

**JOURNAL OF THE
Q R P
RESEARCH SOCIETY**



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THE FIRST DUTY WHICH FACED THE 1953 COUNCIL OF THIS SOCIETY WAS THE CONSIDERATION OF THE SOCIETY'S FINANCIAL POSITION. WE HAVE NEVER AT ANY TIME SOUGHT TO MAKE ANY PROFIT FROM THIS ORGANIZATION, OUR AIM HAVING ALWAYS BEEN TO MAINTAIN IT IN THE BEST POSSIBLE TRADITION OF THE AMATEUR RADIO SPIRIT -- TO GIVE ALL THAT LAY WITHIN OUR POWER FOR THE ENCOURAGEMENT AND ADVANCEMENT OF THE AMATEUR'S ENTHUSIASM AND ABILITY. THE ESSENTIAL MEANS WHICH ENABLES US TO ACHIEVE SUCH AN OBJECT IS THIS JOURNAL. THE NATIONAL (AND INCREASINGLY INTERNATIONAL) MEMBERSHIP OF THIS SOCIETY COULD NOT BE HELD TOGETHER BY ANY OTHER MEDIUM. THE JOURNAL, WHICH IS FREE TO MEMBERS, IS FINANCED ENTIRELY FROM SUBSCRIPTION RECEIPTS AND IS THE ONLY SUBSTANTIAL DRAIN UPON SOCIETY FUNDS, WHEN WE COMMENCED PUBLICATION IN 1949 THE 5/- SUBSCRIPTION OF THOSE DAYS AMPLY COVERED EXPENSES AND LEFT A SMALL AMOUNT IN RESERVE. SINCE THEN, HOWEVER, EVERY COST INVOLVED IN THE PRODUCTION OF THE MAG HAS MORE THAN DOUBLED AND, THOUGH WE OBTAIN ALL OUR SUPPLIES IN THE CHEAPEST POSSIBLE MARKET (TO THE OCCASIONAL DETRIMENT OF OUR APPEARANCE, UNFORTUNATELY!). WE HAVE HAD TO ASK THE COUNCIL TO SANCTION AN INCREASE IN THE SOCIETY SUBSCRIPTION RATES.

WE HAVE TO ANNOUNCE, THEREFORE, THAT :--

FROM MARCH 1 st, 1953 SUBSCRIPTIONS WILL BE 10/- PER ANNUM

.....: THE H - Q Rx. :.....

The H - Q Rx project has raised a great deal of interest and upwards of 45 letters have been received expressing the feelings of both transmitting and SWL members on the subject. We think, therefore, that it is time we devoted some space to quotations from this variety of letters. Since it is not possible to reproduce them in full we shall select the more "pertinent" paragraphs.

First, from DAVID WHITE, of Kingston:--

".... If you use 6 Mc/s (for the IF) you will not get what you need most, ie, selectivity. Consider even 1.6 Mc/s which is what Denco used in the DCR19; even with 3 stages of IF, ie, 8 tuned circuits, the best they could do was a bandwidth of 8 Kc/s without crystal filter or audio filters. So, with 2 stages at 6 Mc/s, you'll be lucky to get down to 20 Kc/s -- probably more like 40 Kc/s. This is assuming you don't make one at least of the IF stages regen. Mr Dent's articles (W.W. Oct 1950 and Feb 1951, quoted as having been studied with this point in view, Dec 1952 issue "QRP") are referring specifically to converters for use in front of receivers which already have the desired degree of selectivity -- though, in the case of the 1155, I doubt it!"

"Secondly, signal to noise ratio. The lack in the basic specification of an RF stage makes me somewhat worried on this point. You'll be lucky if the noise generated by the FC itself isn't more than 10 uV which means, for a 6 dB signal to noise ratio, that your minimum signal will be of the order of 20 uV which is not really sensitive and to achieve a 20 dB signal to noise ratio you'd need an input of 100 uV."

"Another point -- accuracy of scale reading. You'll be lucky to get this with electrical bandspreading due to the possible error of setting the bandspread condenser. To refer once again to the DCR19.... in order to get accurate calibration on that Rx they had to put a Xtal calibrator in, to help in setting the main dial."

"Another thing -- stability. You don't mention the point but, presumably, if the Rx is battery operated, we needn't worry too much about changes of supply voltages, but there are questions of stability of oscillator circuit components including the oscillator itself. Now, in the X18 there may be, since it is a single valve FC, possibilities of pulling on the higher frequencies!"

"From all the above it probably looks as if I don't think you can achieve your object. Well, if your object is to produce an Rx that is as good in performance as the best commercial communications Rx and as easy to handle I frankly don't think you'll make it QRP...!"

Taen. from E.S. SMITH, of Eltham we have a brief description of an Rx he is planning on similar lines. He says:--

".... Bearing in mind the QRP requirements and also enhanced selectivity of the SH when compared to the TRF my ideas are along the following lines."

"(1) A SH line up of FC stage, one IF into a reacting triode feeding phones."

"(2) Bandpass tuning in SF circuit."

"(3) The old dodge of two IFTs back to back with variable coupling to link the FC to the IF valve."

"(4) Bearing in mind the gain which can be obtained from a triode O-V-O just short of oscillation point, a tertiary winding on the last IFT used in the usual reaction circuit should be worth while.

"(5) No AVC -- can't afford to waste RF energy this way and who wants AVC on weak sigs anyway?"

Dsn Auton, of Swindon, has sent along two very interesting letters mainly concerned with this subject and our only regret is that we have not space to print the as a whole. In the first he says:

"It is quite possible to have a real communications Rx well up to the standard of the 1155/BC348/S640 class yet running at under two watts. My present experimental Rx has RC-FC-IF-IF (470 Kc/s)-2nd Det/Audio, with audio filter, BFO and noise limiter, and runs at 1.6 to 1.9 watts. It consists of an E91 in R9er type of circuit. The B2 Rx

41/4

which I have modified so that it works well on 90v. The noise limiter is two 1N34 Xtals and the audio filter is FL8 type with two more Xtals as peak limiters If it was built with low heater consumption valves such as 6AK5s and ECH35 (which is far better than any of the miniature FC'ers in my opinion and can also serve as combined IF and BFO or infinite impedance detector and audio) the whole Rx could be supplied from dry cells. Arrangements could be made to use batteries only when necessary in trying to 'winkle out' a weak one. The Inf. Imp. detector is also worth while in any QRP Rx. It is possible to get just as sharp an IF with 2 stages and I.I. detector as with 3 and any other det. It can also be made regenerative to increase gain and in any case where utmost economy is required can replace the BFO....."

Den's second letter is even more interesting regarding the particular problems of our H-Q Rx. He writes:--

".... I certainly agree with David White that 6 Mc/s is far too high. For up to 90 Mc/s 465 Kc/s is by far the best and special converter is the only real answer above 90 Mc/s. Of course 1.6 Mc/s and 100 Kc/s is better proposition still. Figures on typical IFs I have show the following bandwidths -- "

"Two stages (3 IF cans) critically coupled - For 6.8 Mc/s a bandwidth of 12 Kc/s at 3dB down and 18.5 Kc/s at 12 dB down. For 465 Kc/s a bandwidth of 3Kc/s at 3 dB down and 6 Kc/s at 12 dB down."

"Three stages (4 IF cans) critically coupled - For 1.6 Mc/s a bandwidth of 5 Kc/s at 3 dB down and 8 Kc/s at 14 dB down."

"These figures are from RCA Radiotron Designers Handbook, Australian Edition."

Now, from Bob Kenyon, of Liverpool, we have the opposing view on this subject of IF values. Bob says: ---

"The suggestion that the IF may be 465 Kc/s will, if adopted, cause a lot of trouble with second channel interference, particularly on the higher frequencies. Let us take the signal received as 14 Mc/s then the oscillator is at 14465 Kc/s and the image freq at 14930. Thus the % off tune of the image freq is $930 / 1400 \times 100$ or approx 7%. This I think is not good enough, particularly as there is no RF stage. It

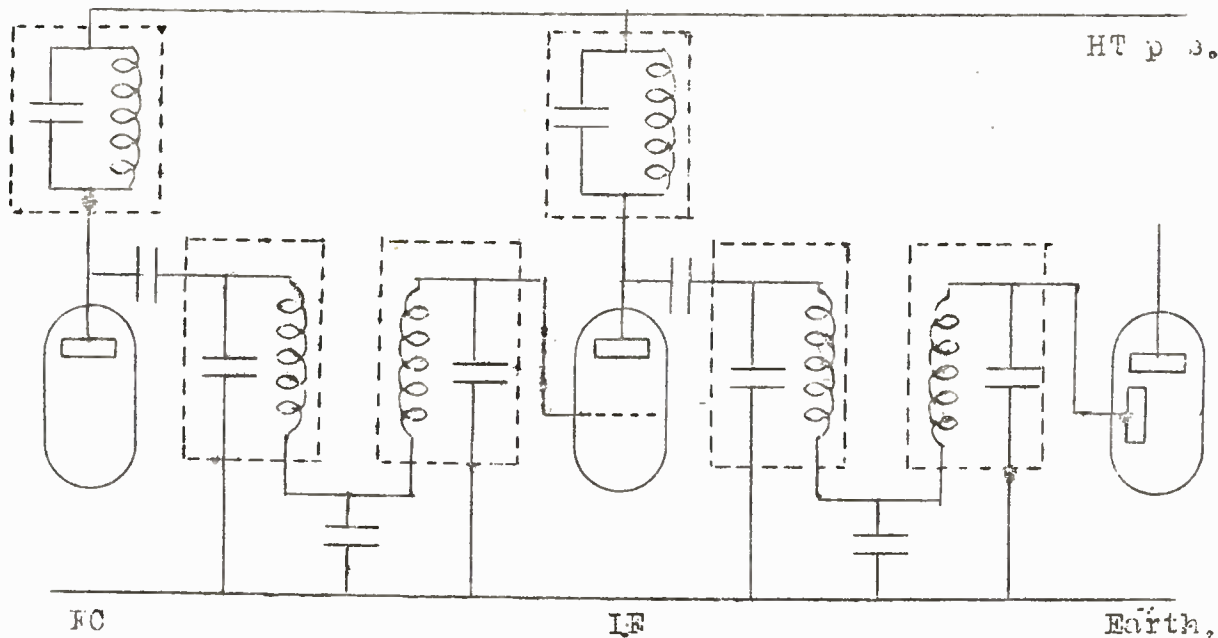
would be better to use a much higher IF. To take 6 Mc/s as you suggested, the image freq for 14 Mc/s is 28 Mc/s. Thus we get $12 / 14 \times 100$ or 85 % off tune. This is far better than 465. Of course it is well known that the higher the IF the less adjacent selectivity we get and we have to compromise between second channel and adjacent channel interference. But, from the figures I have quoted, which I think are correct, even an RF stage would not shift second channel when the IF was 465, but it would give adjacent channel selectivity so that by using 6 Mc/s we could, by adding an RF stage, get both second channel and adjacent channel rejection."

Bob further agrees with E.S. Smith that AVC should be dispensed with and also suggests that the signal and oscillator tuning should be independant. He calls for regeneration in the IFs and suggests the possible use of a diode valve for frequency changing.

From George Partridge, G5CFF, we have received a copy of an article by Byron Goodman, W1DX, published in the May 1950 "Q S T". This has given us a very helpful lead and we have drawn up an adaptation of the basic circuit which, while it considerably amends our original plans, will, we think, set our development along the right lines to obtain adequate selectivity and, at the same time, will enable us to use one of our valves to better purpose. This basic IF layout is shown in the sketch on the next page. It will be seen that the FC feeds the IF stage via three tuned circuits while another three tuned circuits pass the signal to the Det/Audio valve direct. If anyone is interested in going more deeply into the theory of the circuit shown I will try and arrange some of the more valuable extracts from W1DX's article for a future issue. Mean time it seems to us that six tuned circuits with regeneration, a xtal filter and an audio filter should give us such a high value of selectivity that we could better use that second 1T4 as an RF amplifier to be plugged or switched in as and when required (retaining the basic unit as FC-IF-Det/Audio, but with 3 valves instead of 4). We are wondering who will be the first reader to tell us we

41/6

cannot possibly get enough amplification to winkle a signal through that lot anyway! We'll see -- it would make a beautiful little QRP "heart" with careful and patient manufacture. And, curiously enough, it "lays-out" into our existing chassis even better than the line-up that was our original plan. Referring back to sketch on page 3 last month, the aerial and oscillator coils will now be placed under the lower deck beside the tuning condensers, the three valves will go in the middle spaces (8, 5 and 2), the first three IFTs in the left hand spaces (7, 4 and 1) and the second three IFTs in the right hand spaces (9, 6 and 3)



.....: HAMS IN THE FLOOD :.....

Last week PA/HBE was heard to report that, so far as he knew, there had been no casualties among the Hams of flooded Holland. This is very cheering news in a period overshadowed with such grim disaster. It can be appreciated all the more when it is realized what a grand part the PA lads played in their National crisis. An example which has come to our notice is that of PA/DR, Dirk S. Rustima of Middlestum, Groningen -- as soon as he heard of the position he put his portable station in the car and raced south to the flooded areas where he, like many another of the PAs, rendered valuable help by keeping in contact with rescue and hospital headquarters, **without rest or sleep** for the three days and more from that bleak Sunday morning when the deluge struck.

Every amateur radio enthusiast will feel a thrill of pride that, given only the opportunity of a mobile licence, such an outstanding demonstration of the much maligned Ham Spirit has once again been shown to the world at large.

.....: BLOCKED GRID KEYING :.....

Den Auton, G3IHI, has been using this system for some months now and wonders why so little is heard of it. He has arranged his layout by putting a heavy duty pot across the key which is in the cathodes and adjusting it so that with the key up enough cathode bias is applied to cut off 98% of the anode current. A constant load is kept on the PP, allowing the oscillator to be keyed without chirp, and giving a good keying waveform (checked on a scope) and no key clicks (even with QPC). Den suggests that the only possible objection could be abuse of the heater cathode insulation which, in his case with 6V6, 6L6 or 807s does not happen since the bias is less than the heater cathode voltage variation limitation for these valves. The key up signal locally is

41/8

less than when he left the oscillator running and keyed the PA cathode. When, previously, he keyed the Osc and PA there was some chirp or the Xtal did not follow keying faster than about 15 wpm. The rise in Xtal current with BGK is faster than the meter can register, or faster than will do any damage, this rise occurring part of the way. After the bias reaches certain limits the current drops again so, in the resting position, Xtal current is very low.

Den says that he would be interested to hear what the objections are to this system -- he cannot believe that it has not occurred to any one before.

.....: A QRO/QRP PA STAGE :.....

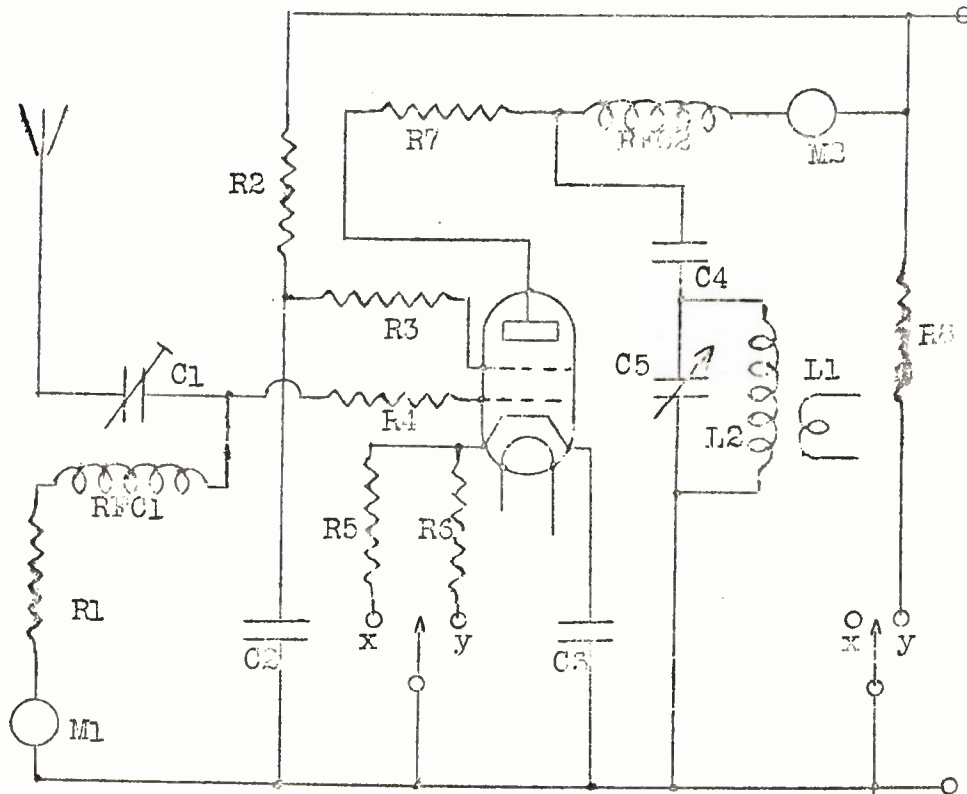
From Allan Herridge, G3IDG, we have received the gen on an arrangement which serve to demonstrate another aspect of QRP working (other than for it's own sake) and will certainly go a long way towards lessening the QRM on our crowded bands.

The 807 PA at G3IDG is always run in the QRP position for local QSOs, giving an input of around 1.8 watts with the values shown for the accompanying diagram. The most frequently worked station, G3IDE, at $1\frac{1}{2}$ miles distance, receives IDG signals at S9 plus on 160 metres with this input and a report of S8 has been received from G3FRV at 6 miles. There is, therefore, absolutely no need for greater power on local contacts.

It will be seen from the circuit that, in the QRO or normal position, the HT is fed to the 807 anode and screen as usual, with a 400 ohm 6 watt resistor in the cathode. This gives just 10 watts at G3IDG and is used for Dx QSOs or for initiating contacts where it is not known if 1.8 watts will give an R5 signal. On switching to QRP the HT is bled to earth through a 5K 40 watt resistor (to compensate for the rise in HT on lightening the load) and a 10K 6 watt cathode resistor is switched in in place of the 400 ohm. With these values the HT remains reasonably constant at 275 volts. The anode current on QRO is 36 mA and on QRP is $6\frac{1}{2}$ mA.

For anyone using this arrangement it is recommended they make a note in their card index system if QRP is found to give a 100% QSO. This will enable the next QSO to be an all QRP affair right from the start.

Allan adds that, by juggling the controls, an input of 0.7 watts can be obtained and that, at this, he has had reports of S9 plus from 3IDF.



COMPONENT VALUES:-

- C1: 100 pF pre-set
- C2: .1 uF, 500 wv
- C3: .002 uF mica
- C4: .002 uF ") 2.2 kV
- C5: 200 pF
- R1: 220 K, 1 watt
- R2: 10 K, 10 watt
- R3: 47 ohm, ½ watt
- R4: 10 ohm, ½ watt
- R5: 400 ohm, 3 watt
- R6: 10 K, 6 watt
- R7: 22 ohm, ½ watt
- R8: 5 K, 40 watt
- RFC1: Denco RFC5, 2.6 mH
- RFC2: Eddystone 1022 1.5 mH
- M1: 0/5 mA
- M2: 0/50 mA
- V: 80V
- L1: 4 turns, 22 TCW, 2 1/8" dia X 3 1/2"
- L2: 52 turns, ditto.
- x: QRO. y: QRP

41/10

.....: 1953 QRP C - Z PANEL

	Countries					C Total	Z Zones	Grand Total
	6	7	8	9	10			
1: E.W.Gardiner	15	5	34	13	-	53	18	71
2: P.Huntsman	10	16	37	3	-	48	20	68
3: N. Bason	5	12	33	1	-	37	11	48
4: A.Stonestreet	6	15	25	-	2	29	9	38

We ended last year with 13 competitors in this contest and it does seem a pity that, with each new year, we have to fall back to a meagre start, gradually working our way up in numbers through the year. Perhaps conditions may have some bearing on the question, though, surely this is the peak of the SWL's season. Nor does the average shown above compare outstandingly with those of previous February returns. The contest did not start till March 1950, but the averages for '51, '52 and '53 work out as follows:--

	6	7	8	9	C	Z	TOTAL
1951:	12.3	5.7	39.3	-	44	13.3	60.3
1952:	9.75	17	33	1.75	41.5	13.25	54.75
1953:	9.0	12	32.25	0.5	41.75	14.5	56.25

Let us hope that this contest, which has always roused more enthusiasm than any other run by the society, will beat the all-time averages both of numbers of contestants and of scores next month!

.....: SOCIETY NEWS AND ACTIVITY :.....

Norman Bason (Peel, I.O.M.) has just finished a "special" for Top Band and it seems to be OK - hence his entry for Top Band Contest. He was so disgusted, however, with results from his "general" Kx that he swept the soldering iron through it and is now rebuilding.

Dennis Benjamin (Aberystwyth) is particularly interested in our HQ-Rx endeavours as he has no mains and finds running a 640 from a vibrator mighty expensive. (No, I'm sorry, Dennis, you're a bit isolated I'm afraid. The nearest member we have to you is in Llandudno).

Fred Stonestreet (Willeeden Green) who, as I mentioned a month or two back, has been busy assisting the WRC to find it's feet again, seems to have done a really fine job if the enthusiasm shown at their recent social and dance is any criterion. And he has still had time to put in a C - Z log and to get a new 1T4 line up tested and showing promise.

E.W. Gardner (Diss, Norfolk) has, like many more of our members I am afraid, been suffering from 'flu. He has found time, however, to get himself a lead in the C - Z stakes and that ought to help his convalescence quite a lot (but lookout for a rise in temperature when Peter gets after you, OM)

C.F. Atherton (Tunbridge Wells) who is one of our few remaining "foundation" members, has been pretty tied up for some months past getting his new QTH in order, but he has now got round to the hobby again and has a 1-V-0 for 40 and his old 0-V-1 for 20.

Derek Williams, GWSKZZ/A (Aberdare) has been active around 1846 Kc/s. Having found that every time he grinds a rock it shifts to a worse spot he is now getting a Clapp built up.

Ian Glen (once of Coldingham) is still wandering around in pursuit of the PAF. He has been passing his off-duty hours by analysing the Call Book to plot the number of Hams per County and has reached G3F--.

Sam Hall, G3AQT (Oxford, Kent) finds "200" scoring tough just now and is hoping for quicker results when the summer shortens the skip. He has put up a very fb suggestion, detailed elsewhere, for set QRP frequencies. (Mni tnx, OM)

41/12

Fred Bailey, G3HJL (Boreham Wood) who is Chairman of the Barnet & District Radio Society is hoping to rouse extensive QRP interest in that Society. They already run a small Tx on 3,5 with the call G3FFA. Fred is particularly interested in G2ACL's power supply, described last month & would like further information as to the exact function of the VR1C5.

Peter Hinkson (Herham-on-Tyne) has now converted his O-V-2 to mains with a built-in power pack using 3 x 6X36s with the first strapped as a triode. Air tests have proved satisfactory and Peter is prepared to get blue prints run off if anyone would like the circuit.

Vic Cuddall, G8FIM (Stratford, E15) should by now have finished his rebuilding. The new rig is 6SN7 VFO/LA - 6SN7 BA - 6V6 PA and is at present covering 160 and 80, with plans for 40 and 20 to follow.

Ted Ault (Kettering) still has the same little rig active though, apart from a little interest on 14 Mc/s his main satisfaction has come from a single Dx call heard on Top Band -- GD6IA, which we think is pretty good going for 0.3 watts HT consumption in a district swamped with Coast Station QRM.

.....: G12DZG SCHEDULES :.....

We are very pleased to hear that Walter Caughey is active again from his new QTH with a 6V6 CO choke modulated with a 6L6 and a 6J5 PA. A bit of trouble with aerial coupling has probably been overcome now by the addition of a pi-coupler which was almost complete at the time of writing. Input varies from 2 to 12 watts. TIMES of operating will be Mon, Wed and Fridays 2030 to 2300 GMT and Sundays 1400 to 1715 GMT. FREQUENCIES: 7010 (cw), 7050 (cw), 7168 (fone), 3510 (cw), and 1850 Kc/s (fone and cw).

All reports will be welcomed and QSL'd and SWL members may send their reports via RSGB.

We hope to have a complete and detailed description of the new rig in the mag shortly (And many thanks for this gen, Walter).

.....: THANKS. "Q M F" :.....

We are indebted to GWSWJ, editor of the TOPS journal, "QMF", for his kind remarks about our Society in two recent issues. In the January number he was good enough to report the results of our Kaleveld Cup Contest and in the Feb issue he stresses the good work which we are endeavouring to do. He also expresses surprise at having heard G3ANQ, using 30 watts recently -- 3ANQ is not and never has been a member of this Society so that his actions cannot at any time reflect upon us. I would point out, however, that membership of the QRP Society does not preclude the occasional use of higher power by any member when he so desires (except, of course, where max power is stipulated as in the case of contests or QRP reports, etc). We exist for the benefit of all who are interested in QRP and, while many of our members do invariably use low power at all times, we do not stipulate that they must always do so. The Muddelcombe Motor-cycle Club exists for the interest of Muddelcombe motor cyclists but it does not stipulate that no member may ever drive a car!

.....: ARMY WIRELESS RESERVE. :.....

This is a new reserve unit of the Royal Signals. Vacancies exist for NCOs and others as Wireless Ops and Radio Mechs, training liabilities consisting of 15 days annual camp. For 1955 the training will be at Blacon near Chester from 13th to 27th June and full information can be obtained from Major D.W.J. Haylock, G3ADZ, 230 Devonshire Avenue, Southsea, Hants. The gear in normal use is quoted as 250 watts, high speed sets, which is a trifle outside our scope (hi!) but there is also some UHF work carried out and a /A amateur section, so looks as if there will be a lot of interest to be gained. My information does not include any mention of the pay involved, but it sounds like quite a holiday!

..... R A D I O A M A T E U R

The March issue of this magazine, which has always been most generous in its dealings with QRP interest and with this Society in particular, will be of especial appeal to our members in view of a description, under the heading "Around the Shacks", of station G3BEC. 3BEC is run by Mr B. J. Clark who is 100% QRP enthusiast..

Other items in the March issue are: MODIFICATIONS TO THE 1155 RECEIVER (including 21 Mc/s converter, "S" meter, noise limiter, aerial equipment etc); AN AMATEUR TRANSMITTER'S CONTROL AND RECEIVING POSITION; FM AND AM (the two systems contrasted); DESIGN OF MAINS TRANSFORMERS (the concluding article in this very popular series gives practical hints for easy construction); RADIATION PATTERNS No 2 (the dipole, showing effects of nearby buildings, etc); "ICI PARIS..." (a review of the English service of Radiodiffusion Francaise); WORKSHOP PRACTICE (the use of taps and dies); STRICTLY FOR THE BEGINNER (more about simple modulation); and the usual commentaries on AMATEUR BAND, BROADCAST BAND and VHF NEWS.

It is my very fond hope that, in the near future, we shall be still further increasing our already excellent liaison with RADIO AMATEUR. It's Editor, G2UK, has been of inestimable assistance to our Society in the past and still has the QRP side of the radio hobby very close at heart.

Anyway, at 1/6 RADIO AMATEUR is pretty good value!

If you have difficulty in getting it from your bookstall write to the publishers, A.S.W.P.Ltd, 57 Maida Vale, London, W9.

..... C H A N G I N G C A L L S

We hear of another two of our members who will shortly be spreading the QRP gospel overseas. G2AJU has already sailed with his family for the VK6 area of Australia and G3AGG is off to Vancouver. Good luck!

41/16

TOP BAND SWL PANEL

	<u>COUNTRIES</u>	<u>COUNTIES</u>	<u>TOTAL</u>
W.B.Baker	6 (-)	52 (-)	58 (-)
H.G.Wells	7 (-)	39 (-)	46 (-)
D.G.Gordon	5 (-)	35 (-)	40 (-)
E.Gardiner	4 (-)	35 (-)	39 (-)
J.Godfre	6 (-)	28 (-)	34 (-)
P.Huntsman	5 (5)	25 (26)	31 (31)
N.Bason	4 (4)	15 (15)	19 (19)

Here again we have done as in the 1953 "200" contest and have shown the accumulated total together with the 1953 scores in brackets. We feel that it may be interesting to see who first collects all available countries as well as who acquires most in the twelve months. Therefore the same comment holds good for this contest -- that, in

the accumulated total column, no country or county recorded last year may be counted again this year.

QRP FREQUENCIES

It has been suggested by Sam Hall, G2AOL, that it might be worth considering the adoption of a certain frequency on each band to be used for CQ QRP AT ANY TIME. He suggests 1840 Kc/s for Top Band and 40 Kc/s inside each of the other bands, ie, 3540, 7040, 14040, 21040 and 28040. When active on any band a regular check could be kept on the assigned freq for other QRP "types" with the probability that many more QRP QSOs would result. The scheme would give an easily remembered system and, in the case of SO anyway, a normally quiet "spot on the dial". If agreed to it would be important to make frequent use of "CQ QRP" at all times and especially away from peak periods.

Comments on this idea would be appreciated

XX
 Members SMALL ADs will be accepted at a minimum of 6d for three lines.