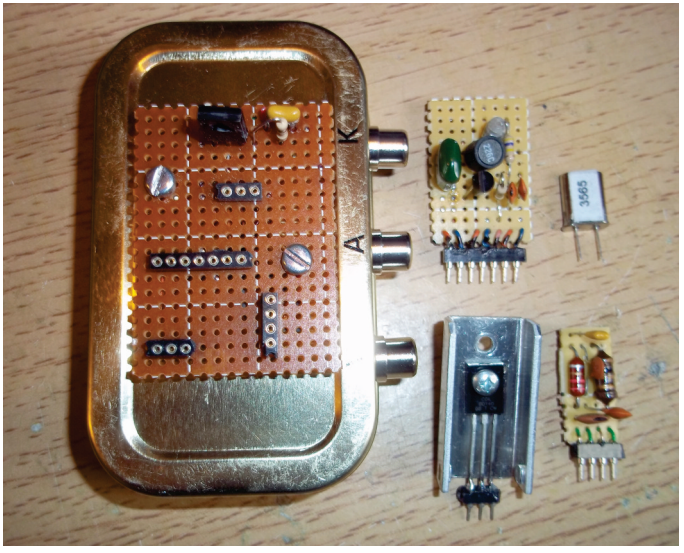
Modular Transmitter

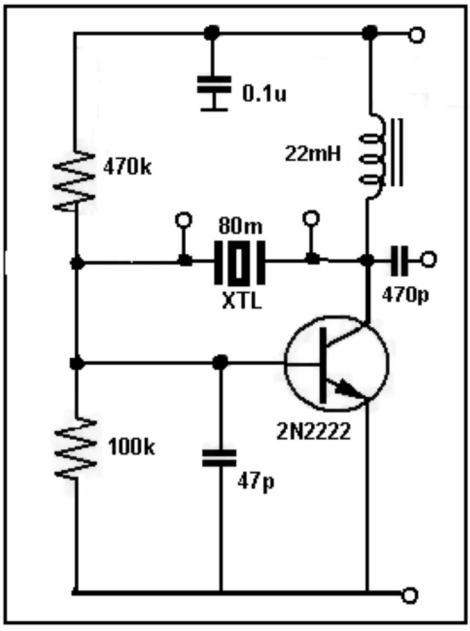
Peter Howard G4UMB 63 West Bradford Rd Waddington Lancs

This simple 80m transmitter was made to try out all the crystals I had pulled a few kHz. to other frequencies which I covered in my last article. I decided for a change to build using Plugin Boards . The plugs and sockets are cut pieces from turned pin IC sockets

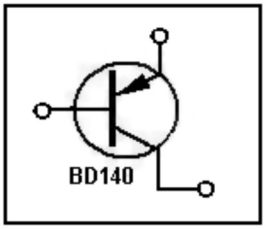


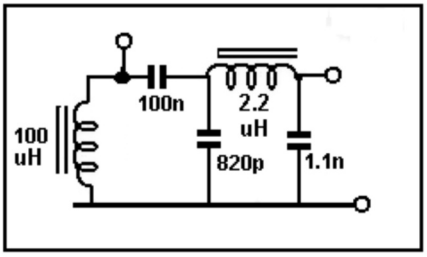
The base is a small tobacco tin. It may be practical to make the transmitter work on another band by changing the crystal and PI filter plugin board? The output power can be adjusted by altering the supply voltage. If you run it on 19v at 5W as I do sometimes using a 2W 100 ohm resistor in series with the key would be better as my quarter watt one gets too hot. Also note the BD140 needs a good heat-sink.

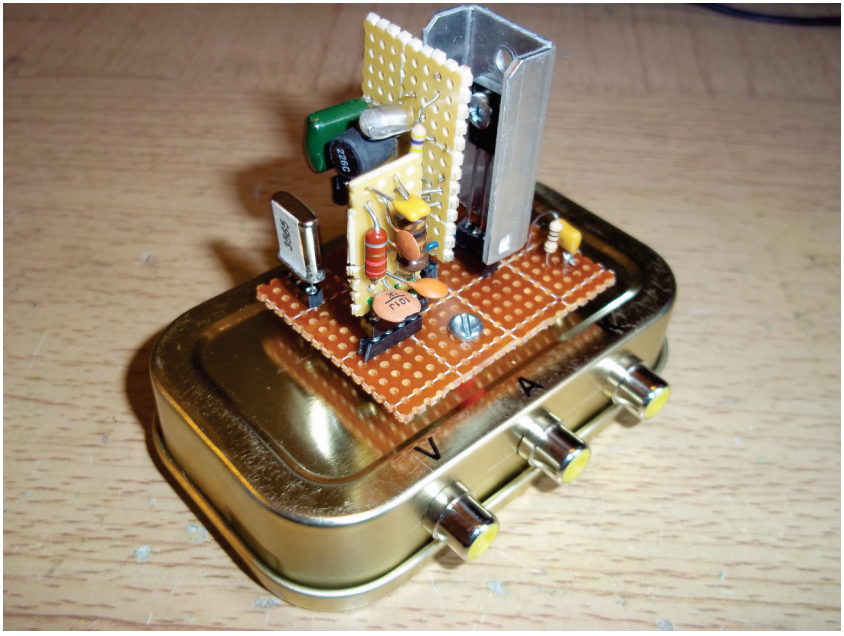




PLUGIN BOARDS





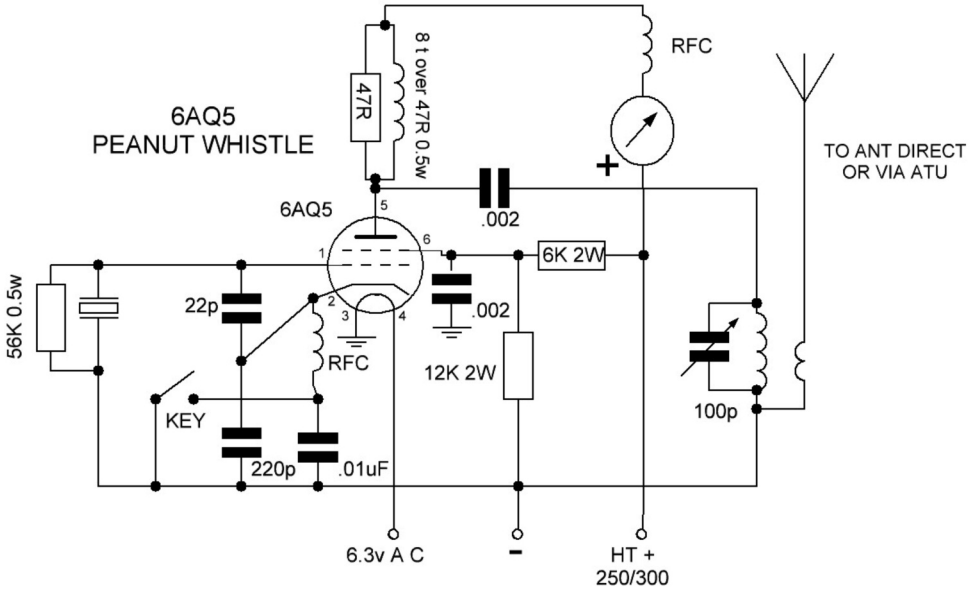


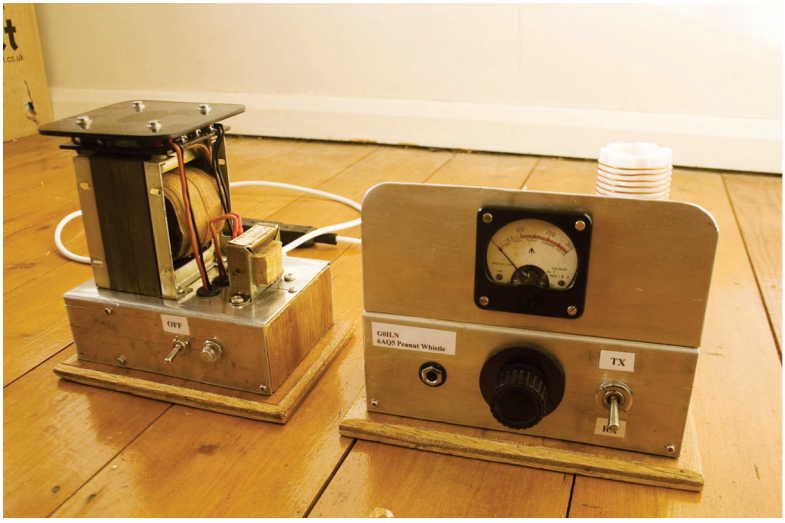
Antennas Valves and Vintage

Colin Turner G3VTT 17 Century Road Rainham
Gillingham Kent ME8 0BG g3vtt@aol.com

Welcome to the Summer AAA. How did you get on in the Valve QRP Day over Easter? Most of this month is about valve QRP construction and events. I hope to have more on antennas next time. Here's an example of how we can encourage each other. Hi Colin, I thought I would send you a few lines about my Peanut Whistle valve transmitter that Adrian G4GDR has been helping me to build. It is a single valve 80 and 40 Meter Transmitter. At the moment it is set up for 40 meter as I need a 3.560 MHz crystal to get me on to 80 Meters. It is capable of 5 watts output using a 6AQ5 valve. When it comes to valve technology I have to hold up my hands and say "I know nothing!" so poor Adrian had to tutor me every step of the way. I started with the power supply which gave out 380volts unloaded and about 320 volts when under load. For the transmitter I used club crystals and buried them inside US two pin power plugs. They do look like old fashioned crystal holders. The coils are home brew and plug into octal valve base. I must admit to being very wary when I first turned the rig on, the high voltage worried me. Especially when I read in all the books on valve equipment the pre cursor that started with the warning about high voltage can kill! Anyway after Adrian had explained to me the mysteries of tuning a valve radio the old saying tune for smoke seemed to work quite well. I did have to back off a fraction to make sure the frequency was stable. My two watt bulb would glow bright white light and then I would plug the transmitter straight into my G5RV - it seemed strange bypassing the ATU! The Peanut Whistle I am pleased to report worked perfectly first time (Most unusual for me) my output is about 4 watts Adrian who is about 153 miles away sent me a letter "Nice signal up here with a T9X note with only the slightest of chirp" and my RST was 579. I would like to take this opportunity to thank Adrian G4GDR who supplied most of the major parts including the mains transformer, valve and valve holder to name but a few of the parts. Alan G3RMZ supplied me with hard to source capacitors and building tips which I incorporated into the design and Stephen G7VFY very kindly sent me two Tupperware boxes of old style capacitors. To date

I have not made many contacts and the longest distance so far has been Ukraine. Richard **G0ILN**. *Hats off to G4GDR and G7VFY.*





Space Charge Regen Receiver Follow Up.

Peter Howard asked me about the two valve regen receiver in Sprat 162 and wondered why the grid and screen connections were reversed. The valve used is a 'Space Charge Tube' and requires some specialised circuit considerations. The positive control grid helps electrons accelerate towards the anode and the signal is applied to the screen. Peter has researched this and provides the following link which gives a fuller explanation of this technique. See the link

http://www.junkbox.com/electronics/lowvoltagetubes.shtml

Craig Douglas G0HDJ informs me he has started to make the receiver.

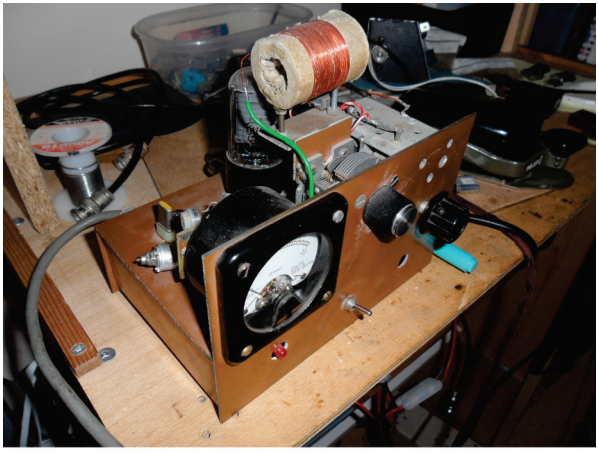
Hi Colin I thought I would attempt the build of the 12AL8 regen receiver in your Sprat 162 article. As you point out the 12AL8 is not readily available! Langrex do not have any and they were not able to locate any in the UK. E-Bay was similarly void of the valve. I did find a source in the US - www.tubedepot.com. Their price is $4.95. I ordered 2 and the postage was $9.45. They were dispatched the same day so good service. I have now managed to get the 12AL8 RX to make a recognizable noise! The circuit coil for 7MHz is 32 turns, tapped at 8 turns on a T68-2 toroid and an air tuning capacitor of about 100pfd (what I had in the 'box') with a 14pfd fine variable tuning capacitor. Also I put a 60pfd trimmer in the antenna circuit. The 47k regen control seems to work. I am certain the valve gurus can sort out a better combination of 'bits'. It is hungry for the amps – settled rate of 0.67A at 12V. It does require some cautious knob twiddling or coordination. I did find a similar broadcast regen circuit (Internet) using the 12AL8 but with 1/2 of a 12EL6 sandwiched between the two halves of the 12AL8. I hope other constructors will come up with knowledgeable and better alternatives to my effort. It works but I was not whelmed and I got the thing to work!!

April Valve QRP Day Feedback

I took part to the GQRP Valve Day for the very first time. I used my 50's vintage station a Johnson Ranger TX at 5W (1954), a Collins 75A-4 RX (1955) the key was a Vibroplex Champion USN (1952). All were repaired and put back to service by me. The antenna was an End Fed 23m (a new project with 1:50 UnUn and loading coil working from 80m to 10m, no tuner needed). Due to job time I worked just few hours then a severe thunderstorm arrived here so I went QRT. (**IK0IXI**) Hello Colin, only

three stations worked, no more time for anything else. All on a Paraset, G3VTT, G3INZ on 80 and F6CRK on 40 using 4 watts to and end fed with an auto ATU. **(G3YVF).** Thanks for organizing another enjoyable QRP Valve Day. I was actually QRV with my valve TRX for a period on each of the 4 days over Easter. I worked some of the 'usual suspects'. In all I had 23 QSO's over the break, working 14 separate stations on 4 bands: 160, 80, 60 and 40m 11 of these stations were running QRP: G3KLT ***G3MCK G3VTT*** G4HMC ***G4ICP G4XRV GW3UEP*** IK5XCT LZ2TW ***M0FMT*** ON4JXC 6 of whom (bold, italic) were also using valve equipment. 60m (5 MHz) was quite lively with more activity this time but Top Band was underutilized as usual. I'm afraid that 40m for me was a wash out as there appeared to be at least one contest going full belt with QRO stations sitting on the QRP channel as usual. My home brew regen RX isn't good enough to pick out the low power stations from amongst them. I may incorporate a small receiving loop aerial next time which will give me a chance if there's another contest running. Alternatively maybe we could pick a contest-free day - if there is such a thing ! **(G3XIZ)** *I agree Chris. Once again a contest spoilt our operating. It's time amateur radio had contest only segments in the band planning and Dxpeditions stopped using the European QRP frequency 7030 as a calling frequency.(G3VTT)* Hello Colin, What a lovely Easter weekend it was and it made my day when you came back to me. You asked for a little info for SPRAT. I built the valve 40 M TX at the end of last year and made it up as I went along. Ninety-nine percent of the parts having been used at least twice before! The circuit is pretty much standard 1960/70s stuff. The starting point was a chassis picked up at junk sale in the 1970s.It had 4 holes for valves so in went 2x EF80s, a 6BW6 and because I like the purple glow, an OA2. The other hole was fitted with a clip for a can type of electrolytic. The mains transformer that I found only gave me about 215V HT, but quite enough for QRP. The VFO got changed to a VXO as the mechanical stability was not good and also because I had one of those bad luck turns to good luck moments. The other gear that I was using was my dear old valve KW77, well over 45 years old and still going strong, a partly indoor doublet with a home built ATU, a homemade key, and some 'Dr Neaper' headphones from the 1930s. **G4AQS.** Gerald **G3MCK** supported the day by using his co/pa and homemade valve superhet working many European stations with 5

watts. **G3NKS** managed just six contacts with his 5W 6V6 CO/PA transmitter and Drake 2C receiver, all on 80m. Unfortunately he couldn't get on 40m due to a yet to be resolved problem with the transmitter. He's looking forward to the next Valve QRP event.



Just a note to say how much I enjoyed the Valve QRP day over Easter. I was looking for an excuse to use my 6V6 co/pa TX once again with club crystals 7025 and 3560. It was from a 1960's PW design. RX used was an IC703 and aerial W3DZZ. Manual aerial changeover was deployed. I first built the TX nearly 30 years ago originally on an old Pye Vanguard chassis and it still is going strong. See photo attached. I suggest we might call "CQ V" or "CQ QRP V" so we know we will be working a fellow valve station, and that we should "tune the band, low to high +/- 5kc/s of transmit frequency". This might assist with gaining QSOs for those who just can't stretch their crystals out to far enough to net onto the CQ station. (*I fully agree G3VTT)* 72/3 ***G4ICP.*** A Yugoslav Army RUP-4 four valve transmitter was used by Kare **YU7AE** to make 15 QSO's. *Finally! I am so sorry I've had to edit many of the letters and emails you have sent me but space in Sprat is rather tight. Next time I hope to have some antenna projects for you. Please keep ideas coming to me at g3vtt@aol.com.*

'Keep your nose away from that anode cap Doris!'

COMMUNICATIONS AND CONTESTS

Dom Baines, M1KTA, 34 Bury Road, Stapleford, CAMBRIDGE. CB22 5BP
m1kta@gqrp.co.uk

As I write this the second May bank holiday is almost here. I hope some managed some QRP or /P operating.

The GQRP calendar has a number of weekends of activity both contest and non contest right through to September.

Summer Sizzler
Hope everyone is looking forward to the Augsut bank holiday week when the Summer Sizzler will be taking place. Dates are the week BEFORE the bank holiday to the Monday. I am hoping many members might take part and activate the WARC bands (12m, 17m and 24m) as well as the more usual HF (20m, 30m, 40m and 80m) frequencies.

International QRP day 17th June.
See how many IARU Region 1 DXCC you can contact in a 6 hour period.
Open to all GQRP members, for the International QRP Day Plaque.
Briefly, the rules are as follows:
All authorised bands 1.8 to 28 MHz, Modes CW and SSB. Power not to exceed 5W RF O/P CW, or 10W PEP SSB. Operation for a maximum of 6 hours in not more than two periods. Stations contacted may be QRO, you do not have to have 2xqrp qso only. Contacts with any Region 1 country (normal QSO's, no rubber stamp qso please). Each Region 1 country contacted on each band scores 1 point. **Only one contact per band per DXCC is allowed, irrespective of mode. I'll go with different DXCC so G to GI or GW count!**

The total points scored is the total of IARU Region 1 countries contacted on all the bands used.

Logs should give name, call sign, address, power, equipment, and time/band for each contact. Summary to give band and overall scores. Trophy and a book token to the winner, plus runner-up certificates. Please send me your logs by 17th July, award to be made at Rishworth.

RSGB IOTA – 25th/26th July quite a few will be off to various places for this annual contest and you will see some rare and not so rare IOTA islands activated this summer. There is a QRP category to this contest which makes it interesting and it's both SSB and CW. I'm off to Sweden and will be operating /P from one of rather barren islands in EU-138 SD7B. Are you off somewhere this summer, please drop me a not or let Chris G4BUE know about it. I am sure some might also manage to operate and pick up a few

of the other GQRP awards this summer. I'm going to try from Sweden to see if I can manage the 5 continent QRP challenge from G5CL.

WAB 144MHz low power phone contest. The date this year is Saturday 5th July and it runs from 1000 to 1400 UTC. Maximum power is 10W and exchange is RS report, Serial Numer, and WAB square."
See
http://wab.intermip.net/Definitions.php
http://wab.intermip.net/Contest%20Dates.php and
http://wab.intermip.net/Contest%20Rules.php

I wonder if we will hear a small collection of qrpp operators near 7.023 using those Chinese pixies if they have not modified to 7.030?

Operating for all these activities should take place on and around the International QRP Calling Frequencies.
CW: 1843, 3560, 5262, 7030, 10116, 14060, 18096, 21060, 24906, 28060
SSB: 3690, 7090, 14285, 21285, 18130, 24950, 28360 kHz

I recommend if there are a few stations on frequency spread out a bit if you can.

Omitted from last SPRAT
G QRP Club Winter Sports
The G QRP Club Winter Sports is one of the most popular QRP operating events. Each year between Boxing Day (December 26th) and New Year's Day (January 1st) the club invites any operators to join in a QRP "QSO Party" using 5 watts of RF output or less. The operating takes place on and around the International QRP Calling Frequencies.

Thanks to all for all of the entries both online especially some DX (W3TS, DM4EA) and post entries. I'll return these to you shortly, especially those that seemed to have sent me some of the station log book pages. Please let me know if you think I have missed you.

Activity seems to have been a bit down on last year especially on 80m. There were 28 DXCC worked by everyone which was not bad for a weeks part time operating. The total was just over 1,800 qso altogether and about 300 unique calls in all. Some said activity was down on last year on LF bands but there was more activity on 30, 20, 17 and 15m. Nice to see some data mode entries. I didn't see any 4m qso, plenty of 2m FM, no 2m SSB or CW but there was some 10m AM. Thanks to all who logged me on 30m.

There were a few "hard core" qrpp entrants this year who tried with even less power 100mW, cannot mention them all but G3YPZ #5273 sent in a log showing great activity with some nice DX contest qso's, and some AM activity on 29MHz. Last years Winter Sports winner G3JNB likewise went qrpp with 200-500mW.

I noted that the bands were very busy especially on the 28th December, (same Sunday 27th last year) and especially during the OQRP contest and it was nice to see so many qrp stations working each other. I had parents staying and at a dinner there was a comment "'surely' people don't still use morse code do they?" so an immediate visit to the shack to show activity on an SDR took place, Again the advise that if the qrp CoA frequency is busy spread out a bit and a few said this worked well but was a "double edged sword" as meant they might miss some crystal bound operators. I noted a few chirping away on 7.023 probably down to those Chinese RM clones some RX for xmas. Yet again some 160m, 17m and 12m qso in the logs as well. Well done everyone who took part. Val RW3AI managed contacts with 25 different DXCC during WS, most entrants managed qso on 3 or 4 bands, the most popular bands were 40m and 80m as always. Some sent in what were their first ever entries to anything contest like. A few worked Santa Claus who was taking a break from delivering presents and spent some time at the key in at OF9X (I note G0KYA worked him and Siggi TF3CW in Iceland). I noted that 29th December saw the most 10m activity and several had QSO with stations in US. Nearly everyone stated the level of QRM from random Xmas lights had risen, I can hear the cries of bah humbug now.
The antenna that seemed to be used most this year was the G5RV not much /P this year, which was hardly surprising considering the weather. About 70% of recorded qso this time were with other G-QRP members. Some contacts were all 599 rubber stamp from a couple (who said as much) but many said the majority of QSO were 'proper contacts' catching up with old friends, some mentioned contacting people for the first time in years qrp again (G3XIZ), some logs (G0KRT and G0KGK) were complete with the exchange of real information name, qth, rig, antenna type etc some went a lot further and logged local weather reports and station details. JP F6EQO #5423 went as far as adding a small tree to the shack table and shared a photo complete with the old GQRO member handbook. There were some nice DX in the logs G0ILN #8596 worked TR8CA (Gabon), DM3EA #7843 working A61Q and CN8YR. GM4XQJ #2743 worked a series of NA stations on 20m on the evening of 27th. G5CL #10670 picked up VK2DX

I could keep going on as many added lot of extra comments. Anyway this is a hard one to judge but the entrant that wins the G4DQP Trophy this year is

Peter G3JFS #10890 with a truly amazing effort this year working all bands 80m to 10m, managed qso on every day, plenty of 2xqrp and some nice DX. Well done Peter, In his entry he let me know he set out to make sure he contacted others every day and worked with cw, ssb, rtty and psk with his FT1000 running qrp only to a very bent 100 ft long E/F wire with a remote ATU in a garden shed.

CHEMLESLY TROPHY

No entries.

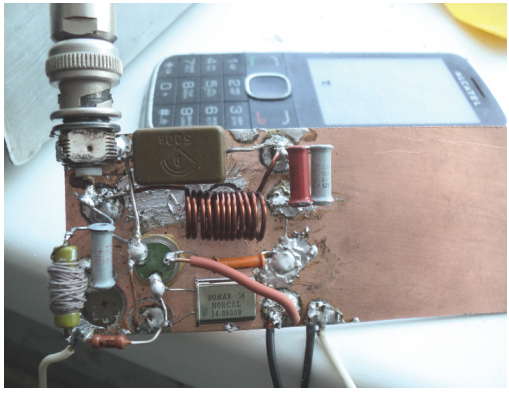
CZEBRIS Results 2015

	80m	40m	20m	Total	Station
OK1DIG	26 qso / 54 pts	28 qso / 68 pts	19 qso / 53 pts	73 qso / 175 pts	KX3, LW and windom
OK1DKR	10 qso / 22 pts	8 qso / 18 pts	3 qso / 6 pts	21 qso / 46 pts	HW-8, 2W/80 & 40, 1W 20m Sloper 80m, vertical 40m/20m
OK1CZ	0/0	4 qso / 8 pts	2 qso / 4 pts	6 qso / 22 pts	IC9100 5W Delta loop 80&40m 2el Minibeam 20m

88 Different stations in logs	
DXCC worked	9A-1, DL-12, EA-2, EW-2, F-5, G-13, GJ-1, GM-1, GU-1, I-5, OH-2, OK-12, R-6, UR-4

73! Milan, OK1DMP

Oleg RV3GM organises what he calls his "QRP Rendezvous" every Tuesday and Thursday for an hour or so at 0900z on/around 14060kHz and wonders whether GQRP might give it a mention in SPRAT. It's a QSO party (no rules/points etc) which I've joined a few times. There is always a fair bit of activity and often some interesting UA stations running QRPp rigs, sometimes from /P locations.



Peter G3XJS worked Andrez R1OA who was running 200mW from a 1 transistor Tx

Oleg's web page is: http://www.club72.su/

Logs can be sent to Oleg direct: mr72@club72.su
It is usual for operators to exchange their G QRP Club membership number when making QSO but it is not essential. Those taking part are invited to submit logs and comments to the G QRP Club Communications Manager, Dominic Baines, M1KTA, email at m1kta@gqrp.co.uk, Dom Baines, M1KTA, 34 Bury Road, Stapleford, CAMBRIDGE. CB22 5BP.

MEMBERS' NEWS

by Chris Page, G4BUE

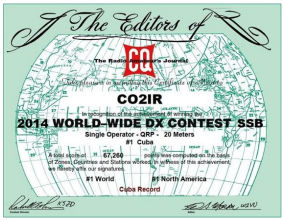
Highcroft Farmhouse, Gay Street,
Pulborough, West Sussex RH20 2HJ
E-mail: chris@g4bue.com

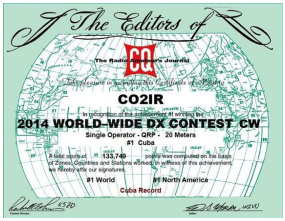
We start this time by saying congratulations to various members and first to **G3RJV** for receiving the *Technical Excellence Award* at the Dayton Hamvention in May. **G4GXL** reported the Award Committee saying there was a lot of competition in 2015 and the impact George has made to the hobby was recognised worldwide and particularly in the USA. See <http://hamvention.org/hamvention-announces-2015-award-winners/> for more information. Congratulations also to George on being awarded the RSGB's *Calcutta Cup* at the RSGB AGM on 25 April. The cup is awarded for work associated with international friendship through amateur radio. Also at the RSGB AGM, **G3MFJ** was awarded the *Don Cameron, G4STT Memorial Award* in recognition of his achievements in low power communications - congratulations Graham.

Congratulations to **GM4YLN** who was awarded the RSGB's Jock Kyle Trophy for the Scottish amateur thought to have made the best achievement for amateur radio in Scotland. Chris was presented with the Trophy on 4 April at the GMDX Convention at Stirling and is shown left holding it with his other awards. Thanks to **GM3OXX** for tipping me off about the presentation. As an aside, George was 79 in March and your scribe will be 71 next birthday; amazing how the years have flown since 1984 when I first met George when we went to the ARRL DX Convention (and ARCI QRP Convention) in Houston, Texas with **G3RJV** for our first visit to the USA! Talking of time flying, I have just realised I have been writing this column for 36 years, that's over half my life, and 144 columns since I wrote the first one way back in the 1979 edition of *SPRAT* 19!

Next we have congratulations to **EA2SN** on being invited by Professor Mediano of the University of Zaragoza in the Aragon region of Spain to attend a special Buildathon session. Master students are taking a lab-only course where the main objective is to build an ILER-40 kit. After characterising the parts, the students had to build, test and simulate each building block. They used the notes that Jon had prepared for the Buildathon at his radio club **EA2RCF**, and which are also carried by Professor Javier Sebastian, **EA1FGT**, at the University of Oviedo. The notes (in English) are at <http://iza.gandi.w>.

Congratulations to **GØFUW**, **G3VTO**, **G4YTN** and **MØTGN** who ran a very successful radio building workshop for youngsters at the Bath Royal Literary & Scientific Institution (BRLSI) on 9 May. Steve says, "Some 14 RSGB 20m PSK receiver kits were built and stations were received from all over Europe on a 16ft 'long wire'. The feedback was all positive and one young lad in particular was hooked and asked where he could go to get a licence - job done! The event was kindly sponsored by the RCF and some help from **G3MFJ** - thanks Graham". The photo above shows **G3VTO** helping two of the youngsters and is by permission of Paul Thomas, BRLSI.





Finally, congratulations to **CO2IR** for winning both the CW and SSB QRP 20m sections for Cuba in the 2014 CQWW Contest (certificates left).

Since **G3XIZ** retired from work last February he has had more time for amateur radio, but has been a bit disappointed to note the low activity during weekdays, but realises many operators still have to work for a living! Chris is keeping his regular Sunday morning skeds on MF (473.5kHz), with **G3DXZ**, **MØJXM**, **G7NKS** and **MØFMT** being regular attendees, and says callers and reports are always welcome. In order to generate more evening MF activity he plans to call for cross-band QSOs in the near future, possibly using frequencies close to the QRP 40 and 80m frequencies for call-back.

M1KTA's QSL cards for his **C5/M1KTA** 13/17 March operation (right). Dom says operating QRP from C5 created pile-ups both from AF-060 and the mainland. Apart from a bit of /P operation about Cambridge, he has been bogged down at home with builders, who have taken over the workshop for storage. Dom says it hurts a lot as he is building a rig for another member and this has stopped it again.

MØHDF updates on the **G7FEK** antenna that he installed last October with two elevated radials and a remote LDG RT-100 tuner for multiband operation. Angel says it proved to be a good companion in the CQWW CW Contest with 300 QRP QSOs and 53 DXCC on 40, 20 and15m. In January he noticed the RT-100 was struggling to tune in some bands and replaced the ground system with 12 random length wires (anything from 6.5ft to 36ft) in the ground. He also removed the balun used to feed the wires, as it had got compromised with rain water, and homebrewed an enclosure to protect the tuner and all the connectors from the rain. Angel says this new earthing arrangement seems to work better because when he got his logbook (*DXkeeper*) uploaded to *Clublog* and *LoTW* recently, he noticed he was not far from 100 QRP DXCC, having got 95/70 DXCC worked/confirmed and 280/173 band slots. Almost all of his QSOs have been on CW and recent 'catches' include 3B8, 3B9, EY, JW and JY.

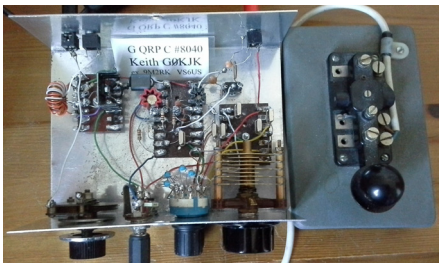
Over the past couple of years **G4AON** has been building a modular receiver based on the Hycas IF design from *QST* (right). Dave says it uses surplus 8.215MHz IF filters with a VFO based on an Si570 synthesiser kit. The transmitter uses a control board idea from the *QST* Universal QRP transmitter and also an Si570 synthesiser, and can be used with many receivers. It features a built-in keyer, side tone, VOX and can transceive using the receiver synthesiser. The transmitter produces an adjustable output up to 10W and both the transmitter and receiver cover all ten current HF bands. Full building information, including some PCB layouts, can be found on Dave's website <http://www.qsl.net/g4aon/>.

GM3VKI has now restored a Century 22 and 604 keyer (right) purchased at the Aviemore Rally, and is active on CW on 40m mostly, but says no faster than 12WPM please. Roy says, "Just such a great CW set up". Largely as a result of 'anti-luddite' pressure from **N6QW** and **G4WIF**, **N2CQR** has been working on digital circuits: AD9850, Si5351, and (thanks to *SPRAT* 162) RTL-SDR Dongle SDR receivers. Bill is building a third BITX transceiver, this one 'all band' with plug-in filters, termination insensitive amps, and an Si5351 chip for both BFO and VFO. It might even have an RTL-SDR Dongle in there for panoramic display. **G8NXD** re-

cently searched the Internet for water-slide transfers for the panels of homebrew projects and found <http://www.craftycomputerpaper.co.uk/.-Inkjet-Water-Slide-Decal-Paper_151.htm>.

MØNDE's daughter **M3SGG** was married and left home recently freeing up a room to relocate the radio shack. Nigel says, "With shorter runs of cable hopefully losses will be reduced into the copper magnetic loop built by **G3HBN** (SK) that he used to good effect from his London QTH when it was his only HF antenna at that location. On 22 February **G3XJS** QSO'd **SM7RYR** operating QRP as **D44TBR** with a KX3 at 4W and a 'simple groundplane' antenna on 12m CW. Peter was running 5W to his Hexbeam.

G3JFS suffered a heart attack at the end of February just before his 80th birthday, but made a good recovery and says all is well except that planned antenna improvements have been put on hold! Peter is currently limited to a 66ft long inverted L antenna with a SG230 Smartuner. While convalescing he had plenty of time for operating but didn't benefit much as he found conditions generally poor for QRP. However, despite the erratic propagation, he has had a lot of enjoyable two-way QRP contacts in the UK and Europe and has just submitted a QRP log for the EUCW QRS Week. The year's QRP DXCC so far is 72, 60 on CW and 40 on RTTY, with the best DX being Antarctica on CW and South Africa with RTTY.

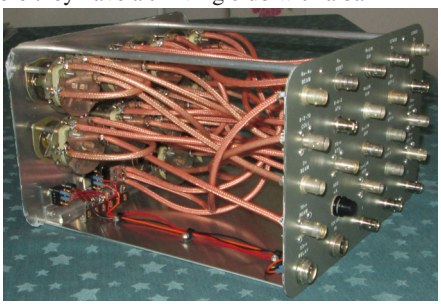


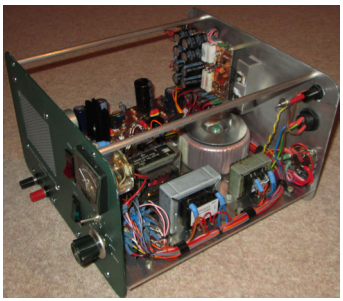
GØKJK says QRP operation never ceases to spring surprises! Keith was experimenting on his desk with a recently completed three stage transmitter (2N2222A - 2N3053 - BD139), not even screwed back into its case and covering five bands - 17, 20, 30, 40 and 60m (left). He was listening on 20m, on which early tests with experimental lengths of indoor and outdoor end-fed wire via a homebrew ATU had given him a number of contacts in Europe (best being OH and S5), when he heard **K3SEW** calling CQ without a reply. Ron CQ'd again without response and all Keith's rig had attached to it was 10ft of wire loosely draped around picture frames on the wall above, but almost in order to practice his CW rather than anything else, he gave Ron a call with just 1.8W going into the 10ft wire! To Keith's utter astonishment Ron came back with a 569 report. He says, "I nearly fell off my chair! QRP is tremendous fun and in exceptional conditions almost anything becomes possible, as all of us from time to time discover!". Keith lives in simple terraced accommodation with a small garden and station on a desk upstairs. Short antennas are almost inevitable and his experiences with just a 10ft wire prove that few if any of us QRPers need to go QRT because we cannot put up a better antenna. An unusual postcript to the QSO with **K3SEW**: Keith writes, "The netting of my TX could be improved as I discovered when I dropped my call-sign on the frequency of a HA station on 20m. Once again the antenna was the draping 10ft wire. A Swedish station must have been calling CQ on a very adjacent frequency because I heard nothing from the HA station but received a call from **SM7ZDI**, who gave me 579. We had a good QSO and I went QSY and who should immediately call the SM station but **K3SEW**! Ron must have been listening to us and I then had the pleasure of listening in to their chat! QRP does give all of us great moments, more than enough to compensate for bad conditions when only the QRO fraternity can get a signal through!".

G4FBC has been operating /P in the Lake District in Cumbria recently (left) and has another addition to his military manpack collection, a Raca l TRA931 otherwise known as the 'Syncal 30'. Ron says, "I am very impressed with this set as it is very 'ham' friendly; it delivers 30W on high power and 5W on low power, covers 1.5 to 30Mhz with USB/LSB AM/ CW and has an internal ATU to tune either LW or 7.8ft whip antennas. It also has a very useful RIT control and the set runs from a 24v 4AH battery, which will last all weekend when out portable. I have worked all around Europe and into the USA with the 5W and can 'claim' a QSO with South Africa - **ZS6MAL** heard me call him but I was lost under QRO calls to him!".

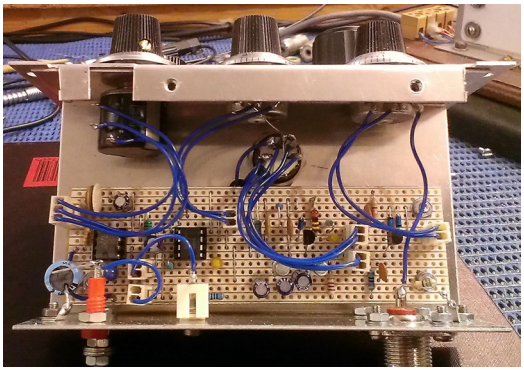
With Michele, **M3WAH**, and (soon to be licensed) daughter Colette (13), **MØNDE** will be QRV from Saint Antonin de Noble in France in late July. They are taking a dipole for 20/40m with Sotabeam traps to try out for the first time. Their RV has mobile whips for most HF bands when wires cannot be deployed and APRS tracking on 2m. They plan

to call on **G3ROO**, Nigel's construction mentor from the Dover Construction Club, on their way to and from the continent, and hopefully find time to meet old friends at the Capelle la Grande Radio Club **F8KGS** where they have a thriving club with a bar!





G3OOU has just finished making a trio of PSUs in the Heath SB style, the last one of which is for a battery valve QRP rig (shown far right), details at <http://www.qsl.net/g3oou/ps1v4.html>. Bob has collected together all his Heathkit rebuilds on one page of his technical web-site at <http://www.qsl.net/g3oou/reengineeredunits.html>, including a RF Switchbox that he completed about a year ago, the photo above left shows the inside of it. He has now run out of Heathkit SB-600 loudspeaker cases! The best way to clean old silver plated variable capacitors was recently raised on the G-QRP Reflector and **G3LLV** said the silver tarnish is usually a sulpher compound, often with brass underneath, just like microwave waveguide. How conductive it is, he doesn't know but says it seems to have been worth cleaning in the past. Joe added that one method he has heard is to line a plastic container with kitchen foil and immerse the object in a conductive solution such as salty water. He doesn't have experience of this but intends to try it with an old presentation tankard he has.



For a 'quick' project, **G3XIZ** has just completed **G3DXZ**'s 1-T-1 TRF receiver (right), first published in *RadCom* in 1995. Chris says, "It is a superb little receiver, very sensitive and with one coil covers 30, 40 and 60m. It took me two evenings to make from scratch and I used my favourite medium: veroboard on which to mount the components (photo right). My current project is a WSPR TX for 136kHz and it's nearly finished. LF does not lend itself to true QRP as antenna efficiencies are extremely low, however I will try using 5W RF output and see how far it gets".

GM4VKI thanks members who visited the Club stand at the Blackpool Rally on 12 April and says the rally season in Scotland started "with a bang" with a *new* rally organised by himself in conjunction with the Moray Forth ARC in Aviemore on 3 May. Roy says it was a great rally with 30 tables selling. The 'usual trio' were on duty with **G(M)3MFJ** and his good lady and **GM3WIL** helping, plus they had the pleasure of Club QSL manager, **GM3VTH**, join them for the day. They had 26 members sign in and another four join. The photo right shows (l to r) **GM3WIL**, **GM3VTH** and **GM4VKI** with an unknown buyer in front of the counter, **G(M)3MFJ** taking the picture. The next rally is at Livingston in June followed by Crianlarrick on 2 August, Galasheilds in October and finally Rishworth on 24 October.

DL2BQD sends a report on the 9th annual DL GQRP Convention in Waldsassen at the end of April. More than 50 participants enjoyed great lectures and constructive chats. The photo right shows **DK6SX** and **DL4JAL** discussing a PIC controlled ATU and the far right photo a group of members listening to **DL2JWL**, webmaster of <http://www.g-qrp-dl.de/>, where the subjects of the lectures are listed. The photo below shows the new eQSL award All Europe, recently introduced with a rush of about 800 applicants. It is a challenge for those amateurs who have all DX and EU awards, but now try to do all of EU within two months or within one contest - QRP. **DM4EA** and **MØTNG** are the eQSL assistants for the award. Dieter says that if a foreign amateur should come to Waldsassen next year, he will invite them for a glass of good Frankonian wine in the Prinzregent Luitpold restaurant, his favourite!

GØKJK says, "Can we please have more QRP activity on 60m? I frequently call CQ and apart from **G3VNC** with his excellent 1W signal, activity seems very low. Secondly, I was in QSO with a GM station who quite naturally was lamenting the blowing down of his antennas in the recent gales and storms up there. I was licensed in the 1980s as **VS6US** in Hong Kong and used sturdy bamboo canes to support and suspend all my wire antennas. When everyone else seemed to be bringing their antennas down as a typhoon approached, I was still on the air and could have transmitted through the eye of the storm if I so chose! I still use bamboo here in the UK (available here in Macclesfield and I think everywhere for just a few pence). It bends in strong winds but is very tensile and never breaks, even in 70MPH and above gusts. Perhaps this idea might be of help to somebody in the Club!". **G4GDR** also asks where the QRP activity is after noticing a decline in the last Winter Sports from the previous year. Adrian has built a one valve TX for 60m and still has his Ten-Tec Argonaut 515, which he is told is now a collectors' item! The wave-change switch on it has gone a bit floppy so he will have to repair that soon. **PA3ALX** says the 40th anniversary of the foundation of the Benelux QRP Club (BQC) in 1975 by Silent Key Frans Priem, **PAØGG**, is being celebrated in 2015 every Sunday morning during between 1000z and 1100z on 3560 or 7030kHz using the special call **PI4BQC.** Herman will be the main operator and when he is not available another BQC member will take over. They invite everyone to join in this special event.

G4FBC has aquired two more HF military sets which he is hoping to restore. The lower one in the photo is the Plessey PRC420, and above is a set which Ron says is a bit of a mystery. Information is scarce but he is told it is part of the Australian armed forces RAVEN radio system. Ron says this is quite strange as its front panel controls are labelled in Arabic! He is hoping some members may have some information on RAVEN?

Thanks to G3RJV for five pages this time and to the contributors to this column. Please let me know how your summer goes for the autumn edition of *SPRAT*; what you have been building, who you have been working, and any other information about QRP, by 10 August. Also, interesting photographs please, don't be shy in letting members see what you have been building and/or where you have been operating from, your antennas, who you have been meeting, and even a shack photograph to let other members know what you and your equipment look like. Let me know if you intend operating from somewhere other than home during the autumn and winter months, including the QRP Winter Sports, so I can let members know to listen out for you.

QSL Cards from Nasko - LZ1 YE

LZ1YE has sent me details of some attractive QSL cards including the Club Log.
Members can make their orders by sending samples, explaining what they want to print, and sending the materials: photos, files...etc via e-mail: qsl@qslprint.com or qsl@kz.orbitel.bg or if no internet access via the postal address: Atanas Kolev, P.O.Box 49, 6100 Kazanlak, Bulgaria. Examples of cards and prices can be seen at **www.qslprint.com**
For people need QSL cards urgently LZ1YE dispatches three days after the payment is made. UK Members can pay via a UK address: Please send your cheque / cash via recorded delivery to: LZ1YE QSP Print service, c/o Melanie Rowe, St. Leonards House, 35 St. Leonards Road, Exeter, EX2 – 4LR, Devon. e-mail: m0mja@aol.com (make cheques payable to : Melanie Rowe)

The Mountains, the Sea and Miles of unspoiled Beach . . plus amateur radio

G3RJV has a Wooden Lodge situated in the Dyfi Valley in central Wales close to the Irish Sea and in the Snowdonia National Park. Well maintained with a large living area, conservatory, double bedroom, twin bedroom plus 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. An easy to use station in a quiet location with lots of local places to visit and a vast open sandy beach only 3 miles away all set in wonderful walking country.

Enquire via G3RJV or email g3rjv@gqrp.co.uk
Google "***acelticlodgeforrent"*** to find pictures and further information.

GQRP Club Sales

Graham Firth, G3MFJ, 13 Wynmore Drive, Bramhope, LEEDS. LS16 9DQ

Antenna Handbook – 2nd edition – members £6.00, non-members £10.00 plus post } £2.00 (UK) or £5.50 EU
Radio Projects volumes 1, 2, 3 & 4 – by Drew Diamond – members £6, non-members £12 } or £8.00 DX per book

6 pole 9MHz SSB crystal filter (2.2kHz) £12 plus post (max of one) } £3.50 (UK); or
Polyvaricon capacitors – 2 gang (A = 8 to 140pF, O = 6 to 60pF) c/w shaft extension & mtg screws - **£1.50 each** } £3.50p (EU); or
– 2 gang – (both 8 to 285pF) c/w shaft extension & mounting screws - **£1.50 each** } £4.50p (DX)

Pair LSB/USB carrier crystals HC49U wires - [9MHz ± 1.5kHz] **£4 pair** } **All components**
HC49U (wire) crystals for all **CW** calling freqs – 1.836, 3,560*, 7.015, } plus **postage**
7.028, 7,030*, 7.040, 7.0475, 7.122, 10.106, 10.116*, 14,060*, 18.086, 18.096, } **(ANY quantity)**
21.060, 24,906, & 28,060 all are **£2.00 each** (* = also available in low profile HC49/S) } £1.20 (UK), or
HC49U crystals- 1.8432, 3.500, 5.262, 7.00, 10.006, 10.111, 14.00MHz – **50p each** } £3.50p EU, or
HC49U crystals – 2.00, 3.00, 3.20, 3.579, 3.5820, 3.6864, 4.0, 4.096MHz } £4.50p (DX)
4.1943, 4.433, 4.5, 5.0, 6.0, 7.2, 7.6. 8.0, 9.0, 10.0, 11.0, 12.0, 13.50, 15.0, 16.0, 18.0, 20.0, }
24.0, 25.0, 26.0, 27.0, 28.0, 32.0, 33MHz – **all 35p each** (Some of these are low profile types) } Post free
14.070MHz – 20m PSK – set of 3 crystals - **£2.55** } if ordered with
Ceramic resonators – 455, 480kHz, 2.0, 3.58, 3.68, 4.00, 14.32 & 20.00MHz – **50p each** } with heavier
Diodes - Schottky signal diode – 1N5711- 20p each; 1N4148 GP Si – 10 for 10p } things
Varicap diode – **MVAM109** – 40pF @ 9v, 500pF @ 1v. **50p each** } like binders, toroids
SA602AN - £1.50 (note – I may supply NE or SA, 602 or 612 as available. All are fully interchangeable. } polyvaricons
MC1350 - £2.00 These are getting in short supply now so max of 2 per member } or filters
LM386N-1 - 4 to 15v, 300mW, 8pin **DIL - £0.40, LM386M-1 SMD – 35p** } Use just
TDA7052A - 4.5 to 18v, 1W 8pin **DIL** low noise & DC vol control – **£0.60 each** } that
TDA2003 - 10w Audio amp 5pin – **£0.25 each** } postage
TA-7642 Radio IC – direct equivalent of **MK484** (& ZN414) – **75p each** } If ordered
2SC536 transistors (npn) fT - 100MHz, hFE-320, VCBO +40V **- 5 for 50p** } with books
MPSH10 transistors (npn) fT - 650MHz, hFE 60, VCEO 25V **- 8p each** } or CDs
2N3904 transistors (npn) fT - 300MHz, hFE-150, VCBO +40V **- 10 for 50p** } add
2N3906 transistors (pnp) fT - 250MHz, hFE-150, VCBO -40V **- 10 for 50p** } this
BC517 Darlington (npn) fT - 200MHz, hFE-30,000, VCBO +40V **- 13p each** } postage
FETs - IRF510 – 50p; 2N3819 - 20p; 2N7000 - 10p; BS170 – 8p - all each } as books
Dual gate MOSFET – BF981 - SOT103 - 1GHz (diode protected gates) **- 85p each** } or DVDs
Pad cutter - 2mm shaft: 7mm o/s, 5mm i/s diam, gives a 5mm pad with 1mm gap **£6.00** } do not
10K 10mm coils – 0.6uH, 1u2H, 1u7L, 2u6L, 5u3L, 11u0L, 45u0L, 90u0L, 125uL – all 80p each } travel well
Magnet Wire – 18SWG – 2 metres – 60p; 20 & 22 SWG – 3 metres - 60p; } with parts.
24, 25 & 27SWG – 4 metres - 40p; 30, 33 & 35SWG – 5 metres - 30p. }
This is solderable enamel insulated. Max of 3 sizes per member per order } Postage
QRP heatsinks - TO92 – 30p; TO39/TO5 – 40p; TO18/TO72 – 60p (pics in Sprat 148) } as for
Axial lead inductors (they look like fat ¼W resistors) these are low current } components
4.7, 6.8, 10, 15, 18, 22, 33, 39, 47, 56, 100, 150, 220 and 1000 - all uH and all 18p each. }

Toroid Cores – **priced per pack of 5 – max of 2 packs of each per member**
T25-2 – 50p, T25-6 – 60p, T30-2 – 60p; T30-6 – 70p ; T37-2 – 75p; T37-6 – 80p; T50-1 - £1.00; T50-2 – 90p;
T50-6 – £1.10; T50-7 - £1.20; T50-10 - £1.20 ; T68-2 - £1.80 ; T68-6 - £2.20; T130-6** - £2.00ea. FT37-43 – 90p ; FT50-43 - £1.20 ;
FT37-61 - £1.20 ; FT50-61 - £1.60; BN43-2402 - £1.20; BN43-202 - £2.00; BN43-302 - £2.00; BN61-202 - £2.40. Ferrite beads – FB73-101 (3.5mm dia x 3.2mm long, 1.2mm dia hole) – 40p for 5
All toroids are plus postage – up to 5 packs = £1.20 (UK), £3.50 (EU), £4.50 (DX). Each additional 5 packs, please add 50%
** Except ** items – they are heavy and each counts as 2 packs (ask for quote if you want more than 2 of the large toroids)

SBSS PCB clamps – single - £12, two - £20 all plus post (£3.50 UK & EU : DX – order direct from Rex please)
MeSquares & MePads - £6.50 each plus post (£3.00 UK & EU : DX – order direct from Rex please)
Limerick Sudden kits RX & TX both single band (160 through 20m); **ATU** (80 through 10m) **£38.00 each plus post** UK - £3.50, EU - £5.40, DX - £8.00
Sprat-on-DVD – 1 to 160. Only £5 each to members plus postage, UK - £1.20, EU - £3.50, DX - £5.00
Sprat Binders – nylon string type – Black with club logo on spine -16 issues per binder – **new stock** - £6.00 each plus postage (one: UK - £2.00, EU – 3.00, DX - £4.00. More - add £1.10, £1.50, £2.50 each)

Cheques (UK) and payable to G-QRP Club. Sorry, but cheques in other currencies are uneconomical to us due to bank exchange charges!

MINIMUM ORDER for cheque or PayPal payments is £5 **For orders less than £5 – please use postage stamps (any denomination) - any quantity of stamps is OK, or cash. I can accept cash in GBPounds, or US$/ €uros (at the current exchange rates) – but please send securely! You can order via e-mail and pay by PayPal - use g3mfj@gqrp.co.uk – and pay us in GBPounds and you MUST include your membership number and address please.**
PayPal charge us about 4% so a contribution towards that is always welcome, or, send as a gift to friends/family - thanks