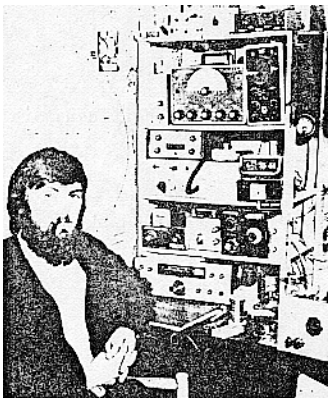
PRINTED RATE.

REV.G.C.DOBBS,(G3RJV) "WILLOWDENE",CENTRAL AVE,STAPLEFORD.NOTTINGHAM.

Devoted to Low Power Radio Communication

SPRAT

SPRING 1979 Issue 18



The G3IGU 40-20 Metre TRANSCEIVER.
Milliwatts From An Argonaut. G4BUE.
Q.R.P. on 10m. With A Liner Two. GM4HBM.
Simple HW8 Modifications. GM3MXN & G4GIE.
Suggested A.T.U. Unit. G4DEP
Invisible Aerials. G8PG.
Q.R.P. NEWS.
CONTEST NEWS.
ACTIVITY PERIODS.

The G3RJV Shack

Rev.G.C.Dobbs (G3RJV) "Willowdene"Central Ave, Stapleford. NOTTINGHAM. NG9 8PU.
Telephone Nottingham (0602) 394790.

Dear Member,

After the last issue, I wondered if the club would break the "500 mark" before this issue - well we have reached an even higher figure. Very good news - but less time for RJV on the bands! Although I have had a little time on the rising 10m band. Pity that at the moment all the best stuff seems at the SSB end.

A couple of points worthy of note - I was pleased to see that the new RSGB president is calling for designs for simple homebrew gear in his address; a challenge to club members perhaps - also please read the section about the formation of a club Communications Department; which introduces the worthy G4BUE to the club officers group.

Alan (G4DVW) and I are still concerned about non-payment of subs. Please pay up if you owe us. If you wish to leave the club, please tell us so. The cost of printing and postage for SPRAT eats away all our subs, so please show your concern for the club and SPRAT by being prompt with your subs payments.

There is a lot of club news and good technical stuff in this issue, so please note the items with care - it was a squash to get it in!

Best 73 and hpe cu qrp  G3RJV

SUBS DUE BEFORE SUMMER (JULY) ISSUE: Numbers - 91-120, 201-222, 272-292, 393-418. To G4DVW quoting membership number.

CLUB DATA SHEETS:
Available to club members for a large stamped addressed envelope to G3RJV.

Tucker Tin MK I valve SSB rig.	Tucker Tin MK II Transistor SSB rig
Minituner (40/80 RX)	G3IGU 80m transceiver.
HW7 modifications (various)	HW8 modifications (various from the US)
HW7 S Meter (a new sheet)	HW7/8 ATU
Minimite all band QRP TTX	Tramsistor 1 - simple one stage TX
SST1 transceiver for 40m	Ultramountaineer - transceiver for 40m
G8EPE 2m AM Transmitter	One Valve xtal controlled Transceiver
Club Awards Scheme	MFJ Audio Filter information/Circuit.

NEW DATA SHEETS:
CALIBRATOR FOR THE HW8 - QST article, internal circuit for 25kHz steps.
SARDINE SENDER - QST xtal controlled ½watt TTX - simple stuff.
CW LOW POWER TRANSMITTER (80-10) good basic valve design 10w from CQ.

****

CLUB MORSE TRAINING COURSE:
Send TWO C90 cassette tape blanks and return postage, giving full name and QTH in block capitals to:
W.G.Jones,24 Underhill Cres. Abergavenny.Gwent.S.Wales.NP7 6DF.

****

SUBSCRIPTIONS: To Alan Lake (G4DVW) 7 Middleton Cl. Nuthall. Nottingham.
Cheques made out to: G.C.DOBBS RE: QRP CLUB. (Please quote NUMBER)

****

CLUB OFFICIALS:
CHAIRMAN: Dr. Gordon Bennett. G3DNF.
CONTEST & AWARDS MANAGER: Mr. A.D. Taylor. G8PG/GW8PG.
TREASURER: Mr. A. Lake. G4DVW.

****

SPRAT:
EDITOR: Rev.G.C.Dobbs. G3RJV.
TEXT TYPING: Mr. A.D. Taylor G8PG and G3RJV.
ART WORK: Mr. A.W.McNeill. G3FCK and G3RJV.
ADDRESS LABELS: Connie Wade. G4CUY.

READ THIS - IT IS NEWS.
COMMUNICATION DEPARTMENT FORMED.

To strengthen our organisation and improve member service the following reorganisation of Club administration took place on 1st January. The old office of Contests and Awards Manager was abolished, and a new G QRP C Communications Department was set up. The officers of the Department are:-

Communications Manager, Gus Taylor, G8PG.
Assistant Communications Manager, Chris Page, G4BUE.
Training Aids Officer, Mr W.G.Jones.GW8PLV

Will members please note the areas covered by these officers and address correspondence to the responsible officer. Responsibilities are:-

COMMUNICATIONS MANAGER. European CW Association, RSGB HF Committee liaison, issuing of all Club Awards, operational and technical research projects, assistant to SPRAT Editor.

ASSISTANT COMMUNICATIONS MANAGER. Club activity events, contests, publicity in radio journals, liaison on ssb activity, assistance to SPRAT Editor.

TRAINING AIDS OFFICER. Provision of morse training cassettes and tapes (always send a tape or cassette and full postage please).

ADDRESSES. G8PG; 37 Pickerill Rd, Greasby, Merseyside L49 3ND.
G4BUE, 'Alamosa' , The Paddocks, Upper Beeding, Steyning, West Sussex BN4 3JW.
Mr W. G. Jones, 24 Underhill Crescent, Abergavenny,Gwent NP7 6DF.

NEW TRAINING AID. 2 hours at 14 to 20 wpm. - 2 C60 cassettes.15 mins a day for 8 weeks could work wonders with your reading speed!

EUROPEAN CW ASSOCIATION - G QRP C IS A FOUNDER MEMBER!

The new European CW Association came into being on 1st January,1979. Its objectives are to encourage cw operating on the amateur bands, to ensure adequate cw training, and to bring cw operators together in regular sesssions. Present members are the SM CW Activity Group, The DL CW Activity Group (whose QRP contests so many of us enjoy), TOPS CW Club and G QRP C. Other groups are expected to join in the near future. There is no individual membership, but any group which supports cw activity can join. Each group appoints a member to represent them on the Executive Committee. The Chairman is Sven Milander, SM0IX, our member DL7DO represents DL AGCW, and G8PG represents G QRP C. The Association is organising activity periods between 1930 and 2030 gmt daily. Frequencies 3550-3560 November to March, and 7030-7040 April to October (Chosen to cover QRP frequencies thanks to our being a member group). The possibility of a cw-only, hf band novice licence for IARU Region 1 is also being actively canvassed (simple technical exam, 5wpm morse test, 10W xtl control, small segments in certain hf bands, Class B licencess take morse test only). But this will need mass support. If you do support the idea, send a postcard of support to G8PG, and start chasing your local radio club and national radio society. Every supporting vote counts, whether you are a swl or licenced amateur, and whether you are a G QRP C member or not.

BY POPULAR DEMAND OUR 3.5 MHZ OPERATING FREQUENCY HAS BEEN MOVED TO 3560 KHZ

BY POPULAR DEMAND OUR 3.5 MHZ OPERATING FREQUENCY HAS BEEN MOVED TO 3560 KHZ

CRYSTAL EXCHANGE: G3RJV has several 7010 crystals, one 100kHz standard and one 1Mz standard crystal for exchange. Requires 5.2MHz or Top Band CW range crystals in range 1825-1835

CLUB NEWS

QRP WINTER SPORTS

Not too many written reports (maybe everybody was frozen in!) but there was a lot of activity, particularly in the UK, Sweden and the USA. All reports received were enthusiastic, and this sort of activity obviously meets a real demand. Watch SPRAT for details of activity periods later in 1979, as several are being planned. To give some idea of what went on we report some of the stations worked. Things started before the official activity period and continued after it, so this report covers December 1978 and the first few days of January 1979. Non-member (at that time) GM4ELV used his 5w to work W1AUT(15w)and VE3JP (3w) on 21 MHz . GM3OXX worked DF6QY (14MHz, 1w), DK8NZ/M (21 MHz,3w), SM5CCT (21KHz, 5w), and UA1ART (28MHz, 10w). The report from G4BUE reads:- 28Mhz:- UB5FAQ (5w), SM7FCU (5w), WB0THC (3w), K5UU/2 (5w,indoor dipole)SP8ATI (5w), K8BHG (5w), OH2GF (1w), WB2VYA (10w), LZ1DD (10w), YO3BTN (3w), UB5CDW (1w), and VE3BIR(5w, indoor 2 el). 21MHz:- SM3JKP (2w), OH7OI (5w), SM4CGN (2w), SM5CCT (5w) , OH7WY (5w) SM3HLV (2w), and (grab this fellows) JA1NRQ (5w). 14 MHz:- DM2BPN (3w). G8PG worked a UA9 running 10w on 28 MHz, heard a VE1 /QRP on that band, and heard 5 SM /QRP and one OH /QRP on 21 MHz. As far as Scandinavia was concerned the skip definitely favoured the south of England - in the north signals tended to peak quickly then go out again. Certificate for the best report goes to G4BUE for his outstanding results. QRP/QRP at inter-country and inter-continent levels is our next big challenge - we must increase our performance to a stage where it happens regularly.

19 COUNTRIES PLUS G-QRP-C BACK INTERNATIONAL ENERGY CONSERVATION MONTH !

Nineteen of the worlds' leading industrialised nations are to join forces next October in the first International Energy Conservation Month. They include the UK, 14 other major European countries, Canada, New Zealand, Turkey and the USA. The event will focus world-wide attention on the crucial role of energy conservation. The main objectives are:- to provide an international focus for national efforts to stimulate public awareness of the long-term need for energy conservation: to give member countries an opportunity to plan events which either culminate during the Month or are launched during the Month; to underline the extent to which industrial nations are co-operating to conserve energy. The main themes will be:- the long-term need for energy conservation as an element of national energy policies; the practicability of saving energy in all areas of life by using energy more efficiently and cutting out waste.

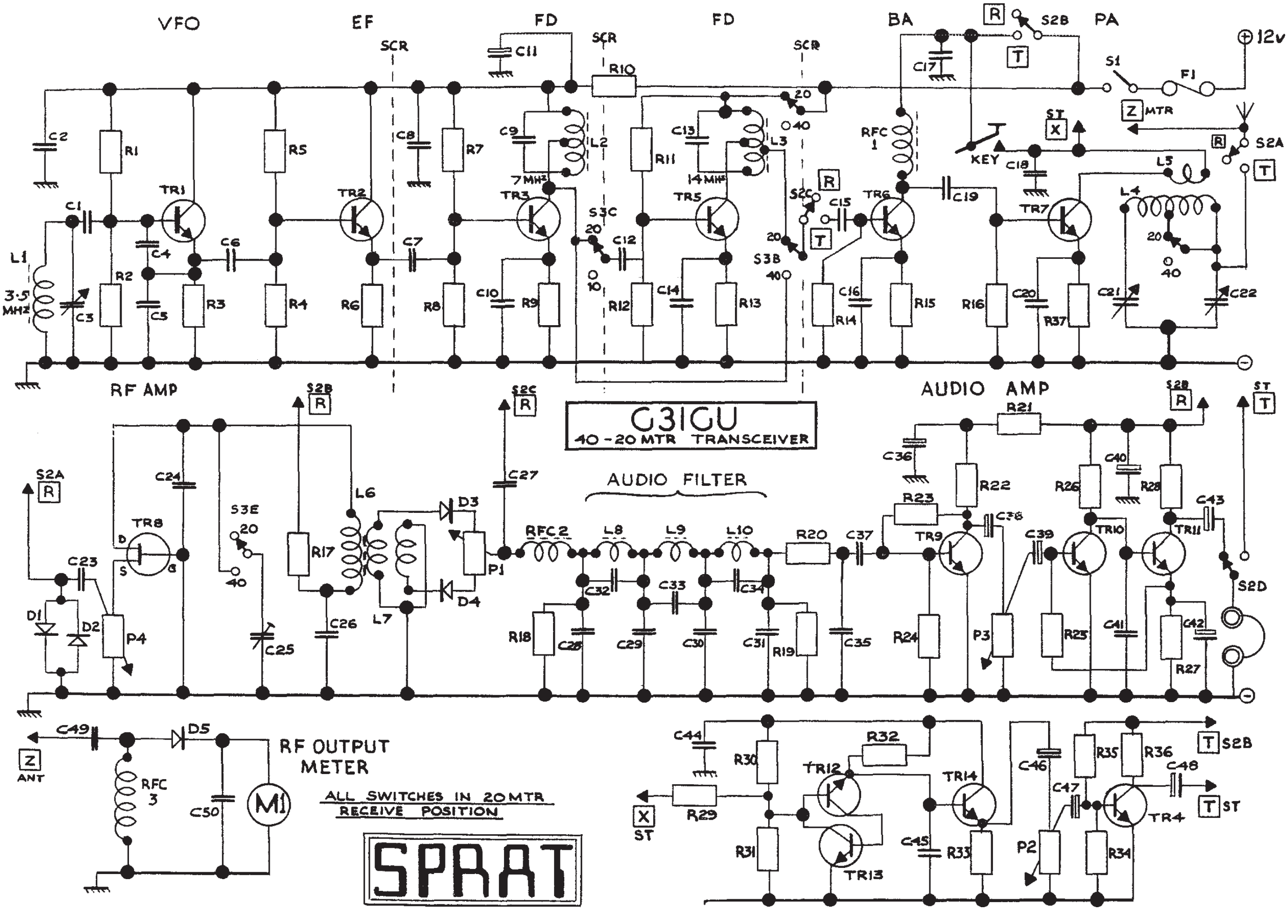
A programme of events to mark the Month are being devised in consultation with a number of organisations.
As the UK leader in the conservation of energy used for amateur communication purposes G QRP Club supports the Month wholeheartedly. Certain proposals to allow UK QRP operators to participate have been made at high level. We await the outcome and will report developments in SPRAT. Meanwhile, what is your local Club doing to conserve energy and decrease the polution of the rf spectrum?
(Press release Ref.No 369 of 1978 from the UK Department of Energy refers.)

W3EDP LOADING PROBLE..

G3GWI had problems in loading a W3EDP antenna when using the circuit shown in the last issue of SPRAT. He had the atu remote from the rig, fed via a long co-axial cable. If any other member has loading problems, connecting together the earthy ends of the two coils in the atu should solve them.

BY POPULAR DEMAND OUR 3.5 MHZ OPERATING FREQUENCY HAS BEEN MOVED TO 3560 KHZ

MEMBERS AD: WANTED HW7 in good condition - contact: J.A.G.Milne, Residence HIRUENA,Rue Du Moulin Barbot,64600 ANGLET. France. would also consider a good homebrew qrp rig with psu.



VFO
EF
FD
FD
BA
PA
SCR
+12v
RF AMP
AUDIO FILTER
AUDIO AMP
G3IGU
40-20 MTR TRANSCEIVER
RF OUTPUT
METER
ALL SWITCHES IN 20 MTR
RECEIVE POSITION
SPRAT
KEY
ANT
ST
MTR
3·5 MHz
7 MHz
14 MHz

G3IGU 40-20mtr TRANSCEIVER

By Kieth Coates G3IGU

COMPONENT LIST

CAPACITORS. C1 120 pf. C2 0.1 ufd. C3 20p variable. C4 .003 ufd. C5 .001 ufd.C6, C7 200p. C8 .047 ufd. C9 100p. C10 .001 ufd. C11 100p. C12 200p. C13 50p . C14 .001 ufd. C15 .005 ufd. C16 .01 ufd. C17 .05 ufd. C18 .05 ufd. C19 .005 ufd. C20 .01 ufd. C21 Twin gang rx type, not strapped. C22 twin gang rx type both halves strapped. C23 .01 ufd. C24 35p. C25 100p variable. C26 .1 ufd. C27 500p . C28 ,29,30, 31 .1 ufd. C32,33,34 .05 ufd. C35 .01 ufd.C36 10 ufd. C37 .1 ufd. C38,39 2 ufd. C40 100 ufd. C41 .01 ufd. C42 100 ufd. C43 10 ufd. C44, 45, .1 ufd. C46,47 2 ufd. C48 50 ufd. C49 20p. C50 .001 ufd.

RESISTORS. R1 4k7. R2 3k3. R3 2k2. R4 3k3. R5 4k7. R6 2k2. R7 4k7. R8 3k3. R9 680. R10 100. R11 4k7. R12 3k3. R13,R14 680. R15 10. R16 680. R17 1k. R18 1k8. R19 1k8. R20, R21 1k. R22 22K. R23 470k. R24 120k. R25 47k. R26 10k. R27 220. R28 1k. R29 2k2. R30 5k6. R 31 1k. R32 100k. R33 22k. R34 470. R35 8k2.

POTS. P1 10k preset det balance. P2 10k preset sidetone level. P3 10k af gain. P4 1k rf gain.

DIODES D1,D2 D5 OA81. D3,D4 ITT44.

TRANSISTORS. TR1, TR2, TR3 BC108. TR4 BC182. TR5 BC108. TR6,TR7 BFY51. TR8 BF256. TR9,TR10,TR11 BC184. TR12 any pnp audio type. TR13,TR14 any npn audio type.

INDUCTORS. L1 35 turns in pot core. L2 24 turns, tapped 9 turns, on Alladin former. L3 15 turns tapped at 5 and 8 turns on Alladin former. L4 12 turns on ferrite core, 1½ inches long. L5 7 turns wound over L4. L6 24 turns on Alladin former. L7 8 turns bifilar wound over L6. L8,L9,L10, 280 turns on small ferrite core.

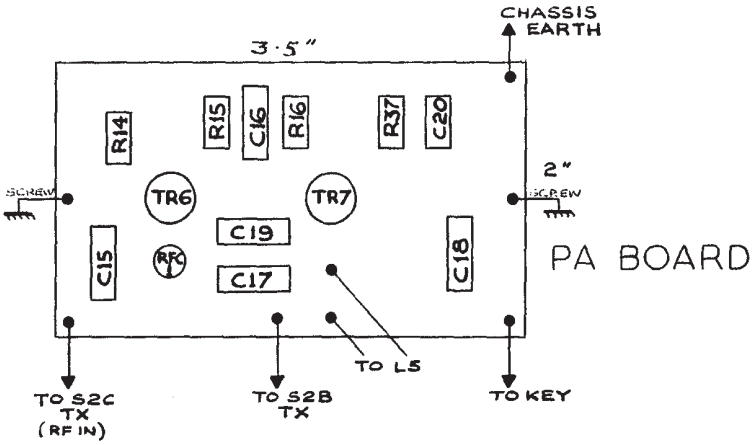
SWITCHES. S1, single pole. S2 4-pole, 2-way rotary switch. S3 5-pole, 2-way switch (original uses ex TV slider system switch 8' long.

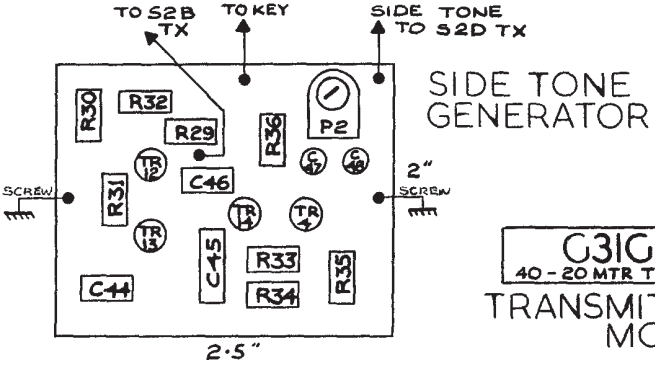
FUSE 500 ma (with holder).

This is the H.F. version of the well known G3IGU 80m Transceiver, for which Keith Coates won the G2NJ Trophy of 1977/8. The formula is basically the same, with transmitter and direct conversion receiver run from the same oscillator.

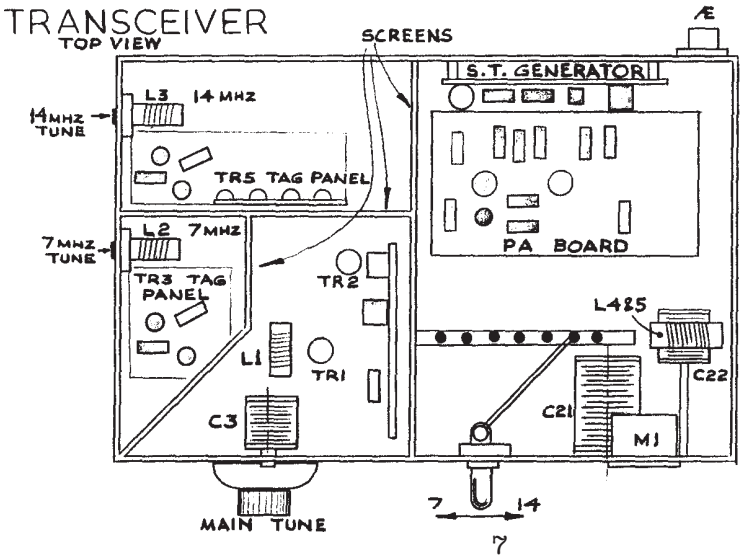
In the true amateur radio tradition, this is a "components at hand" project, so we merely offer the circuit and the layout as used by Keith. The switch S1 - an old TV component - may be difficult to duplicate, but individual ingenuity should soon solve the problem. All the Alladin coil formers are ¼" junk box types. The formers for L8/9/10 were surplus ¼" ferrite bobbins, filled with wire, but other suitable inductances could be tried - or even an active filter. L4 is wound on an old broadcast RX ferrite rod, tap to suit loading.

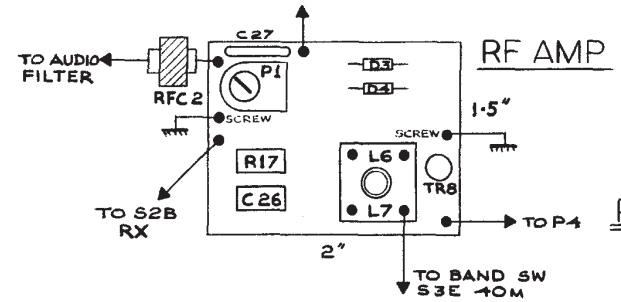
By dipping into junk boxes and salvaging from old equipment, this very useful little rig could be built for very little cost.....and that's what its all about.





G3IGU
40 - 20 MTR TRANSCEIVER
TRANSMITTER MODULES

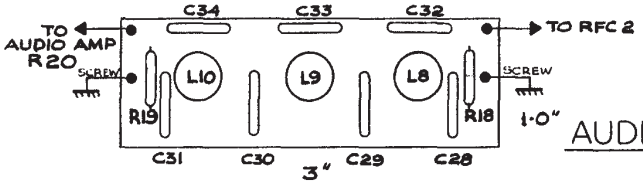




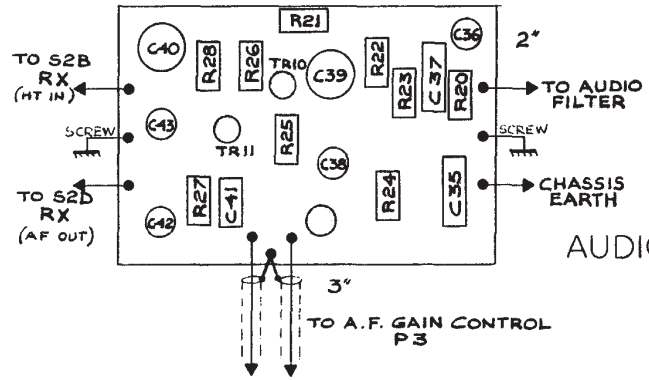
RF AMP

G3IGU
40-20MTR TRANSCEIVER

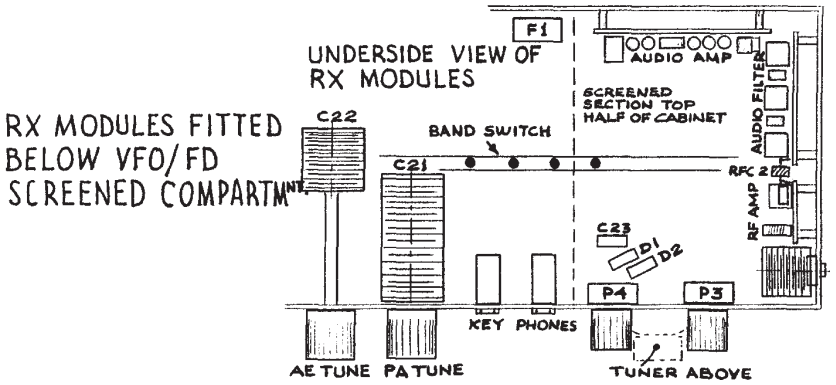
RECEIVER MODULES



AUDIO FILTER

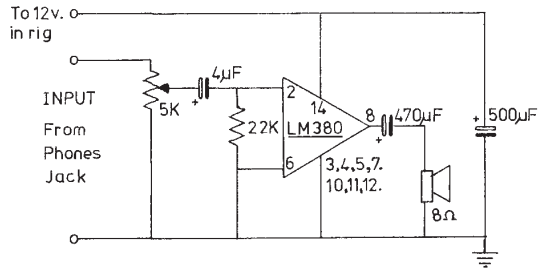


AUDIO AMPLIFIER



Simple HW8 Modifications By Tom Sorbie GM3MXN

[1] Outboard AUDIO AMPLIFIER



The above Outboard Audio Amp for the HW8 (or HW7) works very well and requires no hole to be cut in the rig. It is built into the speaker box with three leads going to the HW8 - input and 12- to the phones jack and 12+ an inline socket through one of the spare holes in the supply point. One could also fit a stereo socket to the rig to provide all 3 points

[2] Meter Pilot Light

I found the HW8 seemed dead with no dial light and was sometimes left on, so a LED indicator was added. Solder the negative side of a LED to the solder tag on the earth pin of the solder tag at rear of the meter. Place the LED just behing the meter, pulling the wires apart. Fix another tag strip to the other side of the meter with the existing bolt. Solder a 470 ohm resistor to the tag strip in series with the + side of the LED and join to the supply ON postion of the on/off switch. This gives a nice glow at the rear of the meter

****

YET ANOTHER HW8 MODIFICATION By John Spinks G4GIE

On receive the HW8 incorporates a quite efficient two stage active audio filter centred on a nominal 750Hz. On transmit the VFO frequency is shifted downwards by a nominal 750Hz by C55 being switch in circuit by D11 to achieve netting. The value of C55 on the circuit diagram is given as 5pF, whereas the construction manual calls for 6pF - as supplied.

On completion of the G4GIE rig, it was found that the transmit/receive offset differed from the filter frequency by seberal hundred Hz, and various junk box capacitors were tried to bring it spot on - 3.3pF being too low, and 5pF being too high, the answer was some kind of trimmer.

Because of the close component packing there was no room on the sompon ent side of the PCB and insufficient space between the foil side and the bottom shell. The answer was found in a pair of twisted wires. Two pieces of thin pvc covered 'hook up' wire twisted tightly together for a length of about 3½" were soldered in place of C55, and this did the trick. It is suggested that a starting length of, say, 5" is tried, being shortened to achieve correct capacitance.

The transmit/receive offset can be compared with the filter centre frequency using another receiver and a stable frequency source such as a crystal oscillator, and because of the mixing process in the HW8, the offset is the same on all bands.

With regret, I announce the death of two QRP Club members:
FRANK GOODALL - G4EVO - (259) at the age of 77. Frank was an ex Marconi operator who came to amateur radio late in life. He only ever operated QRP on CW. Frank wrote the Ladybird Book 'The Story of Radio'.

H.L.PEACOCK (494) who had only just joined us. He was hoping to take the RAE in May. Our sympathy goes to his son-in-law George (G4GRP) member number 371, through whom he came to join the club.

Q.R.P ACTIVITY WEEKENDS

CW QRP ACTIVITY WEEK-ENDS

The following activity week-ends have been arranged to enable members to make QRP contacts, especially with other QRP stations, and members of the Club. They have been designed to give everyone an opportunity to make some contacts. A great deal of publicity has been given to the periods by other radio clubs and magazines and a good deal of QRP activity is anticipated.

23rd/24th June	(	0900 - 1100 on 14060
	(	1100 - 1300 on 21060 and 28060
	(	1130 - 1230 on 7030
4th/5th August	(	1400 - 1500 on 3560
	(	1600 - 1900 on 21060 and 28060 for Europe x U.S.A.
6th/7th October	(	1900 - 2200 on 14060 for Europe x U.S.A.
	(	2030 - 2130 on 3560

SSB QRP ACTIVITY WEEK-END

To cater for the SSB QRPers within the Club, a similar activity week-end is to be held on the 5th/6th May 1979, as per the following schedule :-

1000 - 1100	on + or - 7090
1100 - 1300	on + or - 14285, 21285 and 28885
1500 - 1600	on + or - 3690
1600 - 1700	on + or - 7090

The HF frequencies are those which have been adopted as the international QRP calling frequenices, whilst those for the LF bands have been suggested as being suitable. This week-end has been chosen as there is a cw contest on which will (hopefully) leave the SSB portions of the band reasonable free of QRM.

G-QRP-CLUB WEEKLY ACTIVITY PERIODS

In addition to the popular 1400 to 1500 period on 3560 Sunday afternoons for the cw members, it has been noticed that recently there has been a lot of activity around 7030 between 1100 and 1230 on Sunday mornings. So keep an eye on both these frequencies at the times shown if you want to QSO other members.

As a result of correspondence with our SSB members we have decided to try a weekly SSB activity period, from 1600 to 1700 on Sunday afternoons on 7090 and 3690. In addition it has been suggested we try the HF bands (14285, 21285 and 28885) between 1100 and 1300 on Sunday mornings.

MONTHLY ACTION REPORT

It has been suggested that we ought to send details of some of the activity of Club members to the radio magazines for publication. This would help spread the word that QRO is not really necessary and give publicity to the Club. This can only be done with your help - so let us hear what you have been doing. PLEASE send your information (stations worked, dates times and bands together with power levels, gear used and antennas, and anything unusual, interesting or news worthy in the field of QRP) to Chris Page, G4BUE (see new address in 'Members Changes'.

In order that Chris can collate the information and compile a report to the magazines, please ensure your information reaches him by the 1st of the month. Perhaps we can make a start with the April/May period (to include the new QRP CSB activity periods) with reports to reach Chris by 1st June. If space permits, details can also be published in 'Sprat'.

CW IMPROVEMENT COURSES... Don't forget that the Training Aids Officer can now fix you up with 14 to 20 wpm practise material. 15 minutes a day for 8 weeks will do wonders for your reading speed..... G QRP C is the first Club to provide such study material for its members - free !!

SPECIAL CONGRATULATIONS to HAL COLLARD (121) who has reactivated his old call of G2CVA. Look forward to seeing you on the bands Hal !

MILLIWATTS FROM AN ARGONAUT

By Chris Page G4BUE

Three years ago I would never have said that G4BUE and milliwatts would go together. At that time I never dreamt of using less than 150 watts d.c. or 400 watts p.e.p., as the case maybe, as I sought to add new countries to my DXCC or took part in the many contests which I entered. Although I have retained my interest in both DXCC (260 confirmed), and contests, I have now added QRP to my interests.

Since August 1976 (when I started using QRP), I have progressed via a HW7 and a HW8 to an Argonaut, which gives 5 watts input on 80 through 10 metres. During that time I obtained QRPp DXCC No. 8 issued by C.Q. Magazine and was just wondering what to do with all my 'spare' time now that the hundreth QSL card had arrived, when I read the article in the Autumn Sprat by Brice Anderson, W9PNE - 'Intercontinental QRP QSOs using milliwatts' - the guy must be mad I thought.

Brice's article caught my imagination, and as C.Q. Magazine also offer a Milliwatt DXCC for 100 countries confirmed whilst using an input of 1 watt or less, I decided to see if the idea of working DXCC with milliwatts was possible. The QRP final described by Brice was studied, but I decided to retain the use of my Argonaut, and use it with reduced drive, as long as it remained stable. I decided this for two reasons. Firstly, I had only purchased it a few months previously, and unless I made use of it, I could see it gathering dust as I plugged away with milliwatts. Secondly, although I love constructing, I love being on the air more.

A check of the circuit of the Argonaut revealed that the RF board (80185) receives its 12v line via L1. I decided to break the line after L1 and insert two accurate meters to measure current to the pa. (The Argonaut has no way of measuring current in its standard form.)

I decided to instal the two meters, a 1A and a 100mA in a separate cabinet, with the 100mA meter having the facility of being able to be switched in or out, depending on what power it was intended to use. In addition, I fixed a large red panel lamp adjacent to the meters, which illuminates when the 100mA meter is switched in circuit. This is to act as a reminder in case I should revert to using the Argonaut with its full 5 watts without switching out the 100mA meter.

The existing wires attached to the rear of the 'Rec. Ant.' socket and the 'Aux.' socket on the rear of the Argonaut were disconnected. These two sockets were to act as the means of getting the 12v line out of the Argonaut and back again to the pa, without drilling any holes in the cabinet. The wire attached to the 12v pin of the RF board is disconnected, and reconnected in such a manner that one end of L1 is attached to the board, and the other to the rear of the 'Rec. Ant.' socket. This is to act as the return of the 12v line from the meters. The 12v line inside the Argonaut is then connected to the rear of the 'Aux.' socket, and the condenser C6 connected between the socket and earth. On the rear of the meter cabinet are mounted two sockets to accept the two wires from the Argonaut, and two suitable leads are made up. A jump lead was also made up to fit between the two sockets on the rear of the Argonaut to bypass the meters, should the Argonaut be required for mobile or portable use.

The voltage was then checked and found to be exactly 12 volts on load. The following figures were calculated assuming an input voltage of 12 volts to the pa :-

5 watts input = 417mA	1 watt input = 83mA
750mW input = 62mA	500mW input = 41mA
350mW input = 29mA	250mW input = 20mA
150mW input = 12.5mA	

It is not possible to measure current much below 12.5mA as the standing current of the Argonaut is 10mA. The manual for the Argonaut states that if the drive control is increased until the SWR meter, in the forward position, indicates full scale reading, this will correspond exactly to an input of 5 watts. This was checked on all bands and found to coincide exactly with an input current of 417mA on my external meter. I then reduced the

drive to zero, switched in the 100mA meter and advanced the drive until a current of 41mA was indicated. I was ready to see what 500mW input could achieve, but before trying it I checked to see how much was indicated on the Argonauts SWR bridge at this power level - nothing! When using an input of 1 watt (83mA), the SWR bridge just flickered. I just could not see how such a small amount of RF, that did not even register on the bridge, could be capable of maintaining a QSO.

The moment had come to try what Brice calls, milliwatt DX. 21MHz and there was an SP station calling CQ - swing the beam east and 'SP2ZHB/2 de G4BUE QRP pse' and wow!, he came straight back and gave me 589. I couldn't believe it and had to check that I really was only using 500mW. There then followed a UB5 who gave me 559 and then after lunch, WA2PJG gave me 559. This showed me that Milliwatt DXCC was possible and there and then I set my next target of DXCC using an input of 1 watt or less.

The next day after work I was back on 21MHz and there was HH2MC warming up for the CQ WW Contest giving out a few cw contacts to some Europeans. There was quite a pile up on him, but if I was going to work 100 countries I would have to get used to the odd pile up. Check the beam is west, adjust the drive for 83mA and go.....the third call he came back and gave me 539. Haiti on 1 watt, not only a good country for my milliwatt DXCC, but a new country for me on QRP.

During the next few days I got used to having QSOs without any reading on the Argonauts SWR bridge, but I was begining to wonder what could be done with an input of only 150mW, and would the Argonaut remain stable at that level? A search of the band found HA1KSA calling CQ on 14MHz. A short call and a couple of minutes later I had 569 in the log for my first 150mW QSO.

During the following weeks I used milliwatt power almost exclusively, and it is very true what Brice says, in that when you go back to 5 watts, it is like switching back to QRO. By now I was begining to get very ambitious and was wondering how far 150mW could get me. The ARRL 28MHz Contest on the 10th December gave me the opportunity to find out. With many W stations calling CQ TEST, I could call them at different power levels and compare results. By the end of the afternoon I had worked a W1 at 350mW, a W2 at 250mW and another W2 at 150mW. I took no notice of the 599 reports I received, but my call sign was copied correctly and they copied their reports.

Although by far the majority of the QSOs at G4BUE are on cw, I find SSB useful for picking up the odd new country. By using the 1A meter, I found I was able to measure 1 watt p.e.p., reasonably accurately, but not at lower levels. Therefore I only use cw at power levels below 1 watt.

To date (19th January), just 2 months after starting milliwatt DX, I have obtained the following totals :-

Power	Continents	Countries	Best DX
1 watt	4	51	9H1, HH, EP, UA9, UL7, 5T5, VE, W, TF, EA9 A9, UI8, UH8, UF6, JA, VP2S, ZE, KL7, and SU.
750mW	3	19	UA9, W and ISØ.
500mW	3	17	W, UH8.
350mW	2	12	W, UC2, UA2.
250mW	3	9	W, EP, TF.
150mW	2	7	W, UB5.

I have found that the two secrets of milliwatt DX is to send absolutely perfect cw, whether sending at 12 or 30 w.p.m., and to have a perfectly tuned and matched antenna system. I agree that the four element trap beam which I use at 35 feet certainly helps, but I have spent many hours adjusting the elements to get the best possible match on my favourite part of each band. In addition the feeder is RG8U, is as short as possible, and has no gadgets between the antenna and the Argonaut, unlike the QRO line with SWR bridge, LP filter and antenna switches etc.

QRP ON TEN METRES WITH A LINER TWO

GM4HBM

The Liner Two can be modified to work over the range 28.5-28.73 MHz. The modifications, worked out by the Writer,GM4FPR and GM8NXW, are as follows.

RECEIVER MODIFICATIONS

1. Remove the chassis from the case. Unplug the 38.53 crystal from the 2m converter pcb. (This disables 2m operation).
2. On the if strip there is a screening can at the extreme right (brown core), and immediately to the right of it a test point (mixer output). Clip a short antenna to the test point. Using another rx, verify that 10m is open. Switch on the Liner Two. Verify that 10m signals are being received. Disconnect the antenna.

TRANSMITTER MODIFICATIONS

(These involve constructing an outboard pa stage)

1. Obtain the G QRP C Data Sheet describing the 4w broadband linear pa. If in difficulty in obtaining 2N5590 or the ferrite balun cores these can be had from Modular Electronics and AJH Electronics respectively (see radio mags.).
2. Construct the pa on copperclad circuit board and bolt it through the heatsink into a metal box large enough to also house an antenna changeover relay and an rf output indicator meter. The meter can be either a 0-50 microamp meter or a tape recorder level meter. Before the components are mounted in the box it will be necessary to drill a hole for the meter, holes on the rear panel for a SO239 socket, a 3-pin DIN plug and a co-axial socket, and a hole for an LED indicator in the front panel .
3 Turn the Liner chassis foil side upwards with the front panel towards you. Remove the metal plate covering the 2m mixer board. Identify the mixer input test point in the mixer screening compartment at the extreme left and note its position; it will be the outboard pa drive point.
4 Apply power and press the ptt switch. Find any point of the board which is a 13.6v with the ptt switch pressed and Ov with it released, and to which a connection can be soldered. This will become the power output point for the outboard pa and co relay.
5. Identify L25 on the main pcb. Short the inductor out with a wire link soldered across the coil tags. Locate the relay on the foil side of the pcb and short out the contacts on it which control the RIT, thus making RIT available on both send and receive.
6 Mount an aerial changeover relay (on from a Pye Vanguard is ideal) in the outboard pa box adjacent to the SO239 socket.
6. Prepare an 18 inch length of single core screened cable (miniature 50 ohm co-ax is suitable) and an 18 inch length of twin core screened cable. Pass the single core cable through the small square hole in the rear panel of the Liner and into the TX mixer compartment. Solder the inner to the mixer input test point and the screen to earth. Pass the two core lead through through the same hole in the rear panel. Solder the end of one core to the mixer outpout test point (see receiver modification 2) and the other to the 13.6V point identified in transmitter modification 4. Earth the screen of the cable. Determine the length of cable required to reach the outboard pa and cut both cables to this length. Terminate the single core cable inner on the outboard pa input terminal and earth the screen. Terminate the other lead on a DIN plug.

7. Make up a 50 turn pick-up coil on a small former and position it close to the output coil of the outboard pa so that it will pick up rf. Wire the coil and a diode to the meter to provide an rf indicator circuit. Having done this wire the anode of the LED in the pa box to the +13.6V supply, and connect the cathodeto earth via a 330 ohm resistor.

8. Connect the free end of the 50 ohm co-axial cable connected to the mixer input test point to the pa rf input point (earth the screen at the pa end). Fit a 50 ohm dummy load to the outboard pa output socket. Apply power and note the rf output (either on the rf meter or on a power meter connected across the dummy load. The output should be at least one watt if a power meter is used.) Switch off, disconnect the 50 ohm cable from the pa input and trim half an inch off it. Reconnect the cable, apply power and check the rf output. Repeat the process until the rf output peaks to maximum, then use that length of 50 ohm co-ax to connecter the Liner to the outboard pa. (If a power meter is used the output should be between 1 and 1.5 watts). Properly terminate the cable after the measurements have been completed.
9. Wire up the send/receive relay as shown in Figure 1. Relpace TX board screen.
10. Remove the dummy load and connect an antenna to the pa.

RETAINING TWO METER OPERATION

One can revert to two meters by replacing the 38.53 MHz crystal and removing the shorting link from the relay in the Liner. GM4FPR has gone one better than this, however, by fitting a double-pole changeover switch on the rear of the Liner chassis. It switches the crystal in or out of circuit and breaks or makes the link across the relay. The link across L25 is left in place permanently as it does not appear to alter the 2m performance.

RESULTS

Very good indeed. GM4FPR worked W2,W3,VE, UA3,YU,HA.UQ,UC,UB5,I, and YU during the first few days of tests. Even the GM4HBM wire, which is very anti-28 MHz, has also produced contacts (It is to be replaced with a 10m rotary dipole, so watch that DX score grow!)

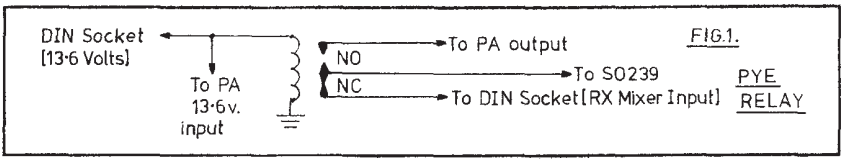


FIG.1.

LESSER-KNOWN AERIALS No2 - "INVISIBLE AERIALS"
G8PG

"Invisible" aerials are the amateur radio answer to planners, landlords, and sometimes even the XYL! In its simplest form the "invisible" aerial is a length of 28 swg enamelled copper wire strung up inconspicuously when Authority is not around. If discreetly erected such a wire is virtually invisible unless you know exactly where to look for it. Because of the thin wire used in its construction such an aerial will not support the weight of a feeder, so it must be end fed, but provided a suitable coupler is used good efficiency can be obtained. The aerial configuration can be an end fed Hertz, a W3EDP, or even a random length of wire.The aerial can be supported on thin black nylon thread, which will also act as an insulator. When erecting the aerial leave a reasonable amount of slack - pulling the wire too tight will break it. In many areas the only outdoor aerials allowed are TV aerials. They too can provide effective "invisible" transmitting aerials for the hf bands. By using brackets the co-axial feeder can be stood off from the roof tiles and walls by a foot or so, thus allowing the co-ax braiding to be energised via a suitable coupler and used as a semi-vertical aerial. If the "TV" aerial is erected specially for the job it should even be possible to arrange that the feeder is cut to a resonant length - say 66 or 33 feet. Even an existing aerial which has its feeder stapled to a wall can be used at a pinch- such a system was tried from an hotel room recently, and a couple of watts produced QSOs with Europe on 14 and 21 MHz. In wooden frame houses, such as those found in Scandinavia and North America, galvanised guttering can be used as an aerial by clamping a suitable lead-in wire to it , then loading it up. This idea was used successfully by Norwegian Resistance radio operators during WW2. The coupler suggested for the W3EDP in No1 of this series is suitable for use with any of the above aerials.

CONTEST NEWS

AGCW SUMMER QRP CONTEST

This contest is being held over the week-end of 21/22 July 1979, and the rules were published on page 11 of the last edition of 'Sprat'. Please note the rule changes from previous years. In a letter received by Chris Page, G4BUE from the contest manager, Siegfried (DK9FN) explained that the new rules had been designed to encourage activity from DX stations. Let us hope they work and that more DX stations participate. It was noticeable that there was an increase in the number of DX stations in the logs received for the Winter Contest (results next issue). The 9 hours break can be taken in two parts if desired.

Siegfried sent Chris a quantity of log sheets and entry forms for the Contest, and these can be obtained from Chris on receipt of a S.A.E. or IRC, (please state how many log sheets you require, there are 25 QSOs per sheet).

CQ WPX CONTESTS - QRPp SECTION

The CQ WPX Contests now have a special QRP Section. Power must not exceed 5 watts DC or PEP output. The rules and scoring for the QRP Section are the same as for the other stations, and are widely publicised in the national radio magazines. The results of QRP stations will be listed in a separate section, and certificates will go to the top stations in each country. QRP stations will only compete against other QRP stations.

It has taken several years for the organisers of the contest to be convinced that there is a demand for a QRP section, and it is therefore very important that a large number of QRP logs are sent in. Logs will be very welcomed from all QRP stations, no matter how many QSOs are made, and should be sent to The CQ WPX Committee, 14 Vanderventer Av., Port Washington, NY, 11050, U.S.A. The entrant should state clearly on the log that it is QRP, and should sign a declaration that his power did not exceed 5 watts. The dates and deadline for the logs are shown below. The results of members will be published in 'Sprat' in due course.

SSB WPX Contest	-	24th/25th MARCH 1979	- deadline for logs 10.5.79
CW WPX Contest	-	26th/27th MAY 1979	- deadline for logs 10.7.79

This is the first year that a CW WPX Contest has been held. C.Q. have also got QRP Sections in their WW SSB and CW Contests held at the end of the year (details in next issue), and it is hoped that other contest organisers will also include a QRP section in their contests.

AWARD NEWS

NEW AWARD- QRP WAC. As the ARRL will not endorse WAC awards for QRP operation, we are now issuing a QRP Worked All Continents Award. It requires written proof of contacts with all six continents when running not more than 5w cw or 3.6w pep on ssb.Six members had already submitted cards as part of their QRP countries claims, so we congratulate the following QRP WAC holders (No1 to No6);- OE1SBA,GM3OXX,G3DNF,GM3RFR,WA2JOC,G4BUE.

Congratulations to those who have qualified for the following Awards:-
QRP COUNTRIES. 100 country endorsement GM3OXX,G4BUE; 75 countries GM3RFR; 50 countries WA2JOC. 25 countries; G4ETJ,OK1DKW,G4GIE,G4FAI,WB8OWM.

Worked G QRP Club; 40 member endorsement; GM3OXX.

Two-way QRP : 20 country endorsement; GM3OXX: 10 countries; OK1DKW.

QRP Winter Sports; Special Merit G4BUE: 2-way trans-Atlantic GM4ELV.

G-QRP-CLUB Changes in QTH.

231 G4BUE, Alamosa,The Paddocks,Upper Beeding,West Sussex.BN4 3JW.

097 G3CWX, 123 Church Rd.Gateshead 9.

247 G4BJZ, 111 Dovehouse Lane,Solihull, W.Midalnds.B91 2EQ (Correction)

068 GW3OIN, 9 Maes-Y-Don Dr. Rhyl. Clwyd.

NEW Calls:

362 GM8FJM, Joe Harkin is now GM4HBM.
261 J.R.Gibb is now G8RVD.

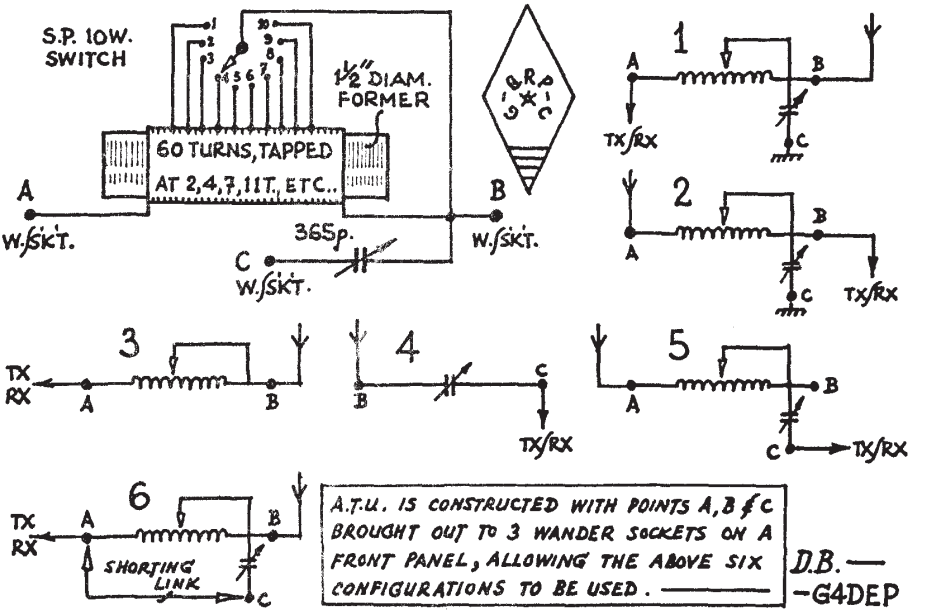
W CLUB MEMBERS

Member G4BUE, Chris Page is wondering where our U.S.A. members have got to. Despite some good openings to the U.S.A. on 21 and 28MHz at the begining of the year when several U.S.A. QRP stations were worked, no members were heard or worked. Chris will be QRV on either 21060 or 28060 at the following dates and times calling CQ QRP beaming to the U.S.A.

1600 - 1700	1900 - 2000
June 2nd, 3rd, 16th, 23rd and 24th July 14th and 15th	April 22nd and 29th. May 20th June 2nd, 3rd, 23rd and 24th July 1st, 14th and 15th

---

SUGGESTED A.T.U. -DAVE DABINETT



MEMBERS AD: FOR SALE: FL400DX TRANSMITTER, good condition £130
Also - FR400DX RECEIVER (matches above) with all options, 4 mech filters, excellent condition. 160-10m (10m in 4 bands) £130. Both little used.
Also- SP600 RECEIVER, black crackle case, good working condition, full details if required (range 0.54-54.0MHz) excellent dial for G.C. and amateur bands, with handbook well worth price of £50.00 -Collect please.
ALL FROM G5IC (QTHR)

G-QRP-CLUB: New Members since Christmas issue 1978.

467	G3WYF	C.W.Heigh, 156 The Stour, The Grange, Daventry, Northants, NN11-4PT	HF. CW. Aerials
468	G3GWI	Norman Spivey, 34 Westlands Grove Stockton Lane, York, YO3 OEF.	LF Band Home Const.
469	G4HPV	Sidney Brown, 42 Landesborough Road, Scarborough, YO12 SAF.	
470	G3UKM	R.J.Basford, 4 West Terrace, The Street, Ludham Gt. Yarmouth Norfolk.	
471	G4HME	Leonard Bailey, 47 Millers Park, Wellingborough, Northants. NN8 3AL.	
472	G4GYQ	Anthony Maguire, 3 Cavendish Place, Brighton, Sussex.	
473	G4HWR	K.K.Howard, 1 Mill Cottages, Crook, Nr. Kendal, Cumbria, LH8 8LP.	
474		G.S.Hall, 17 High Street, Needham Market, Ipswich, Suffolk, IP6 8AL.	
475		Bill Robinson, English Language Unit College of Engineering, University of Kuwait, P.O. 5868, Khaldiyah, Kuwait.	Homebrew.
476	G3LBT	Riy G. Storey, 145 The Knares, Basildon, Essex, 5516 5SJ.	40 & 20m CW.
477 (ex 7Q7AC)	G4BQC	Brian G. Makeham, 83 Chestnut Avenue West Wickham, Kent, BR4 9EU.	CW.
478	G3SYC	Brian Keith Booth, 39 Park Lane, Pontefract, West Yorkshire, WF8 4QH.	CW, SSB.
479	G8AXO	A.J.Nunn, 1 Andrew Close, Leiston, Suffolk.	General QRP.
480	G8OOG	J.W.Chambers, 12 Sylvan Ave., Finchley, London, N3 2LE.	CW on HF Bands PORT/DATA/COMP QRP.
481	G4EYS	W. Fielding, 455 Rupple Rd., Barking, Essex, IG11 9QZ.	Homebrew QRP.
482	G4GOT	Ron Bradbury, 7 Gaisford Road, Worthing, West Sussex, BN14 7HP.	
483	G3ZPF	David J. Reynolds, 30 High Arcal Drive Dudley DY3 1BN, West Midlands	Gen. QRP Home Construction.
484	G3OEP	David J.M.Buddery, 72 Albany Road, Great Yarmouth, Norfolk, NR31 OEE.	
485	GW8HZW	A.Jeffrey Andrews, 61 Mountain View, North Cornelly, Pyle, Mid Glam. CF33 4EG.	Const. & QRP.
486	G3CJ	Evan H. Heaton-Jones, The Gateways, Farm Lane, Leckhampton, Cheltenham.	Gen QRP.
487	G3IGM	Robert, G. Hindes, 53 Rusthall Avenue, Bedford Park, Chiswick, W4 IBN.	Const. Antennas.
488	G8NJZ	George Anthoney Jewell, 'Four Winds' Smeatharpe, Honiton, Devon, EX14 9RF.	Homebrew QRP CW.
489	G31EB	George Henry McDonald, 114 Benwell Dene Terr. West Benwell, Newcastle-upon-Tyne, NE15 6LY.	
490	GM4FPR	John Currie, 14 Ivenhoe Rd, Greenfaulds, Cumbernauld, Nr. Glasgow, G67 4BH, Scotland.	IOM SSB & Gen.
491		Declan Fox, 17-21 Trinity College, Dublin.	
492	G3ZOH	Brian George, 2 Gleeson Dr., Orpington, Kent.	
493	PAØDST	Johan Damsteek, Veenendaalkade 467, 2547 Am Dan Haag, Holland.	Argo. 509

494		H.L.Peacock, 85 Viking Rd, Bridlington, N.Humberside.	
495	GD3FXN	A.D.Radcliffe, Rose Cottage, Ballafreer Lane, Union Mills, Isle of Man.	HF. Homebrews.
496	G4FVE	Dudley R. Winslet, 33 St. Mary Abbots Terrace, London, W148NX.	Homebrew QRP.
497	DK6AJ	Jurgen Duske, Finkenweg 1, D-3180 Wolfsburg 21, W. Germany.	QRP.DX.CW.
498	G3ENW	A.R.Gilbert, 47 Rayleigh Ave., Eastwood, Leigh-on-Sea.	CW & Const.
499	G4EEM	Robert Newson, 54, Bower Lane, Quarry Bank, Brierley Hill, W.Midlands,DY5 2DP.	Homebrew.
500	HB9ANW G3OQF	Richard Kay, 13 r ute de Fayards, CH-1249 COLLEX, Switzerland.	Gen.
501	G4EJT	Ted Kilner, Deeping, Martinsend Lane, Gt. Missenden, Bucks.	
502	G3ILO	49 Rosebery Rd., Dursley, Glos. GL11 4PT	CW. Homebrew QRP
503	HB9 BCO	Robert R. Longyear, chalet Chante-Merle, 3961 Mollens/Sierre, Valais, Switzerland.	Antennas.
504	W7EL	Roy Lewallen, 5470 SW 152 Ave. Beaverton, OR 97005, U.S.A.	Homebrew QRP.
505		Lewis G. Davis, 27 Underne Ave., London, N14 7ND.	General.
506	G3SMV	John Ernest Smith, 18 Hounslow Rd., Mackworth Estate, Derby, DE3-4BW.	CW.
507	G4FQE	E.R.Thirkell, 59 Oulder Hill Drive, Rochdale, Lancs. OL11 5LB.	CW.
508	G4CIB	Brian M. Woodcok, 9 The Willows, Longhope, Glos. GL17 OQS.	Homebrew QRP.
509		John A.G.Milne, Residence Hiruena, Rue du Moulin Barbot, 64600 Anglet, France.	CW & AM.
510	G3OLL	Geffrey Willy, Stocksfield, 13 Dennyview Rd. Abbots Leigh, Bristol BS8 3RD.	General
511	G3TOG	Miss F. Martindale, (Flo) 7 Richmond Pk. Rd. East Sheen, London SW14 8JU.	General QRP
512	PAØYF	Geert Jan Kyff, Arkerwinde 15, 2703 GN-ALPHEN a/d RYN, Netherlands.	Homebrew.
513	WBØWGS	Andy Rosulek, 503 Ninth Avenue, Madison, Minnesota 56256, USA.	Argo. CW. QRP.
514	G3GB	Henry B. Shields, 13 Longnor Green, Gamesley, Glossop, Derbyshire, SK13 OEW.	Gen. HF & VHF QRP.
515	VE4QL (ex G5QL)	Leonard H. Herrington, 42 Nolana Street, Winnipeg, Manitoba, Canada, R2V 3B7.	Gen & Const.
516	G2HKZ	K.H.Dove, 'Sunwey' 25 Rochester Rd., Nr. Rochester, Kent, ME2 1AD.	Gen. Const.
517	G4FEI	A. Marsden, 25 Hard Lane, St. Helens, Merseyside, WA10 6JP.	Gen. QRP.
418	G3XFG	Frederick A. Tickner, Jannina House, 139 North Cray Rd. Sidcup. Kent. DA14 5HE	HW8
519	G4HAQ	Ian Wingate, 17 Kingsholm Rd. Gloucester GL1 3AZ.	HW8
520	G4HWZ	Michael A. Perry, Cartesiuslaan 20, 2341 AN OEGSTGEEST. Holland	CW & DX Home Const