SPRAT

THE JOURNAL OF THE G-QRP CLUB

DEVOTED·TO·LOW·POWER·COMMUNICATION

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CONTENTS

Argonaut

Club member WB8OWM, Skip, meets Jack Birchfield, K4JU. The Father of the Argonaut. Jack was design engineer for the popular Transceiver.

Photo compliments of The DXers Magazine.

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

Dear member,

After the initial chaos I think I can say that the G3RJV household is reasonably intalled in Birmingham. I regret any delays that members may have experienced with mail over this period, but I'm sure that recent QTH movers will understand.

I am still, at the time of writing, using a makeshift antenna. Some 50 odd feet of wire no more than 15 feet high at its highest point, loaded against a quarter wave counterpoise for 80m running along the ground. It was all set up in about an hour and if fed through a rollercoaster L Match ATU. I mention this in detail, to counteract the common view that QRP operation demands commercial or sophisicated antennas.

Although I could not claim to have worked any real DX with the set up, I have worked 15 club members on 80m - best DX on that band YU, and and seem to get into the States, no real problems, on 20 and 15m. Better antennas are on the way in the summer.

In this SPRAT I have taken the unprecedented step of repeating a previous article. I have had several requests for items on the designing of transistor transmitters. To meet this interest I have repeated the useful, and amusing, article on the subject by W9SCH. This was published in an early issue when we had only about 100 members, compared with the present almost 800.

As the summer approaches, I guess we will have our spate of members working /P from various locations. G3RJV/P will be active from the Lincolnshire Wolds (June 7-14) and North Yorkshire (Sept 5-13) I look forward to working members on 40 and 80 during these times.

Like Chris, G4BUE, I have been encouraged by the recent club level of activity on 80m (3560 or thereabouts) from 1400 on Sundays. I hope the activity will continue through the summer. With the change to B.S.T. at the end of March, I will be trying 3560 some weeks on Sundays from 1300 gmt (2pm Clock time) because of my problems of freedom on Sunday afternoons. I invite members with busy Sunday afternoons to join me earlier than usual on the band.

Best 73 and hpe cu qrp.

G3RJV.

SUBSCRIPTIONS

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

091 - 120, 201 - 222 272 - 292, 393 - 418 522 - 572,	BY JUNE 31st

DATASHEETS: Available as before, new sheets in the stage of preparation.
Full list of current sheets available (SAE) from G3RJV.

BUY OR BORROW, For copying, Manual/Handbook for Eddystone 888A - R.E.Daly [illegible] Berks. RG13 2NH.

PROLEGOMENA TO QRP TRANSMITTERS

C.F. Rockey[W9SCH]

1. The VFO

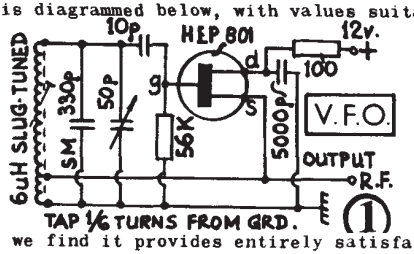
Every truly effective high-frequency QRPp transmitter uses a VFO. While crystal control is simpler, it so-inhibits one's operating scope that its use is not worthwhile. Therefore:

(a) the essence of good VFO design is expressed in a few common sense rules.

1. Strict de-rating of all components to avoid value shift with temperature change, obviously.
2. Sturdy mechanical construction (no more need be said here).
3. Use a high Q, high C tank circuit. Wind inductor with relatively heavy wire.
4. Loose coupling between the transistor and the tank circuit. This is the same principle as involved in a good grandfather clock; a good escapement effectively isolates the free-swinging pendulum from the rest of the gear chain. Such a clock keeps good time despite running down of the weight or spring, and other disturbing conditions.
5. Isolation of oscillator circuitry from following stages. A tight shield around the oscillator is not necessary, but good decoupling of supply leads is mandatory.
6. Do not key the oscillator if this can possibly be avoided.
7. Use only air or "silver-mica" capacitors in the tank circuit.
8. If expedient, run the oscillator at a submultiple of the final amplifier frequency. This is particularly important at output frequencies above 4MHz.

(b) We believe the exact circuit arrangement used is much less important than many people think. With all due respect to Messrs Vackar and Seiler, such "trick" circuits are not necessary to achieve satisfactory amateur level stability. Any good circuit, well set up according to the above rules, is capable of good performance. Rather, the rule should be 'The circuit you like best will work best for you', as QST advised many years ago.

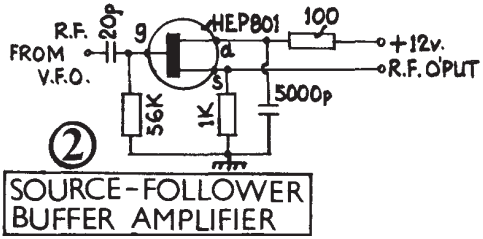
(c) The circuit we like best is diagrammed below, with values suitable for 3.5MHz band oscillation frequency.



We use a junction FET because we find it provides entirely satisfactory frequency stability, yet need not be "handled with kid gloves" during construction. (Anything likely to be damaged by body static is too darn delicate for heavy handed klutzers like us. So, we eschew MOSFETS. "De gustibus non disputandum est".)

2. The Source Follower, Buffer Amplifier

A good FET "source follower" offers better isolation than one using a bipolar transistor, we believe. One of these should be used between the VFO and any following stages. It is important to keep the input coupling capacitor small to ensure good isolation, the circuit is shown fig. 2



3. Frequency Multiplier ("Doubler" or "Tripler")

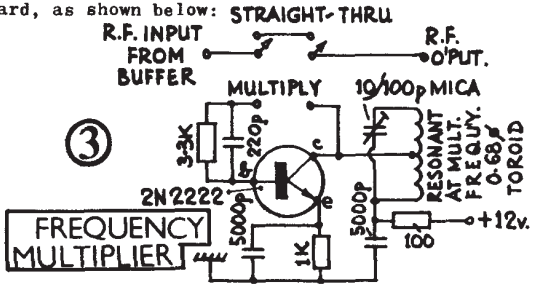
As stated above, we prefer to operate the oscillator at a submultiple of the final output frequency, in the interests of better stability and keying properties. It is best to:

(a) Do frequency multiplying at a low signal power level.

(b) Do not attempt frequency multiplication of more than x3 in a single stage. If greater frequency multiplication factors are required, do it in a series of individual stages.

We find that a good, high frequency bipolar transistor is satisfactory as a frequency multiplier. One gets more RF power output from these than from a FET.

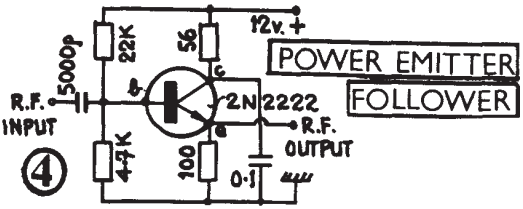
The circuit used is straightforward, as shown below:



The DPDT switch permits either "straight through" operation, on input frequency or "multiplied" frequency as desired.

4. Power Emitter Follower

While it may not be always strictly necessary, one or more stages of this type between the frequency multiplying stages and the driver stages of a QRPp transmitter insure adequate drive to the following stages and performs wonders in the way of isolation. Since such a stage is relatively cheap, simple in construction and does not consume much DC supply power, we heartily recommend its use. It seldom presents any problems. The diagram is shown in Fig. 4. We call this a "power" emitter-follower because it is capable of supplying twice as much, or more, RF power output that a FET source follower will provide.



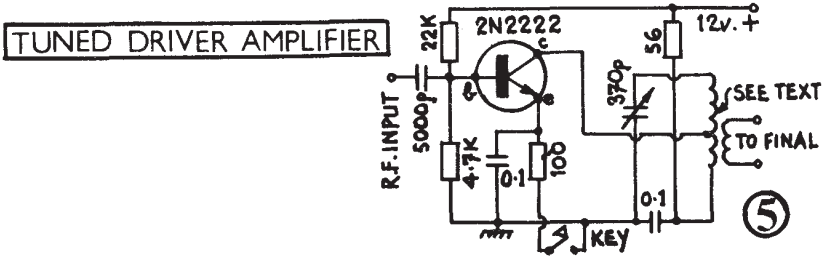
5. Tuned Driver-Amplifier

This stage is so named because it supplies RF signal driving power to a more powerful Class B or Class C amplifier stage, often the final power amplifier stage. Its performance is therefore vital if satisfactory power output and efficiency of the following stage is to be attained. Fortunately, it seldom provides a problem if a good tank circuit and short connecting leads are arranged for. A good RF, silicon NPN transistor such as the 2N2222, HEP-728, or a similar type is to be used in this circuit. This amplifier is always tuned to the output RF frequency, frequency multiplying being accomplished in preceding stages. The tank coil should be would upon a 0.68 inch toroid form and tapped for the collector at about one third of the total number of turns "up" from the low RF potential end. The tank capacitor should either be of the air-dielectric type (for frequencies above 14MHz) or one of these mica variables originally designed for miniature AM BC receiver use. Either type works about equally well for frequencies below 14MHz.

The secondary winding on the tank coil should be adjusted empirically until a No. 48, two volt, 60mA pilot lamp is most brilliantly lit. This will then

provide a satisfactory impedance match into most two to five watt bipolar Class B/C amplifier stages. Seldom will more than five turns be needed on this winding.

Since this driver stage operates in approximate Class A range, and is driven from an untuned, emitter follower stage, no instability problems should normally be experienced in getting it to work well.



6. The Final Power Amplifier Stage

Having completed a clean and stable VFO, the experienced amateur should have little difficulty with the other preliminary stages of a solid state QRPp transmitter. If reasonable precautions are taken as suggested, these stages are largely plain sailing. But the final power amplifier stage is something else again. Indeed, few amateurs succeed in building their first few power RF amplifier stages without having a tale of woe to tell about it. When setting up a first (or even a second or third) solid state transmitter, few amateurs will get by without sending a number of rather fancy and perhaps expensive transistors into solid state Valhalla. This, alas, seems to be the human condition, as the theologians say. There is no doubt about it, it is the development of clean RF power in appreciable quantities that is the greatest challenge in this field for the average amateur.

This is probably not altogether the individual amateur's fault. Unlike vacuum tubes, which can be well comprehended, at least qualitatively by almost any diligent person, the transistor does its business entirely at the atomic level. And atomic theory is obscure, difficult and sometimes utterly incpmparable with normal human common-sense. Aside from this, the main troubles to be expected are:

(a) Parasitic oscillations, sometimes at utterly unpredicatable frequency, (the number one transistor zapper!).

(b) Overheating.

(c) Poor RF power output or collector efficiency.

(d) Interaction with oscillator stage (leading to "chirp" and a "bum CW note").

(e) Quantum-mechanical necromancy. (The transistor simply turns up its toes and dies. Not even an atomic physicist can tell you why.)

Let us consider each of these a bit further.

Parasitic oscillations are perhaps the most prevalent difficulty. Although these may be generated at almost any frequency, it is the low frequency ones which arise most often. These may be minimized (only a magician could prevent them!) by keeping all RF leads as short as possible, bringing all the "grounds" in a single stage to one common point, and by using a small resistor in series with the base, right at the transistor. Often parasitics can be spotted by listening to the signal in a nearby receiver. If the signal is accompanied by a hiss that seems to surround the signal - then you've got 'em brother! Some people say that these little ferrite beads, strung on base or collector leads, help with this problem. Others recommend ritually sacrificing a chicken to Papa Legba.....

Overheating is relatively easily forestalled by using a large enough transistor

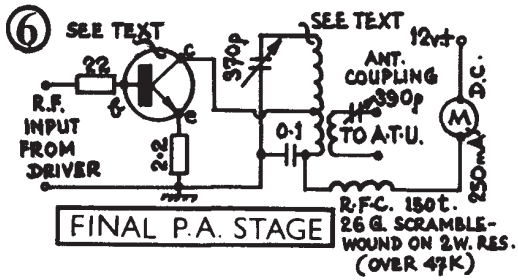
for the jub at hand. It is recommended that the rated collector dissipation be at least twice the operating DC collector power input. With the type of transistors we have in mind here, a little "heat-sink", looking like a miniature king's crown, can be slipped-over the case. This will help radiate and convect away much heat.

Poor RF output and efficiency are often further indicators of parasitic oscillation. If not, perhaps the base driving power is insufficient. A lossy tank circuit, or the wrong number of turns on the secondary (output coupling) coil is often the trouble. Perhaps the collector tap upon the tank coil is not properly placed, although this is not all that critical.

Interaction between final amplifier and oscillator is a real stinker. We assume that your DC power supply is really well regulated, or you're asking for trouble here. The oscillator stage should be physically well separated from the final output stage, or shielded therefrom. If you have enough stages between oscillator and final to insure reasonable isolation, then RF current may be sneaking back via the power leads. We had this trouble once; we licked it by putting a small RF choke coil in series with the plus battery lead to the final amplifier. This cleaned up a persistent "chirp" immediately.

We don't quite know what to say about Quantum-mechanical necromancy, save that we have indeed experienced it. We lost at least one good transistor in this way. We suggest that you contact your favourite witch or astrologer.....

The circuit we use with some luck is given below, Fig. 6



A number of transistors will work well here. We recommend a silicon NPN job with at least three watts collector dissipation, a maximum collector current rating of about two amperes or more, and a common-emitter cut off frequency of at least 200MHz. The 2N4427 is the old reliable, but these are getting expensive again. The GE-18 is ok, as is the 2N3303, if you can latch onto any. Some of these switching transistors for digital use might do well here, too. Of course, we're speaking of operation between 3.5 and 21MHz.....The tank coil should be wound on an 0.68 inch toroid form, to resonate at almost full tank capacitance on 3.5MHz, about half capacitance on 7MHz, and about one third capacitance on 14 and 21MHz. The output coupling coil should be wound over the "cold" end of the tank coil and be adjusted to load the properly tuned amplifier to about 200mA with the antenna coupling capacitor at about two thirds maximum capacitance. This with a 50 ohm output impedance, of course. The collector tap is made about one fifth of the way up from the "cold end" of the tank coil.

The tank and antenna loading capacitors may either be of the air-dielectric type or mica variables, as made for use in AM BC receivers of the smaller type. Either type seems to work equally well, certainly below 14MHz.

WANTED: A Roller Coaster - type and price please to Cedric White G4JBL, 20 Fowley Cl. Shoreham By Sea, Sussex. BN4 5HE.

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7. Some Hints which may save a Transistor

The British say: "The transistor is the fastest fuse on three legs known to man." We agree, so to keep from popping these expensive fuses:

(a) Always put a "safety diode" between the power supply and the transmitter in series with the plus lead. It is so terribly easy to get the power supply leads reversed and, without this safety diode, you're certain to pop at least one transistor, maybe more. With the diode in circuit, nothing happens.

(b) Always put some kind of emitter resistor in circuit whenever the common emitter mode of connection is used. In event of excess collector current, the voltage drop across this resistor opposes the base voltage and acts to lower the current immediately. This, again, may well save the transistor in a crisis

(c) Always check a freshly built circuit with only about one half normal supply voltage first; until you're sure that no "bad troubles" exist. If voltages and currents seem reasonable, then you may apply full operating voltage with less chance of a catastrophe.

(d) Make sure that there is a firm load across the output terminals of a power amplifier at all times. This will hold down transient peaks which may pop the transistor.

8. Tank Coil Suggestions for High Frequency QRPp Transmitters

We have found it most convenient to use the 0.68 inch O.D. ferrite toroid forms for our tank coils. This size seems to be the best compromise between cost and magnetic properties. (The smaller sizes are too difficult to wind by hand, the larger ones are not necessary.) Different ferrite mixes from different sources have slightly different permeabilities, but these do not normally differ enough to invalidate our suggestions here.

A useful empirical formula for estimating the number of turns required for resonance with the HF amateur spectrum is:

$$n = \frac{1820}{f\sqrt{C}}$$

n represents the number of turns.
f represents the frequency in MHz.
C represents the capacitance in use in picofarads.

This formula applies only to the 0.68 inch form of course.

Practical experience indicates the advantage of using one tank coil to cover two amateur bands. Although something of a compromise in niceties, the resulting Q seems adequate to amateur needs, and results in real convenience. Accordingly we have paired off the most popular amateur bands, and suggested coil dimensions in the table below:

MHz Bands	Total turns	Tap, for "driver" use (from low potential end)	Tap, for "power amp"use (from low potential end)
3.5 - 7	28	9	6
7 - 14	20	6	4
14 - 21	8	4	3

A Direct Conversion Receiver For Eighty

By Peter Brent.

This receiver was constructed for conversion to a transceiver at a later date. The VFO, to a ARRL design covers 1.75-2.0MHz, giving a 160m option. Second harmonic is used for 80m injection to a CA3028A mixer. The AF circuits are to be modified for active filtering but the basic circuit does an adequate job using an RSGB design and a 1¾" tweeter to restrict response. The VFO gives about a 5KHz band overlap. Any suitable coil could be used for L1 but the required Q of over 100 probably excludes the use of toriod coils. 12 volts at 60mA is required and the receiver gives good results with a short indoor aerial.

The VFO

L1	Cambion 2260-05	
L2	2 Layers 30swg on ¼" dia 1¼" former (no core)	
VC1	Jackson U101	100pF
TC1	Jackson 330	30pF tubular Trimmer

The BALANCED MIXER

L1	5t 24swg over L2
L2,L3	45t 24 swg on Amidon T-50-2
L4	10t CT single strand PVC wire over L3
TC2,2.	30pF cer. or s.m.

AUDIO AMPLIFIER

To design in 'Guide to Amateur Radio" p.35
PA is required. LS is 8 ohm 2-1 2KHz tweeter

PCB Use

VFO, Mixer and AF may be PCB construction
Layout for AF board in handbook.

INPUT POWER AND R.S.G.B. CONTESTS

G3RJV has become the corresponding member, for the club, on the RSGB Contests Committee. Following an exchange of letters with Dennis, G3MXJ, the committee have agreed to use D.C. Input Power as the standard for future low power sections of society contests.

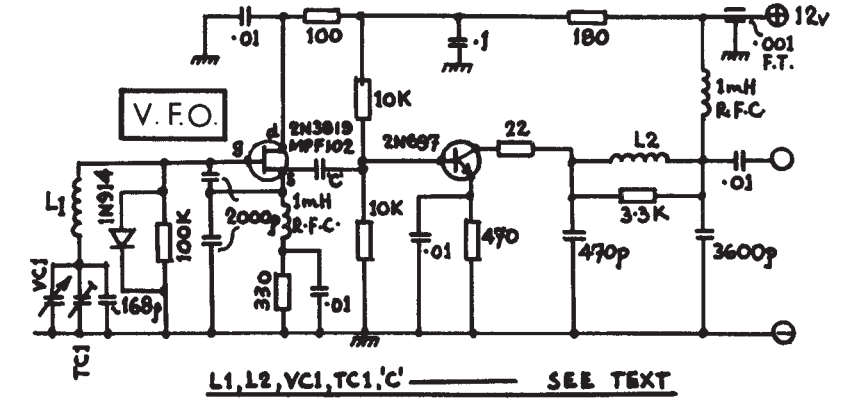
QRP CW AND THE TWO METRE BAND.

It is something of a disappointment that more members do not work 2 metres QRP CW - a potentially good band for such operation - anyone can make a beam too ! Frank, G2HLL, uses a VXO with a crystal (from W.H. Westlake at £1.50) on 8002.5 and gets a swing from 144.010 to 144.080. He has no QRM trouble, but few stations to work !

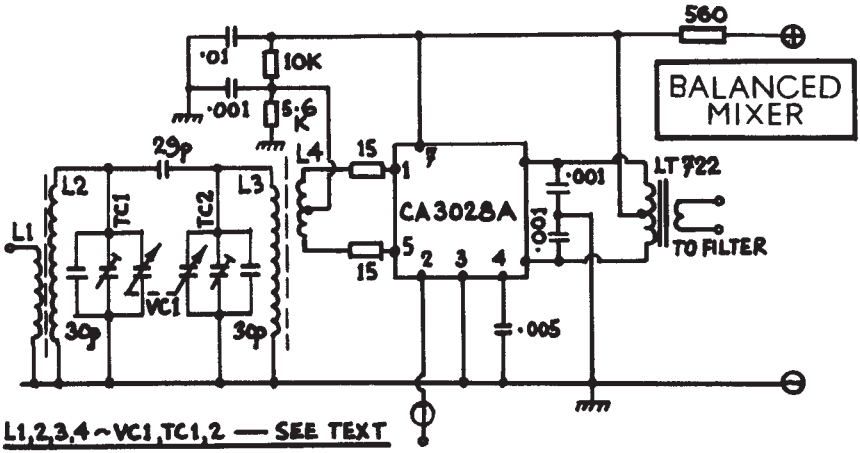
A NEW QRP CONTEST

U.K. Members - have you seen the rules in RadCom for The Region Round-up Contest on 4th May? The R.S.G.B. have included a new QRP section defined as up to 10 watts input, and with the contest now lasting from 0700 to 1200 GMT, should appeal to many members who do not like the longer contests. Activity is restricted to 7 and 3.5MHz and RST, serial number and region number must be exchanged. Scoring is three points per QSO and the multiplier being the number of different regions worked on the two bands. Logs to D.S. Booty, 139 Petersfield Av., Staines, Middsx., TW18 1DH by 19th May. Let's create some QRP activity to encourage more QRP sections in RSGB contests.

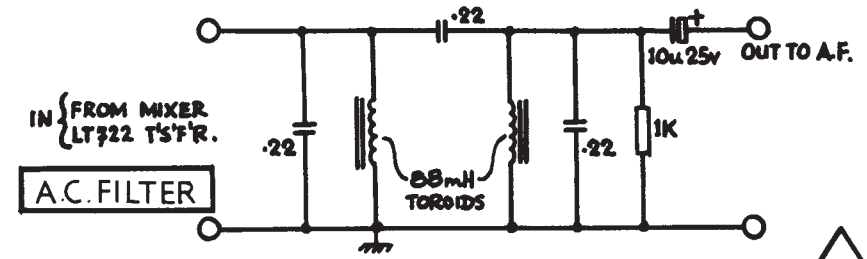
A 160–80 M. D.C. RX — PETE BRENT



L1, L2, VC1, TC1, 'C' ——— SEE TEXT

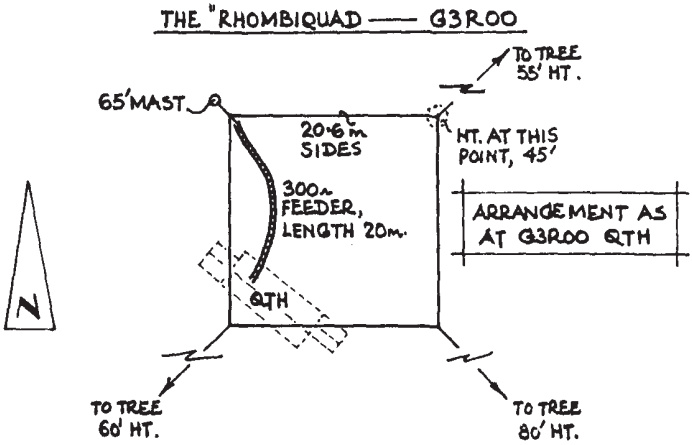


L1,2,3,4 ~ VC1, TC1, 2 — SEE TEXT



FOR CONSTRUCTIONAL NOTES — SEE TEXT

561 PB



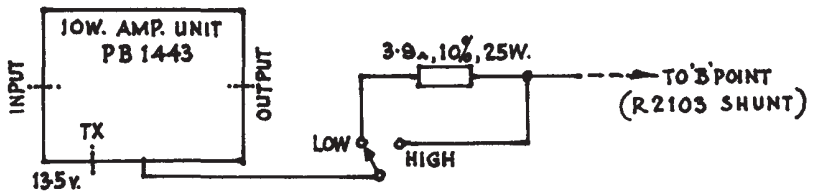
LESSER KNOWN AERIALS No 5 - THE RHOMBI-QUAD

G3ROO

Mentioned in "Technical Topics " about a year ago, this antenna consists of a horizontal square of wire with sides 20.6 m long, fed at one corner via 300 ohm ribbon feeder; the G3ROO version is erected at a height of 20 m. The feeders at G3ROO are 20 m long, and they are fed via a Z-match on all bands 3.5 to 28 MHz. For 1.8 MHz operation the feeders are strapped together. The supports at G3ROO are a 65 foot mast and 3 very tall trees. The supporting halyards are made from polypropalene 6-strand line approximately one eighth of an inch thick. They were erected by using a catapult to fire a lead weight attached to a fishing line over each tree in turn, and then using the fishing line to pull the halyard over the tree. Fed with input varying between 500 mW and 2.5 W this antenna has given fantastic ssb dx contacts on the three hf bands.
(Why is it that everybody except me has a skyscraper antenna!! Ed.)

Two Watts Out with an FT7 — Felix Carbonara I7CCF

I have a FT7 transceiver of ten watts out, but I have modified the final with a switch and resistor, all in the chassis, as in the diagram below :-

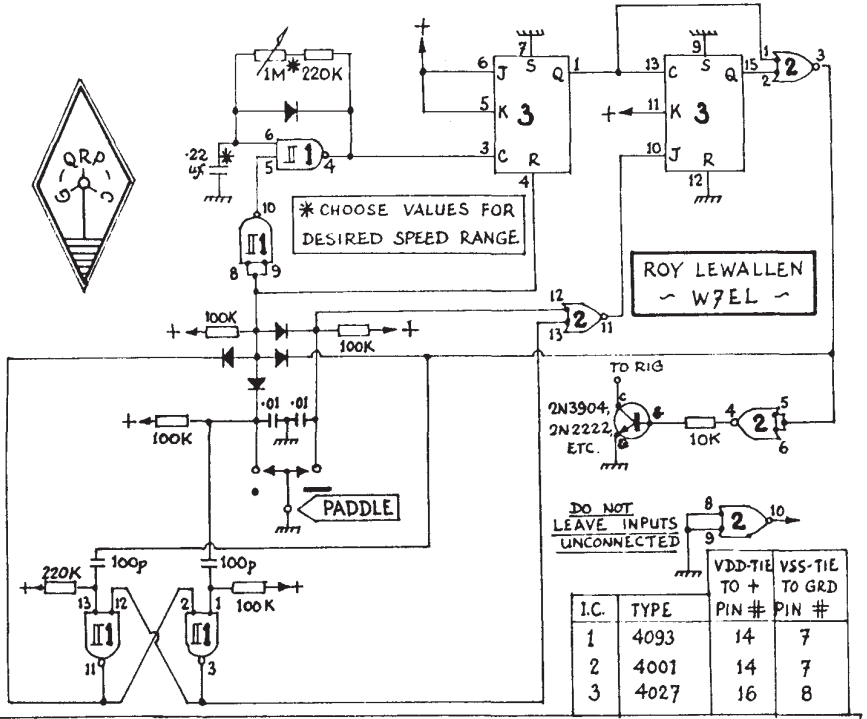


The resistor is mounted in the chassis with two screws and two little bands of thin aluminium (see diagram below). Before fixing the resistor in position, some silicon grease should be smeared between the resistor and the chassis. The switch is mounted on the rear panel in one of the two existing holes. In one position, the switch enables the maximum output power of ten watts to leave the transceiver, and in the other there is about two watts output.

I have measured the power with a SWR Osker 200. The antenna is a three element beam, TH3, which is at ten meters height, but the house is about 40 meters height.

WANTED SKEDS ON 2 METRE SSB, by Chas Anderson, G2BS, 39 High Riggs, Barnard Castle, Co. Durham. Chas can work /P at 2,000 ft. in Summer.

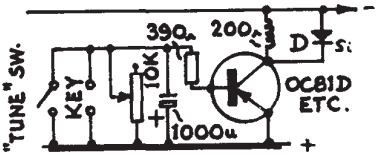
SIMPLE C-MOS KEYER FOR QRP RIGS



I.C.	TYPE	VDD-TIE TO + PIN #	VSS-TIE TO GRD PIN #
1	4093	14	7
2	4001	14	7
3	4027	16	8

NOTES ~ (1) BASIC DESIGN (IN RTL) BY G.D.YOUNG, VE7BFK, IN "HAM RADIO," NOV,1969 (2) ALL DIODES ARE SILICON (3) DO NOT SUBSTITUTE ANY TYPE OF MASTER-SLAVE FLIP-FLOP FOR THE 4027 (4) POS. SUPPLY VOLTAGE MAY BE FROM 3 TO 15 VOLTS.

SIMPLE, KEY-OPERATED CHANGE-OVER ~ G3YCC



With the values given a variable delay of 0 - 8 seconds is possible. I use a relay to mute the RX apply HT to the TX, change over the Antenna...etc. (use npn type for + line use)

WANTED: Base diagrams and Characteristics for the following valves - CV57 (Pentode) and B-30 (Double Triode) G.J. Kyff (PAØYF) Akkerwinde 15, 2403 GN, Alphen a/d Ryn, Netherlands.

WANTED, Command Receivers or Transmitters - pref 80... 40m. Would swop suitable working units for my HW7 or cash. G4GDR. QTHR.

WANTED FOR LOAN, Copy of circuit or handbook for a CODAR T28 receiver. P.Milsom,438 Chickerell Rd.Weymouth,Dorset.DT3 4DH.

A TEAM INVESTIGATION OF THE K8EEG WATTMETER

(G3DNF, GM3OXX, G4BUE, G8PG)

Four different versions of the wattmeter were built and calibrated, laboratory instruments being available for calibration. Checks indicate that all four versions are reasonably accurate- within ± 5% - and that layout is not critical. resistor values selected should be as accurate as possible. Provided that the resistance of the meter movement and its associated shunt is at least 2ooo ohms accuracy should be adequate. Higher values slightly improve the accuracy, but for powers down to loo mW a looo o.p.v. meter used on its o-1o volt range is adequate. When used with low power transmitters the extensive shielding suggested by Adrian was not found necessary (it may be required if one is using a QRO rig through a power attenuator - wasting 149W to get 1W out"). The rf choke can also be omitted without affecting performance. Annexure 1 shows a neat design produced by GM3OXX which proved accurate under laboratory tests.

The most common use of the meter will be to measure transmitter power output. If this is done simply by jacking up the power input until a certain output (say 5W) is obtained, little will be learned, efficiency is likely to be low, and power wastage high. If output is compared to input, on the other hand, efficiency can be calculated, and if it is low it can be improved until the smallest possible amount of power is wasted. Used in this way the wattmeter becomes an important engineering tool. It can also be used to check that the output impedance of a transmitter is what the designer hopes it should be. This is done by using different values of RL, making the necessary calculations, and finding which gives the highest efficiency. A 4:1 discrepancy in output impedance was traced in this way on one transmitter.

The output power obviously contains harmonic content. This cannot be measured directly, but by using a sensitive absorption wavemeter coupled to the leads to RL the harmonic output level can be compared to the fundamental output level,and any excessive harmonic content found can be investigated. If an atu with an output impedance equivalent to RL is used the wattmeter can be connected to this point and any loss through the atu can be established. The dummy load allows note purity and keying characteristics to be checked without overloading the receiver. Operationally, one can set the power output from the transmitter to some low value and discover just how far a few tens of milliwatts will go.

So, as far as the wattmeter is concerned it is a most useful tool for bench work. If every QRP station used one efficiency would be increased considerably, as it helps to upgrade the performance of stations working within a maximum INPUT power limit . We should all be grateful to Adrian for drawing our attention to this useful circuit.

ANNEXURE 1

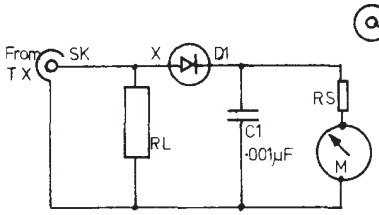
The GM3OXX wattmeter is built on a piece of single-sided, copper-clad pc board. The various areas of the board shown in the Figure are electrically isolated from each other by cutting away the copper with the point of s sharp knife. RL is selected to suit the transmitter output impedance and power. A combination of resistors can be used if desired. RS and M can be either a resistor and meter mounted on the board or an external multi-meter (see text of Report). All components are soldered directly to the pcb.

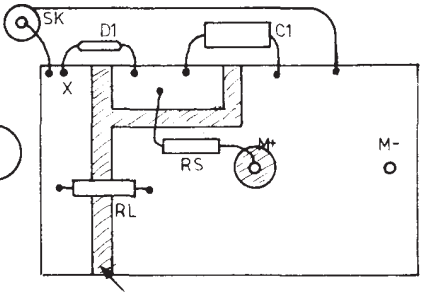
To calibrate, disconnect the diode D at point X, then apply various known dc potentials between the diode and the ground line, and note the reading produced on meter M by each potential. Calibration at 5 or 6 voltages will allow a graph to be drawn up. For each potential the equivalent power (average ac) indicated on M is equal to:-

$$P = \frac{\text{dc potential}^2}{RL \times 2}$$

Caution When dc is appplied across RL the dissipation is 4 times as great as when rf is applied, so only connect the dc for long enough to allow the necessary measurements to be made.

GM30XX Wattmeter





RL may be several Rs in parallel
RS may be part of M

$$P \text{ out} = \frac{E\ dc^2}{2\ RL}$$

Copper cut away with sharp knife

Layout on single sides P.C.B.

G2NJ TROPHY TO GM

This year your Committee had a difficult judging task to perform, but eventually unanimously placed George, GM3OXX, first. His entry covered all bands 1.8 to 144 MHz. On the hf bands, using cw and a wire aerial, George raised 94 countries with inputs between 1W and a few mW , and running 500 mW of ssb on 144 MHz he contacted 3 countries. All the equipment used was home built and of advanced design. A worthy Runner-up was Chris, G4BUE, who worked 148 countries at the 5W level and 111 at the 1W level using cw and ssb. Like George he too made outstanding contacts at the milliwatt level. Equipment used was a Ten Tec Argnaut, a 4-element , tri-band beam, and various dipoles. Third place went to G3DOP another entirely home built station. During an 8 month period he worked 41 countries using his 750mW JU6 station and a low 132 ft antenna. Operation was on 7/14/21 MHz with only 3 crystals. These results reflect the best of QRP in three different fields, and all three operators are to be congratulated on their outstanding performance.

CALLING AUTHORS

The next award of the G2NJ Trophy will be for the best technical contribution(s) to SPRAT during the period 1979-1980.

PARTRIDGE TROPHY

After careful consideration your Committee decided that none of the entries received fully met the requirement for an antenna giving continuous coverage over the range 3 - 8 MHz. They are therefore not awarding the Trophy this year. Meritorious entries were received from OE1SBA and G3LDO, however, and they have been awarded merit certificates. The OE1SBA entry covered a balloon lifted aerial of unusual design, and G3LDO described a multi-frequency antenna using insulators and links.

THE NEXT PARTRIDGE TROPHY AWARD IS FOR ORDINARY MORTALS!

This time we try to do something for the man without high masts or miles of real estate. The Trophy will be awarded to the Member who, in the opinion of the Committee, achieves the most outstanding results under the following conditions during the period 1st January - 31st December, 1980,

Maximum input 5 watts dc.(or pep).
All aerials to be home made (no commercial beams).
No aerial to exceed 25 feet in height.
No aerial to exceed 135 feet in length.
Not more than two aerials to be erected on the site at one time. (You can try as many aerials as you wish, but not more than two at once.)
Any band or mode covered by the licence held may be used.
This throws it wide open for the ordinary guys who live in houses with small gardens. We hope that they will respond with gusto. Entries to G8PG by 31st January, 1981.

G QRP CLUB WINTER SPORTS 1980 - AN UNFORGETABLE EVENT

With more than 80 under-five-watt stations from 21 countries participating, plus much activity from stations in the 6 to 15 watt range, the 1979 Winter Sports were an outstanding success. This year the two-way under-five-watt trans-Atlantic path was really proved to be practicable, with a considerable proportion of those participating in the event getting across. Those who made it at that power level are as follows, multi contacts being shown in brackets after the call.

DJ1TX, G3DNF, G3NEO (5), G4BUE (7), G4EZF, G8PG (4), GM3OXX (2), HA7MK, ON5UP (2), ON6NX, OK1DKW, OK1TW, OZ8E, PAoDST, UA3CLR, VE3BQL (2), WA1JVY, WB2RZU (20), WB2ADF, K4FAD, K4VOX.

Outstanding work was done from the American side by WB2RZU who worked QRP stations in 8 different European countries when running an input of between 1 and 5 watts. K4VOX got across using 1W output. On the European side G3NEO made all his contacts with 1W input, and OK1DKW worked WB2ADF with 300 mW output at the OK end and 2W at the W end. G4BUE made a number of milliwatt contacts. He was heard by G8PG when running 45 mW output on 21 MHz, and it is believed that this was round the world reception. All trans-Atlantic contacts were made on 21 and 28 MHz. On 14 MHz CT4CH did a magnificent job in putting Portugal on the QRP map ; he is now also equipped for 21 MHz. I7CCF was very active on 21 and 14 MHz. There was massive support from the DLs, lead by DJ1ZB and DK5RY. For some reason SM participation was low this year, but this was probably accounted for by the rather peculiar conditions on the Scandinavian path. With high sunspot numbers many stations stuck to the HF bands, but there was also great activity on 7 and 3.5 MHz according to the logs received. The unluckiest man in the contest was EA1QJ - the wind demolished his beam on the second day of the event - but he will be back, and looking for Gs on QRP.

This year the Club has awarded Certificates of Merit to the participants on each side of the Atlantic adjudged to have made the most notable contribution to the event. The recipients are WB2RZU and CT4CH. Well done Andy and Bengt !

The 1980 Winter Sports will take place from 26th to 31st December with extended operating hours. All QRP operators, whether G QRP Club members or not, are invited to participate.

AWARD NEWS

New QRP Master. Gordon, G3DNF has qualified for QRP Master Award No.3. Congratulations on an excellent effort.

Congratulations also to the following Award winners:-

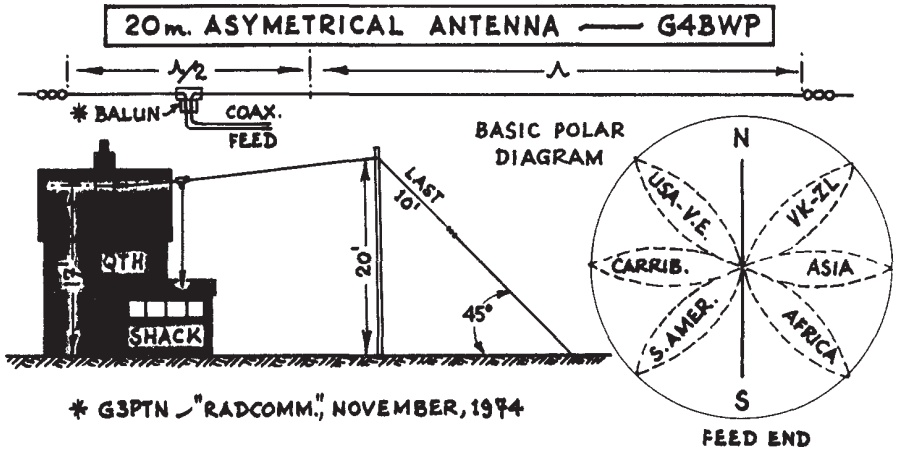
QRP Countries. 75, G3DNF ; 50 G2HCP, GM4ELV.
Worked G QRP Club; 80, GM3OXX ; 60, G8PG, G3DNF ; 40,OK1DKW ;20,G4FAI,G8IB.
Two-way QRP Award; 30, GM3OXX; 20, G8PG, G3DNF ; 10; SM7BNG,G4FAI,G8IB,GM4ELV.
QRP WAC; G3RJV, G2HCP,GM4ELV.

HA 3.5 MHz QRP Contest

Next Contest 1 to 7 November, 1980, 3.5-3.6 MHz cw, 5 watts maximum. If the rules are the same as last year all contacts will count.Exchange RST plus serial number. WANTED; Someone able to translate Hungarian- contact G8PG.

CALLING ALL VERTICAL USERS

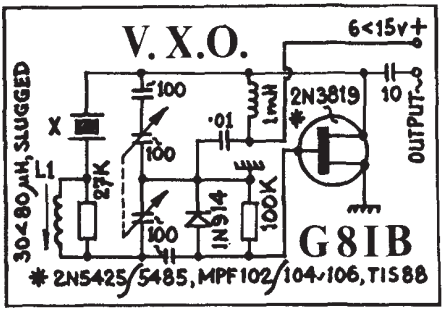
If you succesfully use a vertical antenna please send brief details (including ground/radial system) to G8PG , plus a summary of your results. A survey can then be prepared which will help those with restricted space for antennas.



I have used this antenna on 20m although it could be cut for any band. The polar diagram shows that in my north/south place it gives world wide coverage.

To set the aerial up, I made a dipole and resonanted it with an SWR meter. Then measured a wavelength against the dipole and added it on the end. This is adjusted to give min. SWR. The maximum height is 20 ft and th end slopes to the ground (making adjustment easier).

Adjusted in the centre of the band it gives 1.5:1 across 20m. The aerial performs better than the dipole in the same position, especially into the USA and has worked ZL.

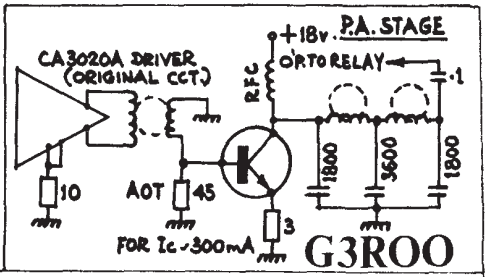


ANOTHER VOX "Dug" Woodford.

Some VOX give a limited range I tried this circuit (after W1CER) Larger old crystals give a swing of up to 10KHz. FT243 s swing about 3.5KHz, but some new HC6U s refused to go! Most tend to oscillate 2-3KHz below the fundamental and swing LF. Care in coil adjustment can bring them HF, but with less swing.

Alterations To the 160-80 Transvertor

[SPRAT 19] Ian Keyser



Some people have had trouble with instability in the CA3020A stage. This appears to depend upon the actual device in use. This improvement uses the GM3OXX PA Design (SPRAT 20) with the CA 3020A as a driver stage. Increase the emitter resistor to 10 Ohms and add the PA on a small board above the CA3020A. Instability is improved and mismatching becomes less of a problem.

Members News Chris Page G4BUE

I have changed the format of the column for this edition in order to include more news from members.

We seem to have a race within the Club for the next QRPp LXCC Trophy (offered by Ade Weiss of CQ Magazine). OK1DKW is on 118 worked/93 confirmed, VE5JQ on 113/92, and SMØGMG on 113 worked. I hear that WA2JOC has been awarded DXCC Trophy No. 10 - well done Bill. Members have been increasing their countries worked totals: G4EFJ has worked 31 with his HW8 to a ZL special, OK2BMA has worked 53 with a HW32A which he runs at 5 watts, CT4CH has worked 45 with his 4 watts and horizontal quarter wave antenna for 21MHz which is fixed to the window of his QTH with the metal window frame acting as the ground. G3ROO has worked 14 countries during the Winter with one watt on 1.8MHz, and W9SCH worked 12 countries with one watt output during a two week spell on 28MHz. As Rocky says working countries is difficult from W9, as the only other country within 1000Kms is Canada. G4DQP has worked 27 countries with a HW8 and an inverted vee at 35 feet.

Some wonderful DX has been worked by members recently on all bands. G4DYF was trying out his 4 watts of SSB at the the DX end of 3.5MHz at the end of January, and was pleased to receive a 55 report from a W1, after calling through a European pile up. On the HF bands Brian has recently worked HH and P29. OK2BMA has worked 9V1 and 3B8 and GM3OXX has recently added 6Y5, CE, PYØ, VP2K, 9G1 and ZE to bring his total up to 142. G8PG has worked ZL to qualify for his W.A.C. and added JR, PJ2, UJ8, VP2M and 3V8 to his countries score. Gus also worked WA7JRL/SU who was also operating QRP.

G5FF will be QRV from Aix-en-Provence and Menton in France as FØAYC between May and August and again between December and April 1981. He asks for members to listen for him on the QRP frequencies on 7, 14 and 21MHz from 0900. Another member who asks for other members to listen out for him is ZE3JO, who is QRV on 21060 with a HW7. Mal has worked WH6, J28, ZS and W8 so far and as there are many members who would like to have a two-way QRP contact with ZE, your scribe suggests 1000z on 21060 on the following dates:- 20/4, 27/4, 4/5, 11/5 and 18/5.

The QRP section of the new style ARRL CW Contest attracted several members. OK1DKW made 80 QSOs on 21MHz with only 400mW output, and OK2BMA made 70 QSOs, including 18 with the USA.

The Winter AGCW QRP Contest also attracted members. VE5JQ made 41 QSOs, but only one two-way QRP contact. G3DNF made just under 7000 points on 28 and 3.5MHz, G8PG made 47 QSOs on 28MHz, GM3OXX 80 QSOs mostly on 28MHz, and your scribe 80 QSOs on 14MHz. There are rumours of a change in the rules for future contests, and judging by remarks from members, a change back to the old rules to encourage contacts between QRP stations would be favoured.

The first Club activity week-end of 1980 was held over 1/2 March and from initial reports it would appear that at least 25 members were QRV. CT4CH, I7CCF and OK2BMA were busy on 14 and 21MHz working members in the U.K. during the mornings, but then came the afternoons and despite wonderful conditions between Europe and the USA on 21 and 28MHz, no members from the USA appear to have been QRV. European members worked QRP stations in all USA call areas, and I7CCF, GM3OXX and your scribe were pleasantly surprised when they all worked 6Y5RM on 28060 on the Sunday afternoon. At the end of the 21MHz period on the Sunday your scribe also worked KP4DJ, who was running an Argonaut.

WB2RZU writes to say how much he enjoyed The Winter Sports (reported elsewhere). Andy uses an Argonaut and a HW7 to a TA36 at 40 feet. He is an electronic engineer and has two children, one of whom is only 1½ and already spends hours turning the knobs of the radio. Is obviously going to take after Dad! Look out for some big signals from SM5GMG, SMØGMG's "contest QTH". Lars has just finished building it, and has yagis for the HF bands on 85 feet towers. He used the 5 element 21MHz antenna to work a HS4 station with just 250mW output of SSB. How about a photo for Sprat Lars? GM3OXX has also been trying very low power QRP and has worked W4 and W3 with just 25mW output. G8PG used an input of only 100mW to work LA, OH, YU and two UA stations, and OK1DKW recently worked G4FKL with 600 microwatts on 21MHz.

G3ROO has been building masts and trying to keep them to stay up. A 75 feet mast became the victim of some 92 knot winds, and at present Ian is using a 60 feet mast holding up a dipole for 1.8MHz. G4EHT built the HW8 last April and says he is delighted with it. He uses it to a 66 feet end fed at only 20 feet and has worked the USA and Canada. As a resultof the recent cold weather Bill installed a feeder from his antenna to the lounge to enable him to operate from in front of the fire! Whilst on the subject of Heathkit, K4BNI says there is a strong rumour in the USA that a HW9 is soon to appear, with 28MHz and slightly more power. Dick, who is ex G5AQJ, uses a HW8 to an inverted vee and gives his best DX as two ZL stations. You cannot do much better than that Dick.

GM3OXX has also been building. A new box of tricks which although being crystal controlled, gives VXO control over about 50KHz, sounds just the toy for the AGCW Contests - that is until they change the rules again! DJ1ZB is soon to announce his 'QRP Lagos Rig', which was designed as a result of his recent trip to Nigeria. GM4CXP occasionally uses a FT101B with the carrier wound back to one watt. As he says "not proper QRP", but he has worked around Europe on the HF bands with it. Derrick has just acquired crystals for 3560 and 28060 and as he says has now got no excuses to do the job properly and build "a proper QRP". Another member who uses the FT101B with reduced power is KAØDGN, but says that he too is soon to build a QRP rig. Nate mentions the recent articles on QRP that have appeared in QST. Several of these have been copied and are available to members through the data sheet service. Nate is QRV on 21MHz with a 7MHz dipole.

G3VTT has recently purchased an Argonaut and during the recent FOC Marathon Contest worked VP2M, PJ, PY and Ws, so he has obviously found how to work DX with it. Colin recently received a "599--- but really 549 for QRP" report during a contest QSO with a W4. Such reports are useless to the QRP operator and from memory Colin, you are not the first to complain about the 599 contest style reports. Your scribe has seen log books of DXpeditions where the 599 report has been inserted at the beginning of the page and carried right through, before the QSOs were made! Colin has a sked with G3ZWH most evenings on 3560 around 2200 local time and would welcome calls from other members. They will always QRS if requested.

G5DEH also uses an Argonaut with a double inverted vee in his loft for 28MHz. Tim settled in England in November and has worked into New York, but his only two-way QRP QSO has been with SM. SSBers are reminded of the Clubs SSB QRP Activity Weekend over 10/11 May. Times as shown in the pull-out supplement in the last edition of Sprat for the cw week-ends, but on the ssb frequencies of 3590, 7090, 14285, 21285 and 28885 instead of the cw ones. Last year there was very little activity and unless the event is better supported this year, it will be dropped in 1981.

A recent letter from G4FMD mentions the lack of coverage to VHF QRPers. Let us put that right straight away by saying that Malcolm is QRV on 144.060 from 2030 on Monday evenings, with 5 watts input. Recently he worked G, GW, F, PAØ, ON and DL in one week-end. If sufficient interest is shown on VHF, perhaps we can organise some sort of activity period - what do you think?

Reports from members indicate that many of our members are regularly appearing on the QRP frequencies. CT4CH has worked 20 members and OK2BMA 30 members since joining the Club. It is interesting though that nothing higher than a 80 member endorsement has been issued, and with over 750 members in the Club, there must be many members yet to meet each other for the first time. The weekly activity nets are sponsored for this purpose, so if you tune and don't hear anyone, give that 'CQ QRP' call, you maybe pleasantly surprised.

GM3OXX is the proud possessor of both editions of the call book, and has kindly offered to supply QSL information to members upon receipt of a S.A.E. (and/or IRC).

Members are reminded of the RSGB Low Power Contest on 13 April, and the AGCW-DL Summer Contest over 19/20 July.

All news, views, likes and dislikes to Chris Page, G4BUE please. Let us hear how your Spring has been. The next edition of Sprat will be appearing at the end of June, so news would be appreciated by the end of May. Don't forgot you can send your QSL cards at the same time, so why not kill two birds with one stone?

It seems that the call letters RJV are associated with QRP in the U.S.A., as well as being associated with QRP here in the U.K. Your scribe recently had a QSO with W5RJV who was running 4 watts on 28MHz.

Best 73 and good QRP DXing,

Chris Page - G4BUE

CHANGES OF QTH: The Following are members new addresses:

097	G3CWX	123 Church Rd. Low Fell, Gateshead.
116	G4FKH	62 Chesnut Walk, Chelmsford. CM1 4JT. Essex.
161	G3PXS	19 Ditton Court,Rd. Westcliffe-on-Sea,Essex. SSO 7HG.
214	GM3WIG	Applin,3 Orchard St. Roxburghshire. TD9 9JJ.
223	G3WME	20 Kipling Cl. Thatcham, Newbury, Berks.
323	G4JCY	12 Sandy Vale,Haywards Heath,West Sussex. RH16 4JJ.
333		25 Belvedere Rd. Exmouth, Devon. EX8 1QN.
484	G3OEP	67 Southtown Rd. Great Yarmouth, Norfolk. NR31 ODY.
509	F6FZL	Residance Peintre d'Europe,Bat Renoir,No.16, Rue de L'Estagnas,Biarritz, 64200, FRANCE.
615		Tim Cook, Box 2012,RAF Mildenhall,Bury St.Edmunds, Suffolk. IP28 8NF. (G5 call to follow)

NEW CALLS IN THE CLUB:

329 Alan Jeffreys (ex G8MUA) is now G4JEA.

385 Ray Wilson is now G4HIH.

436 Clive Hancock (ex G8OOB) is now G4IVP.

520 Mike Perry (G4HWZ) now also holds PA3ASC.

754 Ronald Marshall now holds GM4 JJG.

Late News:
728, A. Sambrook
is now G4JJN.

Also from new QTH list above: 323 has changed from G8JCY to G4JCY.

CORRECTION TO COMPLETE MEMBERS LIST FOR NOVEMBER 1979:

PLEASE NOTE THE FIRST OF THE GW COLUMNS - AFTER GD3 - SHOULD BE GM .

ADD: G3CLL, G3FKM, GM4FDD, G4HHG, GI3XZM (not XZN), WD4NDG (not NGD).

RESIGNATIONS:

114 - G3ZPN, 593 - ZL1BGS, 681 - N2AXL.

PLEASE QUOTE MEMBERSHIP NUMBER IN CORRESPONDENCE WITH CLUB OFFICERS.

CLUB QSL SERVICE

A new service for members.

Chris, G4BUE, has noted the large amount of direct QSLing which occurs between members who work each other. It also occured to Chris that QSL cards could be included in the mailings of SPRAT. Chris is there -fore offering to run an internal Club QSL Service linked with SPRAT. The system will be:

1) Send your QSL Cards to Chris Page, G4BUE, Almosa, The Paddocks, Upper Beeding, Steyning, West Sussex. (see 4)
2) Cards must clearly state the MEMBERSHIP NUMBER of the person to whom they are being sent.
3) Cards can only be sent by members and to other members in any country.
4) The main saving will be in sending batches of cards to Chris, but cards in ones or batches can be sent to other officers of the club (G3RJV, G3DNF, G8PG, G4DVW) if you are already writing to them on some other matter. These officers regularly circulate mail and the cards will reach Chris in due course.
5) Any cards held for members will be sent out in each SPRAT mailing.

ALAN LAKE, G4DVW, Our Treasurer, is interested in aquiring early radio and electronic books and magazines. Details and price required.

NEW MEMBERS

691		Bill Masciarelli, Box 101, Index, WA98256, USA
692	ON5AG	Francois Scheyvaerts, 206 Boeretang, B.2400 MOL, Belgium.
693		R.J.Benitez, 65 Castlebar Park, Ealing, London, W5 1DA.
694	G8NGY	Cliff Milsom, "Bemerton", Old Brookend, Nr. Berkeley, Glos.
695	G4CUF	Arthur Byers, 2 Beechwood Ave., Ashton-in-Makerfield, Wigan,
696	DK2NV	Herman Nafziger, D3040 SOLTAU, Keidjerweg Nr.1.Gmy. Lancs.WN9 9LZ
697		Charles Makin, 61 Gleneagles Dr., Ainsdale, Souport. Merseyside.
698	Kb4IP	John H.Parmenter, 4605 Latimer Rd., Raleigh N.C. 27609, USA.
699	WD4KWD	Thomas W.Hyer, 235 Marne St., Memphis, Tenn 35111, USA.
700	WB2RZU	Andy Webster, 6 mT Wilson Ave., Farmingville, N.Y., 11738 USA.
701	KA8EDG	William H. Bergeron, 405 Dilton Ave., River Ridge, L.A.70123,USA
702	G4FQQ	Roy E.Deane, 11 Park Hill, Carshalton Surrey, SM5 3RS.
703		Alan MacFarlane, "Braemar", Richmond Ave., Burscough, Ormskirk,
704	WA4YMQ	Frank Erker, Bx.1600, Rt,8,Campers Hol'd'y, Lancs L40 7RD. Brooksville, FL 33512, USA.
705		A.G.Edwards, "Kantara" West View Rd., Bere Alston, Yelverton,
706	G4AWQ	George McCarthy, 2 Sherwood Rd., Barkingside, Devon PL20 7DD Ilford, Essex, IG6 1BW.
707	N6CDQ	Hart York, P.O. Box.365, Fontana, Ca. 92335, USA.
708	KA8DDI	Donald L.Groulx, 1124 Creek Rd., Beaverton, Mich. 48612, USA.
709		Lt.Cdr.F.J.Pavey,MBE RN (Rtd) 125 Sussex Rd., Petersfield, Hants
710	G3TKO	Eric E.Snow, 118 The Bridgeway North Harrox Middx.HA27QA. GU31 bLB
711	ON4PQ	Paul Borloo, Av.du Monoplan 28, B1150 Brussels, Belgium.
712	WA7ZBL	Mahlon Hale, 22840 Tumbleweed CT. Bend. Oregon, 97701 USA.
713		Charles Delvaux, 192 Avenue de la Gare, B05450 Melreux Hotton
714	EI7DN	Paddy Treanor, 25 Maywood Ave., Raheny Dublin 5 Eire. Belgium.
715	G4LV	Maurice Selby, Brewery Cotts. Ovingham Prudhoe Northumb. NE426AG.
716	G8EAS	A.G.Gale, 7 Glebe Close, Lewis, E.Sussex, BN71LB.
717		Seane L.Forde, "Gougane Barra" 603 Howth Rd.,Raheny, Dublin 5.
718	G3JBA	G.H.Maddox, 13 Cecil Aldin Dr., Tilehurst, Reading Berks,RG3 6YP.
719	G8OVW	Walter W.Hearn, 35 Glenthorne Gdns. Barkingside,Ilford, Essex,
720	N6WR	A.Noble, 2120 28th St., Sacramento, Ca 95818, USA. IG6 1LA
721	W2LTG	Theodore Rau, 48 Dawes Ave., Syosset, N.Y. 11791, USA
722	W9JKF	Rodney D. Bowen, 1802 Will James Rd., Rockford, Illinois 61109
723	G3TBT	Ralph Hodgson, 18 Clayhill, Lyndhurst, Hants, SO4 7DE. USA
724	WA2K5M	John P.McNeil, 168 Lexington Rd., Shirley, Long Island N.Y.11967
725	KB5EPU	M.G.Stobbe, 23107 Stepinwold, Spring,.TX 77373 USA USA
726		Marvin Rosen, 20 W. Maddison St., Baltimore, Maryland,21201, USA
727	WBØROJ	119 West Morgan St., Boonville, Missouri 65233, USA.(William
728	RS41687	Alan Sambrook, 351 London Rd., Leftwich Green, Northwich, Simmons)
729	ON7IR	Imbrechts Rudi, Kerselaarstraat 15, 2820 Benheiden Cheshire,CW98HA Belgium.

730 IØSKK Alessandro Santucci, via Boccanegra, 8 00162 Rome, Itaky.
731 K5BOT Edmund Popp, 2212 Deadwood Dr., Austin, Texas 78744, USA.
732 WA4YRN William Behrends, The Medical Center Clinic, 8333 North Davis Highway, P.O.Box 151, Pensacola, Fl. 32591,USA.
733 KA1CZF Thomas Magera, 106 Chestnut St., West Haven, Conn. 06516, USA
734 N5AMQ John Bacak, 13416 Onion Creek Dr., Manchaca, Tx. 78652, USA
735 GM3SPT George McKay, 41 HallHill Rd., Springboig, Glasgow G32.
736 GM4ELV Daibhidh Dhuglas, 3 Kirkfield Plc., Arrochar, Strathclyde,G837AE.
737 WH3AAA William Springs, P.O.Box 327, APO San Francisco 96305, USA.
738 W9AYH H.W.Robinson, 230 S.Ash, Hobart, Ind. 46342, USA.
739 DK2EV Lothar Wittwer, 6148 Heppenheim Wilhelmstr. 45 Germany.
740 N6BVZ Terrence Robinson, P.O. Box 603, Templeton, CA 93465, USA.
741 Peter Jones, 49 Grove Rd., Hoylake, Wirral, Merseyside L47 2DS.
742 N4GR Bruce Baker, 335 N.Broad St., Salem, VA 24153, USA.
743 WDØEDH Wes Morrow, Rt.2 Box 539 Conifer, Colo. 80433, USA.
744 W3TF Tom Folan, 65 Penrod St., Johnstown, Pa.15902, USA.
745 WA1ZKP Hank Lefcort, 131 Round Lake Rd., Ridgefield, Ct. 06877, USA
746 K4JHP Alan Marx, 11704 Devilwood Ct. Potomac, Maryland 20854, USA.
747 WBØAJI Brian Zdan, 4817 Douglas St., Omaha, Nebraska, 68132, USA.
748 GM3ZTA William Curri, 4E Raploch Cres., Faifley, Clydebank, Glasgow.
749 G4IMG George Simpson, 10 St.Golder Rd., Newlyn, Penzance, Cornwall,TR18 5QW
750 G4JDB Richard Mills, 24 Lawson House, White City Estate, London W12 7PZ.
751 G3FTQ Alan Frost, 11 Ingleboro Dr., Purley Surrey CR21ED
752 WB5NGB Douglas Loughmiller, Rt.6, Box 515, Paris, Tx 75460, USA.
758 G4EYF Geoff Cundell, 4 Cranvrook Rd., Acomb, York, YO25JA.
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