PRINTED RATE.

Rev. G.C.Dobbs,(G3RJV) 8 Redgates Court, Calverton, Nottingham. NG14 6LR

Devoted to Low Power Radio Communication

SPRAT

FRANCE

FØHX

(ALSO G3ZXK AND C31DV .)

DL AGCW Contest Operation from ANDORRA.

CONFIRMING QSO WI			MHZ	RST	MODE	POWER

PSE/TNX QSL

DAVID POWELL

Number Nine.
Winter 1976.

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EDITORIAL NOTES:

I seems a long time since the very hot day in July when I wrote the last editorial for SPRAT. At the moment snow is laying on the ground just outside the window, /P days are long away and 20 is dead by early evening. But this hobby has many facets and out comes the soldering iron...

Since that time we have had the Leicester Exhibition, where I met several club members, some of whom I have not seen before. Alas only a few were able to meet in the tea room, but I did speak to others in the main hall earlier in the day.

One of the pleasant tasks at Leicester was to present G3NEO with the G2NJ Trophy. Phil never fails to amaze me with what he can do with QRP, and he is a very worthy first holder of the very splendid cup. As Phil said, "I never thought it was this big!"

The really enjoyable part of our little getogether at Leicester was just being able to sit down and "talk QRP". I hope this type of meeting will increase, and in that hope, may I offer an idea. The rally season sees many of us in situations where we might met. May I suggest that if there is a local rally near you, that you write to me, as far in advance as possible, and suggest a meeting place and time for members to seek each other out. I only usually get to the Derby Rally, and know nothing of the layout etc of other events. So if a local can suggest a suitable meeting point, I will publish the idea, in advance, in SPRAT.

A suggestion for a meeting of QRP fans in Scotland has been mooted. At this stage I must confess to having lost a wad of members letters including the one which suggested it (I think GM3OXX or GM3MXN ? apologies to both) But if any GM members are interested write to me and I will pass the letter onto the correct person.

The response to my appeal for ideas about the future of the club was answered by many members, most of whom, I am pleased to say, were happy with the club and its present officers. Some of the ideas appear as items in this issue. G4ETJ has suggested that the club may seek a patron, and I wonder what others feel about this, and if you have any ideas for a "worthy name" to grace our headings?

May I welcome all new members, the net is spreading to EA8 and ZL and I have a letter to hand about the club from 3B8BJ. May I also welcome the offers of help from some members. This takes the form of typing for SPRAT by Reg Lyddon, G4ETJ, his are the bits in this issue without the mistakes! Also some drawings by Mac. G3FCK; Alan, G4DVW is to handle renewal of subs and Connie Wade, G4CUY, is once more preparing a full members list for issue in a couple of weeks.

The Sunday QRP group has been a bit thin lately, so stoke up the rig, try to find members, have a go in the contests, and at the awards (if I can get the QRP Countries Award - number 13! - anyone can)

Hope CU QRP, 73's

George

G-QRP-CLUB. STATEMENT OF ACCOUNTS. YEAR ENDING 31.9.76.

Balance in hand 31.9.75 £53.90

INCOME:	EXPENDITURE:
£332.48	£239.92

Balance in hand 31.9.76 £146.46

Audited by J.Youle
7.10.76

Note on expenditure: Postage = £67.93
SPRAT = £138.33
Sundries = £33.66 (mainly club tie purchase)

(After having considered the above, I have recently purchased a large amount of paper for SPRAT, to overcome the price increase expected in the new year)

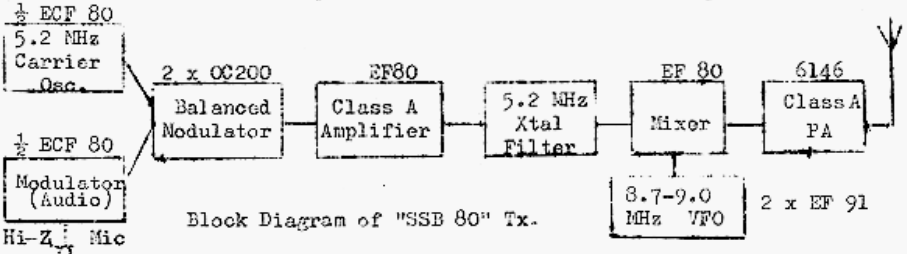
THE "SSB 80" – A SIMPLE QRP 80 METRE SSB TRANSMITTER

by G3YUQ

The rig was developed after much reading up on SSB and some references are given at the end.
The requirements were – it must be simple, cheap and quick to build, test and use. It must be VFO controlled.
The rig is easy to build; a little more complicated perhaps than the popular 160/80 metre rigs, and not a rig for the 'first-time builder'. Junk-box parts and surplus crystals keep the cost very low – mine was less than £5.00 !
Not too much metal-bashing – with a total building time of 50 hours or ½-hr a day for 3 months (get up earlier !)
Test equipment required is a BC221 or similar frequency meter to check the crystals and VFO (borrow !)
A pair of high resistance 'phones to check out the modulator (not essential) and an 80 metre receiver (which you should have anyway !)
The rig is easy to use – a three position function switch for Net/Tune/Standby, and only one PA tuning control.

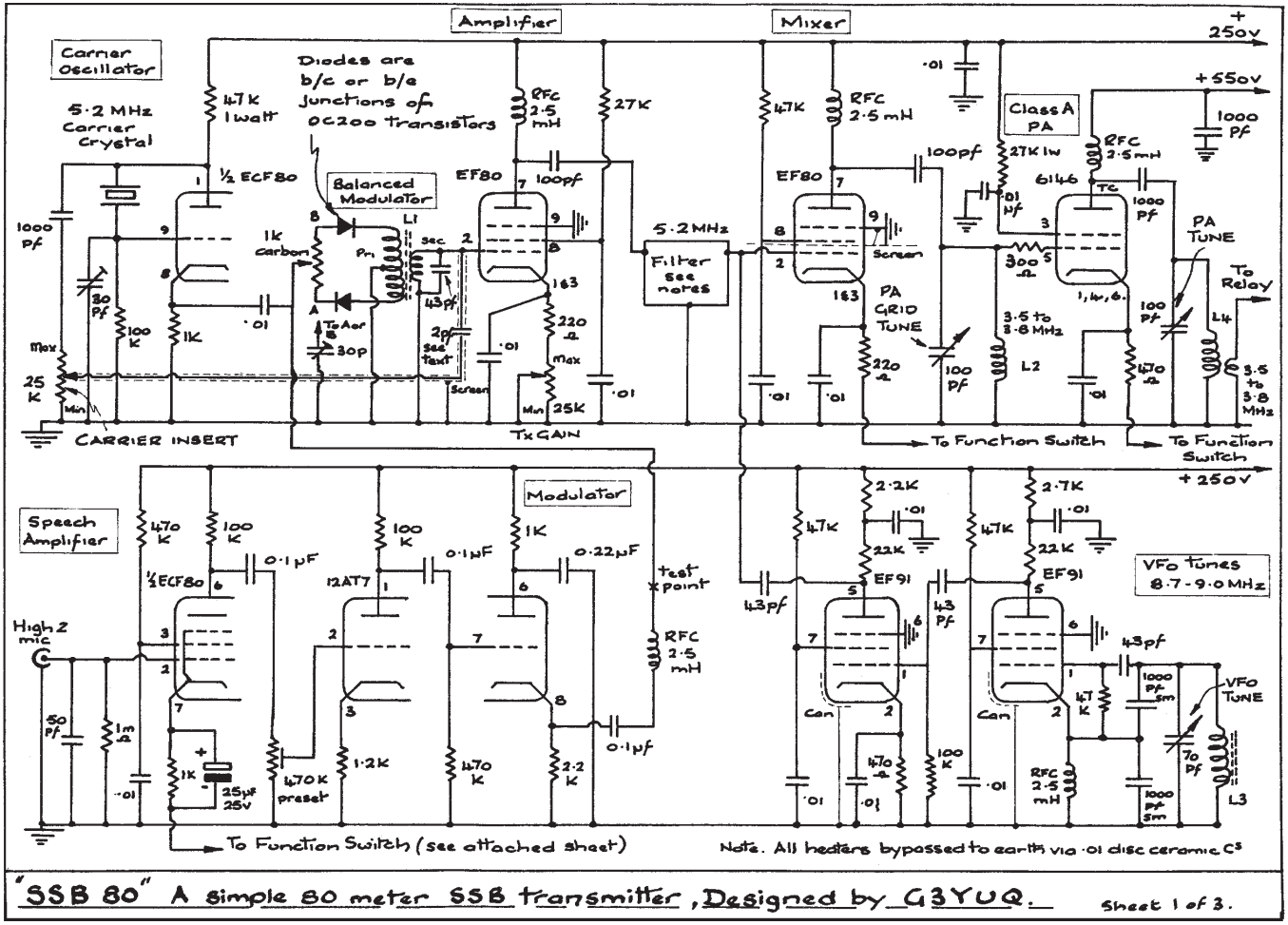
CIRCUIT DETAILS

Reference to the Block Diagram will assist in understanding the circuit.

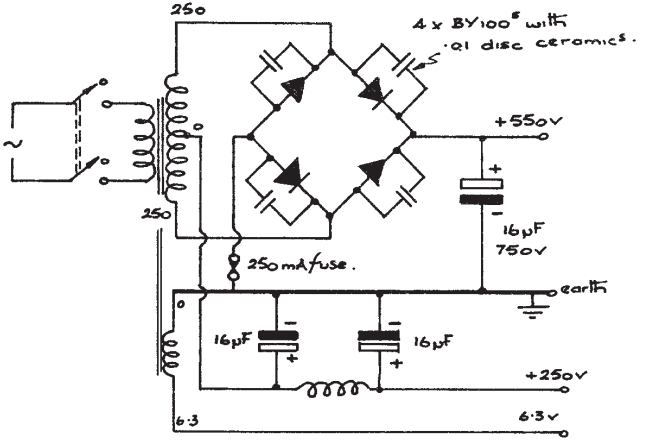


Block Diagram of "SSB 80" Tx.

The carrier is produced by the Carrier Oscillator using ½-ECF80 (or ECF82) valve, operated as a simple Pierce oscillator on 5.2 MHz, and 800 Hz lower than the lowest crystal in the filter. A trimmer from grid to earth can be used to adjust the final frequency for best 'on the air' SSB quality.
The output is fed at low impedance from the cathode to the Balanced Modulator. Here I have used 2 x OC200 transistors using either the base/emitter or base/collector junctions. I found these to be better than any of the diodes most of which are difficult to match, and nearly all drift.
The other half of the ECF80 is used as a Speech Amplifier suitable for high impedance microphones (crystal). The output of this is fed to a 12AT7 valve (a 12AU7 or 12AX7 will also work). This acts as the Modulator, gain being controlled by the 470K preset potentiometer, which should be set at ½-travel initially.
The modulator output at low impedance is also fed into the balanced modulator.
The output from the balanced modulator, when correctly adjusted is DOUBLE Side Band. A 2pF capacitor (2 insulated wires about ½" long twisted together) allows some of the carrier to be fed around the balanced modulator for tune up (and AM use, should you wish)
The next stage is an EF80 operating in Class A. A25K pot in the cathode controls the gain of the rig and needs to be ½-open provisionally. It can be a preset inside the Tx, if you wish.
The output from this stage goes to the 5.2MHz Crystal Filter. This removes the unwanted sideband. The output is 5.2 MHz USB. This goes to the Mixer valve, again an EF 80, although an EF 183 or 184 will give a little more gain.
The VFO uses 2 x EF91 valves, (but EF 80's should work equally well). The frequency range is 8.70 – 9.0 MHz. The output is fed into the mixer valve.
The grid of the PA valve is tuned to 3.5 – 3.8 MHz (i.e. the difference between 5.2 MHz and the 9.0 MHz VFO.
This inverts the sideband from USB to LSB. The signal passes via a 300 ohm resistor which acts as a grid-stopper (do not omit) onto the PA valve – a 6146 operating in Class A. An 807 or its miniature equivalent can be used.

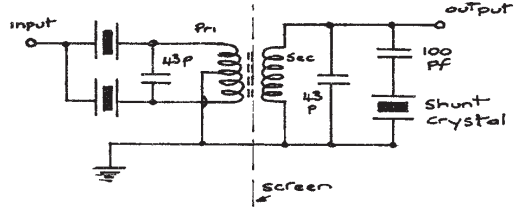


"SSB 80" A simple 80 meter SSB transmitter, Designed by G3YUQ. Sheet 1 of 3.

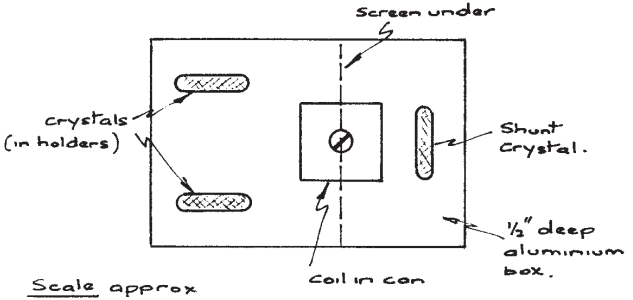


Note polarity of electrolitics

Circuit of Power Supply.



Crystal Filter



Scale approx full size

Filter layout

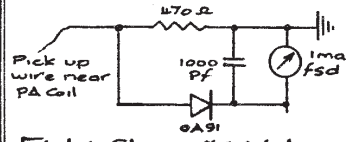
Coil data.

L1 & Filter coil.
Primary 23 turns bifilar wound
Secondary 46 turns wound ¼" above primary winding.
both 26 swg on ¼" former
Note secondary tuned with slug.

L2 (PA grid coil)
30 turns 32 Swg on 7/16" dia former. (No slug).

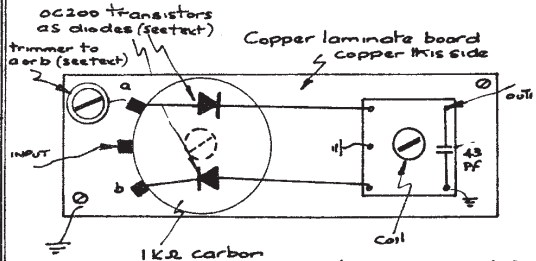
L3 (VFo coil)
5 turns 32 Swg on ½" dia former with slug

L4 (PA coil)
Primary 22 turns 22 swg
Secondary 6 turns 22 swg wound below earthly end of primary.
former 1⅓" diameter.

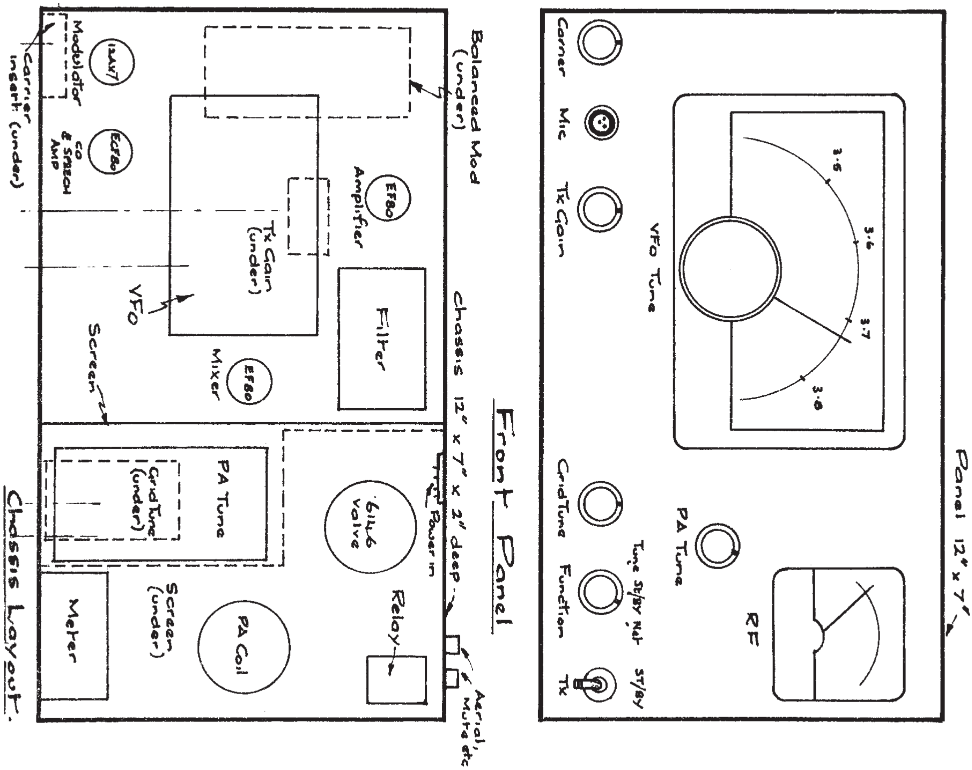


Field Strength Meter

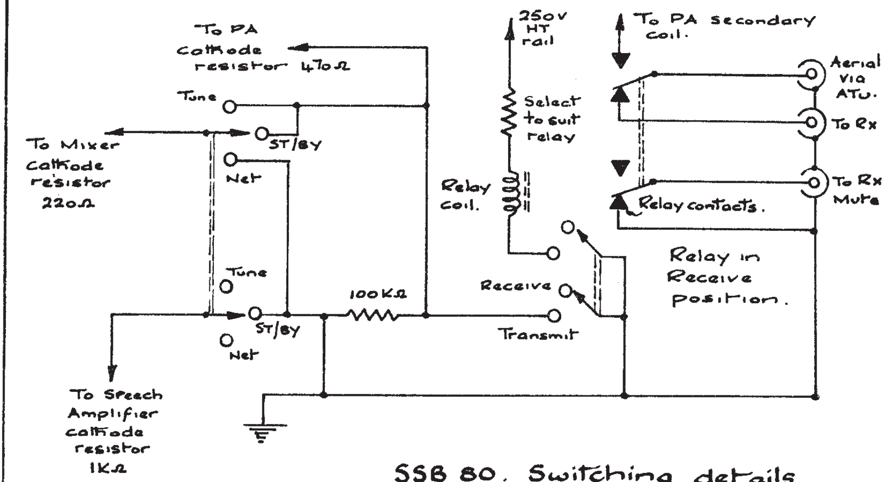
Balanced Modulator layout



Board is mounted on chassis with spacers.



SSB 80. Sheet 3 of 3.



SSB 80. Switching details.

The output from the rig is about 15 watts PEP maximum. However if the PA valve is run with only 250v on its anode the output is still up to 6 watts. (It makes little difference at the other end).
If you intend to use the lower HT voltage then any of the popular small PA valves will suit, viz: 6V6, 6BW6, 5763, EL 84, etc.
By the way, if you use an 807, the cathode resistor needs to be 270 ohms.
The PA has only one tuning control which works well in practice.
The PA current in a Class A stage cannot be tuned for a dip (it doesn't vary). Therefore a simple field strength meter is used for tune-up.
The rig is controlled by a 3-position switch and an HT on/off switch which in the Standby position acts as a Transmit/Receive switch.
The Power Supply is on a separate chassis and uses a 100mA 250-0-250 volts transformer with 6.3 volts heater winding.
This gives 250 volts HT for the Tx except the PA; 550 volts for the PA and 6.3 volts for the heaters. The power for the change over relay is obtained from the 250 volts rail via a dropping resistor.
(Some experiment is required to find a suitable value for the relay to use)
If you only intendtto use 250 volts on the PA valve anode, then the PSU can be a simple full wave rectifier type. (See Handbook for details).

BUILDING THE RIG.

I suggest that you build the PSU first. It can then be used to energise the various stages of the rig as you build it.
REMEMBER : The PSU has over 550 volts on it - so do be careful.
Once the PSU is build, check the voltages are OK. I suggest you put a 6.3 volt lamp on the unit across the heater supply to indicate the rig is on.
For the Tx I suggest that first you scrounge, beg or if all else fails, buy the components: the bits that you get may be different in size to mine and you may have to adjust the chassis dimensions. Do not, however, try to make it smaller; you will gain very little and it will be difficult to wire up. Keep all leads short and direct.
The chassis has 3 sides plus a 3/16" lip at the front to attach it to the front panel. The front panel has a 1½" bend at each end, and this is fixed to the sides of the chassis. The result is a strong, rigid assembly.
Make up the chassis and temporarily fix all the components. I then remove everything and clean up all the metal work. Paint (car spray) and letter up (Letraset) the front panel. Then replace all the components properly.
Build the carrier oscillator first. This can be used to check the crystals for the filter and carrier oscillator.
Connect up the oscillator and BC221 and allow them to warm up; then take your time. The exact frequency is not required - only the difference in frequency between the crystals.
Plug each crystal in turn into the holder, and find the one with the lowest frequency, then the next one up, and so on, making a list of the results something like below:-

Crystal No.	Frequency MHz
1.	5.200 (reference crystal)
2.	5.2015
3.	5.202
4.	5.2026
5.	5.203
6.	5.2035
7.	5.204
8.	5.2043

etc.

Note that all the frequencies are in reference to crystal No.1, i.e. 5.200 MHz. Measuring the frequency difference is not difficult with a BC 221.
Now for the Filter we require 2 crystals with a frequency separation of between 1.5 to 2.0 kHz. We also require another crystal about 500 to 800 Hz lower than the lowest filter crystal for the carrier oscillator.

So lets look at our list of crystals. From the above crystals, 3 & 7 have 2 kHz spacing, so they will be OK for the filter; crystals 3 & 6 would be OK having 1.5 kHz difference. The carrier in both cases will be crystal 2. This is 500 Hz lower than the lowest filter crystal. Alternatively, crystals 4 & 8 could be used for the filter. These have 1.7 kHz spacing, and crystal 3 can be used for the carrier oscillator. The carrier oscillator can be closer than 500 Hz to the filter if you are pushed, as the trimmer will pull it quite a way lower.
The third position on the filter is for a SHUNT crystal. Disregard this for the moment - further details are given in setting up.
I obtained my crystals from:-
INTERFACE QUARTZ DEVICES LTD.,29 MARKET STREET,CREWKERNE,SOMERSET.TA18 7JU
They will send a list of surplus JAN crystals for an SAE. The type that I used are hermetically sealed CR7/U type @ 70 p each or 3 for £2 plus VAT. The frequencies that I chose were 5.2 MHz and 5.202 Mhz (i.e. 2kHz difference). I bought six on 5.200 and two on 5.202 Mhz; checked them on the BC 221 and the results were similar to the list I have given you. Details of the filter layout and circuit are given on a separate sheet.

The Modulator can be built next. When complete, connect a jumper lead from the switch end of the 1 K cathode resistor on the speech amplifier ($\frac{1}{2}$ -ECF80) to earth and test by listening on a pair of high resistance phones connected between the 2.5 mH choke on the output side of the modulator (marked test point on the circuit) and earth. Plug in a high impedance microphone and have a chat to yourself ! Speech should be clear and with little hum. (Make sure that the mic has a screened lead). The gain should be advanced about $\frac{1}{2}$-way provisionally. Once satisfied,disconnect the jumper lead and 'phones. The modulator is now OK.

The VFO is built into an aluminium box with no lid. Its a little tricky as there is not much room. Use a good quality variable capacitor. When complete, listen for the signal on the BC 221 and adjust to cover 8.70 - 9.0 MHz. Final adjustment can be done on the Station Rx. when the rig is set up. NOTE: The screening cans on the VFO are a must, otherwise feedback will occur.

The Balanced Modulator should be built as shown, on a piece of copper laminate board. Experiment later will determine which diode (OC200) the trimmer will need to be connected to. (Points A and B on the Circuit Diagram)

The Amplifier, Mixer and PA are straightforward. Just keep the leads short and put a screen across the base of the mixer to separate input and output. Don't omit the PA grid stopper (300 ohms). It stops a lot of "creepy crawlies" from getting about !

The Field Strength Meter can be omitted if you already use some form of metering in your antenna system. Just tune for maximum output.
When complete car fully check all the wiring.
The relay that I used is a 12 volt 2-pole changeover (2-way) type. Experiment with various wirewound resistors until the relay pulls in clean every time that the HT is switched on.

FINAL ALIGNMENT AND TESTS

Connect a 15 watt lamp, or dummy load, to the antenna socket. Plug in the microphone. Put Function switch to TUNE.
REMEMBER The rig from now on has up to 600 volts on it, even when the HT Switch is Off SO DO BE CAREFUL.
Switch on HT.
Set Carrier Balance to one end of its travel. Now find the signal on the Receiver (you may have to use earphones to avoid feedback.
Tune the PA grid and anode for maximum loudness. Peak the core of the Balanced Modulator and Filter coils for maximum. The output meter should now be showing some reading. (if too much - reduce the coupling).

The Carrier Balance is next. With the carrier insertion control at minimum (near the earthy end), adjust the carrier balance potentiometer (1 K carbon) for minimum reading on the output meter. Then adjust the trimmer (this should be at minimum to start). If the output reading continues to decrease, all is OK. If not, connect the trimmer to the other diode (OC200) and try again. Continue adjusting both in turn until a very low (almost nil) reading is obtained on the output meter.
When satisfied, switch to Standby and speak into the microphone; the meter should kick-up. Monitor on the Station Receiver, and adjust the Modulator and Tx Gain controls for best quality speech.
Different crystals can be tried in the carrier oscillator position. If the speech is "toppy" then the carrier needs to be closer to the filter, but if too close, speech will "bass-y", and suppression will not be so good.
Final trim can be done with the trimming capacitor.
Each time that the carrier frequency is changed, you will have to rebalance the Balanced Modulator as described before. If doesn't take too long.
Now you can try different crystals, of those remaining, in the SHUNT position of the filter. Listen on USB, and select the crystal which gives the best suppression. Listen on USB (the one you don't want) and LSB (the one that you do want), and compare them. The USB should be very much lower, but as you are so close to the Transmitter you will be able to hear it.
Well that's all to the setting up, so let's try it on the air.
Replace the dummy load with the real thing (aerial).

OPERATION
Switch to NET and zero beat onto the other station. If you've moved a reasonable distance from your previous QSO, switch to TUNE, switch on HT. Insert some carrier to get a reading on the meter. Peak the PA grid and anode capacitors for maximum output. Return Carrier Insertion to minimum switch off HT, put Function Switch to STANDBY.

TO TRANSMIT
Function Switch to STANDBY, and use HT on-off switch as Transmit/Receive switch. Meter will kick up when speaking, indicating that all is OK.

Well, that's all there is to it - it sounds a lot more difficult than it really is.
I have had a lot of good QSO's around Europe and Scandinavia using the rig and at the present time it is the only rig in use at G3YUQ.
I shall try to help with any queries but please send an SAE.
I'd also be pleased to hear from anyone building and using the rig.

References:- Short Wave Magazine - June 1961 and Nov/Dec 1966
Radio Communication - October 1967
RSGB Handbook.

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ARTICLES FOR SPRAT:
Share that circuit, tip, idea etc. No need to write out a full text if you dont wish - notes and a sketch will do.

UNHOOKED YOUR SPRAT? During the stapling of the summer issues, my faithful long-arm stapler gave up the ghost, so I have bought a new heavy duty model for use on SPRAT - So thatswhy you couldn't undo this issue!

IMPROVING THE HW-7

by DJ1ZB

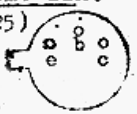
Part I: Double Balanced Mixer and Receiver Muting.

One great problem of the HW-7 receiver is it sensitivity to direct AM demodulation. This can be reduced by replacing the dual-gate FET mixer by a double balanced IC mixer, which to a great extent will cancel out the detected AM. Fig.1 shows the IC mixer and its associated circuitry, which is placed on a small printed circuit board (Board No. 1), and attached to the inner right side of the HW-7 cabinet. The IC chosen is a popular type made by several manufacturers, and can be operated asymmetrically on all three ports. Therefore, no balancing devices are needed for signal and oscillator input (as in a QST Jan 1974 circuit). Also, current consumption is lower than with comparable devices such as the Plessey types SL640/641. The resistor value between pins 2 and 3 is a compromise between sensitivity and large signal capabilities. An R.F. amplifier before the mixer has been found unnecessary.
Before wiring the IC mixer into the HW-7 board, the dual-gate FET and its gate 2 resistor divider must be removed. Also, additional holes must be drilled for the positive supply and the two ground leads. All connections are made with short self supporting insulated wire.
When the IC mixer is ready for operation, the oscillator voltage at pin 7 of the IC should be measured by a diode RF voltmeter if possible. At 40 and 20 metres, the voltage should be up to 600 mV. If the voltage is lower, capacitor C57 must be increased to 3.3 - 10 pF. Experience from converting two HW-7 has shown that, due to voltage variations at the collector of multiplier Q4, a fixed value for C57 cannot be given. On 15 metresm the oscillator voltage always will be much lower, usually 150-200 mV. Finally, the 10 K potentiometer is adjusted for best AM broadcast suppression.

Receiver Muting during transmit.
The IC mixer board also contains a separate resistor-diode combination which will provide exact muting of the first AF amplifier within the CA 3035 audio IC as long as the antenna relay is in the transmit position. The wire bridge X - U on the HW-7 circuit board must be removed, and the combination wired as shown. As soon as the relay coil is energised, the first transistor in the CA 3035 IC will be driven into saturation. A clean CW monitor signal will be heard, even at high speed.
Fig. 2 shows the printed circuit board of the IC mixer, and Fig.3 the positioning of the components on it.
In a subsequent part of this article a circuit for RIT and oscillator shift compensation for the HW-7 will be described, also a Q - 30dB step attenuator for the receiver input.
These improvements can also be applied to the TEN-TEC PM2 amd PM3 QRP transceivers which are using a circuitry similar to the HW-7.

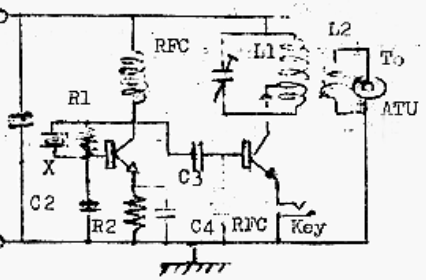
THE G8PG SPRATLET 80m. TTX.

Tr1,Tr2 - BFY50 (CV7725)



L1 - 55 T, 28SWG Enam. Tapped 15 T from End A.
L2 - 20 T, 28SWG Enam. Wound over centre of L1.
Both on Amidon T-68 formers.

C1 .01uF
C2 300pF
C3 200pf
C4 .1 uF
R1 100K
R2 100 ohm
X Xtal



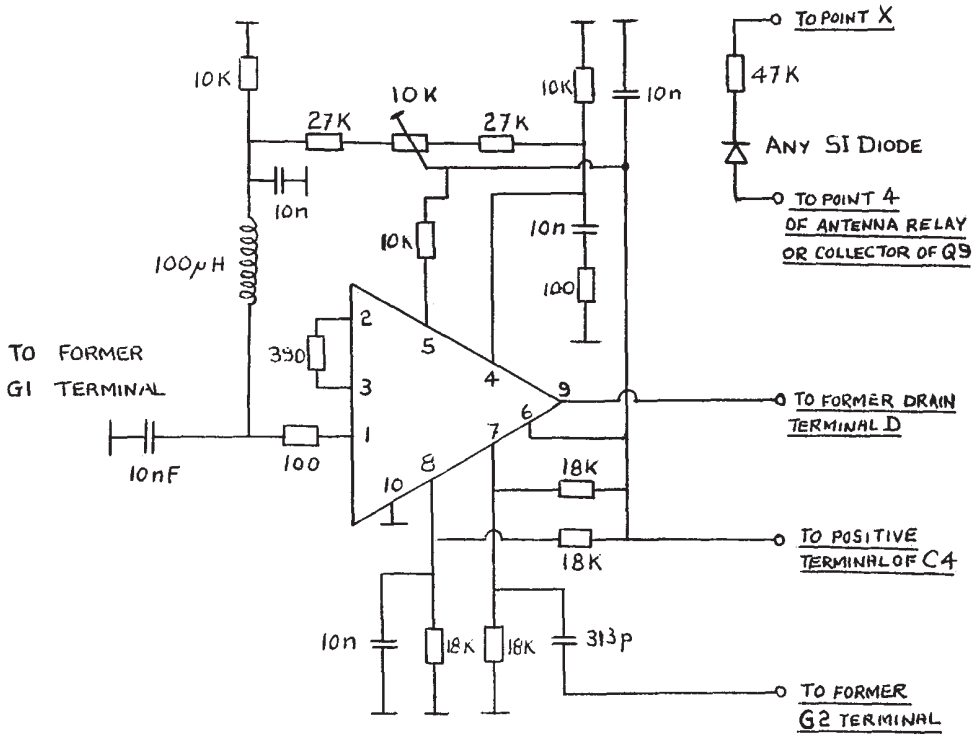


FIG 1

REPLACEMENT OF DUAL-GATE-FET MIXER BY A SYMMETRICAL IC MIXER TYPE µA796 (FAIRCHILD), MC1496 OR 1596 (MOTOROLA), SG1496 OR 1596 (SILICON GENERAL) OR LM1496 OR 1596 (NATIONAL SEMICONDUCTOR)

HW7 Modifications.

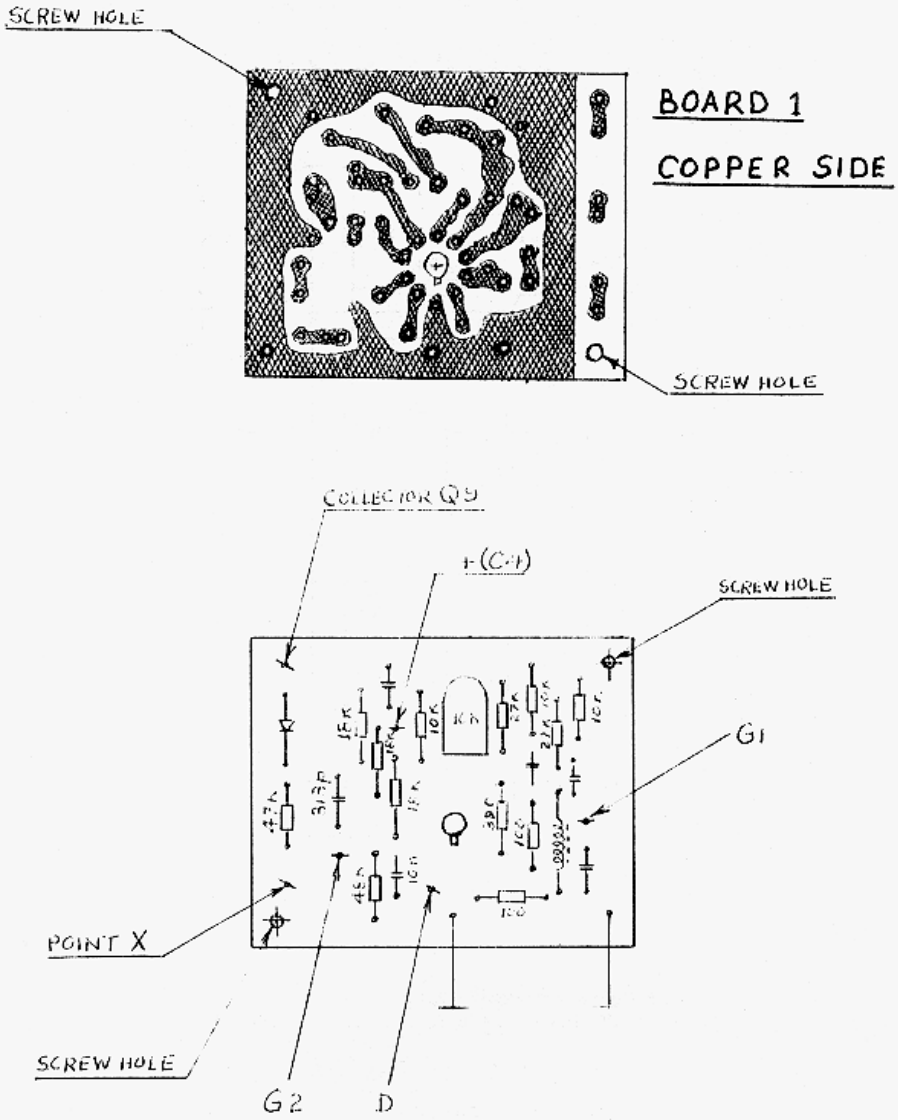


FIG 3 BOARD 1

COMPONENT SIDE

IC = MC 1496 NOSE OF CASE AT PIN 10 TO BE GROUNDED

AGCW-DL HAPPY NEW YEAR CONTEST.
Date: 1st Jan each year. Time: 0900 to 1200 GMT. Mode 2XCW. For all licenced EU ops.
Freq: 3500-3600, 7000-7040, 14000-14100 (participants asked to call near the following freqs: 3560, 7030, 14060
ClassI: input max 500w, Class II input max 100w, Class III input max 10w, Class IV SWL.
General Call: TEST AGCW/EU de....call... Exchange: RST/001 upwards.
At the end of QSO the freq to be left to caller. No CW speed limit, govern by slowest.
Scoring: 1 pt for every valid QSO with any EU station irrespevtive of country or band. (EU by DXCC lising). Multiplier pint for every AGCW member worked - these members will add their members number to the exchange.
Total score: Sum of QSO points multiplied by sum of multiplier points, on all bands. Each station may only be worked once on each band. Single operator entries only.
LOGS to show: GMT,band(m), call, serial numbers sent-redd, QSO point, multiplier pnts as well as total score, with op's full name,QTH, call sign and signed certificate to show rules have been obeyed.
Logs, postmarked not later than 31st Jan, to Renata Krause, DJ9SB, Johannesmuhler Str 36, D-6800 Mannheim 31, Germany. For results SASE with log.

**********.

QRP WINTER CONTEST. AGCW-DL 15/16th Jan 1977.
1500-1500 GMT. Input under 10 watts. Single op. on 5 bands 1.8 - 28mHz
15 hours operation at most,take 9 hours pause in two parts or whole, other gaps optional
Call: CQ QRP TEST. Exchange RST serial number, and input. add x for xtal cont TX.
QSO's with any station valid, RST only for non-contestants., but send contest number.
Scores: own counrty=1, own continent=2, DX=3, add 3 if other station is qrp.
Handicaps: Inputs below 3.5 watts and crystal control. Handicaps apply to both sides of QSO eg. if both sign .../2x there are 4 handicaps. Both stations double QSO points for 1 handicap, x3 for 2 handicaps, x4 for 3 handicaps.
NOTE: reducing power of commerical rigs below 3.5w or working Xtal AND vfo on same band no longer counts for handicap.
Multiplier: own continent = x1, DX = x2 multiplier points per band. But JA,PY,VE,VK, W,ZS count extra. Final Score: sum of qso points x sum of multiplier points.
++++++(I hope I am correct in saying that Gus, G8PG, will forward entries for members of the club, and help sort out the rather complex scoring.)

****

R.S.G.B. LOW POWER CONTEST 1977. ADVANCE NOTICE.
The general HF contest rules, Jan '77 Rad. Comm. will apply.
When: 0700-1700 GMT. 17th April 1977. A max of 8 hours in not more than two periods.
Single Op. only, UK station must be RSGB members. Section a) UK Section b) Overseas incl. EI. Contacts on CW ONLY. in the 3.5 and 7 MHz bands.
Excahnges: RST, Serial number, Power group. EG. 569 001/2w

SCORING:	Power group:	1w	2w	5w (max input?)
	Points:	100	50	25

Contacts between QRP stations: Each station scores points for his own power group plus the points for the other stations power group. Normal QSO= according to own pewer, Overseas stations may only claim points for qsos with UK stations.
Multiplier: A multiplier of 2 operates on ALL contacts on 7 MHz.
LOGS: Separate sheet for each band. Column 5 to be "power group recd", Column 6 to be "My power group".
Entries to RSGB HF CONTESTS COMMITTEE, c/o D.S.Booty, 139 Petersfield Ave,Staines, Middlesex. TW18 1EH. (Closing overseas logs 28th May)

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NEWS FROM GUS, G8PG, TEST AND CONTEST MANAGER:
Awards: QRP COUNTRIES AWARD.
The second endorsement for 50 countries goes to DJ1ZB. Ha-Jo used his TTX and the -T-2 RX (circuit in SPRAT, reprint for SAE) while qualifying for the award. No beams were used, EX includes: JA, UH8, FY0, CT3, 9J, all worked with under 5 w. WORKED G-QRP-C.
The 2nd goes to G8PG, who has worked 20 members. The fact that only two have been issues so far is disappointing - remember this is the one award in which YOU are the station that other members are hunting for. If you don't call the odd CQ QRP at weekends they can't work you!
Ha-Jo (DJ1ZB) is very disappointed at lack of G/DL QRP QSO's. To remedy this we

.....suggest that as many members as possible, both G and EU call CQ QRP on Sundays on 14065 during the period 1130-1145 GMT. Listen for weak replies - you may be surprised!

Arising from the above, I would like to put forward the idea of a G/EU Activity Weekend early next Spring. Perhaps call at alternate hours on 14060/7040 during the period 0800-1400, and on 7040 and 3540 from 1400-2000 GMT, the object to have contacts outside one's own country - How does the idea grab you ?

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ACTIVITY WEEKEND REPORTS:

This event was rather 'a curates egg' but enjoyed by all who took part. As far as I can tell no one who brewed up their rig on 80m failed to get club QSOs but not so good on other bands. Des, GI3XZM was belting out from Portstewart with 5w and ½ doop, Gus, G8PG worked 11 members and also hrd G2HLL,G3IQF & G4BWP. Gordon, G3DNF, worked 16 members including DK5RY/P(on 40) G4CQK worked 9 members, GM3OXX has a session on 20m with lots of qsos by no members, although G4CUY worked on top band.

The real DX log was from Phil, G3NEO, who did a bit on most bands but easily got going on 20m and worked ZL2LA and HI8MOC ! DETAILS:
1040 GMT, 14065, ZL2LA, recd 339. 2140 GMT, 14065, HI8MOC, recd. 569. WELL DONE PHIL.
Members heard/owrked included G3RJV, G3DNF, G8PG, GI3XZM, G5FF, G4CQK, G4DEP, G3LGX, G2Cp, G3AHS, G3CEL, G4DDX, G3Ycc, G3IQF, G2HLL, G3UYM, DK5RY/P, G4AYS, G4CUY, G3PZP, G3VFA,
Non-member QRP stations included G6PGo F6AAX (4w), ON5AG (5w), PAØKSB (10w)

I think it would be fair to say that all who took part request that we do it again, and I hope to announce another event in the Spring issue of SPRAT.

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REQUEST FROM DL7DO/P:

Will QRP operators on 160m not forget the possibility of split-frequency working since band is not the same for G and DL. He was baffled in the QRP contest by G's calling CQ, but not turning over the band.

MORE QRP EX NEWS:

George GM3OXX, has been 'at it again' on 20m with 2 watts. His latest being JA8ZO (569), JA1PIG/PZ and EA6CL. But George was not pleased by his 599 (stereo-typed report from HK4ACY! (I would have been pleased by any report!)

QRP HEARED INDOORS:

Larry, G5IC, was testing an indoor antenna (Rad Comm Aug.'72. p.526) whem he heard ZL1BLJ calling CQ. He sent a card and received a letter which said that Mike, ZL1BLJ, was using his Argonaut on 5 watts, to a Hustler antenna. Pleased to say that thanks to Larry, Mike is now a member.

GM8FHV sent me a members list of the Old QRP Club for 1954. I note that present members G2BOF, G3CED (cunning cover for G3VFA) G3CWL and GW8WJ are on the list.
John has most British magazine going back 20 or 30 years and will copy any articles for members at 6p a page + postage. He would like to hear from Ham Radio readers so he can complete his collection of this magazine.

PLEASE NOTE that member 182, G4BXN was missed from the members list in error.

MORSE TRAINING: It is with regret that Ted, G3ANQ, most now through ill health discontinue his personal CW training scheme. Ted has helped several club members in the past (including introducing me to 'mental reading') On behalf of the club, may I thank Ted and hope that his health improves.

MORSE TRAINING: The club is still able to offer to SWL's and G8's the G8PO tapes and also an RSGB tape and a simulated morse test tape. Details from G3EPU.

GM3OXX has crystal to offer for postage costs: 3725.417, 3715.00, 3705.417, 3677,750, 3676.853, 3673.083, 3671.917 and 3668.417.

G4CCW would like any mains PSU for WS62 and gen on Telequipment Scope 520.

TWO MISTAKES: In G3DOP Breakin Circuit omit lead from anode of diode to earth line
Colin, G3VTT is PA9AQG not PA9 AQG.

You will have seen in Rad Comm, but after exchanges of letters with the Home Office, G3YUQ has been told that DSB will be legal and in licence after Jan. 1977.

WELL DONE TO NEW CALLS IN CLUB: Member 150, Bruce is GM4RNE, Member 217, Brett is now G4FLQ.

GI3XZM has suggested that there should be more interchange of ideas and views in the club through SPRAT. As from Next issue I hope to have a VIEWPOINT column. So any ideas views about QRP and the Club (brief please) will be welcomed. Also we hope to begin a column or short section for SWL's, ideas, news etc from Hal Collard...

DL AGCW QRP CONTEST OPERATION FROM ANDORRA. By Dave Powell G3ZXK/FØHX/C31DV.

Andorra, as most people know (especially radio amateurs) is a tiny country in the Pyrenees between France and Spain. My fixed QTH is near Toulouse and I have had the opportunity to travel the 200 km to Andorra to participate in the DL AGCW QRP Contest. I would like to share my experience with the other members of the club.

Reglementation:

First of all, an outline of the administrative procedure should help those who may wish to operate from Andorra. A C31 reciprocal licence is free and is obtained from the following address:

Le Prefet des Pyrenées-Orientales,
Deleque Permanent pour l'Andorre,
66000 PERPIGNAN,
FRANCE.

The application should include as much detail about the station as possible: Bands, Power (under 100w), proposed QTH, proposed dates, photocopy of licence etc.

The administrative delay will be considerably shortened if the application is in French and even then should be sent at least 6 months in advance for a first application, and 3 months in advance for renewals. The licence is issues for a period of three months, even for Andorra nationals, so dont ask for a longer period.

The licence, which is a simple letter, gives details of the other administrative procedures that must be followed. The 'radio police' in Toulouse must be notified in advance concerning the exact QTH and operating dates. The licence must be stamped by the French frontier police on entering and leaving Andorra. Lastly any changes of QTH whil st in Andorra must be notified to the 'Viguerie d'Andorre'.

Equipment:

The equipment I use consists of an HW7, a homebrew ATU and SWR meter, a tri-band dipole, a 20m dipole, two 6v dry batteries, a toolbox including battery soldering iron, a table and chair, an insecticide spray (and one wife for meal and coffee making!).

The table and cair are used inthe daytime during clement weather as this reduces the fatigue of of operating from the back seat of a car (I do not yet have a frame tent). the insecticide is indispensable as most mountain forests seem to be alive with moth sized flies. A last item that is important for car operation is an ex-army morse key with knee straps.

Two technical details may be of interest:

i) A 1000 ohm pot as an RF gain control makes one heck of a difference to strong, out-of-band BC breakthrough. I couldn't get the QST HW7 mods to work in time for the contest but this part of the mod did a great deal of good.

ii) Being unable to find 75 ohm twin feeder for my 20m dipole I used bell flex! The losses over 20 yards or so seem to be small and the impedance difference is tuned out by the ATU. (It would be interesting to measure the loss and impedance in the laboratory).

Operation:

I have always operated from the same site in Andorra; 'la Rabaesa' which is about 22 km above in the mountains leaving from St. Julia near the Spainish frontier. The site is excellent for HF working (alt. 2169 m) although mediocre for VHF (except to south) since Pic Negre towers up to 2900 m in the North West. It is possible to operate from the very top but one has to take into account such factors as accessibilty by car, water, and trees for tieing aerials to.

This site is very popular and in 1975 I met a group of ten German radio amateurs installed for a QRO DXpedition. I discovered their presence 200m from my site only after having erected my aerials and it was much too late to move. They were using mainly 20m and my HW7 did not tolerate this only 200m away! However they were very kind and appeared at my site with a Hammarlund transceiver in the middle of the night, a generator to run it and all the cable and adapters necessary for me to use it as a station receiver, the HW7 being used as a TX. This enabled me to make a few contacts and participate in the contest. The following day one of their group fell ill and was evactuated to Toulouse in a helicopter. I was able to return their kindness by visiting him when I returned there.

This year, howver, I was the only radio amateur on the site. The triband dipole was erected running aprox. N/S and the 20m dipole at right angles.

40m proved useless (for me anyway) and I concentrated on 20m and 15m. The total number of contacts was 91 with a few get-aways. The best DX was UA9CAM who gave me

QRP Contest in Andorra Cont....

579 at 6000m for 2w input!

A rare callsign makes a lot of difference to QRP operation and I have great respect for those who achieve a high score from their home QTH. Being in C31 means that even with QRP one can call CQ and get a reply. At certain times in the contest I was able to work one QSO a minute (mainly DL). I had already noticed the difference between a look-for callsign and a common callsign at the home QTH in Toulouse. My calls to East European stations during the winter QRP Contest at FØHX where frequently replied with 'sri om qrm 73 cq dx pse dx pse'. One week later in the French CW contest when French callsigns are cherished - I operated 10 minutes and worked 10 stations: all UA1,UB& etc!

One of the hazards of /P operation from mountain tops is strong weather. The last two hours of this years contest were spent in a storm and the QRN was terrific not to mention the two inch sparks on the feeder of the unused aerial!

The second hazard of contest operation from Andorra is that most of the car accessible sites are visited twice daily by jeep excursions for tourists. For most tourists amateur radio is a local curiosity and must be seen like everything else. This natural curiosity means that next year I will try to coincide my rest priods with jeep excursions and not my meals!

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QRP RESEARCH.

In the discussion that followed the Whyndham Project idea and from the letters that followed by invitation to write about the future of the club, one idea which has emerged is that quite afew members think the club should attempt to look at the area of QRP COMMUNICATION RESEARCH as a group.

Naturally this is already being done. In a real sense every member of the club is engaged in research in low power communication and many articles in SPRAT are rather like research reports on this work. It may be possible to add a bit more structure and publicity to the results of this work.

I would like SPRAT to become a forum for ideas in this work, not only to print the results of the careful work that members do, but also to indicate which members are engaged in what fields so that like-minded members can correspond if they wish, and share their work.

It seems reasonable to divide the work into the following classes:

a) Receiver and Transmitter Design - sophisicated and simple.
b) Antenna Design and Use.
c) Propagation.
d) Operating techniques.

One of the results could be the publication of reliable designs for QRP equipment capable of construction by the average 'home brewer'. Naturally this is already being done, and past issues contain many valuable ideas. I hope that in the future the club may be able to bring together past and future ideas and designs to issue a 'QRP HANDBOOK' for sale to both members and non-members. Therefore I would be happy to receive any indication of the work you are doing, plan to do, or would like to do, so that I can publish an 'interests and work in progress list' in the next issue. Any other ideas on this theme would be welcome. Oddly enough, when talking to QRO operators and commercial equipment users and showing them past issues of SPRAT, they show a great respect for what we do. Perhaps we can attract more people into our ways?

AWARDS.

The club awards are still being 'picked up' at a steady rate (see G8PG's notes) but their are others for the QRP operator. There are two quite simple awards that could probably adorned your walls right now! The RSGB IARU REGION 1 AWARD is not difficult to achieve and can be issued with the endorsment "CW UNDER 5 WATTS" if asked for when application is made. The QRP ARCI (the 100w !! USA Group) also do a series of awards (a copy is available as a datasheet) amongst which is the 1000 MILE/WATT AWARD which must have been achieved by many members.

THE CLUB TALK FILE.

I have prepared a file for members who wish to give a talk to local clubs. It does not contain 'a talk' but is a mixture of photographs, circuits facts and figures etc about QRP - available on loan from G3RJV.

MEET THE MEMBER:

GM3MXN. Tom Sorbie.

I am 40 years old 3rd of a family of twin feeders (girls) and employed at the Architects Department of Strathclyde region. My main QRO rig is a HW100, RA1 RX for QRP and a cedar RX in car. My QRP TX is VFO cobtrolled and built on a short bread 1in(!) (9"x6"x1") complete with tartan paint - hi. I am a member of TOPS and ex-Royal Signals morse and procedure instructor, so like CW. Mainly interested in building simple rigs as my technical background is limited - building the DSB I by G3YUQ.

G4CMY. Tony Mann.

I am 20 years old and been licenced for two years, my main interest being CW opeartion mainly on 80m. I use an old army 62 set (10 CW - a bit high for QRP, but other gear on the way) modified to suit my needs. The main receiver is an 1155N with a BC453 '05er' and homebrew audio filter. For the HF bands I have a modified RF24 unit as a converter for 20,15 and 10. I am interested in radio history and enjoy the use of old type equipment. I am a member of the RSGB and TOPS. I work in the Pensions Department of the Eagle Star Insurance Co. and hope to become an Actuary.

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DRAWING FOR SPRAT.

In the past I have mentioned the first rate illustrations by Keith Simpson G4DQP which have made SPRAT a cut above many small scale magazines. At the moment pressure of work no longer permits Keith to do our illustartion for a while. My we all thank Keith and hope that he will be able to 'grace our pages' again soon.

Mac. G3FCK has kinally offered to produce drawing for the magazine, and has already prepared some excellent drawings, for this and future issues. It would be unfair for the burden to remain totally on Mac (as with Keith in the past) as so if we have any other members with draughtman experience in circuits, the 'odd drawing or two' would b helpful.

REQUESTS:

G3RJV would like to know any 'simple' methods of small batch PCB etching and masking. I teach a small Practical Electronics evening class and the need is often present to produce upto about 5 to 10 small boards for the students. (Dalo pen taks hours!) This information could perhaps be used to produce boards for club projects, so is simple silk screen (do own one) or photographic masking possible for the amateur ?

G3RCK would like circuit/details of a unit known as "Crystal Calibrator, L.F." It does not appear to be an ex-service unit, and has a 3 way switch, one position of which is a mystery.

DATA SHEET SERVICE.

This service, providing photocopied information sheets for a SAE to G3RJV, is still going well, thanks to the sterling efforts of G4FKH. By the way - a lot of Tucker Tin MKII's have been sent in sheet form, but I've yet to hear of a working model - do we have any?

TWO NEW SHEETS:

FOUR WATT WIDE BAND LINEAR. (Ham Radio)

A stable RF power amp over range 300kHz-30MHz requires only 25mW of drive. Sent by G3DOP and later GM3OXX. G3DOP drives one with a simple xtal cont. source.

THE TUCKER TIN MARK ONE. ZL2AMJ

This is the original Tucker Tin circuit of the '60's. Amazing with only two valves required for 9Gm SSB. We also have the sheets for the improved phase shift network the vfo and a linear. Surprise the 'old lady' nets with a 12AT7 and a EL84 !

OTHER SHEETS:

HW7 Mods - simple ideas from members.
QRP Awards - ours and QRP ARCI.
G3IGU 80m transceiver.
G3XUQ, Transistor One.
Miniature Solid State VFO (Ham Rad)
Transistor PA Design The Safe Way - A paper by DJ1ZB.
Tucker Tin MkII with improved PCB layouts and alignment details.
Delux CW transceiver for 20m (Ham Rad)
G8EPE 2m 4w AM Rig.
QRP VFO TX for 20m (Ham Radio)
Active Filters article by K8EEG
MFJ Active filters, circuit and data
Minituner, Direct Con RX 80/40 (Ham Rad)

(If you come across any useful circuit etc in overseas or uncommon magazines, please lend a copy to the club to make a data sheet)

CLUB MEMBERS.

Within about a couple of weeks of this issue appearing on your door mat, you should receive a complete membership list which will be accurate upto the 1st Jan. 1977.

The typing for this list has been kindly done by Connie Wade - G4CUY - to whom we all offer thanks.

In view of this, I only offer a brief list of new members since the last issue, the full details of the new members listed below will appear in the full listings.

NEW MEMBERS.

Walter Blattner.	HB9ALF.	233.	Arthur Kerford-Byrnes.	G6AB.	244.
Tom Burton.	G2BON.	234.	George Rolton.	(pending)	245.
Paul Newbold.	SWL.	235.	Mike Hutchings.	ZL1BLJ	246.
Mike Turner.	G3LYE.	236.	Gordon Saunders.	G4BJE.	247.
Leonard Lawrence.	SWL.	237.	Ronald Everest.	G4EOE.	248.
Alan Jenkins.	G6AAL/T.	238.	Neil Smith.	G4DBN.	249.
Francisco Guerra.	EA8OA.	239.	Terence Spicer.	G8IQT	250.
Albert Smith.	G4FMK.	240.	W.R. Petheram.	GW3CIJ.	251.
Ian Fair.	G3AWQ.	241.	Victor Tatman.	G8IUS.	252.
John Spinks.	SWL.	242.	Tom Williams.	SWL.	253.
Julian Forsey.	G4ETS.	243.			

The membership now stands at over 250, which is quite a rise from the 30 or so who received SPRAT number 1.

We have some interesting calls amongst the new members. We can only hope that Francisco, EA8OA, decides to take part in some QRP contests and activities, to give us a new prefix. Mike, ZL1BLJ is mentioned elsewhere in SPRAT, we have had one QSO from G3NEO with under 5 watts to ZL, and Mike has been heard in the UK by G5IC, so lets await the first G/ZL two-way QRP QSO! Walter, HB9ALF, is a very well-known HB9 call, I have lost his original letter (sorry Walter) but he is, at present, chairman of the Swiss equivalent of the RSGB.

I am very pleased to see Neil, G4DBN, a member of the club. Neil was a member of a school electronics club I once ran in Lincoln. That makes me feel old! I redall that club with fondness because I devised a step by step beginners course for the boys which became the text for the Ladybird Book, 'Making a Transistor Radio'. Neil is reading electronics at Hull University.

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MEMBER PROPOSED FOR RSGB COUNCIL.

Den Holt, G4OO, member 167 was proposed as a member for the RSGB Council by Nick Carter, G2NJ. I was very pleased to support the nomination. At the moment I dont know if Den made it, but lets hope we have a member on the council.

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SUBS SUBS SUBS SUBS SUBS SUBS SUBS SUBS SUBS SUBS SUBS SUBS

I am afraid to say that there are afew defaulters who still owe subs to the club from previous paying-in times. The idea is that in each issue of SPRAT, I state which members (in numbers) owe current subs.

I am pleased to record that Alan Lake, G4DVW, has agreed to handle the renewal of subscriptions. So renewals should be sent to:-

Alan Lake, G4DVW, 7 Middleton Close, Nuthall, Nottingham.

Please quote your membership number. The current fee is £1.50, and cheques should be made out to - G.C.DOBBS re QRP CLUB.

RENEWAL NUMBERS:-

MEMBERS UP TO NUMBER 200 should pay their second subscription.

MEMBERS FROM 001 to 089 should pay their third subscription.

This represents members who joined before Easter 1975 and those who joined between Christmas 1975 and Easter 1976. Therefore they are due before the next (Spring) issue of SPRAT.

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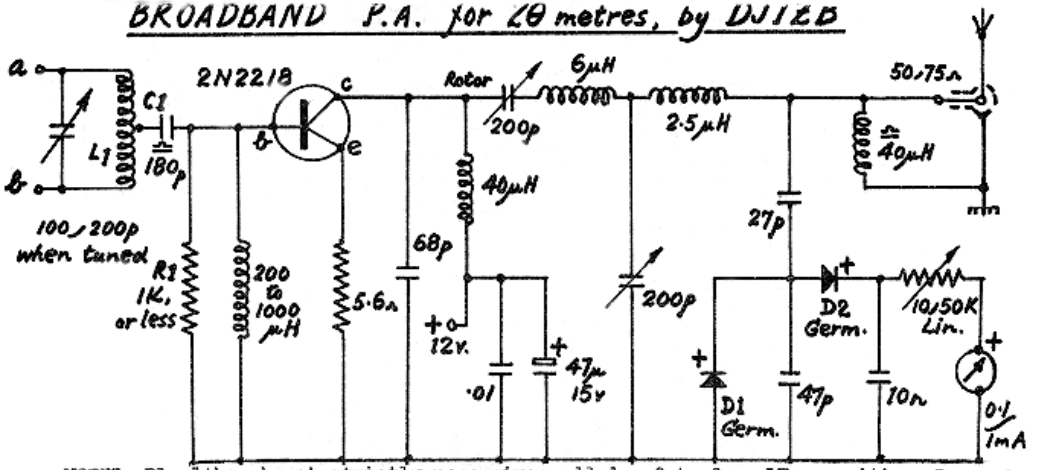
Club TALK FILE.

Elsewhere in this issue, I mention the file of material for use in QRP talks by members. I would like to collect more material for it and would be pleased to receive photos of rigs, shacks etc, logs of QRP and Members QSL cards.

BROADBAND P.A. for 28 metres, by DJ1ZB



NOTES: R1, although not strictly necc, gives added safety from LF parasitics. Low value.
C1, approx. 180p by experiment. Variable caps may be solid dielectric types.
L1 tap at ½ total turns

PA STAGES, TUNED OR BROADBAND, WHATS BETTER FOR QRP? By DJ1ZB.

In the years of tube and early transistors all PA stages were tuned. But since the beginning of this decade broadband, untuned PA's have come up in industrial and even ham radio transmitters. What is the reason? Are tuned PA's obsolete? This comparison, from the authors viewpoint, will show the benefits and drawbacks of each technique.

In tubes, and to some extent in general purpose transistors, the internal capacities, compared to their input and load impedances, are so high that they must be tuned out by resonant circuit s to get maximum amplification from the device. These tuned circuits are also used for harmonic suppression and impedance matching. By a suitably designed tank circuit high SWR loads and high impedance or even random wire antennas can be matched. Bandwidth is sufficient for one ham band. To cover several bands howver, a switch is needed for appropriate L&C values.

The internal capacities of modern RF power transistors are so low that they can be used in broadband amplifiers up to 30MHz and even higher. But without the fly wheel action of a resonant tank circuit single stages must operate in Class A, and, for higher efficiency, Class B and C stages must be arranged in push pull to provide amplification over the full cycle of the sine wave. Coupling between the stages is by ferrite broadband tran sformers. They are also used to divide RF power to several identical amplifiers and to sum up the output of these to an amount which cannot be generated by a single transistor. Such an arrangement will will amplify any input frequency from 1.6-30MHz without the need for tuning or switching. With a multiband antenna, band changing is very simple.

For practical operation of a broadband PA however some kind of LC network must be switched into the output line for the band in use, because of the suppression of harmonics (especially the odd ones in push-pull PA's) In most cases low pass filters are employed, so there are no means for impedance matching. Therefore to get full output from a broadband PA, the SWR of the antenna must be as low as possible. For loads differing for 50 or 75 ohms, a separate ATU is necessary.

Broadband transformers can be designed for impedances from 5-500 ohms. Transmission line transformers offer the best frequency response, but can unfortunately be realised for impedance ratios of 1:1, 1:4. 1:9 etc only. Frequency response at the lower and higher end usually must be optimized by series and parallel capacitors. Construction and measuring techniques for these dvices and the resources for the ferrite are not well established for home brewers yet. On the other hand, tuned matched sections will take a much higher impedance ratio and can easily be optimized by resonance tuning. Also, power output and efficiency for a given transistor will always be somewhat higher in a tuned amplifier, especially for class C CW purposes.

The QRP PA desiner, according to these explanations, is facing the following facts; For multiband transmitters, both PA types need a bandswitch. QRP power can easily be generated by a single transistor. Some means of impedance matching is desirable, for every antenna show some SWR over the band. Therefore, the single transistor PA - tuned- will be the best solution for QRP. The driver and all pre-stages can be operated in broadband class A. The need to switch the driver output-PA input circuit by an additional section of the bandswitch is the only drawback

J. BIRKETT

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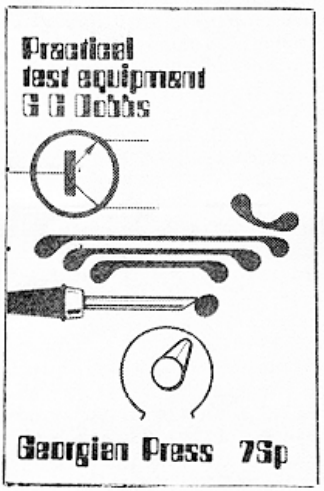

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THE WORLD RECORD ANTENNA SYSTEM

Manufactured by Partridge Electronics Ltd.

THE PARTRIDGE SYSTEM

—For YOU—whether or NOT you have Antenna Space !

Gold stove enamel case. Red, black and silver fascia. Size: 6" x 5½" x 2½"; 15½ x 13½ x 7½cm. Wt.: 1kg. 2·2lb.

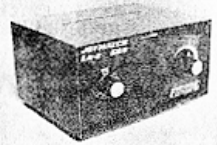
11lb Front View.

FOR SHORT WAVE LISTENERS; TRANSMITTING AMATEURS; (250w P.E.P. maximum); 1.6 mHz Thru 32 mHz.

SYSTEM 'A' £32·40
Delivered AIR-MAIL

Suitable for ANY unshielded location. Puts you on the air within minutes of unwrapping the package. Just screw together the three antenna sections and lean the 7' 6" (230cm.) JOYSTICK VFA against a wall, behind a drape or place horizontally on a non-metallic shelf. The terminated feeder plugs into the JOYMATCH 11lb A.T.U. and the terminated coaxial cable links the A.T.U. with the 50-75ohm antenna socket on your equipment. When ordering state clearly, with sketch if necessary, your antenna termination and we will match all common connections.

Gold stove enamel case. Red, black and silver fascia. Size: 7½" x 4½" x 6"; 20 x 16½ x 15cm. Wt.: 2kg. 4·4lb.



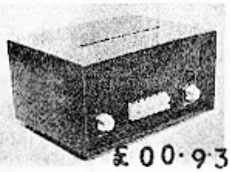
LO-Z 500 Front View.

FOR TRANSMITTING (500w. P.E.P. max.) and improved 'Q' factor for listening. 1750kHz Thru 32mHz.

SYSTEM 'J' £38·60
Delivered AIR-MAIL

Suitable for ANY unshielded location. You can be on the air in record time. Just screw together the three antenna sections and lean the 7' 6" (230cm.) JOYSTICK VFA against a wall, behind a drape or place horizontally on a non-metallic shelf. The RF input socket on the JOYMATCH LO-Z 500 A.T.U. is the universal SO239 for which you almost certainly have a terminated coaxial lead.

A GOOD GROUND AND/OR QUARTER WAVE RADIALS ARE ESSENTIAL — See A.G.T.U.



Rear view of LO-Z 500 showing A.G.T.U.

SYSTEMS 'A' & 'J' If extra height can be gained by elevating the JOYSTICK VFA externally we can supply the following:

The Partridge A.G.T.U. Quarter-Wave Radial and Natural Ground Terminal block (fitted). We can supply a complete set of radials for:

£00·93

(a) the 6 amateur bands receiving £04·88

(b) the 6 amateur bands transmitting £09·28

(c) the 10 short-wave broadcasting bands £05·49

Insulated Clamping Points for securing to existing support using locally obtainable JUBILEE CLIPS or similar from your hardware store. £00·31

Hurricane Brace (supplied fitted) to strengthen VFA against high winds. £00·86

A Longer VFA Feeder (supplied fitted) per 3 metres (10 feet). £00·39

Warning. Do not position feeder too close, for any distance, to external walls which radiate electricity supply noise adversely affecting your signal to noise ratio.

Gold, Stove Enamel and Black. 3 x screw together sections. Overall length 7ft. 6ins. (230cms.). Weight 11lb., 0·66kg.

PARTRIDGE ELECTRONICS LTD.

BROADSTAIRS, KENT CT10 1LD
TEL. THANET (0843) 62535

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