

ARAD

Dedicated to the
advancement of LOW POWER RADIO

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RESEARCH GROUP



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OFFICIAL REPORTS

No 17



17/1
FEB 1951

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EDITORIAL

How does the sports writer fill in his column when the event which was to have been his high-light is completely washed out? Our glorious, temperate British climate should provide plenty of practice for such a situation.

But it was neither rain nor snow which inflicted disaster on our January contest. By a stroke of cynical fate it was, fundamentally, that brazen old hypocrite, King Sol. I have no idea who first granted him the dignity of royalty, but I would gladly have "crowned" the spotty-faced, interfering old so-and-so on January 14th when he maliciously ruined our chances by squeezing out his spots all over the nice clean Layers which Messrs Appleton and Heavyside so kindly provided for us.

I suppose it is a clear case of "least said soonest mended", and, as all reports received to date are unanimous that there was "nothing doing" (and that goes for the QRO boys as well) there is not much that I can say.

Let us hope that the "long term" contests -- the QRP Trantest and the Carter Shield -- make up in gradually increasing interest for this very flat start to the new year.

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RADIO CONTROL OF MODELS.

On several occasions in the past we have mentioned this im-

portant aspect of our hobby. It is particularly suited to our technique since, from both Tx and Rx views, the gear must of necessity be highly QRP. We know that more than one of our members are already interested in either boat or aircraft control, lead by our Group President, C.W.C.Overland.

Here at QRP HQ we are getting busy on a radio controlled speed boat, the idea of which was born during last year's holiday. Progress to date is favourable and it is hoped to launch the craft, flying the pennant of the QRP Group, during the early summer. If initial tests prove satisfactory full descriptions will be published in these pages and the date of the public launching fixed. It is hoped that as many as possible of our Home Counties members will turn up and make the occasion a really well supported QRP rally.
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CALCULATING Q R P.

A number of letters have come in this month, from recently joined members, asking for information on this point.

The agreed maximum rating for a receiver is 1.25 watts HT consumption. This is very easily calculated from a fundamental law of electricity which informs us that WATTS = VOLTS x AMPS. But, in practice, the current consumption (HT) of a valve is reckoned in milliamps (1000 mA = 1 A) so our formula must be altered accordingly and this we do by deviding by 1000. Now, converting this into the recognised symbols which we meet in radio text books, we have:-

$$W = \frac{V_a \times I_a}{1000}$$

where W means "watts", V_a means "anode voltage" and I_a means "anode current in mA". In the case of a one valve set it is only necessary to substitute the actual values of V_a and I_a and work

out the fraction.. For receivers with more than one valve the sum must be evaluated for each valve. For example, suppose a set uses an HL2K detector and a 210LE audio valve with 125 volts HT to each valve. We should then have $V_a = 125$ and $I_a = 2.0 + 4.8 = 6.8$

$$\text{Then:- } W = \frac{V_a \times I_a}{1000} = \frac{125 \times 6.8}{1000} = 0.85 \text{ watts}$$

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THE TU6B TRANSMITTER - RECEIVER (part 2).

The first step is to strip the TU of all parts not needed for the Tx-Rx. This process will engender a large measure of respect for the rugged assembly methods which characterise Signal Corps equipment, and to be honest, perhaps a certain amount of exasperation. The lives of men depended on the reliability of their communications equipment and it was built accordingly. Patience and the proper tools will, however, soon see the unit ready for conversion. In addition to the usual pliers and screwdriver, a set of Allen screw wrenches is a must. These are essential because of the profusion of set screws which are not removable otherwise. Leave only the centre partition, dials, coil, condenser and switch on what will be the transmitter side of the finished product.

Construction is started in the receiver section by cutting a piece of Masonite to serve as a sub-panel. The size is approx 6" x 7", mounted $3\frac{3}{4}$ " down to allow clearance for the tubes and coil. Lay out and drill the three socket holes. The sub-panel is next mounted, using $\frac{1}{2}$ " x $\frac{1}{2}$ " angle brackets. The tuning condenser C3 and bandspread condenser C4 are next mounted. These are brought out to their respective dials and knobs by using $\frac{1}{4}$ " dia bakelite rod and $\frac{1}{4}$ " / $\frac{1}{4}$ " solid or flexible couplings. Drill a hole through the panel for the control of C4. If a flexible coupling is employed,

a $\frac{1}{4}$ " panel bearing may be used to prevent wobble. Regeneration control R2 is mounted behind the hole left by one of the original switches which brings it below the sub-panel. The front panel layout is completed by mounting the phone jack and the small feed through insulator for the antenna lead. A four-lug terminal strip is mounted under the sub-panel to make a handy junction point for the power supply cable, which need not be attached until all the interior wiring is finished. The original RF choke, found on this side of the TU is used as RFC1. With the remaining components connected and the coils wound, the receiver may now be connected to an external power supply, ready to be tested. Working properly this receiver will prove itself to be a capable performer

"Scanning" the crowded ham bands is a lie surely performance with a 50/1 vernier dial. In practice it will be found that the condenser C4 is useful where it is desired to speed up the action of the vernier dial. To elucidate, the slow action of the high ratio dial makes re-tuning to bring in a wanted signal a slow process. When the desired signal is approached by the dial, the directly driven knob of C4 may be used to clarify it. Fine calibration is easy since both a rough and fine reading may be logged. Because of it's very low capacity, the setting at the time of calibration will have little influence when relocation is desired.

Construction of the Tx section is started in the same way as with the receiver. Exact dimensions of the Masonite sub-panel will have to be ascertained by the constructor since there may be some variation in coil placement. Irrespective of the size, two holes are needed for the tube and crystal sockets. A hole must be cut in the panel for the milliammeter. Although of heavy gauge, the aluminium panel will be found easy to work with a circle cutter.

Lacking a cutter a series of hand drilled holes and some smoothing with a half-round file will be found satisfactory. Mount the keying jack under the meter and the two feed through insulators

for the antenna transmission line. Another lug-strip, this with five terminals, is employed in the same way as the one in the Rx. RFC2 is likewise the choke found in this section of the TU. The heavy duty switch should be retained as it provides an excellent means of shorting out the meter when keying -- always a wise practice.

After completion of the Tx the final step towards getting on the air is the construction of the antenna coupling, L3 C15. Among the surplus parts, the condenser and coil removed from what is now the receiver section will do very nicely. The coil and condenser may be mounted on a Masonite base and fastened to the wall at the point of antenna lead-in. Because of its heavy duty construction and generous air gap, the variable condenser might be better employed in the amplifier section of a higher powered rig. A condenser of lower rating will do as well. In tuning up the transmitter there are no exceptions to the conventional procedure. With the antenna coupler detuned, the plate voltage is applied and the tank circuit tuned to the point of lowest dip as indicated by the milliammeter. When this point is found the antenna may be loaded to draw somewhere in the neighbourhood of 75 mils. Before shorting out the key a few signals should be tried. If, when keyed, the meter shows a state of non-oscillation by jumping beyond it's previous reading, the antenna may be too heavily loaded. If an annoying hum is heard in the receiver, even when the key is up, it may be necessary to kill the transmitter power by cutting the high voltage centre tap. The switch to accomplish this may be mounted conveniently on the Tx panel. Operation on the 40 metre band is obtained by use of the proper crystal and shorting out a portion of the tank coil. A short piece of flexible wire to which an alligator clip is attached is used as a shorting bar. A piece of heavy gauge wire soldered to the coil winding provides a terminal for the clip. The exact position of the wire will be subject to a small amount of experiment but

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will, roughly, be found to be about half way down from the end of the coil. This may not produce peak efficiency, but it is effective and in this case more convenient than the use of plug-in coils. For operation on 80 metres the shorting lead will be safely disposed of if it is tucked down inside the coil former. Where space is limited and the "shack" may be no more than a corner of the living room this transmitter-receiver will fit well and in no way detract from the decorative motif. Portable operation is also a possibility. Very enjoyable contacts have been made with this rig, with favourable reports on it's signal strength, surely a sufficient return for the time taken in it's conversion.

(The above article , by C.E.Clark, WKLS, is reprinted from the Chicago RADIO NEWS).

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STATION V E 8 O M.

The long awaited letter from Don Matheson has arrived, and so interestingly does he describe current conditions in VE8 that I cannot do better than reproduce the bulk of the letter verbatim.

"Dear OM," he writes, "Thank you very much indeed for your letter and copies of "Q R P", received here in the last mail a few weeks ago -- VE8-land doesn't get it's daily delivery!.... As to getting on the air, I am waiting patiently (?) for this next mail which should bring me a new crystal for 80 metres (around 3900 Kc/s). The Tx which the Company (The Hudson's Bay Co.-Ed.) have here covers only part of that band, consequently I guess it will be 80 only for the time being. Operating times will be irregular as we have to depend on the wind to charge our batteries at present so with the longer dark periods we don't use the gear beyond our nightly contact with the Govt stn at Chesterfield Inlet. However I should have explained earlier, most of these stations

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have a two valve Tx (20 watts) and NC46 Rx, operated off 32v batteries. We are about 8 miles from the Govt Radio Range Station here -- the ops there are active on 20, 40, and 80 and I see they have been heard by members of the Group -- the c/s is 80H. I'm not sure if they QSL or not. We have a nightly sched with them on 80 at 5.45 eastern -- they are on phone and we are CW. Our commercial freq, like all other HBC stations, is 4356."

"My home QTH is Basingstoke and I've only been VE for a year and a half. I was VE2AGO last year at Port Harrison, wkg mostly on 40, with an 1154 Tx (not vly QRP!). Before coming out I hoped to have gone /MM, but saw more future this side of the 'ditch'. I am the assistant at the store here, 'learning the business', and do all the radio operating (which suits me fine). Before coming out I did a lot of SWLing -- burning the midnight oil usually to get the Dx on Top Band."

"Southampton is one of the more fortunate Northern places in that there is an airstrip -- constructed by the Americans during the war. In winter the area is kept flat by snowploughs and bulldozers, the RCAF having two men here specially for the job. Up to the middle of November we had planes in every week or so, but since then only one has got close and turned back owing to the cleared strip not being long enough -- so our Christmas mail is still in Churchill. Every settlement in the North have had their winter's mail except here, and we are one of the few with an airstrip! Still, we can't complain -- I guess it wasn't so long ago when there was one per year, and that was that!"

"I must thank you for publishing my call and will certainly QSL -- as an ex-SWL I know what it is like to get "let down". If you want any VE8 QTH's let me know and I'll do my best. I listen quite a bit on 80 at night when all the Baffin Island boys are on, though, as I say, I hope it won't be long before I can substitute "work" for "listen"!"

Well, there you are, OMs -- and we have been grumbling at half an inch of slush! Let's hope that Xtal got through all right and that it provides many an interesting contact to lessen the monotony of that snowbound isolation. I am afraid that there is faint hope of any of our QRP receivers pulling in a signal from Don on 80, but I do hope that, when he can get onto 14, we shall be able to make regular scheds with him and that our SWLs will make a big hole in his stock of QSLs.

We all wish you the best of luck, Don, and hope those snow-ploughs are making a clean sweep of it now.

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EXPERIMENTAL CIRCUITS, No 2: A PERSONAL Rx

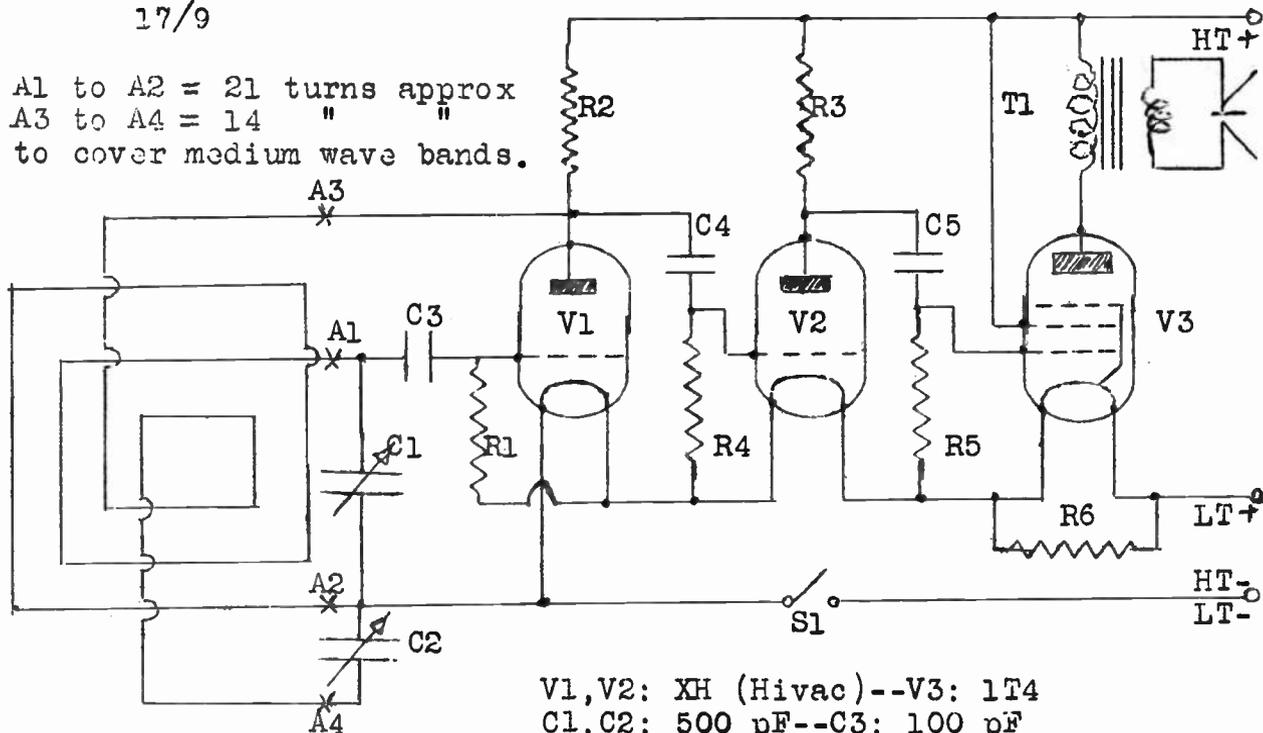
The outside dimensions of the "cabinet" which houses the whole of this highly portable receiving station, including loud-speaker and batteries, is $4\frac{3}{4}$ " x $4\frac{3}{4}$ " x $2\frac{3}{4}$ ". The weight is a little over two pounds, and it will work anywhere -- even while slung from your shoulder in a camera case.

It is not experimental at all in the matter of it's basic circuit. That is tried and tested. The only point on which experiment is called for is in regard to the aerial dimensions. Those shown are for medium waves, so that a reduction in turns will be needed for Top Band and again for 80. A little trial and cut is called for here, though the difference between the existing range and 160 metres will not be more than two or three turns. With a little forethought it should be possible to switch the surplus turns so that both Top and medium are available -- and, perhaps, 80 as well.

I got the gen on this set from a friend whose real hobby is fishing and to whom a receiver is a knob you turn to get the news. So you can be assured this Rx is simple to make and very reliable.

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A1 to A2 = 21 turns approx
A3 to A4 = 14 " "
to cover medium wave bands.



V1, V2: XH (Hivac) -- V3: 1T4
C1, C2: 500 pF -- C3: 100 pF
C4, C5: .01 uF (150v Wkg)
R1: 2 Meg -- R2: 100 K -- R3: 150 K
R4, R5: 1 Meg -- R6: 80 ohms
T1: 90/1 midget o/p transformer.

The loudspeaker is a 2½" Celestion. C1 and C2 may be either solid dielectric (mica) types or of the very small "air trimmer" variety. Obviously increased performance can be obtained by the addition of an external aerial, and this can be easily arranged by winding a few turns of wire round the outside of the "cabinet" so that the existing frame aerial windings are acting as a "coil" and are inductively energised by this additional aperiodic winding.

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The ends of this external winding will, of course, go to the external aerial and to earth respectively. Alternatively they may be used to feed from a dipole. The internal frame aerial should be of 34 swg DCC wire, semi pile-wound on four nails insulated with sleeving and placed close to the corners of the back panel so that the mean dimensions are 4½" square.

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S W L ACTIVITY.

P. WHITE (Rushden) says activity is still flourishing and so it would seem judging from his list of Rxs which include an SH4 (1.1W), a 1-V-1 (.4W), a 0-V-1 (.3W), and a 1-V-0 (.3W), all mains operated except the SH4. Experiments include an SH2 (two 6K8s) and future plans are being laid for a 132 ft long wire to replace the present 32½ ft job. An aerial tuning unit has also been constructed and has proved a pronounced improvement.

P.HUNTSMAN (Hexham-on-Tyne) having, like so many more of us, spent a period in bed with 'flu, passed the time, unlike most of us, with the 0-V-1 beside his pillow and logged 150 stations in 20 countries during two days.

MIKE WASSELL (Birmingham) has been modifying his SH4 to cover down to 8 metres. He recently challenged a BC348 to show it's paces and, owing to the latter's excessive noise, his SH4 (using only 95 volts HT) gave an excellent account of itself. Mike is converting an 18 set for 10 and 15 metres which will complete his collection of 18s as he already has one each for 1.7, 3.5, 7 and 14 Mc/s.

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All future issues of "Q R P" will appear as soon as possible after the 15th of each month. The "deadline" for all news must therefore be the 3rd or 4th of each month at latest.

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TX ACTIVITY.

G3EKP (Darwen, Lancs) has made up the Tx described by GW2DDX, using an EL32 in place of the 6L6 for reasons of heater economy (2 cycle lamp batteries when portable). He says "...it worked immediately on completion and, except for a slight chirp if the CO is loaded too much, is fine." He has worked 1.7 and 7 Mc/s and when home as at present, uses DC mains with a 40 watt lamp as ballast. The antenna is a W3EDP and Xtals at present are 1850 and 7030 Kc/s.

G3GZJ (Deptford, SE8) covers 1.7 to 28 Mc/s with a Tx using HL23 Xtal grid, tuned anode oscillator and an ATP4 double tetrode PA, the input being up to 3 watts. Due to local restrictions the antenna is a 30 ft end fed indoor rig. Receivers at present are a modified R109 and a 1-V-2, the latest acquisition being a 21 Rx. Incidentally 3GZJ is ex-Y11FC and still has some cards left if any of his old friends failed to get one.

G3CHW (Pontefract) runs 1 watt into a pentode CO with a 66 ft dipole. Operating times are 1000/1600 hrs on 7 Mc/s. Owing to shift work, however, he can only manage two weeks in four and no weekends. CHW promises to QSL 100% to both Tx and SWL members of the Group. He is organising a 138 ft end fed so that he can get onto 1.7 with a VFO/PA. In his first month on the air he has worked 10 countries with 32 QSOs.

G3EBL (Worcester Park, Surrey) has a most remarkable "Best QSO". When he was VQ4HGB he worked Coventry (England) on CW from Nairobi (Kenya), using 0.8 watts and a 33 ft, almost vertical ant. He hopes to be Xtal-con. and VFO on 14, 3.5 and 1.7 early in Feb, both CW and phone. He is looking forward to meeting other members on the air. EBL was also AC3SS for a period.

G3HBI (Herne Hill, SE24) has migrated to Top Band and has been getting his one watt out fairly well. He would welcome any reports from Group members and QSLs 100 %.

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"Q R P" C - Z PANEL.

1951 SERIES	Megacycles				Total	
	3.5	7	14	28	C	Z
P.Huntsman	4	7	56	--	60	22
H.G.Wells	14	1	25	--	36	14
D.G.Gordon	9	9	34	--	36	13

No doubt there will be several changes in our C-Z Panel regulars this year owing to the number of SWLs who have achieved their licenses and will consequently turn their attention to the Two-watt Panel or Trantest. But P.H. has given us a fine start and judging by the quiet regularity with which he climbed the Panel last year, I am expecting him to be among the leaders from now on.

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"Q R P" TWO - WATT PANEL.

1951 SERIES	Counties		Countries			
	1.7	1.7	3.5	7	14	28
G5QI	2	24	15	13	--	--

Now, come on chaps -- you left all the hackwork last year to 5QI and 3EDW, and it's got the makings of a good contest if you put a little bit into it. Don't try to kid me that only two of our members have had QSOs at less than two watts!

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THE GROUP Q S L CARDS.

G3CED's design met with very widespread approval and orders followed so rapidly that I had no hesitation in submitting the layout to one of the best known QSL card printers in the country for an estimate. This estimate is duly to hand and, though I had hoped, thoughtlessly perhaps, for an even better price, I cannot see how, in view of the present tremendous cost of paper and printing, any great improvement could be made.

On this estimate the cost of the cards will be as follows:--

Per 100,	10/6	=	10	cards for	1/0 $\frac{1}{2}$	or	approx	1 $\frac{1}{4}$ d	each
"	150,	15/0	=	"	"	"	1/0 $\frac{1}{2}$	"	1 $\frac{1}{4}$ d "
"	250,	£1.3.0	=	"	"	"	11d	"	1 $\frac{1}{8}$ d "
"	500,	£2.1.6	=	"	"	"	10d	"	1d "

Unfortunately, of course, the design which we have chosen is by no means the cheapest to reproduce, entailing as it does special blocks and double printing for the two colours. Even so the above charges, on due consideration, are not exorbitant.

Will you please let me know your reactions to this, OMs?

Before I can clinch the deal I must have your firm orders in hand -- you need not necessarily send cash in the first instance, but I must be able to assess my outlay. At the same time please do let me know exactly what you want printed down that left hand column (which, you remember, is variable to suit your individual requirements) and also let me know the exact location of the lines of latitude and longitude for your QTH.

As the advertisements say, don't delay--do it now! The sooner we get all your gen together the sooner we shall be able to let the printers have confirmation of our bulk order.

I should like to hear from you by return on these points, and if you feel it's too expensive don't fail to say so, otherwise you will leave me wondering if your order is coming in later.

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"Q R P" TRANTEST.

	Total to date	QSO with	Miles	Mc/s	Watts	X	Points	Months TOTAL
G3HCW	--	OH2AU	1100	7	1	2	2200	
Pontefract		SM7BHF	570	7	1	2	1140	
		DL1ZN	420	7	1	2	840	4180
G3EDW	--	G3CGD	120	3.5	1	5	600	
Rayleigh		ON4JW	150	3.5	2.5	5	300	
		OZ7BO	520	3.5	2.5	5	1040	1940
G3EKP	--	ON4IK	300	7	2	2	300	
Darwen		GW3GXL	150	7	2	2	150	
		G8SI	90	7	2	2	90	540

The column X is the frequency multiplying factor, 160 metres x 10, 80 x 5, 40 x 2, 20 x 1, 10 x 1. (See note below).

The formula on which this contest is based is :

$$\frac{\text{MILES} \times \text{X}}{\text{WATTS}} = \text{POINTS.}$$

The multiplying factor, X, has been the subject of some discussion and an amended version has been suggested by G3EDW who is convinced that the present figures give too great an advantage to Top Band users. He suggests that the X factor is modified to 160 metres x 5, 80 x 3, 40 x 2, 20 x 1 and 10 x 1. He has also pointed out my original error in quoting 10 and 20 as multiplied by "nil", a slip which I have hastened to correct as witness above!

Will you let me know what you think about these suggested amendments, OMs? If you agree that the existing factor is too much in favour of 160 we can still alter it before next month's entry.

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TOP BAND RECEPTION REPORTS

P.Huntsman, Hexham-on-Tyne:

- 17/12/50 -- G2CID, 2YM, 3FK 3CSE, 3FEW, 3AGP, 6FO, 6UC.
- 20/12/50 -- G2FXK, 2ADD, 2YV, 3GP, 3EKT, 3CKW, 3ANS.
- 28/12/50 -- G2ACV, 2ADD, 2QX, 3FGI, 3AUT, 3FEX, 3HSR, 3FDG, 3BEE, 6WI, GW3AJ.
- 30/12/50 -- G2BOI, 2FNW, 3EKT.

H.G.Wells, Waltham Cross:

- 2/1/51 -- G2DPQ, GW3AL.
- 6/1/51 -- G5XM, GD3UB, GW8BW.
- 20/1/51 -- G2DPZ, GW8BW.
- 21/1/51 -- G2FPS, 4OC, 5QG, 8UR.

D.G.Gordon, Bournemouth:

- 21/1/51 -- G2ACV, 2ABV, 2BCX, 4MY, GM6SR, GW2BW, GD3VB. (All phone).

Ron Turner, Brierly Hill

- 16/1/51 -- G2ABK, 2BOF, 3EPT, 3FGT, 3MFQ, GW3FWY.
- 17/1/51 -- G2FS, 2JF, 2KO/A, 2YU, 3ABG, 3AVT, 3EAY, 3FST, 3GHC, 2GKQ, 2GR, 3GWG, 3HAQ, 3NT, 3TA, 3YF, 5BP, 5HB, 5JL, 5JS, 5MY, 5WW, 5YN, 5XF, 6LL, 6NB, 6VC, 8JM, G16YN, GM3UM, 8MJ, GW3CDH, 3JI, 3JS, 3ZV. (All the above CW).

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BRISTOL NEWS.

Our three Bristol members, G3GZA, G3HCN and G3FYX, have arranged to spend every TUESDAY EVENING solely on QRP work in the 160 metre band. GZA will use 4 watts CW, HCN 4 watts CW and FYX 3 watts phone. All reports will be welcomed and SWL members are requested to make a special effort in monitoring the band on Tuesday evenings. As a further identification the normal "CQ" calls will be interspersed with the call "CQRP"

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WHEN YOU READ "S W N"
READ "S W N"

WHEN YOU CALL "C Q R P"
CALL "C Q R P"