

SPRAT

THE JOURNAL OF THE G-QRP CLUB

DEVOTED TO LOW POWER COMMUNICATION

ISSUE NR 28

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Autumn 1981

FOUR EXTRA PAGES!



Eric, G2CGL, winner of the Partridge Trophy for 1980/81. To the left of the shield, with the beard is Frank, G3YCC. Both are active constructors and operators.

CONTENTS: G3ZQA Top Band TX. 'Bren' 160m DSB/CW TX. 160m Converter. No Cost ATU. 10m VXO TX. Club News. Touch Paddle. 'OXO' Miniature All Band Transmitter. 10/15m Phased Verticals. The HMW8. OK CW for Czechs. GM30XX Transverter. Adjustable Power for the Argonaut TS120V Modification. G3RJV 20 Trophy. Members News.



Rev. George Dobbs [G3RJV]
17 Aspen Drive, Chelmsley Wood,
Birmingham. B37 7QX [021-770-5918]

Dear Member,

One of the more gratifying results of producing SPRAT has been the repeated requests for more issues each year. In terms of cost and resources this is not possible, but as from this issue we hope to be able to produce a larger SPRAT. We are introducing 4 extra pages and hope that the balance of technical material and news will remain roughly as before.

One of the advantages of being editor of SPRAT is seeing and sometimes testing some of the circuits before publication. In this issue I have built and used the OXO TX, helped to complete and use the prototype BREN, tested the Toucher Paddle and worked both LA2QAA and OK2BMA when they were using the equipment they describe.....and its all good stuff !

I hope to see as many members as possible at our get-together after the Donnington Park Exhibition and look forward to meeting many others on the calling channels.

73 fer nw

George G3RJV.

SUBSCRIPTION RENEWALS

Renewal (rates now £3.50 or \$9 US) to Alan Lake, G4DVW, 7 Middleton Close, Nuthall, Nottingham, NG16 1BX. PLEASE QUOTE YOUR MEMBERSHIP NUMBER. Cheques made out to "G-QRP-CLUB". European members may use Giro Cheques. A reminder is automatically stamped onto Sprat for the series of numbers due between each issue. IF YOU HAVE ALREADY PAID PLEASE IGNORE THE STAMP.

THE G-QRP-CLUB QSL CARD

A distinctive Club card, white with blue information and the members call and details in red, is available to members. The card has a novel "Circuit Puzzle" and Club information on the reverse side. Details and an order form can be obtained from the Club Treasurer, Alan Lake, G4DVW.

CLUB GET TOGETHER - 10TH NATIONAL AMATEUR RADIO EXHIBITION

This year The National Amateur Radio Exhibition, formerly at The Granby Halls in Leicester, has moved a few miles further north to The Donnington Park Motor Racing Circuit. This annual exhibition has proved to be a good meeting place for members, and several have suggested a venue be arranged for members to meet after the exhibition.

This year we intend to try this after the final day of the exhibition. We have secured a room in a pub a short distance from the exhibition site with a bar and buffet supper. The details are as follows :-

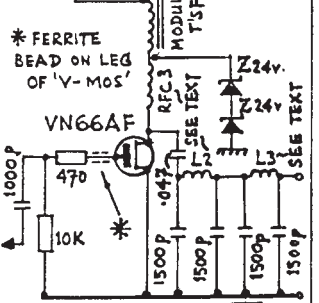
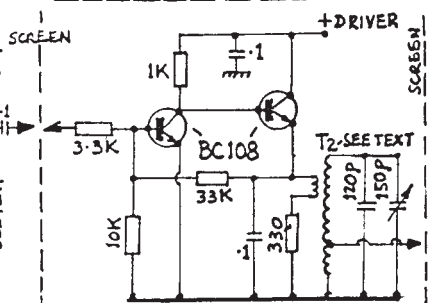
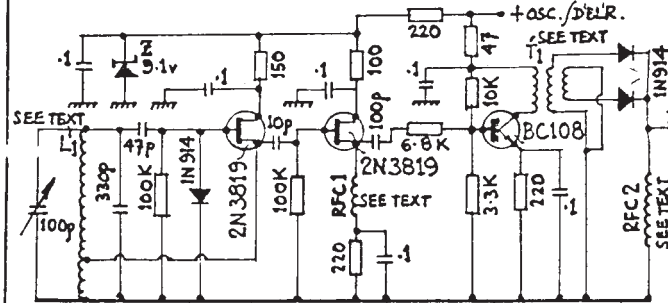
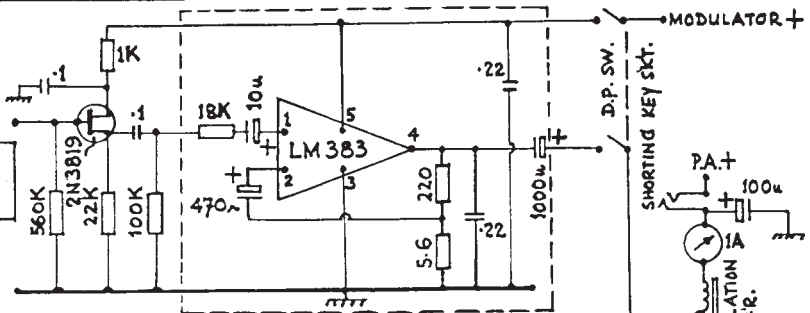
Meet at The Tanya Manor, Castle Donnington, a few miles along the A453 towards Nottingham, from about 6.30p.m. Buffet supper approximately £1.50. After the close of the exhibition on the final day, Saturday October 31st. Members who require help to find the venue can link up at the main exit of the exhibition at 6pm., and those with 2 metre F.M. mobile equipment listen around for G4DVW or G3RJV on S20, 21 or 22.

So Midlands members can easily join us and if you are at the exhibition from far flung parts, join us for supper before you drive home. To add interest to the evening we hope to have a look at some homebrew equipment, so bring along any gear you have, however simple or scruffy.

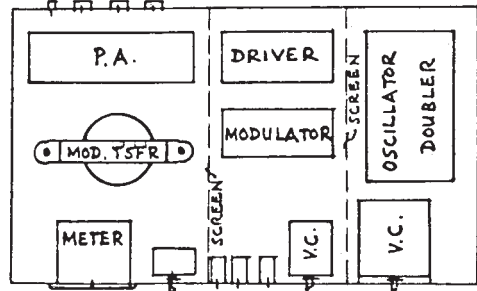
IMPORTANT: Will members who intend attending this get together, please notify G3RJV not later than October 23rd.

G3ZQA 'MAIN STATION' TRANSMITTER

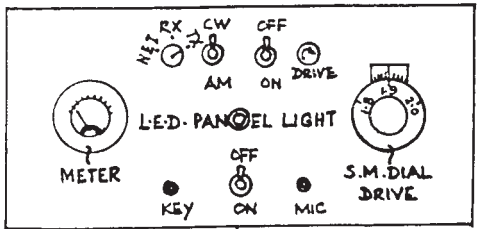
160 METRE TX



MUTE TO RX ANT.

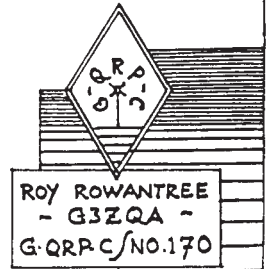


PLAN



PANEL

SUGGESTED LAYOUT
NOT TO SCALE



160M Main Station VMOS Transmitter G3ZQA

The three sections of the transmitter are built on veroboards and the modulator on the PCB in the kit and mounted upright with the FET pre-amp on a small piece of veroboard attached to one of the securing bolts. When winding toroids, slide the toroid to the centre of the piece of wire being used and wind in two halves. For L1 wind 45 turns, turn it over and wind 45 turns with the other wire. The toroid is then full, so a tap is made and a further 17 turns wound over the winding just completed, this end then forming the earth end. T2 is wound with 15 turns, a tap is then made and a further 20 turns wound, turn it over and fill the toroid with the second wire (about 33-35 turns). The link is wound over this with plastic covered wire.

Polystyrene capacitors are preferred in the oscillator circuit and 0.1 disc ceramics for decoupling. The modulator is an 8 watt amplifier kit from Maplins, based on the LM383 with the addition of an FET source follower pre-amp. No volume control was found to be necessary. The output capacitor in the kit is connected in the reverse polarity from that shown on the circuit board and a 100K resistor is connected across the input posts to check possible instability. The dotted square on the circuit diagram indicates the Maplin Kit components.

The modulation transformer is made up from a valve type output transformer with about a 1/2 inch square core and the windings on a boffin. The laminations are removed and all windings taken off the bobbin. Then four layers of about 20/22 SWG are wound on, a tapping made and a further two layers. The start of the winding (at the centre) goes to the PA and the outside to the power supply. About 25-30 turns per layer depending on the gauge of wire used, but the number does not appear to be critical.

A separate earth lead is taken from each of the four sections to a common point on the chassis to which the negative power supply is connected.

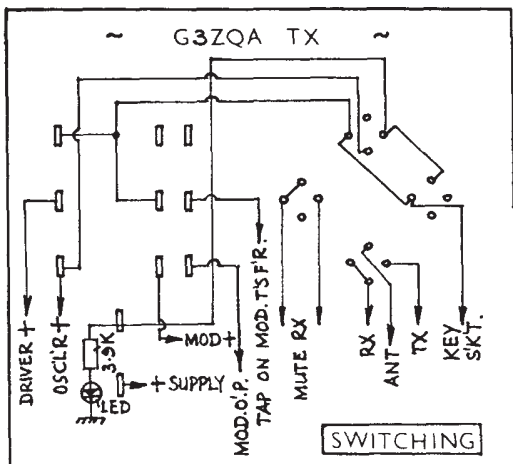
The Vmos is a high frequency device and is very ready to go into spurious oscillations at some VHF if leads are not kept short and the layout follows good practice. In developing this circuit, several Vmos were blown due to apparently to two main causes: (1) overdriving and (2) destructive surges in the modulation transformer seem to develop under certain conditions. To prevent damage from (2) zener diodes are connected from the modulation transformer to ground and for (1) a satisfactory drive level is indicated when, with a dummy load of 25 ohm connected to the output, about 450mA at 12 volt supply is drawn by the PA. The drive level can be adjusted by altering the value of the 3.3K series resistor to the base of the first transistor of the feed back pair, but three transmitters have already been built to the circuit as shown and all behave satisfactory. The transmitter works well into an aerial/earth input impedance of about 25 ohms and shows efficiency of over 60% when measured with a simple output meter similar to those recently described in Sprat.

The switching is arranged so that on net, the driver can be put in or out of circuit to vary the strength of the netting signal so that on local signals it is strong enough to be heard (driver in) and on weak signals it does not swamp the receiver (driver out). The AM/CW switch cuts the modulator out of circuit, the modulation transformer and 100uF capacitor then forming an effective key shaping network. The receiver is muted on transmit.

Coil Data

- L1 - 107 turns of 30SWG on T68-2 toroid tapped 17 turns from the earth end
- T1 - 15 trifilar turns of 30SWG on Ft37-61 ferrite toroid (3 wires twisted about ten per inch).
- T2 - 68 turns of 28SWG on T68-2 toroid tapped 20 turns from the earth end. Link 7 turns evenly spaced.
- RFC1 - 1mH RFC2 - 11 turns of 24SWG through a small (1/2 x 1/2) ferrite bead.
- RFC3 - 100uH
- L2 and L3 - 27 turns of 22 SWG on T68-2 toroids.

FOR SALE: HW7 with good modifications: Attenuator, RF stage, new meter etc. complete with a pair of Ericson 2K Headphones, and matching PSU. £30.
Bill Trenchard, G4EHU, 34 Monmouth St. Bridgewater, Som. TA6 5EJ. (55923)



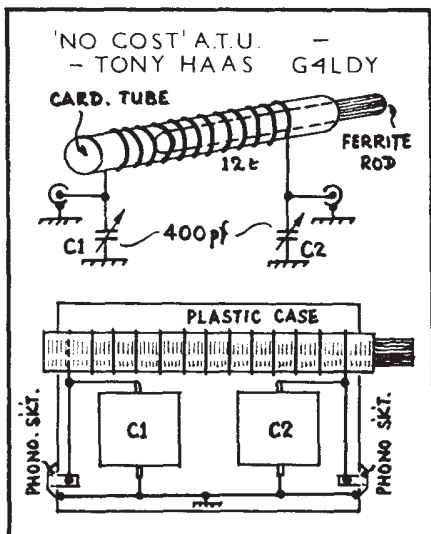
160M VMOS TX

Switching

Top Band

Quite a lot of Top Band ideas in this issue. Not very many members seem to be active on 160. Why not try a call on or around: **1850KHZ**

NO COST A.T.U.



This QRP ATU was constructed from parts of old transistor radios and works extremely well, and has variable inductance and capacitance. The construction is as follows:-

The ferrite rod was stripped of original windings and then had a piece of notepaper wrapped around it. Once the paper was nearly into a tube, it was glued and finally rolled up into the complete tube, leaving the ferrite rod a sliding fit. The coil was then wound round the tube and fitted into a plastic box along with two small capacitors from the old radios. The unit was then wired to diagram. Operation is very straightforward like any other circuit, except that the inductance is completely variable by sliding the ferrite in and out of the ube.

I have used the ATU on 3.5MHz through 28MHz with very reasonable results. The first call to a station on 7MHz produced results using ten feet long wire indoors, ending up in a three way between a station in Hull and one in Dublin using 2 watts PEP. Subsequent tests on better aerials have proved very reasonable and a 1:1 match can always be achieved.

WANTED: Manual for HW7 to buy or loan for photocopying. Bill Seymour G4ACN, 13 Swanage Rd. Lee on Solent. (Lee 550906)

WANTED: Argonaut (any model) or HW8 in exchange for FR50B receiver and FL50B transmitter with FV50B V.F.O. (all in mint condition) Adrian Heath G4GDR, 39 Barn Cl. Highworth, Swindon, Wilts.

G4GIE is looking for Top Band Equipment. TX,RX,Converter, preferably a transverter, QTHR. or 037 977 669.

The 'Bren' 160m DSB/CW Transmitter

Colin Turner G3VTT

For the last few years I have kept, or tried to keep a regular sked on 160 metres with G2HKU and PA0PN every Sunday morning. With the decision to go 100% QRP and the selling of the Far Eastern Tin box 101, I was stuck with the need to get a couple of watts of phone and CW energy on 1832KHz.

Although the previous transverter had been transistorised, I decided I wanted to try out a few ideas on the theme of DSL and CW. I am using a Drake 2C receiver along with the receiver section of the transverter described in Sprat a couple of issues ago. The transmitter, which I call the BREN, works fairly well and has been used by our illustrious guvnor, G3RJV on his last Summer visit to this corner of the Island.

The VFO - The VFO is stolen from the QRP Bible (Solid State Design for The Radio Amateur from ARRL which, of course, you will all have a copy of!). I built the VFO in an Eddystone diecast box using soldertage, tagstrips and a tagboard. I also built the SBL 1 balanced mixer into the same box using a small strip of vero board. I recommend that the VFO and mixer are built together to stop "carrier" leakage, i.e. VFO output leaking past the mixer, which will make your DSB sound like AM in a local receiver. A little attention to the usual VFO design criteria will ensure the VFO is stable and re-settable (driftitus is NOT a problem with this design).

PA and DRIVER - The amplifier stages are in Class A and are along the lines of the excellent recommended circuits in the abovementioned book. I have built this driver and PA using the most readily available parts, if in doubt consult the book, but you will find all RFC's are 15uh. 2N3053 are used as they were available, the input power is about four watts and measured output power is two watts on CW.

CW OPERATION - Having been spoilt by using a Ten-Tec Argonaut for the last few years I decided to try and get full QSK. This has nearly been achieved by the circuit shown, which has a 2ufd capacitor in the base circuit of the relay switching transistor to prevent 'chatter' at high keying speeds. The relay is a normal continental 12 volt type which is used for antenna change over, receiver muting, HT switching, plus a few contacts left over if I want to add and switch a further amplifier stage. CW output is achieved by the second transistor, they are both PNP, which puts DC into the SBL 1 to unbalance it each time the key is pressed. The component values shown give fairly soft keying, which I prefer.

DSB - A simple two stage microphone pre-amp gives ample gain to drive the SBL 1, the gain control is normally at half gain. Switching to CW puts the AF input of the SBL 1 to the LC voltage coming from the keying transistor.

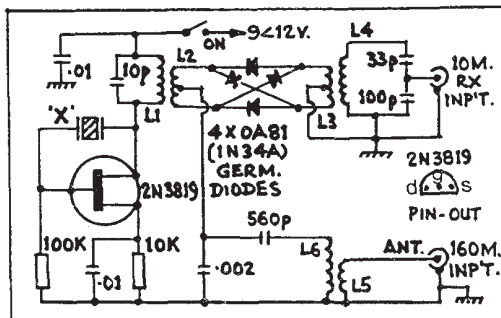
RESULTS - No tank circuit is needed, I merely use the normal station ATU to give maximum RF output with minimum SWR. The first nights operating gave good reports around G land on DSB and a CW QSO with OK1DLE at 559. Why call it 'BREN'? Well, George has The SCD and the BEN (which my spies tell me has been developed for the new 10MHz band!), I decided to keep in with the wife by using the first four letters of her name. Needless to say she is not amused, anyway why not try a bit of DSB on 160 metres?

Reference: ARRL Solid State Design by W7ZOI/W1FB, pages 38/206.

Quick Tip

Salvaging Die Cast Boxes by Ian Keyser, G3R00

That old unused die cast box full of holes? Cover the holes on the inside with PVC tape and fill the holes from the outside with plastic padding. Allow to cure and then sand off. A quick coat of paint and it is ready for the next VFO! (P.S. RF leakage through holes at HF is virtually zero as the holes are not near half wavelength!)



Basic 160m Converter

Described by
G3RJV

[USEFUL WITH BREN ?]

- L1 - 13 turns 36SWG L3 - 2 turns 22SWG ct. L5 - 5 turns 22SWG
 L2 - 2 turns 22SWG ct. L4 - 8 turns 22SWG L6 - 33 turns 36SWG

All coils on 1/8 inch (10mm) former with slug.

X1 was 26.61MHz (1.8 to 2.0 equals 28.41 to 28.61). Any crystal to cover 10m band minus 160m would serve. Other bands could be used as an IF with suitable junk crystals and alteration of L1,2,3 and 4. (Peak L1 with diode probe and meter and peak L4 and L6 in use).

For readers without a 160m receiver, the above circuit offers about the simplest converter. It is the circuit from QST by Alan Bloom, WA3JSU, adapted for U.K. parts. 10m offers a handy tunable IF as 10 is usually not too good when 160m is useful, the high output frequency and no conversion gain prevent IF breakthrough and IMD, and lack of gain is no real problem on Top Band. I knocked it up in a couple of hours in an old, well drilled box and fed into the Argonaut 505 receiver on 10m. Results have been good for what the circuit entails. U.K. SSB and Continental CW signals have been received without any problems.

The G3RJV Twenty Trophy

Next Autumn the G3RJV call is 20 years old and to mark this I intend to privately sponsor a plaque for design of a transceiver. The requirements are as follows:-

DESIGN AND BUILD A TRANSCEIVER FOR THE TWENTY METRE BAND, USING NO MORE THAN TWENTY COMPONENTS IN THE RECEIVER AND TWENTY COMPONENTS IN THE TRANSMITTER AND SUBMIT A LOG OF TWENTY DXCC COUNTRIES WORKED WITH THE TRANSCEIVER.

The circuits must not be a direct copy of previously published circuits. A log countersigned by one other licensed amateur will be accepted as proof of the countries worked. Submit the design, with full circuitry and other relevant notes, with the countersigned log by THE CLOSING DATE OF SEPTEMBER 6TH 1982. The best designs will be published in Sprat and a plaque will be awarded to the entry I consider to be the best overall effort. Designs can be crystal or VXO controlled, but how about trying a VFO design? Integrated circuits may be used, but all components should be readily available and the design should be reproducible by other Club members. I await with interest.....

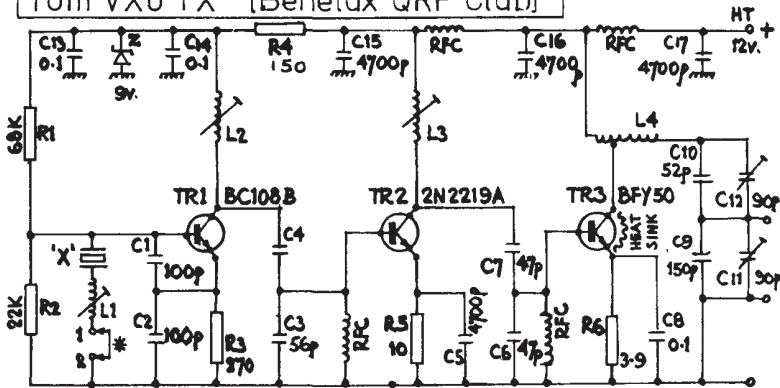
G3RJV

SILENT KEY - G2CAS (008)

John Douglas, G2CAS, of Harrogate, who passed away suddenly on July 4th, was well known for his portable activities; he was operating by the side of The River Tweed in Scotland nine days prior to his death. John used to put out a nice QRP signal from Harrogate where he was a stalwart member of the local radio club. He had held a number of calls, including ON4ZD and was a strong advocate of the Band Plan. A retired Lloyds Surveyor he was 73. Sympathy is extended to his widow, son and daughter.

Nick (G2NJ)

10m VX0 TX [Benelux QRP Club]



* OR INSERT 50p<100p V. CAP, IF REQUIRED. 'X' = 10m. 3rd. O'TONE XTAL.
 ALL RPC'S - SUGGEST 'RF 1' (FROM 'R.S.')

Concise Description

The oscillator operates in the third overtone and uses the crystal in a 10m walkie talkie, (receive crystal 28.045MHz). L1 can vary the frequency by three to five KHz, although a variable capacitor is normally used connected between points 1 and 2. The variable capacitor can have a value of 50 to 100pfd, the minimum capacity should not be smaller than 5pfd, otherwise oscillator instability is likely.

The output from the oscillator is coupled to the next stage by a capacitive divider network for exact matching, and the PA stage is coupled to the driver in a similar manner. The PA collector is coupled into the output tank circuit at a low impedance point also to ensure good matching.

The R and C in the emitter of T3 safeguard too high collector currents. Courageous constructors can connect the emmitter directly to the earth!

Capacitor C11 is to allow resonance with a 50 ohm load. All PA connections should be short to prevent self generated parasitics. The HT supply can be keyed and the signal is without chirp or click.

The two amplifier stages are in Class C to keep the quiescent current low, and to give an efficiency of 66%. The output is in the order of one watt.

With a capacitor giving a variation of 50 to 100pf, the VX0 range is about 25KHz.

Adjustments

Connect transmitter and don't forget to connect a dummy load! Adjust L2 to give maximum output on the crystal third overtone, do not adjust it too far from the overtone frequency otherwise the oscillator will not operate correctly or stop. A frequency counter with inductive coupling could be put to good use here. Adjust C11 and C12 for maximum output, then adjust driver coil, (a GDO may be useful to ensure this circuit is tuned to 28MHz). Adjustments of C11, C12 and L3 should be made to give maximum output. Finally, with the capacitor vanes enmeshed, adjust L1 to 29.025 or 28.030 when the capacitor is varied a frequency range of 25KHz should be possible.

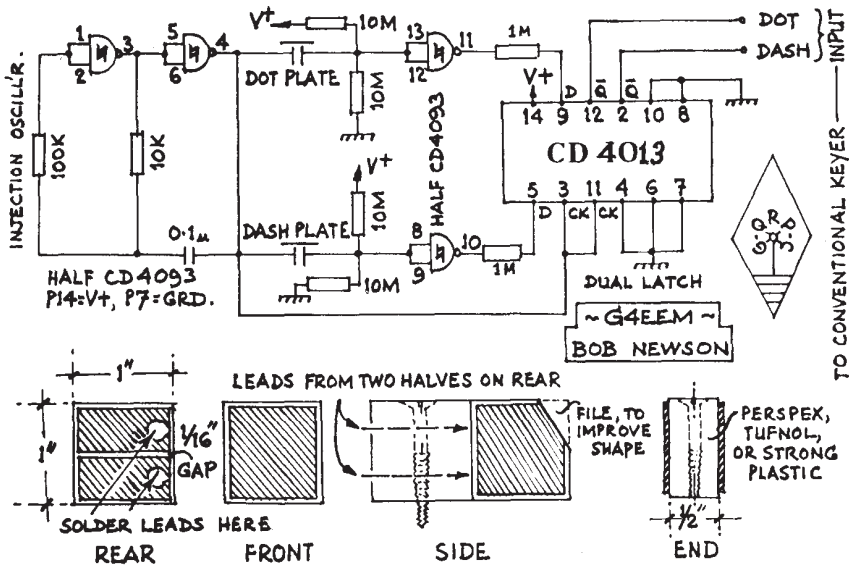
Coil Data

- L1 - 15 turns 0.2mm wire on a 7.5mm diameter red toroid.
- L2 - 10 turns 0.6mm wire on a 7.5mm diameter red toroid.
- L3 - 7 turns 0.6mm wire on a 7.5mm diameter red toroid.
- L4 - 10 turns of 1mm copper wire on an air cooled former, 10mm diameter and 20mm long, with the tap 4 turns from the "cold" end.

The new frequency for The Benelux SSB net is now 3690KHz, from the 1st January 1981. Don't forget that G-QRP-Club members are welcome to join in this net at the end, after the Dutch QSOs are finished. Times are 0930 in the Winter and 0830 in the Summer, both times are GMT.

Capacitance Toucher Paddler

Bob Newson G4EEM



Construction

The touch plates are constructed from standard 1/16 inch thick double sided fibre-glass PCB material. A one square inch of material is cut for each paddle and the side of each square has a 1/16 inch gap cut along its' centre. This can easily be done by scribing with a sharp point, heating with the soldering iron and the copper in the gap should be easy to pick out when it is hot. Solder wires to the places shown in the sketch and tin coat all copper surfaces.

Actual dimensions, and the spacing between the plates, and shape of the plastic part of the paddle are left very much to individual taste.

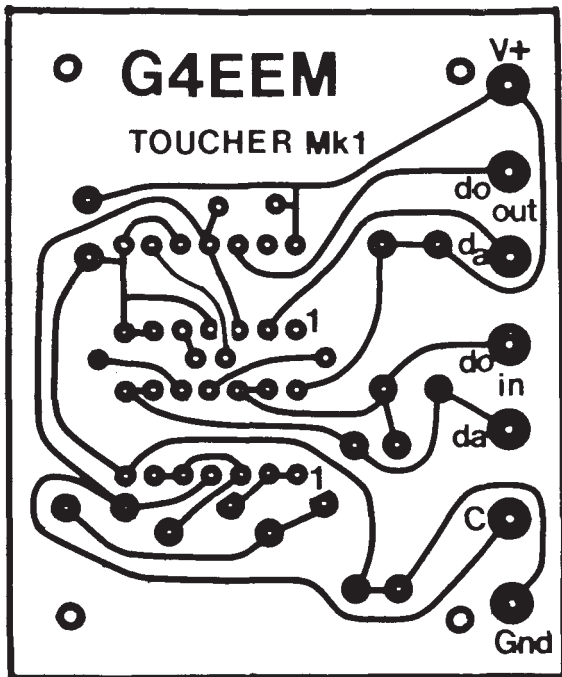
The circuit is powered from the keyer supply, 5 to 15 volts will do. Most common mechanical paddles have their common connection grounded, for those which use V+ as common the 'Q' outputs of the flipflop must be used (pins 1 and 3 of the 4013).

Operation

The capacitor, formed by the touch plate, constantly injects the oscillator frequency into the 4013 catch holding the 'Q' outputs high. When a plate is touched the capacitance is effectively shorted to ground causing the oscillator signal to cease. The 'D' input of the 4013 goes high and the next clock pulse sends Q low. When both plates are touched then both Q outputs go low and provide iambic keying for those keyers fitted with this facility.

The designer wishes to add that this paddle is better to use than expensive mechanical types once the 'feel' has been obtained, and the shape, height and position of the paddle has been found to suit individual requirements.

G3RJV requires a complete set of the Practical Wireless "Helford" articles. Would be pleased to borrow the magazines or receive photocopies of the set of articles, Expenses refunded. Also looking for the following crystals: 8.2MHz (or 2.733), 11.7MHz (or 3.90) 18.7MHz (or 6.233) 25.7MHz (or 8.566) frequencies a little higher would probably serve the purpose.



G4EEM
 Toucher Paddle
 PCB Layout
 Full Size

Communication and Awards News from G8PG

SSB.....POWER.....SSB.....POWER.....AWARD RULES CHANGED.....SSB.....POWER

The maximum pep which may be used when claiming Club Awards is increased to TEN WATTS (10w). CW levels are not changed.

SILVER TERN TROPHY GOES TO FRANCE

Our sincere congratulations to Jack, F9YZ, who has been the first Member to qualify for the Silver Tern Award and thus receives the silver trophy. Jack used an Argo and a 3-el beam. Six of his contacts were on cw and one on ssb.

AWARD NEWS

Congratulations to the following members.

QRP Countries; 125 (ssb) W6YKV; 25 G4JRE, G4JFN, G4BDQ, E16BA.

Worked G QRP C; 100 G8PG; 40 G3SYC, G4JRE, E16BA; 20 G3PT0, G4JFN, E10CF.

Two-way QRP; 10 G4JRE, E8EY, G4JFN, E16BA.

QRP WAC; E8EY, SM6AWZ, W6YKV.

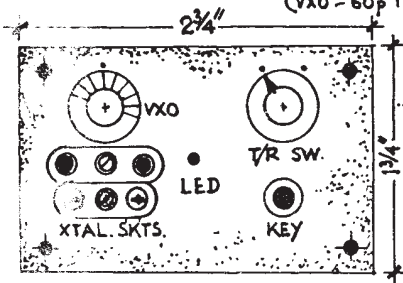
CQ CQ CQ DE G8PG G8PG G8PG QTC

1 27 Greasby 7 1900 = All UK Members = Will anyone interested in handling formal practise messages on cw as part of the proposed EUCW Western European Emergency Network please inform G8PG = Gus + NIL TU SW

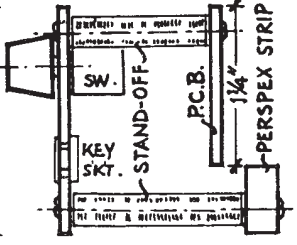
NOVICE LICENCE FOR UK

We understand that this is now agreed in principle but may take a little time to implement. If only we were CBens !!!

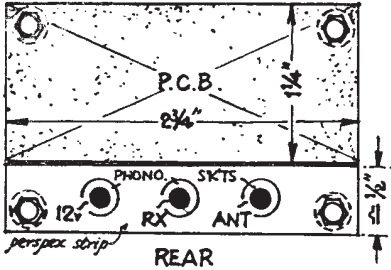
(VXO - 60p TRIMMER + KNOB)



PANEL



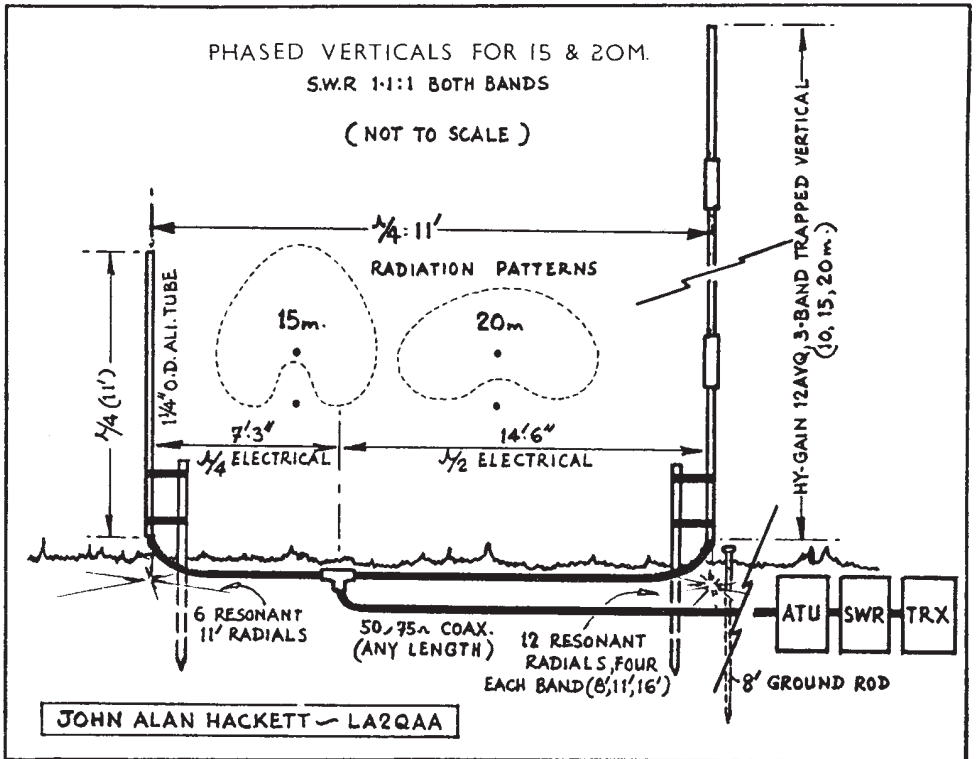
SIDE



REAR

Suggested OXO Layout

G3RJV





Copying the HW8

THE HMW8

Pavel Cunderla

OK2BMA

It all started when I read the article from K8EEG in The May 1977 CQ Magazine, about "The Heathkit HW8 QRP Transceiver". I liked this article very much and it also helped me further, when I started building it. At the end of this article, was a conclusion with the sentence, 'it would be very difficult for the homebrewer to produce an equivalent transceiver....' So, it was perhaps this sentence that made me think about my own HW8.

After this I started to seek for The Heathkit assembly manual, and finally got it from a friend in Sweden. Having studied the manual, I started to get all the components together and then to produce the printed circuit board, which was a hard job. I think that the most unpleasant job was to pick all the components together. In addition I had to find the proper equivalents for the transistors and diodes, but I had to use the original integrated circuits and FETs. It was also a problem to find all the toroid cores, since there is no Amidon representative in our country. So I had to find some domestic ones and some that I had from Sweden. Another problem was to get the crystals. At last I got the crystals for SPR-4 Drake, also from Sweden. I must say it is quite difficult to make a copy of such a rig in our country where most of the components are hard to get. For the homebrewers in Western countries, where the original components can be more easily obtained, this project maybe more easier, but perhaps more easier for them is to buy the complete rig, hi hi.

I wanted my "HMW8" to be as much as possible the exact copy of the original, so that is why I used the printed circuit board from Heathkit, tried to make the same chassis, front panel and also the dimensions from Heathkit. I think I managed it, but do not know whether the receiver sensitivity is the same as the original, since I have no chance to put on the table my HMW8 and the Heathkit HW8 to compare their performance. As far as the sensitivity is concerned, I think it is very good for this type of receiver (direct conversion). I agree with K8EEG that 21MHz is the worse band as to sensitivity, and also the transmitter output is lower than on the other bands.

After having all the components soldered onto the board, I made the coils and would like to express my great thanks to G3DRP, who was very kind to help me with the coil data. After this, the day of the first test came. First I measured the VFO (I had the possibility to use a Tektronix oscilloscope, Philips frequency counter up to 800MHz and a digital multimeter,) put it into its range and then tried to put into operation the crystal oscillator. This was probably the most trouble part of the rig. It was impossible to make it work until the C127 had been increased up to about 27pF. But even then, some crystals did not want to oscillate, and I had to increase C126 up to 180pF (it is a big difference compared with Heathkit's 10pF, but I think that everybody must try the best circuit to make certain the crystals oscillate). After this, all the crystals have been oscillating

To put the receiver into operation was then an easy job, just to adjust the appropriate coils, and the same to make the transmitter work. I would like to say that Heathkit has made a wonderful design. It was quite easy to put the rig to work when you keep to the recommended values of the resonant circuits. It is necessary to make just slight adjustments. When I was testing the PA (I have 2N3553 in this stage), I used the wattmeter that I built according to K8EEG's design, and I was trying to get the best possible output of the transmitter by moving the winding of L22 - L25 on the core, and also moving the windings on the cores of the output Pi-Net. It was not necessary to adjust it much. I am not sure if my PA is at its best, but at present I am getting the following outputs from my HMW8: 3.5MHz - 1.7w; 7MHz - 1.27w; 14MHz - 1.27w; 21MHz - 900mW. So the efficiency of the PA is best on 3.5MHz. Input in all cases is about 3.2 watts. My transceiver has not been made RIT, but in the front panel I made a hole for this potentiometer, and would like to add RIT now (the circuit according to K8EEG). I am quite satisfied with the audio filter performance, which helps greatly in some QRM, of course the more narrow filter could be a help yet. I did not manage to get the RX/TX switching relay, so I am switching this by means of a hand switch. I like very much the keying circuit, cw monitoring and the receiver muting, all works nice.

I am using this rig mostly with a long wire antenna, 40 metres long and 10 metres high. It works well on 3.5MHz and 7MHz, a little worse on 14MHz and not very good on 21MHz. In addition for 14MHz I use a 4 metre vertical, which is better than the LW antenna

Note from Pavel's QSL Cards that he and Wilf, G3DRP, have the distinction of having worked each other, both using their own homemade copies of the HW8. (G3RJV)

OK CW For Czechs

Petr OK1DKW

In Sprat there have been two articles to help with contacts with UA and F amateurs. I would like to introduce members to a few words and phrases that OK amateurs might be pleased to hear from abroad. Notice there is no Czechoslovakian language as people in Bohemia and Moravia (OK1 and OK2) speak Czech, in Slovakia (OK3) they speak Slovak. The following words are given in Czech, but OK3 amateurs will easily understand them as well.

In SSB I recommend only the greeting AHOJ, pronounced AHOY, because the pronunciation of other words is complicated for foreigners. The words are written without the strokes and hook shaped accents above the letters, as they are ignored in CW. The abbreviations are given in brackets.

<u>English</u>	<u>Czech</u>	<u>English</u>	<u>Czech</u>
both HELLO and CHERRIO	AHOJ or NAZDAR	GOOD DAY	DOBRE DEN
GOOD MORNING	DOBRE RANO	GOOD EVENING	DOBRY VECER
GOOD NIGHT	DOBROU NOC	DEAR	MILY
FRIEND	PRITEL	THANKS	DEKUJI/DIK/DIKY
FOR	ZA	AND	A
IS	JE	I HOPE	DOUFAM (DFM)
GOOD-BYE or CUAGN		VERY	VELMI
hope to meet him again	NASHLEDANOU (NSHL)	SOON	BRZO
hope to hear him again	NASLYSENOU (NSL)	GOOD LUCK	MNOHO STESTI
MERRY CHRISTMAS	VESELE VANOCE	YES	ANO
AND HAPPY NEW YEAR	A STASTNY NOVY ROK	NO	NE
I WILL SEND QSL	QSL POSLU		

It is up to you which phrases you want to use. You can easily combine the words according to the vocabulary, e.g. GE DR OM is DOBRY VECER MILY PRITELI. TKS FOR CALL is DIKY ZA CALL. HPE CUAGN SOON is DFM NSL BRZO, etc.

In a QSO with a OK3 amateur, use DPC instead of NSL.

Finally a few greetings from various languages that mean HELLO or CHERRIO:-

OK - AHOJ; SP - CZESC; HA - SZIA; SM - HEJ; OH - HEI; YU - ZDRAVO; I - CIAO

THE GM30XX TRANSVERTER

A Suggested Circuit by George Burt

Having a transceiver that tunes 5.1 to 5.2MHz, transvertors were needed for the other bands, and as trying to build a six band switched unit was not easy, it was decided to take the easier, but more expensive way of building six separate units. This has the advantage of being easy to optimize each one for best performance on the band.

The circuit is fairly conventional and just bits of circuits from various magazines. The receiver needs no comments, it is just a 3N201 mosfet mixer with a double tuned band pass filter.

The transmitter is fairly conventional, but as is the way with solid state transmitters it does need some optimising for the correct performance, see components marked *, C21, R15, R18 and R19. C21 will only be required on the HF bands. R15 is adjusted for required drive level. Make R18 as large as possible and R19 as small as possible for best stability and drive.

Some Values as a Guide

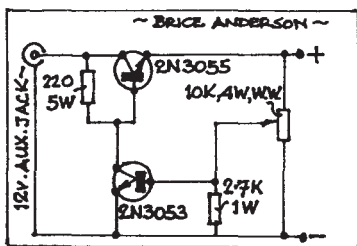
L5	L6	L7		C16	C17	C19	C20	C22	C32
1.8	50 turns	36 swg	)	All coils wound on	1.8	1000 - 2000pF			
3.5	40 turns	36 swg	)	6 pin 1/2 square can,	3.5	330 - 1000pF			Big
7	20 turns	36 swg	)	3/8" high, coil size	7	270 - 1000pF			value
14	15 turns	32 swg	)	3/16 of inch with	14	100 - 1000pF			on
21	14 turns	32 swg	)	core.	21	47 - 470pF			bottom
28	14 turns	32 swg	)		28	33 - 470pF			

L10 - C42 need if crystal is too close to drive frequency, as it is a single ended mixer.

C1	C2	C3	to suit band	C7	C12	15pF (adjust	C38	.01µF	
C4			.1µF LF/.01µF HF			for opt)	C35	.001µF	
C5			470pF	C10	C14	C18) .1µF LF	C37	47µF	
C6			47pF	C34	C36	C21*) .01µF HF	C39	C40	C41 to suit band

Adjustable Voltage Regulator for the Argonaut

Brice Anderson W9PNE

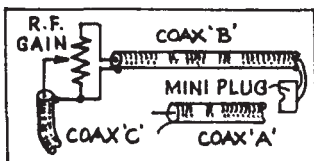


This simple and inexpensive voltage regulator provides from zero to 11 volts of very well regulated power for operating the Argonaut final at reduced voltages.

The Argonaut requires low voltages for efficient operation in the milliwatt ranges. The Argonaut 515 requires a lower voltage than the 505 or 509 for a given input. I have found these values are optimum :-

100mW input	-----	1.1 volt at 90mA
250mW input	-----	1.7 volt at 140mA
500mW input	-----	2.5 volt at 200mA
1 watt input	-----	3.3 volt at 300mA

Be sure to monitor the output power, as an increase in drive past the optimum point causes a power output drop. I use external meters, but regulator and meters could be built into a small cabinet.



Simple TS 120V Modification

Doug Hill G3ZWH

1. On examining the circuit it was found that the RF gain control is in fact an IF gain control and the RF stage is run flat out all the time.
2. I therefore decided to effectively re-distribute the gain which I did as follows.
3. Disconnect the leads from the RF (IF) gain pot. (10K ohm, front section of of twin pot on top right of the front panel).
4. Wire onto these leads a small 10K ohm preset and wind it up to maximum gain.
5. This now leaves a spare front panel 10K ohm pot which I decided to use as an antenna attenuator.
6. I therefore located the receive antenna lead, (plug on RF board, second mini plug from rear right hand side of board when facing the rig).
7. I removed this plug from the board and removed the mini coax (A) from the plug.
8. I wired a 4½ inches length of mini coax (B) to the plug and put the plug back in its socket.
9. I wired the other end of mini coax (B) to the original RF gain pot like so:-
10. I then cut another 4½ inches length of mini coax (C) and connected it to the wiper of the pot, as above.
11. I connected the far end of this mini coax (C) to the original coax antenna lead (A) which had held the mini plug.

Results - These are quite fantastic and at night time it is amazing to listen to the ~~cross~~ modulation go and the signals come up on 7MHz. I would now compare the receiver favourably with my Drake R4C and as you can see the mod is very cheap, does not involve defacing the rig and is easy to reverse for re-sale.

CLUB OFFER

As a result of a kind offer made to The Club, we are able to offer quite a few 4433KHz crystals to members at a very reasonable price. What use are they? Well, many recent articles have used these UK TV colour burst crystals for I.F. filters in various circuits. Can I commend The Solid State Design for the Radio Amateur circuit on page 215 onwards, or The Mini Misers Dream receiver in the same book. We can offer **MATCHED SETS OF THREE CRYSTALS (± 10Hz)** at £1.00 a set. **INDIVIDUAL CRYSTALS** (for BFO or CIO use) at 25p each.

Send your order, with cheque to G-QRP-CLUB, to Colin Turner, G3VTT, "Hurley", Weaving Street, Maidstone, Kent. Please send a stout S.A.E. The stamps required are 14p up to three crystals. The crystals are HC6U mountings.

CONTINUING CLUB OFFER

HC25U crystals on the QRP calling frequencies - 7030, 14060, 21060 are available from P.R. Gollidge Electronics, Merriott, Somerset for £3.00 including VAT and post.

CORRECTION to 14 - 144MHz Converter (SPRAT 27) VR2 should be 4.7K not 47K. Note that inductance above L11 is an RFC (as RFC 1 to 5)

WANTED: Information and or circuit for the Hallicrafters No38 RX. William Doherty, 15 Upper Mount Pleasant Ave, Rathmines, Dublin 6.

THE TEN TEC ARGONAUT: I hear from Joe Redwine of Ten Tec (via WB8OWM) that the 515 is not to cease production and will continue to be available in the UK from KW Electronics. I regret to say that we appear to have been misinformed by the former importers, Radio Shack of London. (G3RJV)

QRP NEWS

1981 VK VERSUS THE WORLD CW QRP CONTEST

Sponsored by The VK CW QRP CLUB (Member of THE WORLD QRP FEDERATION), this contest is directed to all CW enthusiasts WORLD WIDE who elect to tackle that extra challenge! Contestants may work DX or OWN COUNTRY for scoring! QRO stations are eagerly invited to participate, but must submit contest logs with QRP stations only to qualify for the QRO section of the contest. QRP stations must sign /QRP for identification (Note: In the U.K. to sign/QRP is illegal, suggest your call sign - space - QRP - see note on this matter in G4BLE's column, Ed.)

0000 21st November to 2400 GMT 22nd November 1981, CW only, all bands 1.8 - 28MHz. Call "CQ QRP TEST" and exchange RST plus serial number up to 99 (start again at 01 if 100 QSOs reached), QRO stations give RST only and VK QRP Club Members will also give their membership number. In addition to QRP and QRO either multi-band or single band sections there are also sections for the full period of 48 hours or any period of 24 consecutive hours. Scoring for QRP stations is dictated by output power as follows :- 0 - 1 watt 6 points; 1 - 2 watts 5 points; 2 - 3 watts 4 points; 3 - 4 watts 3 points; and 4 - 5 watts 2 points; maximum of 5 watts output for QRP sections. QRO stations score 1 point per QSO. Multiplier is the number of VK QRP Club members and DX QRP stations worked on each band. Separate log sheets required for each band. Logs to show date, time, station worked, number sent and received, multiplier, output power and points claimed. Total score is points total multiplied by multiplier. Entries to include summary sheet showing total score claimed, name address, call sign, etc., and following signed declaration "I certify that all entries in my contest log sheets are true and honest."

Certificates will be awarded to the highest scoring station in each section. Entries to be sent to VK CW QRP Club, 59 Collova Way, Wattleup 6166, Western Australia to be received by 31.1.82. Results will be posted to entrants if they include 1 IRC with their entries.

HA QRP CONTEST 1981

Promoted by the editorial of the magazine "Radiotechnika" to demonstrate that it is possible to make two-way contacts with low power equipment. For the first time the contest has been made international, and amateurs all over the world are invited to take part.

0000 1st November to 2400 GMT 7th November 1981 in the 3500 - 3600kHz band on CW only. Call "CQ TEST QRP", and exchange call sign, RST, QTH and name. Score 1 point for QSOs with your own country and 2 points for EU and IX stations. Either single or multi operator and final score is total points multiplied by the number of DXCC countries worked. Maximum power is five watts input, and the log must contain date, time, report, call sign, QTH and name of station worked and the "type of the active element of the PA". Logs to be sent postmarked not later than 21st November to Radiotechnika szerkesztosege, Budapest, Pf 603, H-1374, Hungary. All contestants will receive a Special Participating Award and the outstanding scorers will receive Radiotechnika free for one year.

CORRECTION

Roy, G3ZQA asks us to point out a correction to his kite transmitter in The Summer Sprat. When the switch is moved to transmit there is no +supply connected to the oscillator as in the diagram shown. The + connection should be made to both outside contacts of the pole connected by the oscillator.

AGCW-DL QRP ACTIVITY WEEK-END

Members of G-QRP-CLUB have been invited to participate in the above event which is being held over the week-end 31st October/1st November 1981, as follows :-

1600 - 1800	3560	1000 - 1100	
1000 - 1400	7030	1300 - 1600	21060
1100 - 1200		1300 - 1600	28060
1800 - 2000	14060		

Reports on the event should be sent to :-
DK9TZ, Uli Eberhardt, Umlandshole 9/1, D-7260 Calw, West Germ.

MEMBERS NEWS

Chris Page G4BUE



What a busy time approaching for QRPers who like to participate in Contests or Activity Periods. The week-end of the 17th/18th October is the QRP ARCI 20th Anniversary Contest. Starting at 1200 on the 17th and ending at 2400 GMT on the 18th, participants must be off the air for 12 hours. Exchange RST, State/Province/Country and ARCI member give their Club number and non-members their power output. Members count 5 points, and non-members 2 points with DX non-members 4 points. Multiplier is for 4/5 watts X2, 3/4 watts X4, 2/3 watts X6, 1/2 watts X8 and less than 1 watt X10 (output). Scoring is QSO points X total number of States/Provinces/Countries X power multiplier. Contest only on the QRP calling frequencies. Send full log data to ARCI Contest Chairman, William Lixkerson, WA2JCC, 352 Crampton Drive, Monroe, Michigan, 48161, U.S.A. Certificates to high best scoring station in each State/Province/Country.

Unfortunately there is a clash with the above contest with The R.S.G.B. 21MHz CW Contest being held on the 18th October. This contest has sections for QRP operators. The following week-end (24/25th October) is the CQ SSB Contest with its QRP Section, and the week-end after that is The AGCW-DL QRP Activity Week-end (details published elsewhere in this edition of Sprat). The following Sunday, 8th November is a new event: a joint ARCI/G-QRP-CLUB Activity Period designed to promote two-way communication between members of both these Clubs. Activity will be on 14060, 21060 and 28060 between 1500 - 1700 and again from 1800 - 2000. Reports welcomed by your scribe. The week-end of the 28/29th November is the CQ CW Contest and finally to round off year is The G-QRP-CLUB QRP Winter Sports from 26/31st December. So all in all plenty of events for members to contact each other, qualify for The Club awards, or just try out that new rig or antenna.

K8IF, Thom tells me that the ARCI SSB Net on 14285 has now been changed to Sundays at 2300 GMT. It is going well although no European QRP stations have yet checked in. The Brighton Mobile Rally gave an excellent opportunity for your scribe to meet G3RJV, G3ROO, G3VTT and several other members. Colin, G3VTT has built the two transistor PA for 3.5MHz from the W5VTW Lata Sheet, and with his SCD PLUS has worked several countries, including LA, SM, GW and GD on 3.5MHz. A new ATU has also been built. G4ETJ is another member with the building bug. Recently Reg has built a RF noise generator, stepped attenuator, wide band RF amplifier for testing equipment, and a more involved wide band PA is in the planning stage, consisting of two 2N3632 in push pull, class AB, which will drive up to 42 watts input from his HW8! F3IM has built a one transistor crystal oscillator transmitter and has been very QRV recently working members on the HF bands, including ZE3JO, K8IF and WB9QPS.

In my comments above on the coming events of interest to QRP operators, I neglected to mention the new VK CW QRPP Contest on 21/22 November, rules elsewhere in Sprat. The AGCW Summer QRP Contest attracted members in the shape of G3DNF who made 65 QSOs on 14/21MHz and found the 'going tough', G4JFN who worked a PY to complete his WAC, E88EY who made it on two-way QRP to LA, SM and YU, I7CCF who made 130 QSOs in the 10 watts class, I0SKK who made 82 QSOs with 3/2 watts, and I1HKJ who made 30 QSOs. G8PG had an all night session on 14MHz and was rewarded with his highest ever score, and first two-way QRP contact with U.S.A.

G4JFN mentions the growing QRP interest in the Farnborough area of Hampshire. Bob has now worked 39 EXCC and has found his new HQ1 mini beam a great asset, especially on 28MHz. He is working towards The AGCW 1000 CW Award. ZE3JO has now completed his WAC with one watt. Recent new ones on 21MHz have included FC, JA, 3B8, VK, W7 and HC. Mal mentions a change of call soon, possibly to Z23JO. G4GDR has been showing off his 7MHz 500mW rig to KA0GMT who recently stayed with him. Adrian visited The Droitwich Rally and purchased the Mk 123 Spy Transceiver. He would like

to hear from other members who use one. EI0CF still prefers his JU6 to the Argonaut, and has made even more mods to the JU6. He says that EI4DZ has also built one and whilst in QSO recently they were overheard by G8PG on 7MHz, as Gus says 'amongst the NFD racket.' GM30XX goes marching on with 9U5, E1 and JT. Poor old George is still waiting for a North Dakota QSL to complete his WAS. G3PT0 is another contester who took part in The RSGB RR Contest and made 65 QSOs before his battery went flat. John continues to plug away at working DX on 7MHz, much to the amazement of your scribe. Besides working M11PA, he also worked a VK2, J5 and JA. G3VTT worked OJ0 for a new one and C31NL on 28MHz (SSB!).

HB9IK has now reached 325 DXCC with QRO, and has just purchased the Ten Tec Delta, which runs at 100 watts. Being a keen QRP amateur as well Peter has modified it to run QRP. He found the driver output impedance and the LP filter impedance were both 50 ohms, and by cutting the mini coax on both in and out of the PA, and inserting some connectors, he can feed the output of the driver direct into the LP filter resulting in an output of undistorted CW power of about 500mW. A 3.5 watt PA is planned matched to 50 ohms, to be inserted in place of the 100 watt PA when working QRP.

Several members have either reached or nearing the 100 DXCC Countries for Ade Weiss's trophy. I7CCF has worked 110 with 71 confirmed, recent ones being CE0AE and 9V1. SM0FSM has just got 102 confirmed all with an Argonaut to a ground plane. Per has also qualified for WAS and says he is now going for The Club's Masters Award.

On a different tact, several U.K. members have mentioned a comment in Rad Com recently where a LX operator deplored the use of QRP stations giving long calls and signing with their call signs/QRP. I feel these operators are probably loners and not members of a QRP Club, as it has been proved that the most successful way of working IX with QRP is to give short calls, but timed perfectly. Here in the U.K. it is illegal to sign G4BUE/QRP, but perfectly acceptable to sign G4BUE QRP. This in fact is commonly done on the LF bands and enables QRPers who may be listening to identify other QRP stations on the bands.

From G3PT0 comes a suggestion of a SKN (Straight Key Night) on the lines of The A.R.R.L. events. I feel this would be an interesting event and suggest a Wednesday evening on 3.5MHz in the Spring, when conditions will hopefully improve. Your suggestions will be welcomed.

There has been a rumour circulating that Ten-Tec are to stop manufacturing their very popular QRP Argonaut rig. It would appear from enquiries that your scribe has made that this is not the case but that KW Electronics are going to import the rigs and sell them under their name. Radio Shack do not appear to be stocking them in the future. Ten-Tec have just announced a new rig, The Argosy, which has capabilities of switching from 100 watts to 5 watts input, and has the new 10 metre band fitted.

EI8CE has been QRV on 7030 with one of the Mizuho LC7X rigs and is looking for other Club members. He uses a double zepp at 15 feet and has worked UA9 with it. Adrian thinks that G-QRP-Club is the best thing that has happened to amateur radio (hear hear). HB9ASJ says he is the QSL manager for the expedition to ZB2 at the beginning of September. Perhaps Leo can let us have a short story of the expedition, especially from the QRP point of view.

PA3ASC recently operated for two weeks as GW4HWZ and during that time worked 17 countries with his HW8, including HB0. G4EBO has been working DX on 21MHz in the shape of EA9,CN,VU,PY and JAs, all with his HW7 and an indoor inverted vee in his loft. He also worked a VK on 14MHz to complete his WAC. G4CQK has been working QRP on RTTY. Albert uses a Microwave Modules MM 4000 terminal unit with a ASC11 keyboard. He has recently worked I3 and OE8. GM4JJG provides a useful tip of using plastic drinking straws for the spacers of open wire feeders. PA3ABA is another member who likes 21MHz DX. Joop has worked HH,HK0,H2,JT,DU and TY, and worked 40 countries in the WPX Contest. I0SKK worked 320 QSOs in the Contest and OK2BMA made 392 QSOs, including 58 countries all with 700mW output. G2HKU has been suffering with a bad foot, but Ted still managed to find VP2M,KP4,ZD8,PY and a good selection of W7 stations.

Thanks to everyone for writing. Let me know how your Summer went.

Best 73 and good QRP Dxing,

G-QRP-Club Statement of Account

For the period 12th February 1980 to 12th February 1981, (from the transfer of "G.C. Dobbs Re G QRP" to National Westminster Bank, Chelmsley Wood, to the close of account and transfer to "G-QRP-CLUB Accounts 1 and 2").

<u>EXPENDITURE</u>		<u>INCOME</u>	
Sprat	1045.77	Balance B/F	53.98
Postage	427.43	Subscriptions and	
Tedco	129.30	Donations	2501.95
Awards	50.08	Tedco sales	129.30
Stationary	34.10		
Photocopying	20.68		
R.S.G.B.	13.47		
Returned foreign cheques	8.58		
	<u>£1729.33</u>		<u>£2685.23</u>
Balance in hand	£955.90		
12th February 1981 transferred to :-		G-QRP-CLUB No. 1 Account	£705.90
		G-QRP-CLUB No. 2 Account	£250.00

During the period the finances of The Club fluctuated from break-even at the beginning of 1980 to £89.55 overdrawn on the account after the Autumn issue of Sprat, to the healthy situation at transfer of account. The increase in subscription rates from £2.50 to £3.50, the rapid rise in membership late in the year and pressure applied to subscription defaulters all contributed to the change in fortunes. For the first time The Club has funds in hand to enable us to undertake ventures which require an initial spending. This has funded the membership certificates, the initial cost of The Club QSL cards, and should fund the book, now in preparation, of the best articles in SPRAT from the beginning of its publication.

George C. Dobbs

Christine Smith

YOU HAVE TO HEAR THEM TO WORK THEM

G8PG

The Beveridge antenna, originally developed to reduce atmospheric and other interference on low frequency radio circuits, can also give a good account of itself when used for hf working, often producing a signal-to-noise ratio improvement of 10dB or more on received signals. The antenna can consist of 100 m (300 ft) of wire at a height of 1 to 3 m (3 to 9 feet). The end of the wire remote from the receiver is pointed in the direction from which it is desired to receive and connected to a ground spike via a 470 ohm carbon resistor. The other end of the wire is connected to the receiver. Under these conditions the polar diagram consists of a single lobe in the direction of the grounded end of the antenna. The width of the lobe will be about 30 degrees at 3.5 MHz, decreasing to about 5 degrees at 28 MHz (measured to the 3dB points). Signals and atmospheric noise from directions outside the lobe are almost completely suppressed. When erecting the antenna accurate alignment on the correct great circle bearing is essential, and if a magnetic compass is used for alignment the correction factors for deviation and variation must be applied. (A shorter antenna could be employed, but with some loss of directivity). There is no doubt that if a Beveridge aerial pointing in a suitable direction can be erected it will allow QRP signals to be heard which would otherwise be completely buried in noise and QRM - and the low height means that no planning permission is required. Will someone now please invent an equivalent transmitting antenna !

Membership Changes

NEW QTH:

426 OK1DKW U1.Baterie 1, 16200 PRAHA 6. Czechoslovakia.
621 G4MBP Labour Construction Unit, P.O.Box 1283, Maseru 100
Lesotho. Southern Africa. (now 7P8BS)
749 G4IMG 8 Redinnick Gdns, Penzance, Cornwall. TR18 4JF.
789 G4IKR 3 Choughs Cl. West Park, Cambourne, Cornwall TR14 7XH
808 G4IUP 33 Bartle Gill Dr. Baildon. W.Yorks BD17 6VE.
944 GW3SSY 2 Dalwyn Houses, Llanover Rd. Blaenavon, Gwent NP4 9HY
1169 GI4LXL 95A Regents Park, Doury Rd. Ballymena. Co. Antrim.

CORRECTIONS:

201 Full QTH: WB2EUE, P.O.Box 708, East Hampton L.L. NY 11937 USA.
319 QTH correction to 31100 Falkenberg
1025 Correct callsign is ON8CP / DJ8FU not ON8GP (Christian name=Horst)
1136 Correct QTH for YU3TVN: Kersnikova 32, 63000 CEJE, Yugoslavia.


RESIGNATIONS: members 147 and 181

NEW CALLSIGNS:

621 is now G4MBP (7P8BS) 678 now KC5EV (was KA5AMD)
830 is now G8ZNC 915 is now I2MXY
1054 now KM8X (was WD8RY) 1185 is now G6DQV

PLEASE NOTIFY CHANGES IN QTH OR CALLSIGN TO G3RJV, Quoting your NUMBER.

SPRAT: The journal of the G-QRP-CLUB	
Editor: Rev. G.C. Dobbs	G3RJV
Artwork: A.W. McNeill	G3FCK
Text-type: C.J. Page	G4BUE



New Members

1158 A. Hayes, 17 Canterbury Rd., Ash, Aldershot, Hants, GU126SP.
1159 G6BYG J. Harris, 20 Thornwick Ave., Kingston Rd., Willerby, Nr. Hull.
1160 JH1HTK Takahisa Masuzawa, 8-34-102 Onari-machi, Kamakura 248, JAPAN
1161 G4LBY S. Wright, 22 Crown St., Mansfield, Notts. NG183JL.
1162 AC1P D. Ericsson, 158 Adamas St., Dedham, Massachusetts, 02026, USA
1163 G4JZV B. Bellamy, 35 Bishops Rd., St. Neots, Cambs.
1164 G4KMC M. Craven, 16 Doodstone Ave., Lostock Hall, Preston, Lancs.
1165 C.G. Turner, 190 Norwood, Beverley, Humberside, HU17 9HA.
1166 G8SRL M. Wright, 1 Parkside Cottages, The Green, Upper Hale, Farnham
1167 G4LVM P. Sharpe, 40 Melrose Gdns., Arborfield Cross, Reading, Surrey
1168 VE3ABT D. Hill, 36 Sanderling Plce., Don Mills, Ontario, M/C J1, Berks
1169 GI4LXL E. O'Reilly, 32 Devenagh Way, Ballymena, C. Antrim N. Ire. Canada

New Members Cont....

1170 G3IUJ A. Rogerson, 19 Martins Rd., Shortlands, Bromley, Kent, BR20EE
 1171 G3UOV M. Beck, 11 Orde Cl., Pound Hill, Crawley, Sussex, RH103ND.
 1172 ZL2ASW G. Avery, No. 5 R.D., Feilding, New Zealand.
 1173 M. Henry, 37 Central Drive, Haydock, St. Helens, Merseyside.
 1174 G. Ford, 43 Shaw Str., St. Helens, Merseyside.
 1175 G4LKV E. Hocking, 14A Cross Str., Northam, N. Devon, EX39 1BS.
 1176 G4EFE M. Peters, 42 Gorselands, Wash Common, Newbury, Berks. RG14 6P.
 1177 G8NMQ I. Wooller, 6 Riseley Rd., Maidenhead, Berks. SL66EP.
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 1179 NØART T. Mitchell, 2403 Inca Lane, Ramsey County, New Brighton, USA
 1180 G3IGN L. Marshall, Edificia, Chaparil, 3-7, Nerja, (Malaga) Spain.
 1181 G3VOM D. Lane, 39 Lawnswood Pk. Rd., Swinton, Manchester.
 1182 G4LWP J. Thornhill, 10 Fairholme Rd., W. Knighton, Leics. LE2 6GL.
 1183 G3UDA K. Linney, 57 Whitmere Rd., Mount Pleasant, Shrewsbury, Shrops.
 1184 G3ZUL B. Kennedy, Mence Lodge, Heath Lane, Stourbridge, W. Midlands.
 1185 C. May, 19 Meadow Prospect, Wolercote, Oxford, OX2 8PP.
 1186 R. Payne, 1 Ashby Rd., Daventry, Northants, NN11 5QD.
 1187 G4GYU J. Coates, 30 Abbott Rd., Mansfield, Notts, NG19 6DD.
 1188 G4HJT D. Lloyd, 39 High Str., Twerton, Bath, Avon, BA21DB.
 1189 J. Ramsay, 79 Humphrey Lne., Urmston, Nr. Manchester, M311PT
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 1191 H. Rice, 16 St. Peters Rd., Droitwich, Worcs. WR97BJ.
 1192 G3CSC S. Roddan, 18 Muncaster Dr., Rainford, St. Helens, Lancs.
 1193 WB7PFB M. Winkle, 5422 S.E. Bybee Blvd., Portland, Ore 97206, USA.
 1194 G4LRL P. Wilkins, 12 Chadcote Way, Catshill, Bromsgrove, Worces.
 1195 SM6AOQ S. Mattson, Guldgubbegaten 3B, S-43400 Kungsbacka, Sweden.
 1196 D. Fleetwood, 31A Upper Highway, Hunton Bridge, Kings Langley
 Herts.
 1197 W. Moffitt, Electronica Texas 33 Isidore Macabich,
 1198 KA6IDI C. Russell, 4667 Pendleton St., (Sa Punta) Santa Eulalia, Ibiza
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 1199 G4LGX J. Hall, 104 Regent Ave., Harrogate, N. Yorks, HG1 4BJ.
 1200 W. Todd, 53 Warout Rd., Glenrothes, Fife, KY7 4EP, Scotland.
 1201 G4LSE K. Darton, 18 High Field Ave., Bishops Stortford, Herts.
 1202 LA7YW A. Børkaas, Øvre Lynghaugen 4, 5035 Bergen Sandviken, Norway
 1203 VK4IO K. Griffin, 20 Kordick Str., Carina, Queensland 4152, Australia
 1204 VK4ARJ R. Haigh, 18 Wickham Str., Morningside, Queensland, 4170
 1205 G8UUK R. Barker, 22 Murray Court, St. Marys Hill, Sunninghill, Australia.
 1206 G4LJW J. Jenkins, 32 Glebe Rise, Sharnbrook, Bedford. Berks.
 1207 G3TSS C. Waters, 1 Chantry Estate, Corbridge, Northumberland.
 1208 G4LVK A. Kelly, 8 Green Slade Crescent, Marlbrook, Bromsgrove, Worcs.
 1209 G4MHY F. Monson, 142 Cradley, Houghgreen, Widnes, Cheshire.