# SPRAT

THE JOURNAL OF THE G-QRP CLUB

DEVOTED·TO·LOW·POWER·COMMUNICATION

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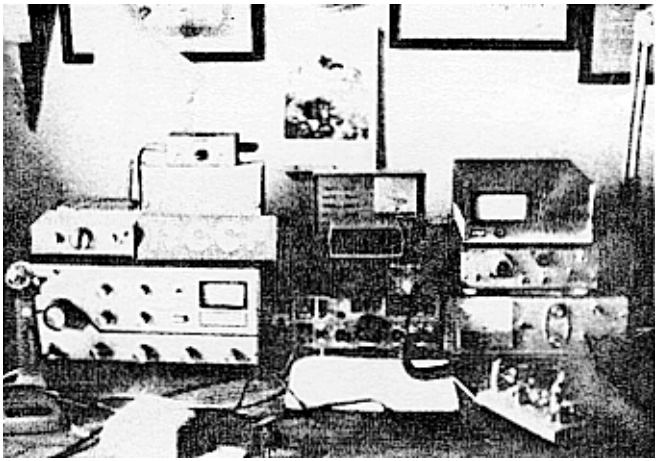
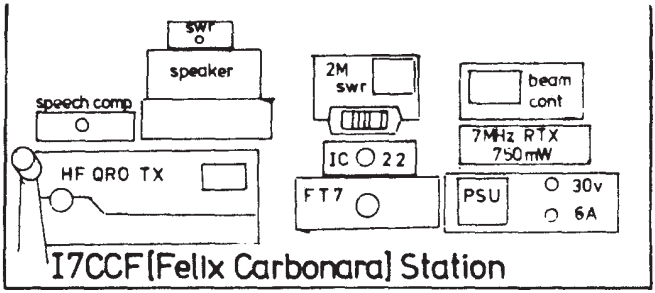





I7CCF [Felix Carbonara] Station

CONTENTS:

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

Dear Member,

This year has been a good year for contact between members, not only on the air, but in the flesh. In his News Section, Chris, G4BUE, mentions the Upton gathering of members. By the time this is published I will have done my "QRP crawl" of the south coast, staying with G4BUE, G3ROO and G3VTT. The Leicester Exhibition is booked for November 6th to 8th and as usual many members will attend. It has been suggested that we ought to book a room in a local hotel for an evening get-to-gether after the exhibition. This year I am not sure that I can be at the exhibition on any particular day. I hope to make it Saturday, but at present I will have to pass on a wedding to make it! May I suggest that this year any members at the show, whatever day, make for the tearoom at 4pm holding a copy of SPRAT and see who they can meet. I would value your views on the possible booking of a room for the Saturday evening of the exhibition in 1981. We could then meet, with an informal programme and a buffet supper.

My only real concern about the club, apart from the work it seems to generate, is non-payment of subs. As from the next issue a new code for subs payment will be introduced and members who fail to pay will receive a note in the next issue of SPRAT, after which they will receive no further copies.

As the nights get longer and we plug in our soldering irons there should be a lot of interesting QRP project under construction. Drop us a line with a circuit or two and share your ideas with the other club members. The circuit need only be a rough sketch, as long as you mark all the component values clearly, and the text need only be notes.

73 fer nw  G3RJV.

## SUBSCRIPTIONS

Renewals to Alan Lake, G4DVW, 7 Middleton Cl. Nuthall, Nottingham.
UK and Europe £2.50 - US and Others $5 cash ($6 cheque)
Cheques to G.C.DOBBS, RE: QRP CLUB. PLEASE QUOTE MEMBERSHIP NUMBER.

151 - 177 233 - 253 326 - 350 DUE BY DECEMBER 31st
445 - 466 616 - 690

ATTENTION U.S. MEMBERS: KC4IG has kindly offered to duplicate and supply the club datasheets to U.S. members. He will supply sheets by request for a stamped envelope (large) and a list of current sheets is available. Write to: Gary Hall (KC4IG) 190 Severt Street, Marion. VA 24354. Please give Gary a month from publication of this issue to get started.

DATASHEETS IN THE UK: Thanks to the response of some kind members, I am agin able to offer the sheets. Most of these are prepared free, but some of the larger and more complex sheets have to be prepared at the cost of paper. To cover this in future there will be a nominal charge of 5p per sheet (a sheet may be 10 pages!) Sheets and list of current sheets from G3RJV, enclosed a large SAE.

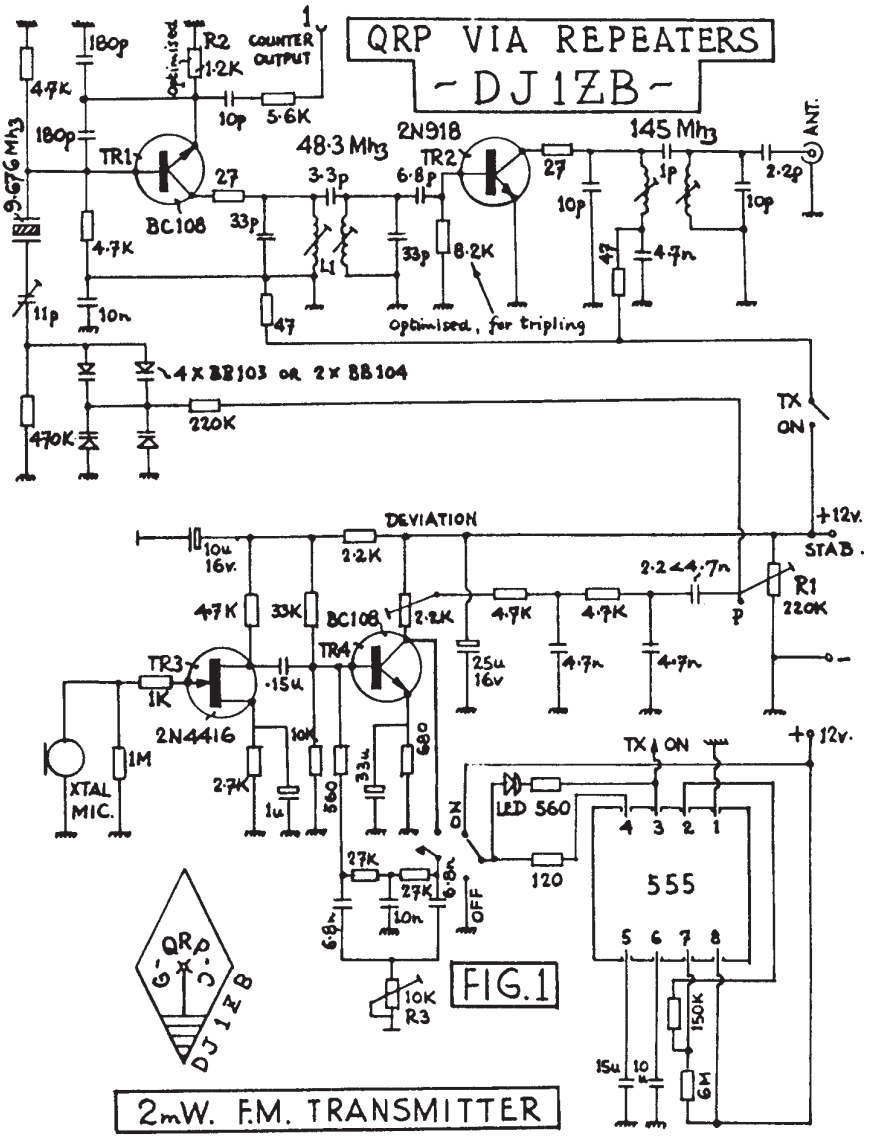



Table 1

| Crystal Fundamental | Proposed Multiplication Scheme | Crystal Fundamental | Proposed Multiplication Scheme |
|---|---|---|---|
| 6 MHz | 6 x 4 | 12 MHz | 4 x 3 |
| 6.9MHz | 7 x 3 | 14.5MHz | 5 x 2 |
| 7.25MHz | 5 x 4 | 16 MHz | 3 x 3 |
| 8 Mhz | 6 x 3 | 18 MHz | 4 x 2 |
| 9 MHz | 4 x 4 | 20.7MHz | 7 x 1 |
| 9.67MHz | 5 x 3 | 24 MHz | 3 x 2 |
| 10.35MHz | 7 x 2 | | |

The higher multiplication factor is always in the oscillator to avoid collector saturation (see text).

# QRP VIA REPEATERS

By Ha-JO Brandt DJ1ZB

Repeaters are one of the most advanced developements in amateur radio (in contrast of the operating procedure of some users). If someone is living in the vicinity of a repeater or is willing to travel to a repeater site, he does not need any expensive FM equipment. As all sophisticated FM technique is installed in the repeater itself, only a simple up and down link is required. The repeater can be received and addressed by very simple, homebrew circuits, and communications can be established within the whole range of the repeater.

The idea came to the author who is working in the vicinity of the Munich City repeater. It could be received by an ancient tube receiver. What would be the simplest circuit to address it?

A crystal of about 1/15 the repeater input frequency was found in the junk box and an oscillator built around it. The crystal was excited between base, emitter and ground of a 2N918, and the 15th harmonic was filtered out in the collector circuit and fed to a simple ¼ lambda wire antenna. The circuit was the same as in Fig. 1, but the 2N918 was used for T1 first and the 145MHz output filter was connected instead of that for 48.3MHz. The output measured at 145MHz was 5µW. Suppression of the 14th and 16th harmonic was about 10dB only, but this was no problem because 25µW is the limit of unwanted harmonic power in Germany for VHF amateur equipment.

The crystal oscillator was directly frequency modulated by capacitance diodes. As the voltage swing at the hottest point (H) was about 10 volts, four diodes were needed to pull the crystal frequency plus or minus 5KHz/15 = plus or minus 333kHz. To check this, a frequency counter was connected to the oscillator and the frequency deviation controlled by turning potentiometer R1 through its range. The voltage swing needed was plus or minus 5 volts, not entirely symmetrical because of the pulling characteristics of the crystal.

As a cheap crystal mike should be used, a two stage AF amplifier was built to modulate the oscillator. T3 is a junction FET to provide a high input impedance for the mike, and T4 is operating as a limiting amplifier at 10 Vss output. The harmonics which are produced by the limiting action are attenuated in a two stage RC low pass filter, and the AF voltage is fed to point P, the DC voltage of which must be adjusted to the middle of the pulling range (about plus five volts). The coupling capacitor of 2.2 ... 4.7nF is to suppress the low speech frequencies for good readability. The best value depends on the voice character of the user. Limiting of the speech amplitude and the FM deviation is highly recommended to avoid distortion in the receiver at the other end. Also, many repeaters have a deviation control and will shut down on excess deviation signals. Because of the limiting action of the AF amplifier and the operating point of the capacitance diodes the 12 volt supply should be stable.

With this 5µW single stage transmitter, the repeater could be addressed from a distance of several hundred meters, and of course many repeater users were astonished about the low power level. Stations within the whole range of the repeater were worked, also some special sites in the Bavarian Alps via mountain reflections.

Later on, the repeater aerial was moved to another location on the same building (to improve coverage in the northern part of Munich). After this the author could not safely address the repeater from his working room with 5µW because propogation via another reflection path was needed. So he decided to split up the frequency generation and to build a two stage transmitter. The 2N918 in the oscillator was replaced by a BC108 and the 2N918 used as a frequency multiplier.

First, the crystal frequency was tripled to 29MHz in the oscillator output, and then quintupled to 145MHz in the 2N918, resulting in an output of 350µW. However, the tripled resonant voltage at the oscillator collector was so high that the transistor saturated, and there were two maxima when tuning L1 for best output, therefore the emitter resistor had to be increased to avoid saturation and to get

a single tuning maximum. But this changed the frequency modulation conditions too.

As the reduction of oscillator current meant a power loss, the frequency multiplication scheme was changed to X5 X3. The oscillator output was tuned to 48.3MHz and tripled to 145MHz. R2 could be decreased to 1.2K again, the modulation characteristics were as before, and the 145MHz output was 2mW. Suppression of unwanted crystal harmonics is at least 35dB, so the harmonic power is still well below the 25µW limit for Germany. Fig. 2 shows the final circuit.

With 2mW output it was also possible to address the repeater from the home QTH over a distance of about 15Kms across the city area of Munich, but safely only at night, when the channel was really clean. The home aerial was a 120Cms vertical wire under the roof, about 9 meters above ground, matched to 60 ohms by a matching section Fig. 2).

To open the repeater by a tone call, T4 was bridge by a double T network, adjusted to 1750KHz by R3. The resistors at the inputs of T3 and T4 (1K and 560 ohms) are to prevent VHF oscillations. Also, as a countermeasure against speech time limitation, a 555 timer IC has been added which cuts a break of 1.5 second into the transmission, the first time 60 seconds after begining, then every 45 seconds (at the begining, charging of the time capacitor starts from zero volts, not from 1/3 of supply voltage as usual with this IC). During the interruption of the FM carrier, the LED is on to signal what part of the speech should be repeated.

Reproduction of this circuit depends of the availability of a suitable crystal. Excitation in the fundamental mode is recommended to achieve good modulation characteristics. A wide variety of crystal frequencies and multiplication schemes exist, including cheap CB crystals (channels 19 to 23 for repeater input) in the fundamental mode (see table). First, the oscillator must be pulled to a sub-harmoni of the desired repeater input frequency (eventually use a series coil to increase the pulling range). After this the frequency deviation range should be checked by varying R1 and eventually the number of capacitance diodes. The frequency multiplication must be checked with an absorption frequency meter or a good counter to avoid output on a wrong harmonic. The limited AF output voltage of T4 is determined by the difference between supply voltage (plus 12 volts) and the voltage drop at the emitter resistor (2 volts), which is dependant on the voltage of the base divider. The collector must be on the mid potential between the emitter and the supply voltage (plus seven volts). If the capacitance diode combination should require less than 10 volts p-p for plus or minus 5KHz deviation, the modulating voltage after limiting can be reduced by the deviation control potentiometer.

Simplest FM Receiver

After the transmitter problem had been solved, the next question was: what is the simplest circuit to receive a nearby FM station? All those popular FM IC's would require a super-heterodyne receiver. For instance, the transmitter carrier could also be used on receive to mix the repeater output frequency to an IF of 600KHz, where the IC could be operated.

However, the simplest kind of receiver for this purpose was found to be a special version of the author's shortwave FET regeneration receiver (SPRAT - Autumn 1975 and Spring 1976) operating as a slope detector just before regeneration (no super-regenerative receiver, no radiation). The detector circuit is shown in Fig. 3. A two stage AF amplifier is n eded for headphone reception, like in the 1975 publication (2 x BC108).

For good mechanical stability of the VHF circuitry, a small PCB was etched. To avoid any influence of hand capacity, both resonance and regeneration are tuned by capacitance diodes, like in the 1976 circuit. An Amidon toroidial coil was used even at VHF because the influence of nearby components on resonance is much less and coupling between coil parts L and Lr is much better and improves regeneration performance.

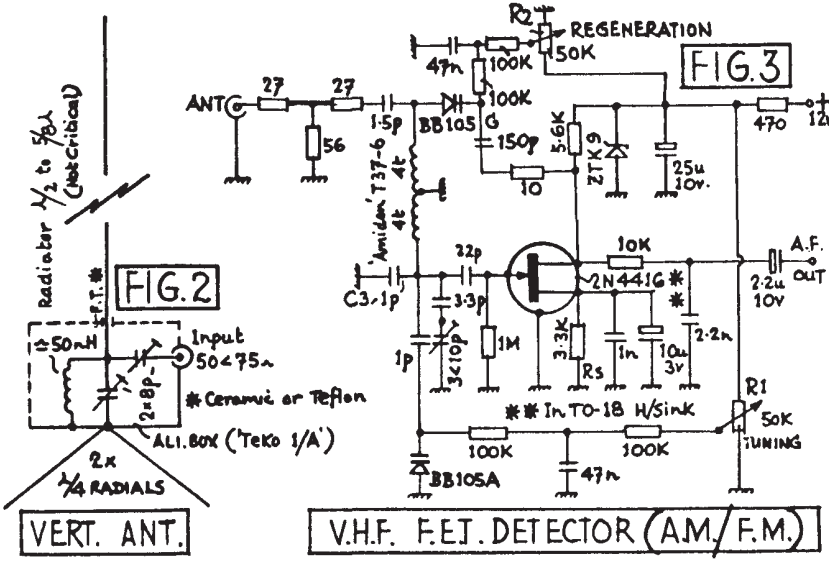
The optimum values of resistors Rs and Rd depend on the FET characteristics which may vary considerably even within a specified type. Rs is replaced by a 5K and

Rd by a 10K trimmer, and both are adjusted first so that the FET does not saturate ($V_{DS}$ about two to three volts). Next the regeneration is made operative and the resonance checked by an amplitude modulated VHF signal generator. It may be necessary to vary the number of coil turns and/or to add a small capacitor C3 to make the circuit resonate at about 145MHz with trimmer C1, with the regeneration operating within the range of potentiometer R2. Then Rs and Rd are varied for best detector sensitivity combined with good regeneration performance. The resistance values obtained are measured and replaced by fixed resistors. At last capacitor C2 is checked for a total tuning range of about 1MHz or somewhat less over the range of potentiometer R1. Both potentiometers should be of rather high diameter for good linearity.

An advance model of this detector circuit, using trimmer capacitors and slug tuning, was tested in the vicinity of the Munich City repeater. Reception was sufficient, but adjustment was very critical. With the diode version however, adjustment was so fine that the Munich City repeater could be received at the home QTH over a distance of 15 Kms. The Zugspitze repeater on West Germany's highest mountain in the Bavarian Alps, on the neighbour channel 25KHz apart, could also be received and seperated from the city repeater. This was much more than was expected and needed in co-operation with the QRP transmitter.

Some temperature drift on both resonance and regneration was noticed first but could be greatly reduced by two measures. The FET was cooled by a TO-18 cooler (Wakefield NF201 or 203 or equivalent) in spite of the small DC power needed for this purpose. Also, a better than average voltage stabilisation was needed, ordinary zener diodes or 78XX type stabilisers being insufficient. The µA 723 or improved versions of it are recommended, or the ITT ZTK9 stabilisator especially designed for voltage tuned radio and TV circuits. Further experiments on this receiver will also evaluate capacitance tuned line circuits.

It is hoped that the circuits of Fig. 1 and 3 are especially interesting for the home brewer, who does not like to spend much for FM gear, but who likes to experiment in spite of being different from the generally accepted view.




DJ1ZB's vertical VHF aerial (under the roof). The coil is dimensioned so that the parallel trimmer is not at an extreme position.

# MINIATURE 40m PORTABLE TRANSCEIVER By W7EL

This is a description of a rather small 40 metre QRP station I put together over a period of time. It all began when I acquired a number of boxes about 4 x 7 x 9 cms. in size, and the station grew as I filled more of them. At present the station consists of the following items, each in its own 4 x 7 x 9 cms. box:

40 metre cw transceiver (2 watts input, approximately 1.5 watts output).
40 metre transmatch with bridge for matching.
CMOS keyer with paddle assembly and self-contained battery.
Power source of 10 'A' size (660mA-h) NiCd cells (12 volt nominal).
For those QRO fiends.....a 10 watts input (approximately 8.5 watts output) add on amplifier with relay for semi-break-in, designed for the U.S. Field Day.

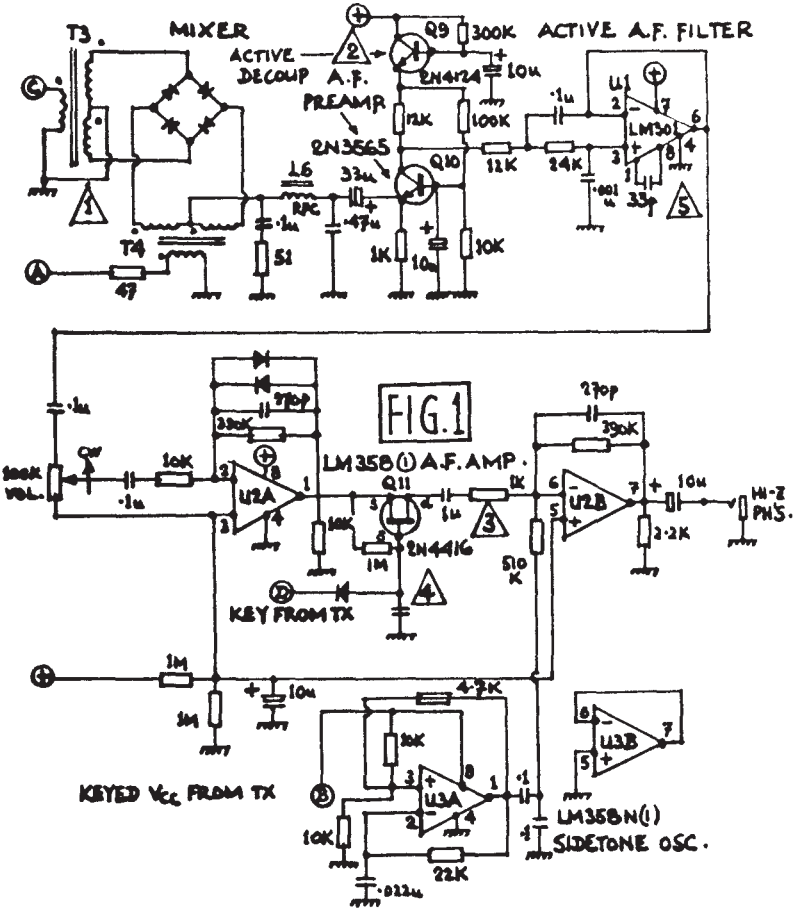
The station is still evolving. I won't mention future projects as I don't really know when I will finish them. Perhaps never - hi.

Here is a description of the transceiver: The RF Amplifier and PA are quite straight forward and further descriptions may be found in the reference. The 36 volt zener successfully protects the output transistor if the rig is keyed with the antenna disconnected. Replacing the output transistor is quite a job in this compact rig, and I did it twice before adding the zener. No trouble since. Note that the zener has an equivalent capacitance of about 30pF, so the capacitance at that point was reduced accordingly. Unless the capacitance of the zener can be measured it is probably wise to make the collector capacitor variable. A one watt zener may have as much as 200pF of capacitance. The 51pF capacitor is an integral part of the transmitter output network when transmitting, since the T/R diodes are on at that time.

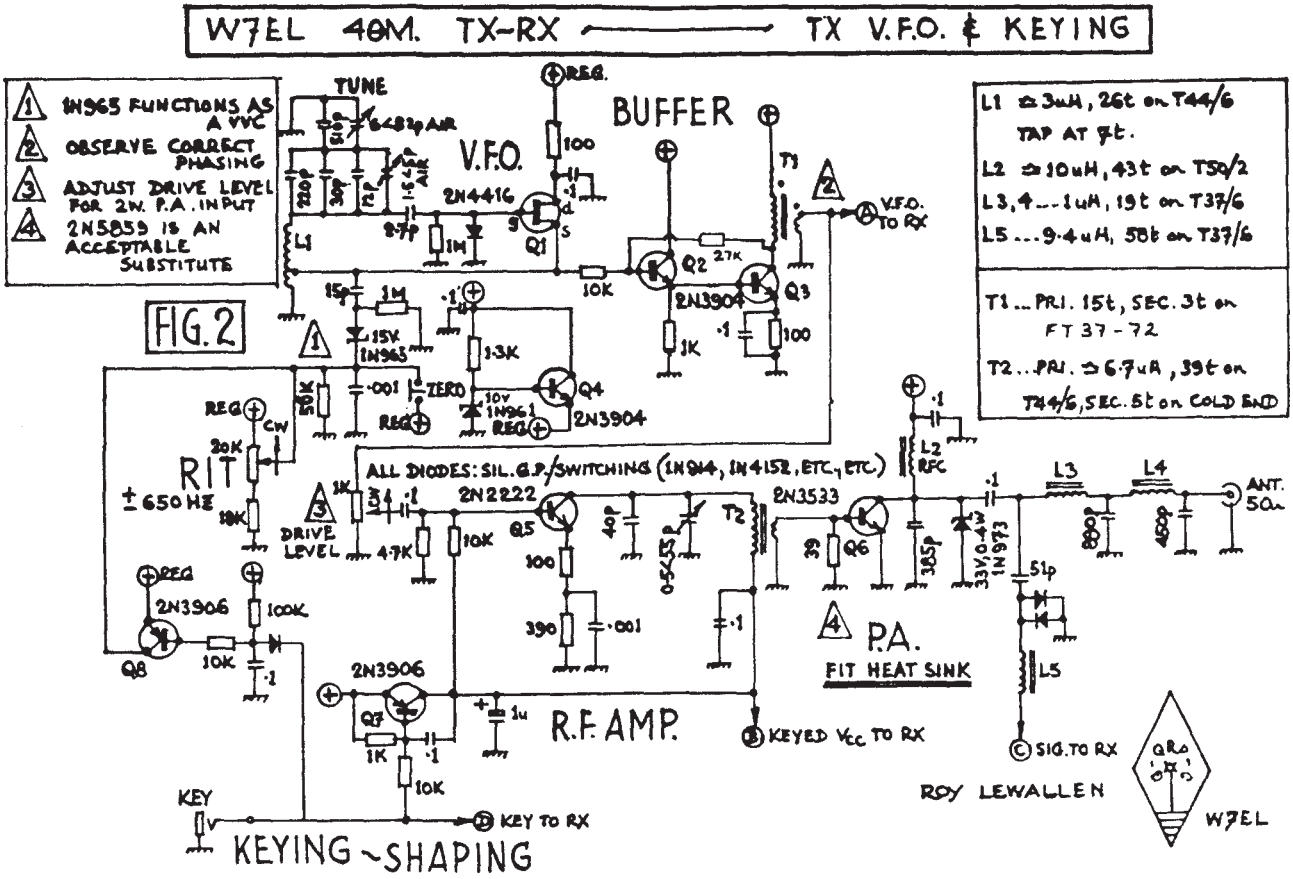
The VFO is a Hartley type which I found to be unsurpassed for simplicity and stability. When NPO ceramic capacitors are used as recommended, the only significant source of drift is the conductor. A toroid wound on type 6 powdered iron is the best I have found, and I believe most drift is the result of dimensional changes in the core and/or wire. The warm up drift is about 100Hz. over a period of about 15 minutes, with the majority occurring in the first two. It is virtually unnoticeable. Of course it can be compensated if desired by replacing some of the capacitance with polystyrene or temperature-compensating ceramic units. Voltage stability is 50Hz./volt or less from 6 to 15 volts supply without regulator Q4, and unless the supply is pretty ragged, the "+REG" line may be connected directly to the supply and Q4 eliminated. Do not construct a VFO on a printed-circuit board unless you are aware of critical parts of the circuit. Use standoffs above a ground plane or similar techniques instead. Printed-circuit board capacitances are very sensitive to temperature, humidity, etc. Building on printed-circuit board squares (ARRL style), is not recommended for any VFO for those reasons. The buffer consumes about half the receive current of 20mA, and seems to be a reasonable compromise between efficiency and complexity. Other types would certainly be satisfactory.

The receiver design was changed several times as shortcomings were discovered. The original rig used a MC1496 mixer, but it suffered from demodulation of strong AM signals. Balance could be effected, but only for a given source of impedance, which in the case of an antenna is a function of frequency. A great deal of effort went into making the MC1496 insensitive, including baluns, different injection levels, etc., but it was finally abandoned in favour of a diode mixer. Singly balanced mixers, using two and four diodes were tried, and there was much improvement, but noise figure was poor for some configurations, and AM demodulation was still present to some degree. The doubly-balanced mixer now in use is very insensitive to AM demodulation: a 10 millivolt, 30% modulated AM signal 100kHz. away produces a note equivalent in amplitude to a 0.5 microvolt desired signal. An AM signal under two millivolts is not audible, even though a desired signal of less than 0.1 microvolt is. The low pass filter consisting of L6 and the 0.47uF capacitor prevent the audio amplifier from rectifying any RF that does get through the mixer, and helps make the rig immune to nearby signals.

# W7EL — 40M. — TX-RX



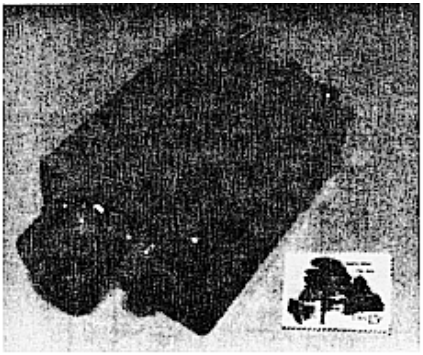

| | |
|---|---|
| 1 OBSERVE CORRECT PHASING | T3,4 — 5 TRIFILAR t. ON BLN-43-2402 (OR ON FT 37-72 CORE) |
| 2 2N3565 ACCEPTABLE SUBSITUTE | L6 — 100uH. SUBMIN. RFC, WOUND ON ¼W. RESISTOR-SIZED FERRITE FORMER (D.C. RES ≈ 8Ω) |
| 3 2N4416 PINCHOFF SPEC. IS 6V. MAX.. DEVICES WITH PINCHOFF OF 5.3< 6.0K MAY NOT WORK WELL HERE | NOTE ALL DIODES ARE G.P./ SWITCHING, SIMILAR TO 1N914, 1N4152, ETC., ETC.. |
| 4 MAY NEED TO VARY, WITH INDIVIDUAL F.E.T.'S. IF SO SELECT TO JUST ELIMINATE "POP" WHEN RIG CHANGES TO 'RX' | ROY LEWALLEN — W7EL |
| 5 HALF LM 358 MAY BE USED HERE. NOISE FIG. DEGRADED BY ≈ 2 dB. | |

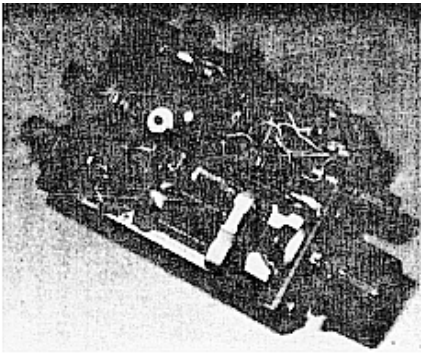

W7EL 40M. TX-RX ——— TX V.F.O. & KEYING
1 IN965 FUNCTIONS AS A VVC
2 OBSERVE CORRECT PHASING
3 ADJUST DRIVE LEVEL FOR 2W. P.A. INPUT
4 2N5859 IS AN ACCEPTABLE SUBSTITUTE
TUNE
V.F.O.
BUFFER
REG.
2N4416
Q1
Q2
Q3
2N3904
T1
V.F.O. TO RX
L1 ≈ 3uH, 26t on T44/6 TAP AT 7t.
L2 ≈ 10uH, 43t on T50/2
L3,4 ... 1uH, 19t on T37/6
L5 ... 9·4uH, 58t on T37/6
T1 ... PRI. 15t, SEC. 3t on FT 37-72
T2 ... PRI. ≈ 6·7uH, 39t on T44/6, SEC. 5t on COLD END
FIG. 2
RIT
± 650 HZ
ZERO
Q4
ALL DIODES: SIL. G.P./SWITCHING (IN914, IN4152, ETC., ETC.)
DRIVE LEVEL
2N2222
Q5
2N3533
Q6
T2
L2 RFC
L3
L4
ANT. 50Ω
P.A.
FIT HEAT SINK
L5
2N3906
Q8
Q7
R.F. AMP.
KEYED Vcc TO RX
SIG. TO RX
KEY
KEY TO RX
KEYING ~ SHAPING
ROY LEWALLEN
W7EL

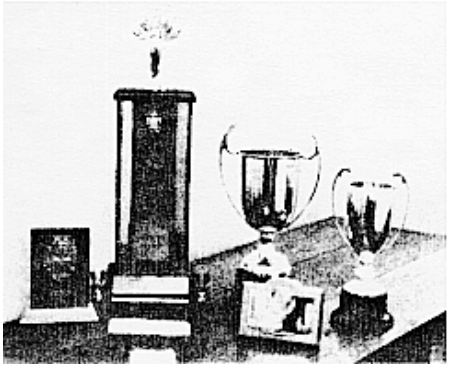
Now a few words about T/R switching. This rig is full QSK. A great deal of attention was paid to timing: the receiver is silenced. The oscillator frequency is then shifted an amount approximately equal to the peak frequency of the AF filter. Finally, the transmitter is keyed. The reverse sequence is followed when the key is released. Transmitter keying is shaped to avoid clicks. The result is a rig which receives nothing but the finest compliments on its keying, and one which is a pleasure to operate, with no thumps, clicks, etc.

The audio filter, U1, is adequate for nearly any circumstances, but of course more elaborate filters can be constructed. Since the schematic was drawn I moved the volume control from the location shown to a position between pins 1 and 2 of U2A, in place of the 390K resistor. This makes the receiver completely quiet when the control is turned down. As shown, there was a bit too much gain following the control.

(TWO PHOTOGRAPHS WHICH ILLUSTRATE THE SMALL SIZE OF THE TRANSCEIVER)







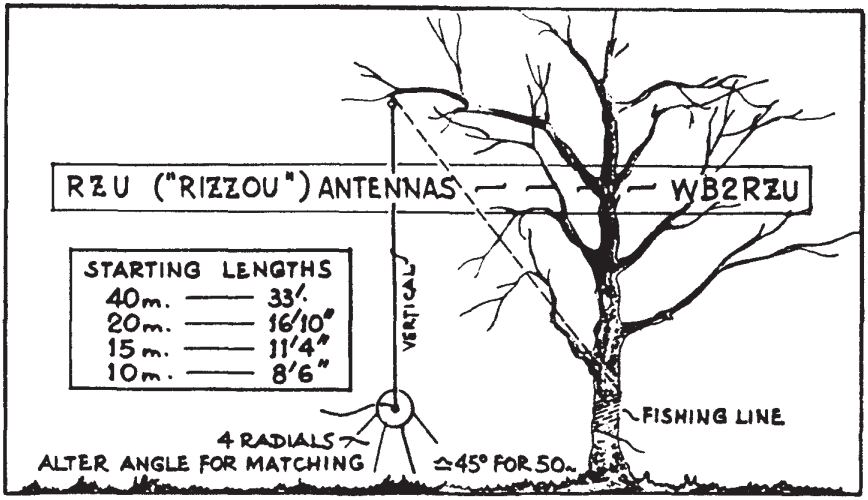
## The GM3OXX Trophy Collection

The fine collection of awards gained by George Burt (GM3OXX) for his QRP work. Left to Right: G2NJ Trophy Keepsake, Milliwatt DXCC (100 countries with 1 watt) G2NJ Trophy, QRP Masters Award Plaque, and the Jack Wyllie Cup.

George denies that he loads his trophies up in series as a 160m antenna! May I remind members that George uses 100% self designed, home made equipment, nevr more than 2 watts D.C. input to simple wire antennas.

Q.R.P. CALLING FREQUENCY CRYSTALS: Peter, G3EDW, has kindly agreed to stock the following QRP International Frequency crystals: 3560, 7030, 14060 and 21060, all HC25U mounting, ± 0.002%, load capacity 30pF. His price for club members is £3.00 inc. postage and V.A.T. Orders to: P.R.GOLLEDGE ELECTRONICS, MERRIOTT, SOMERSET. TA16 5NS.

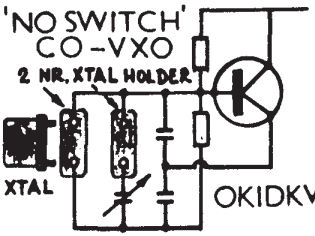
BEST OF SPRAT: G3RJV gets repeated requests for back issues,which we do not hold as our overprint is very small on each issue. The club intend to produce a bound book of the best practical articles from 5 years of SPRAT. Details next issue, including how to order in advance of printing to ensure your copy.




One of the homebrew antennas that is more often over looked is the quarter wave vertical...why? Because you have to use aluminium tubing for the vertical radiator...right? Wrong - try using all wire for both the radials and the centre. In the field one also needs a 'radio rock' and fishing line to secure the centre radiator to a tree. What is a radio rock? Just a rock which you can tie the fishing line to...ever try to throw the unweighted end of a fishing line?, you can't, hi hi, hence we need a radio rock.

Make up heads for each band using a paper cup coaxial fitting, and some kind of rubber potting compound, (bath rubber base calking compound works well, but let it cure for a few days removing just a bit of the paper cup at a time to make sure it is curing).

Start off making all the elements the sizes listed below, and then trim for desired SWR. A cheap matching trick for all of us who like 50 ohm coax is to raise the vertical radiator off the ground to get a better match, that ground plane looks like 33 ohms when flat on the ground (earth) and approaches 50 ohms as you let the radials get some angle. Try these, they are great for camping, field day or as a back up antenna system for emergencies, and they are cheap and amazingly broad band.

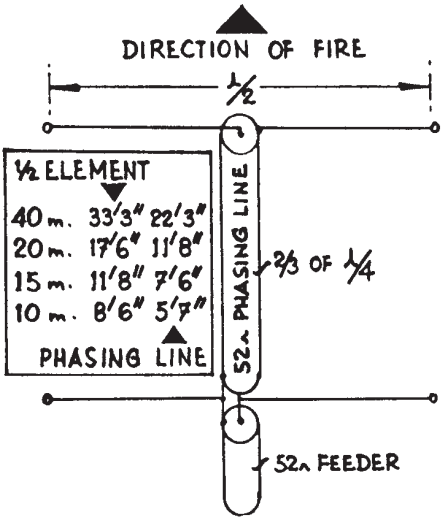



C.O. VXO.
Simple,but useful idea from Petr. OK1DKW.


GRIND BROKEN HACKSAW BLADE, AS SHOWN

Use the point on copper or fibreglass sides, against a steel rule, to cut the board. Will also scribe open channels in the copper. (I have tried it and it works well - G3RJV)

WANTED: Rollercoaster Coil. Any HC6U crystals (8MHz) for CW end of 2 metres, can swop for 48 MHz xtals (144.5-145MHz) G4EYE, A.J. Free Homeric,Main Rd,Lt.Oakley,Nr.Harwich. Essex. CO12 5TF




The outline of Antenna should look like a tent as the dipoles are in an inverted vee. Suggest 8" - 10" extra on elements to allow for different installation conditions. More elements can be added and mimensions are the same for each element.

DOUBLE INVERTED VEE ——
—— TIM COOK/G5DEH

**VERTICALS: No 2, THE G4EUW THREE - BANDER**

**This antenna was erected on the flat roof of an 18 foot square double garage. It was designed to cover 14, 21 and 28 MHz. An old wooden door was laid on the centre of the roof. A 6x6 inch piece of brass was fitted with terminals for the radials, and an old car gear lever knob was bolted to its centre to provide a base insulator. The piece of brass was then secured to the centre of the door with wood screws. A base section made from a 4 foot length of 3/4 inch diameter aluminiun tubing was then placed on the base insultor and supported by a steel tripod which was screwed to the door. The base section passes through an insulated clamp at the top of the tripod. Before installing the 4 foot length of tubing it was fitted with an inside sleeve so that other lengths of the same tubing could be plugged into it. Total lengths required are 19ft 9 in for 14 MHz, 11ft 3in for 21 MHz and 9ft 5in for 28 MHz( these lengths include the 4 ft base section). The additional lengths were made up from a combination of 3/4 in tubing and whip antenna sections. Four wire radials were run from the brass plate to the corners of the garage roof and there attached to the aluminium waterproofing round the edge of the roof. These radials are not resonant. A 100 pf air spaced capacitor housed in a waterproof box was placed at the base of the antenna and connected between the antenna and the inner of a 50 ohm co-axial feed, the outer of which was connected to the brass plate. Setting up was accomplished by plugging in the correct top sections, placing a radiation meter near the antenna and adjusting the 100pf capacitor for maximum rf (before leaving the shack the tx was first loaded into a 50 ohm load, then the co-ax feeder was connected to it). This tuning method gave an excellent swr. No guys were necessary on the antenna. VK, ZL, W etc were worked when using QRP with the antenna. An expensive multi-band commercial vertical has since been installed. It is more convenient for band change but no better on DX!**

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HELP WANTED BY MEMBER: Alex Vise, 29 Bayview, Jonesboro, Newry, Co. Down, wishes to contact local GI members. Alex is awaiting his GI4 call and is unfortunately nearly blind. Interested in QRP CW and requires help.

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FOR SALE: FT200 Transceiver, Good condx, with ext PSU + Speaker £200 or near offer. 2m Monitor Rx. Seiwa M82, 4channels, scanning. S20,21+R4,RØinputs, Nicads and charger. £50. Alan Lake G4DVT (QTH p2)

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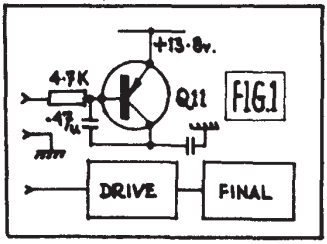
HELP! I have been given a Cossor Commando (CC 703 L/B) ser No. 11097 which I'm told can run on 4m. Anyone got a circuit or conversion details ? G3RJV.

# HW8 Improvements By Mike Perry PA3ASC/G4HWZ

KEYING WAVEFORM

The leading edge of the HW8 keyed RF waveform is very sharp and mey be considered by some to be unacceptable. The transmitter is keyed by switching electronically the supply voltage to the buffer amplifier which drives the final power amplifier. (Fig.1) The 2uF capacitor discharges slowly when the transistor Q11 is turned off, giving a slow trailing edge; but on turn-on, Q11 rapidly sucks charge out of this capacitor to give a fast leading edge. The remedy is to connect an additional 0.47uF capacitor across the collector-base junection of Q11, thus slowing down the rise and decay of the collector voltage due to the miller effect. The capacitor is easily "back-mounted" on the circuit side of the printed circuit side of the printed circuit board.




REFLECTED POWER MEASUREMENT

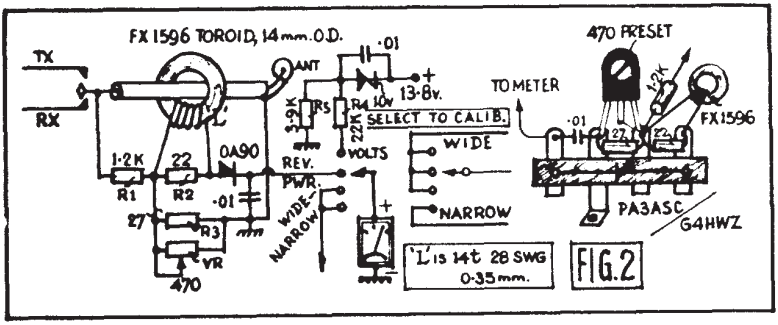
The front panel meter of the HW8 can be used to measure reflected power using the circuit of Fig.2, which has been designed for a 50 ohm output. The principle is well known. Antenna current passes through a short piece of coax which is encircled by a high mu ferrite toroid, suitable for the frequencies involved. The toroid samples the current and the secondary winding develops a voltage across $R_2$ which should be about 300 mV for full RF output (a good test to see the ferrite is suitable). The braid acts as an electrostatic shield and must be earthed only at one end. Voltage is sampled by $R_1$ and $R_2$ and added vectorially to the voltage across $R_2$. The resultant is rectified and fed to the meter via a switch.

Installation is as follows. Remove the front panel and replace the audio bandwidth switch by a 3 pole-4way switch about 25 mm diameter. Replace the front panel and re-connect the "RF Output" and "Wide/Narrow" functions. Remove the lead from the antenna socket to the relay.

Construct the swr circuit on a tag strip keeping all leads as short as possible, Fig. 2. Drill a 3 mm hole in the rear panel near the antenna socket and mount the tag strip, remembering to make a good ground contact. Connect the lead from the diode to the switch. Wind 14 turns onto the toroid and slip it over the coax. It may be necessary to remove the outer PVC sheath and insulate the toroid with a thin layer of tape. Ground the braid at the antenna socket and connect the relay to the antenna output. Connect up the toroid and $R_1$ and set VR to max.

With the HW8 on dummy load, key the transmitter and tune for maximum output. Switch to 'reflected power' and observe the meter. If the meter deflection is near maximum reverse the leads from the toroid. Adjust VR for zero deflection.

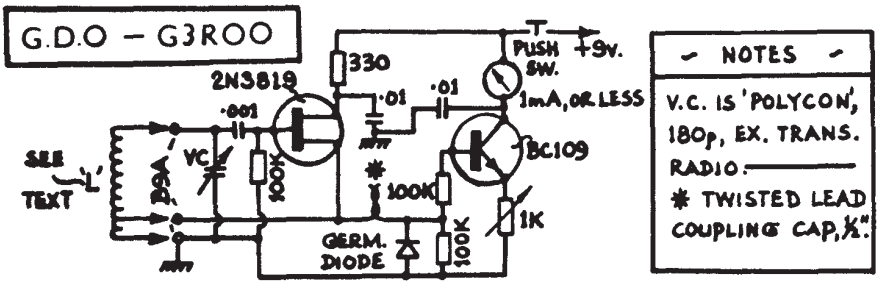
Due to stray capacitance it may not be possible to obtain a complete null, but the meter deflection should be less than one mm. Finally, if the voltage across $R_2$ is too low, do not add more turns since this will upset the circuit performance; find better ferrite.




VOLTAGE MEASUREMENT

A zenor diode and a resistor network may be used to check the supply voltage, useful for portable operation. Calibration is empirical. Components may be mounted on a tag strip secured by one of the bolts holding the meter in place.

25 mm = 1". 3 mm = 1/8" or 6 BA.




Having discovered that TOKO 10K coil formers (AMBIT) fit B9A valve holders a long sought after piece of test equipment, a GDO, was the next construction project. Several circuits were tried, and, as usual, the simplest proved to be the best.

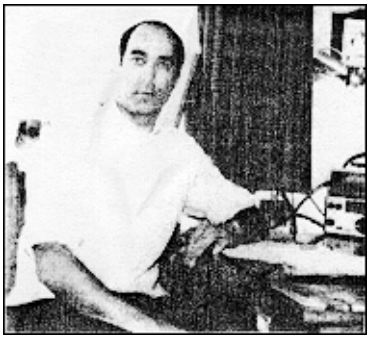
A few points: The earthy end of the coil must be at the top to reduce pulling. Start with a tap ratio of about 5 : 1, on a coil covering about 8 to 15 Mhz. Then adjust the coupling to the detector circuit to give about ¼ scale deflection on the meter. On other coils the tap should be adjusted to give an indication between ¼ and ½ scale. This is no hardship as winding coils on TOKO formers is simplicity itself.

CLUB QSL CARDS: Following requests from members, we are considering producing Club QSL Cards. These would be standard size, printed one side on glossy card, with the club badge. Each card would be overprinted with individual members callsign and personal information. Orders would be a minimum of 500 cards and the cost would be at least two thirds less than usual commercial cards. To assess club interest, would interested members drop a line to G4DVW (address on page 2) A sample of artwork may be printed in the next issue - Alan will welcome any ideas and opinions.

WANTED: VFO FV50B or one to suit FT75. Pse Ring Nottingham 257396 with price and details -

WANTED: Circuit diagram of Heathkit MT1 transmitter, also commercial or good homebrew paddle for el-keyer. Prices/details to G3FCK QTHR.

# MEMBERS NEWS — By Chris Page G4BUE



As I write this (the week-end of The Asian CW Contest), conditions on the HF bands have improved greatly. The highlight of the Summer for your scribe was a meeting with George, GM3OXX at The Upton Mobile Rally along with several other members and a meeting with Ben, CT4CH and his xyl, Henrietta when they visited England in July. Ben was also looked after north of the border by George, GM3OXX and his xyl.

All your letters are very welcome and it is very encouraging to all the officers of the Club that so many of youare showing so much interest in the Club. It is your Club to provide you with what you want. Don't forget that when writing you can enclose QSL cards for other members, which will be distributed with Sprat, free of charge.

Despite the bad Summer conditions on the HF bands, dx has been appearing as can be verified by George, GM3OXX with QSOs to ZS, HC, VK, ZL and JAs bringing his country score to 149. Arthur, G4EFJ has recently worked all USA districts, except 6, and Volker, DF5KD has found 81 countries and 48 USA States. Two good days for Volker were the 28th October when he worked WAC on SSB and the 17th February when he worked 17 USA stations on 7MHz. OK2BMA is now up to 78 countries and Mal, ZE3JO up to 35, including WAC. With his HW7 on 21MHz he has recently worked KH6, VU, UA9, JAs and many Europeans. A case of TVI put him off the air for a while but when he got back on the bands he found VK and ZL.

Another QRPp DXCC holder for the Club hopes to be Per, SMØFSM. After 828 days QRPing, he worked his hundredth country which was OJØ, as he says 'a rocks throw from SM land'. Recent DX worked by Per includes KH6, KP2, VU, HM, 9V1 and OA. An interesting QSO for GM4ELV was when he worked SL8AEN, the Swedish Scientific Arctic Station on 7MHz.

It is nice to hear from some of the newer members. Gus, ON6KE says he has just become QRV on 7MHz as he is a '40 metre fanatic'. With 4 watts SSB he has worked 6 countries and has been receiving many 59 reports, including one from member G4OO. From the other side of the world QRP dxing means prefixes such as YO, YU, EA, JA, W, and 8Z4. These have been worked by Maggie, VK3NQQ with her Argonaut. Maggie is Publicity Officer for ALARA and says her most exciting QSO was with a W6 who was running 3½ watts output. G3NKS is mainly QRV on the LF bands with his HW8, although Derek has worked Ws on the HF bands with his G5RV. From South America, PY2TU has been QRV since May, working 22 countries on 21/28MHz with his QRP rig.

All reports reaching your scribe on the new Argonaut model 515 are very favourable in fact no member has seriously criticised this rig yet. Frank, G3YCC has recently purchased one and with his TA31 at 46ft worked HS, HM, VU, ZS, TU, D4 and about 75 JA stations during the first two months with it. Len, G3WBO has also just purchased one. From commercial QRP rigs we turn to homebrew rigs and I'm reliably told that the new transceiver in the GM3OXX shack is "out of this world". All George's expertise has gone into it and the DX he has been working with it (see above) has been in the same class. Another homebrewer is G3ZQA, Roy would like to hear more of what members have been building. He likes desiging and playing around with simple 160 metre AM/CW gear. It is the only band he uses and he has developed a portable solid state transmitter for AM/CW having 1 watt input. AM QSOs up to 50 miles have been made so far using a kite antenna.

G4EFJ has just built the 'ultimate Keyer' from the Feb. 80 RadCom design, but has added some mods of his own. G4ELZ is now QRV on 3.5MHz with his homebrew rig. Jeff is now in the process of adapting a CW/SSB transmitter for the other bands for QRP use. G3YCC has built the SCD 80 metre rig, crystal controlled on 3560. He finds the VXO swings the frequency about 1.5KHz, and has enabled him to work GM, GI, GW, PA and several members in G land.

G4GDR has renovated the transmit section of the B2 rig, and would welcome any information from members on the receive section. Adrian has also renovated a Command receiver for 7MHz. Between being Club Secretary and attending to Parish chores, George, G3RJV found time to build a small wide band linear (80-10). With about 150mW of drive it gives about two watts out. Petr, OK1DKW is building a a transceiver and has been getting advice from George, GM3OXX on matching the PA to the antenna. Petr and George have also been exchanging information on some microwatt experiments that Petr has been doing with valve PAs. Gordon, G3DNF has rebuilt the PA of his HF rig and improved the efficiency (this being a result of Gordon building the K8EEG power output meter and finding the efficiency of his PA was not as high as he thought!).

The AGCW Summer QRP Contest in July attracted members again with G8PG and OK1DKW being amongst the high claimed scores. Gus stayed on 28MHz and made a reasonable score despite the poor conditions, whilst Petr used 20,80 and 40 metre bands. Pavel, OK2BMA made 63 QSOs on 14MHz including W,VE,FG7,UM8 and JAs, and Gordon, G3LNF decided 21MHz was the band to be on. After making 1000 points on the Saturda and not finding any USA stations he turned to 14MHz on the Sunday and made a furthe 3000 points. G4ELZ made a very creditable 28 QSOs on 3.5MHz using only 800mW with his homebrew rig. This included five countries.

The Second CW Club Activity Week-end held over 2/3 August appears to have been well supported despite the poor HF conditions. Your scribe apologises for his absence during the week-end but he was on holiday in Devon. DJ1ZB commented on the poor HF conditions, but still found several members on 14/21MHz. Ha-Jo says he heard no Southern UK stations during the whole week-end. Gus, G8PG also agreed that conditions were poor. He spent the majority of the time on the LF bands meeting four members for the first time. Those of you who worked Jeff as G4ELZ/P maybe interested to know that the inverted vee was erected by initially using a catapult to put a 15lb fishing line over a 40 feet high branch. GM3OXX met some members for the first time and has now worked 120 members. Most of George's QSOs were on either 7 or 14MHz. Per, SMØFSM worked ten members for the first time.

Members are reminded of the Third CW Activity Week-end over 1/2 November 1980, times and frequencies as shown in the last Sprat for the August event. As the next edition of Sprat will not appear until the end of December, I have set out below the details for The 1980 QRP Winter Sports, to be held daily from 26th to 31st December 1980 inclusive :-

| | | | |
|---|---|---|---|
| 0900 - 1000 | 14060 | 1500 - 1730 | 21060/28060 |
| 1000 - 1100 | 21060/28060 | 1730 - 2000 | 14060 |
| 1100 - 1200 | 7030 | 2000 - 2100 | 7030 |
| 1200 - 1300 | 3560 | 2100 - 2200 | 3560 |
| 1300 - 1400 | 7030 | 2200 - 2300 | 14060 |
| 1400 - 1500 | 3560 | | |

All times in GMT.

Please send logs and comments to Gus Taylor, G8PG within three weeks of the event, in order that a write can be prepared and the certificates awarded. The Club award a certificate to the member in each continent who contributes most to the event. The event is not a contest but an opportunity to enjoy two-way QRP QSOs with other members.

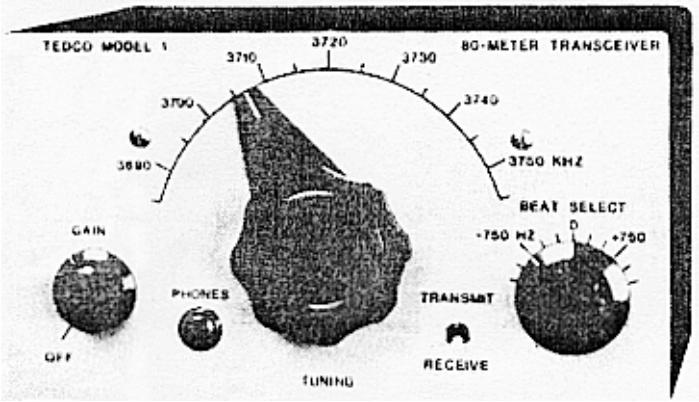
On the VHF scene, Leonardo, 15WUO has now worked 13 countries on two-way QRP on the VHF frequencies. He has worked 9 countries on 144MHz and 8 on 432MHz. Recent additions on 432MHz were EA and 3A. The attention of members interested in VHF QRPing is drawn to the "wanted" notice elsewhere is Sprat for a VHF Club Manager.

Regarding Bill's (WA2JOC) comments on lists, nets etc for working QRP countries, I will give members reactions next issue, but more opinions are wanted.

If you QSO with OK2BMA in the near future and Pavel describes his rig as "HMW8", don't think you have copied his cw wrong, as that is what Pavels calls his rig. He acquired the circuit diagram of the HW8 and made his own version calling it "Home Made HW8". Let me know how your Autumn went and anything else of interest to your fellow Club members. To reach me by the 20th November, please.

Best 73 and good QRP DXing,

Chris Page - G4BUE




(This illustration is the Model 1.)

# TEDCO MODEL 2 EIGHTY METRE TRANSCEIVER

A SHORT TEST REPORT BY G3RJV.

Some time ago I was pleased to receive a TEDCO MODEL 2 TRANSCEIVER for testing. The transceiver is a VFO controlled 3.5-3.6MHz, 1 watt input transmitter, with a direct conversion receiver. The transceiver is designed for /P use, with battery mounts in the case for HP2 (D cell in the U.S.) although it can be used on external 12volt batteries.

On use the receiver proved excellent (sensitivity less than 1uV for 10dB (S+N)/N- selectivity 150Hz @ 3dB)and the transmitter was loaded via an L Match into a long wire. The output impedance is adjustable 10 to 1000 ohms balanced. The one watt gave reliable QSOs all around the U.K. last winter, with plenty of European contacts. The IRT circuit seemed especially useful, being calibrated for ± 750Hz, enabling accurate netting, with checks on the reverse sideband.

The transceiver was very functional and extremely well made and I was pleased enough with its results to offer to accept a small number on behalf of the club to sell in the U.K. Space precludes a fuller report, but the fact that I am willing to help make the transceivers available in the UK indicates that I think it a worthwhile buy. A specification sheet is available for a S.A.S.E. At present I have four transceivers at the UK price of £41.85 (inc. customs charge for duty and VAT) plus postage at £1-25. U.S. members should contact TEDCO direct at: TEDCO 9 CANONICUS AVE, NEWPORT. RHODE ISLAND 02840 for specifications and price, including a S.A.S.E.

## WEEKLY ACTIVITY PERIODS

As a result of suggestions from members, we are altering the format of the weekly Sunday Activity Periods. The Club Activity Periods will now be 1100-1230 and 1400-1530 gmt on all the QRP frequencies (both ssb and cw). This will enable members to choose for themselves which band to use (depending on conditions, their rigs and whether they want to work local or dx). The new format is for a trial period of six months starting with this edition of Sprat. Whether it remains, depends on your comments. All views please to Chris Page, G4BUE by 15.2.1981.

## THE NEW 10MHZ BAND

There is a possibility that the new 10MHz band maybe available for amateur use in 1982. In order that the view of amateurs can be taken into account when The IARU decide how the band is to be used, members are requested to write to John Allaway, G3FKM, 10 Knightlow Road, Birmingham, B17 8QB with their opinions. Bearing in mind that the new band is only 50KHz wide one suggestion under consideration is that it should be restricted to cw. Another is that it should be free from contests.

## "WANTED"

Two volunteers to fill the positions of Club HF QRP SSB Manager and Club VHF QRP Manager. Obviously volunteers should have an interest and be active on the respective bands/modes applicable to the position. The work would entail arranging Club Activity Periods and suggesting a suitable Club Award together with anything which the applicant can offer for the benefit of members interested in QRPing with SSB or on VHF frequencies with either SSB or CW. Applications please to George, G3RJV.

MEMBERSHIP CHANGES:

NEW QTH:

| | | |
|---|---|---|
| 073 | G4FRE | 19 Bostock Rd. Ipswich. Suffolk. IP2 8LP |
| 116 | G4FKH | Flat 9. 92 Crystal Palace Road, London. SE26 |
| 152 | G3WOV | 183 Clotherholme Pk. Ripon. Yorks. HG4 2HR |
| 213 | G4EYE | Homeric, Main Rd. Lt.Oakley. Nr.Harwich |
| 471 | G3VKM | Newgate, Thorpe Rd. Haddiscoe. Norwich. NR14 6PP. |
| 507 | GM4FQE | 20 The Glebe, Crail, Fife. KY10 3UJ. |
| 539 | G4GIU | Flat 3. 21 Norfolk Sq. London W2. |
| 614 | G3IRW | Hillside, 51a Main Rd. Hundleby. Nr.Spilsby. Lincs. |
| 815 | KA4NRM | 58 Salem Dr. Vero Beach, Florida 32960. U.S.A. |

CALLSIGN CHANGES:

| | | | |
|---|---|---|---|
| 073 | ex G8JMO is now G4FRE. | 363 | is now GM8WMU. |
| 434 | G4HQH missing from list | 510 | is G3CLL not G3OLL |
| 522 | ex GW8PBO is now GW4IED | 613 | is now HB9IK |
| 726 | is WBØROT | 783 | (WD4HTN) upgraded to KC4IG |
| 800 | call is G4HTM | | |

PLEASE NOTIFY QTH OR CALL CHANGES TO G3RJV, QUOTING MEMBERSHIP NUMBER.


QRP ARCI QSO PARTY

4th and 5th October, 1980, all international QRP frequencies .

HA QRP CONTEST 1980

Open to stations in all countries. 0000 gmt 1st November until 2359 gmt 7th November. CW only, 3500-3600 kHz. Maximum INPUT 5W. Contatcs with all stations, QRO or QRP, count. For each contact log must show date, time, report, call of station worked, name of operator worked and his QTH. Front sheet of log must show type of device used in the tx pa. Contacts with own country count 1 and other countries 2. Total score is points multiplied by number of DXCC countries contacted. Logs, postmarked not later than 21 November, to Radiotechnika, Budapest Pf 603, H-1374 .Hungary. Souvenir award to all entrants.

IMPORTANT INTERNATIONAL DEFINITION OF QRP AGREED IMPORTANT

Member Societies of the European CW Association have agreed to define QRP thus:-

An input not exceeding 10W or an output not exceeding 5W. Where output is used it must be measured with an instrument approved by the Society concerned. It is further agreed that these are MAXIMUM figures, that Societies may set lower limits for the purposes of Awards etc, and that experimental work at lower power levels should be given every possible encouragement. (Note that G QRP C Award rules are unlikely to be changed as a result of this agreement.)

AWARD NEWS

New QRP Masters. Gus, G8PG ( No4 ) and Petr, OK1DKW ( No5 ) have qualified for the QRP Master Award. Congratulations to both !

Congratulations also to the following Award winners:-

QRP Countries. 175 G4BUE, 125 GM3OXX, 100 GM3RFR, 75 G8PG, OK1DKW, 50 SM0FSM, 25 G3DOP (700 mW), G3KPT (1st QRP rtty award).

Worked G QRP Club: 100 GM3OXX, 80 G4BUE, 60 OK1DKW, 40 G4FAI, 20 G4DQP.

Two-way QRP Award. 30 G4BUE, 10 G4CQK, GM3VAI.

MILLIWATT DXCC AWARD

Ade, K8EEG, has authorised Gus, G8PG, to check cards for this Award. If you send cards to Gus for checking please sort them into alphabetical order, provide an alphabetical order list for Gus to sign, and enclose an envelope and return postage. Please note that owing to the high cost of this Award claims sent to Ade should be accompanied by $15 US (if you send this amount by cheque make the cheque for $17 to cover bank exchange charges).

## New Members

| | | |
|---|---|---|
| 834 | VE7DHM | Paul Johnson, #3-2847 Sooke Lk. Rd., Victoria, B.C., Canada. |
| 835 | G4GIQ | Ronald D. Marshall, 87 Carlton Rd., Witton Pk, Northwich, |
| 836 | G3PDL | Peter Linsley, Lonsdale, Melton Rd., Wrawby, Cheshire. |
| 837 | G4IVY | Rosemary Linsley, Lonsdale, Melton Rd., Wrawby, Brigg, |
| 838 | G3RD | Ed Stevens, 14 Heather Cl., Southam, Leamington Spa, S.Humberside. |
| 839 | G3NTD | Alan Marsden, 15 Northfield Way, Hallcroft, Retford, Warks. |
| 840 | | John Morris, 3 Milldale Cl., Atherton, Manchester. Notts. |
| 841 | ON6NF | Paul Dhondt, Albertlaan 52, Knokke-Heist 1 8300, Belgium. |
| 842 | G4JRE | John O'Halloran, 29 Knox Lane, Harrogate, N. Yorks. |
| 843 | G4IDL | Thomas Wade, 70 Racecourse Rd., Swinton, Hexborough, S.Yorks. |
| 844 | HB9ASJ | Leopold Spreitzer, Hopfernstr 4, CH 4900 Langenthal, Switzer- |
| 845 | | PO, HQ A.R.G., c/o B.G.Makeham, 83 Chestnut Ave., land. West Wickham, Kent, BRA 9EU. |
| 846 | G4GTU | Steven Pocock, "Lanfine", 57 Golden Ave., Angmering-on-Sea, |
| 847 | G4HEP | R.Marshall, 700 Maidstone Rd., Gillingham, Kent. Sussex. |
| 848 | G4JNW | L.Norton, 52A Station Rd., Earlsheaton, Dewsbury, W. Yorks. |
| 849 | WA3BME | Raymond Huml, 3310 AldineSt., Phila., Pa. 19136, U.S.A. |
| 850 | KA1BPC | Vincent Castronova, 14 Soljer Dr., Waterford, Connecticut 06385 |
| 851 | N1AQK | Otto Persson, 151 Fort Ave., Salem, MA 01970, U.S.A. U.S.A. |
| 852 | G4BVV | Peter Goben, 1 Petal Cl., Maltby, Rotherham, S. Yorks. |
| 853 | G3UZI | Ian Wollen, "Lorien", Ruspel Rd., Horsham, W.Sussex. |
| 854 | GI4IVI | Gerald Kerr, 24 Old Rectory Pk., Portadown, Co.Armagh, N.I. |
| 855 | K4HTJ | Medrick Chandler, Route 1 Box 437-B, Midland, NC 28107, U.S.A. |
| 856 | G8WEW | Kenneth Graham Fraser, 48 Cranley Rd., Walton-on-Thames,Surrey. |
| 857 | WD4FXX | Howard Johnson, Route 1, Hopkinsville, Kentucky 42240, U.S.A. |
| 858 | G3LYU | Derrick Pfice, 16 Dorset Ave., Glenfield, Leicester. |
| 859 | | 272 Summer St., Route 2, Marshfield, Massachusetts 02050,USA |
| 860 | G4JLL | Lionel Furness, 5 Colwick Cl., Highgate, London, N65NU. |
| 861 | SP5AGU | Zenon Saraszenski, 00-950 Warsaw, PO Box 342, POLAND. |
| 862 | | Gene Lavarello, PO Box 55, Center Tuf Ten Boro, New Hampshire |
| 863 | RS39968 | Raymond Howes, 501 Chickerell Rd., Weymouth, Dorset, 03816,USA |
| 864 | G4GZJ | Derek Brown, 35 Middleton Hall Rd., Kings Norton, B'ham 29. |
| 865 | G4GED | David Richardson, 92 Betham Rd., Greenford, Middx. |
| 866 | KA1DYT | Greg Marshall, 29 Stancliff Rd., Glastonbury, Connecticut 06033 |
| 867 | PY2TU | Paulo Moser, PO Box 8268, 01000 Sao Paulo, BRASIL. USA |
| 868 | CT1DP | Emil Andersen, Rua Dioso Bernardes 23-6-DTO, 1700 Lisboa, |
| 869 | GM4HBG | Iain Robertson, 123 Altyre Ave., Glenrothes, Fife. PORTUGAL. |
| 870 | K9ZWH | Robert Palambo, 18625 Homewood Ave., Homewood, Illinois 60430 |
| 871 | | Wayne Plauche, 3327 Huntlu Drive, Algieu La 70114, USA. USA. |
| 872 | G4JBR | Peter Dixon, Browns Marsh, South Molton, N.Devon. |
| 873 | G4JIM/W8 | Dave Smith, 2864 1st st., Detroit Deach, Monroe, Michigan 48161, USA. |

| | | |
|---|---|---|
| 874 | G8OXM | Paul Newman, 18 North Everard St., Kings Lynn, Norfolk. |
| 875 | G8VOQ | Richard Rogalewski, 47 Partridge Cres. Dewsbury, W. Yorks. |
| 876 | G4EYD | James Bailey, 15 The Morelands, West Heath, Birmingham, B31 |
| 877 | G3KKQ | Dennis Booty, 139 Petersfield Ave., Staines, Middx. |
| 878 | G3VTZ | Ralph Roebuck, 19 Park Rd., Ashley, New Milton, Hants. |
| 879 | G4IYE | Ray Smith, 72 Worthing Rd., Patchway, Bristol. |
| 880 | WL7AHR | Timothy Moore, PO Box 534, Juneau, Alaska, 99803, USA. |
| 881 | WB5VXH | Mike Emerson, Box 374, Spur, Texas 79370, USA. |
| 882 | | Jack Pogue, 18 - 2nd St., Bonita Springs, Florida 33923,USA. |
| 883 | G4GLQ | John Tysiorowski, 18 Thompson St., Toll Bar, St.Helens, |
| 884 | G8TKF | Bill Hainge, 5 Truelocks Way, Wantage, Oxon. Merseyside. |
| 885 | | Gene Laubenstein, Route 1 Box 70-C, Amberg, Wisconsin, 59102, |
| 886 | G4JUC | High Woodward, 18 Stambourne Way, West Wickham, Kent. USA. |
| 887 | GW4GJI | Richard Whitley, 78 Coed Coch Rd., Old Colwyn, Colwy Bay,Clwyd |
| 888 | ZL4IZ | Ian Jeffery, PO Box 96, Belfour, Northern Southland, NEW ZEALAN |
| 889 | G4JZO | Martyn Watts, 22 Queens Rd., Wellington, Somerset. -D |
| 890 | GW4IZJ | Patrick Rennick, 18 Thmynydd, Pontnewydd,, Cwmbran, Gwent. |

SILENT KEY: We regret to announce the death of Les Tucker (G3BVN) 370. G3BVN was active on CW each morning right upto his death in June.

I.Q.C. (Italian QRP club-Firenze). 1st Alternative Energy Contest.

With the goal of stimulating use of laternative sources of energy, especially for portable use.
Date: From 0000Z Sat. 15th November to 2400Z Sun. 16th November, 1980.
Frequencies: Any amateur band - All contacts on HF have to be made on, or, within 5kHz of the international QRP calling frequencies (3560, 7030, 14060, 21060, 28080.) On CW only. VHF: any mode and frequency.
Antennas: The antenna (or all antennas used) should weigh not more than 12 kgrams and capable of erection by no more than two men.
Two classes: one for those wishing to participate in the section for alternative energy and one for all others.
The first one can use an OVERALL PSU only.
(a) A natural source - sun, wind, water flow.
(b) A continuously renewable source. Biogas etc. is excluded and all kinds of professionally made, commercially available supplies.
Power: For ALL : Max. input 5W.
Points: Each contact 1 point. Each country (only the first ten) yields 1 multiplier.
LOG: By end of November to I5WUO LEONARDO BOSELLI, v.D. Comparetti 26, I-50135 Firenze, Italy.

SPRAT EDITOR: Rev. George Dobbs (G3RJV)
TEXT PREPARATION: Chris Page (G4BUE) Angus Taylor (G8PG)
GRAPHICS AND ILLUSTRATIONS: 'Mac' McNeill (G3FCK)