

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

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.....
JOURNAL OF THE
Q R P SOCIETY



.....
ISSUE No 56
FIFTH YEAR
JUNE 1954

.....Published in the last week of each month:.....

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Deadline for publication in next issue is the 12th of each month

EDITORIAL

Once again we reach the month when we must say THERE WILL BE NO "Q R P" FOR JULY owing to our entire editorial staff being on holiday. In past years we have tried to arrange things so that it might be possible to get in an issue, but cutting two weeks out of a month makes it an altogether unequal struggle. We shall be with you again, as usual, in August and I hope that by then we may have devised some means by which we can increase our size by a page or two -- our most pressing need at the moment.

ANOTHER RECORD TO QRP! -- News has just reached us that Jack Harris, G2BOF (winner of our "200" contest for 1953) has succeeded in working Fifeshire with a transistor transmitter on Top Band. It is hoped that he will participate in our Transistor Tests, details of which will be found on page 13 of this issue.

Please do note the deadline date given in the heading above. This will be of especial importance for the August issue.

DESIGN OF QRP SUPER-HETS,
 by DAVID WHITE, G3JKA.

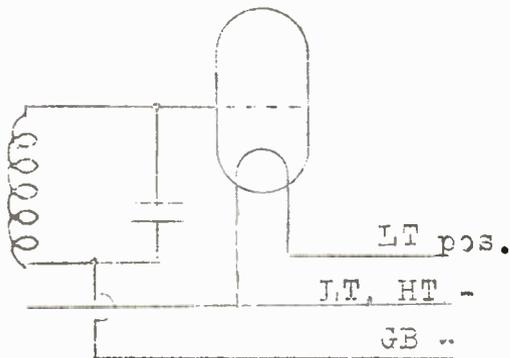
AUDIO AMPLIFIERS (continued from last month):

As far as audio amplifiers are concerned a high gain pentode or triode will be suitable. Coupling to any subsequent stage will usually be R.C. since with normal pentodes and high-mu triodes the anode impedance is too high for transformer coupling to be useful.

For use with a diode detector, a triode or pentode combined in one envelope with one or two diodes will normally be used. For mains, suitable valves are: EBC33, 6SQ7, 6B8 or EAF42. For battery operation: 1S5 (1.4 volts), HL23DD, KBC32 (2.0 volts).

If an anode bend detector is used an RF pentode will do and may be followed by another such valve, used as an audio amplifier if more gain is desired.

For battery operation the diagram illustrating last month's article will be modified in order to supply bias as shown here.



Note that there is no objection to the use of non-thermionic (crystal) diodes in place of thermionic diodes.

We have now completed the survey of the sections of the standard PX and can proceed to a consideration of any additional circuits or techniques which will enable us to improve the performance.

The desirability or otherwise of having AVC has been discussed previously in this magazine (with some heat, at times!) and most people seem to be of the opinion that, for QRP work, it is not essential. My own opinion is that it can prove

(Continued on page 5)

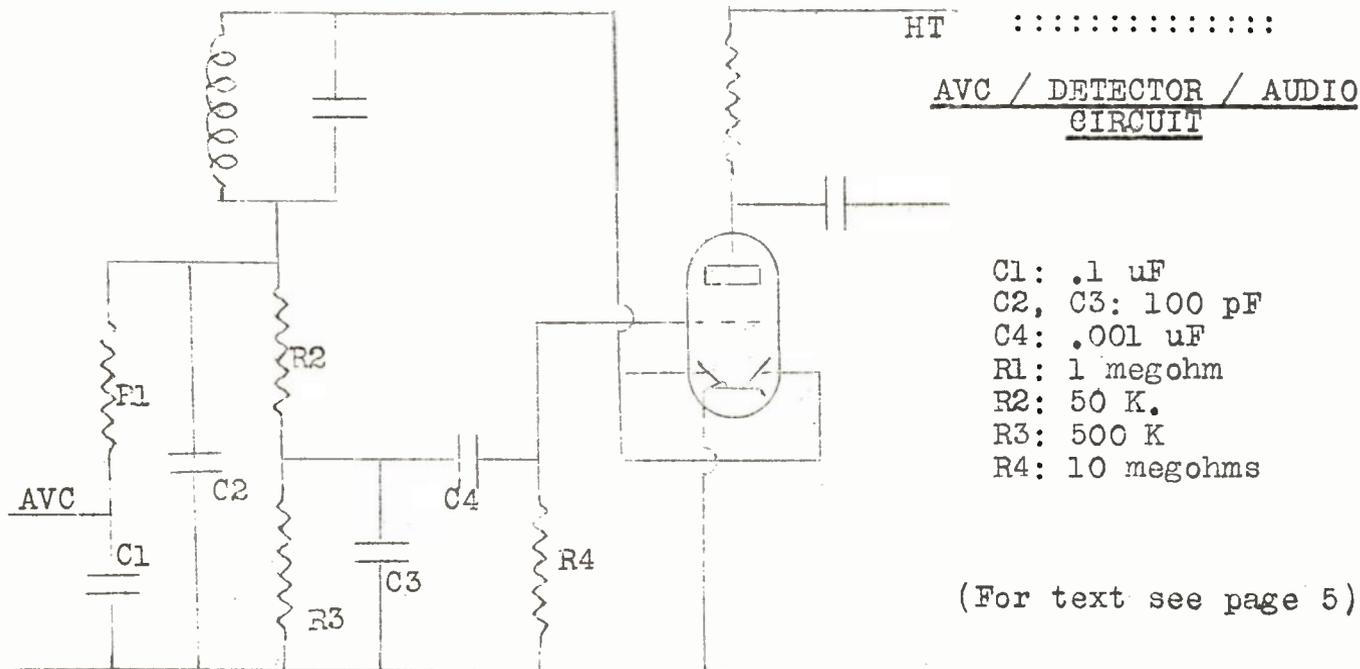
.....: THE FIVE WATT NET :.....

Most of you, no doubt, read the Old Timers' "Random Jottings" in the June Short Wave Magazine and will have appreciated the paragraph headed "Time and Motion Study" in which he said "...Then again, so many local QSO's (chiefly nets) operate with far too much power. In this connection, we are glad to note that there is a move afoot for a power limit of 5 watts for local nets, and it would be a good thing to spread a certain amount of propaganda on this subject. Too many stations working semi-locally (typical 80-metre contacts, for example) seem to regard signals of S9-plus as the bare minimum necessary for results. If they can achieve a report of S9 plus 40 dB with their 150 watts, they could reduce to less than 20 watts and still maintain S9 signals; with real QRP they could still be S7 or even better. BUT THEY HAVE NEVER TRIED IT FOR THEMSELVES AND CAN'T BE BOTHERED".

We are much encouraged to see that "The Old Timer" has thus publicly approved our tentative plans to organise a campaign to popularise the use of low power on local nets, the first announcement of which appeared in Short Wave Magazine for May (The Month With The Clubs page 186). We feel that, at last, we have an ally here (and a strong one at that) and that we are no longer the lone voice crying in the QRM.

Already we have one net working regularly at well under the five watt maximum and a transistor-TX net is in the process of formation. From these we hope to build up facts and figures which will speak for themselves. Undoubtedly, however, our most valuable asset is the ever-increasing number of clubs and societies which are affiliating to the QRP Society. If each of these would set aside one period each week for a 5-watt-maximum net we should have a demonstration that would rapidly gain national proportions.

WE PROPOSE TO SET ASIDE A COLUMN EACH MONTH FOR 5-WATT NEWS. All clubs and individuals can help our campaign by reporting items for this



.....: OPERATION ARIES - 3, by G5JNB. :.....

The first phase of the operation has been, so far as we amateurs are concerned, a dismal failure. Due to extremely bad weather conditions in the Atlantic and circumstances of which I have not yet had details, Aries was unable to comply with her communication schedules during the outward voyage to New York where she arrived on Friday 25th June, a fortnight overdue.

Information as to the schedules for the return trip are given
 (Please turn to page 16)

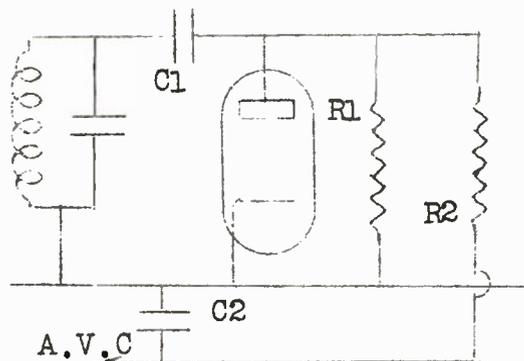
(Continued from page 2)

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useful but generally is only an aid to laziness. It does enable the provision of an "s" meter and due to the increasing use (and abuse) of this instrument, this is probably a potent argument AGAINST the use of AVC.

AUTOMATIC VOLUME CONTROL.

AVC is usually applied by taking the standard parallel diode detector circuit, smoothing the O/P and feeding the negative bias to one or more stages of RF (and IF) amplification. The method is shown in the figure below.



In this figure R1 is the diode load and R2, C2 are the smoothing. Now the great snag here is the damping imposed on the tuned circuit (which is usually already damped by the detector anyway). This damping is equivalent to shunting a resistor, value $R1/3$ across the tuned circuit.

There is, however, another way of obtaining AVC and the figure on page 4 shows a circuit giving undelayed AVC, detection and audio amplification. It

will be seen that the 6Q7 is grid leak biased with 10 megohms. If normal cathode bias is used the grid leak should be reduced to 500 K and the bottom of the 500 K diode load should be returned to the cathode. In this circuit the only damping is that imposed by the diode load and is approximately equal to 250 K. A point to be remembered about AVC is that it operates by REDUCING the gain of the RX, so that when all the available gain is required as, for instance, when receiving weak amateur signals, AVC is, if anything, undesirable.

(To be continued in our next issue)

.....: MAKING THE MOST OF TWO VALVES :.....
A O-V-1 BY H. J. HINKS.

It is all too seldom that we are presented with descriptions of two valve receivers which have been given so much careful thought in the design stages. Unlike the majority of present day SWLs, H.J.H. has not been satisfied to build a rig around one central object or idea, safe in the knowledge that another rig, or a rebuild, will give the maximum on some other pet objective. He has worked from the start on the assumption that his one RX is to fulfil every possible aim and to provide such an abundance of satisfaction that it will remain his most cherished pride for a very long time. That he has achieved his object may be judged by the fact that it was completed in March 1953 and has been in use EVERY DAY since with only one modification during that time.

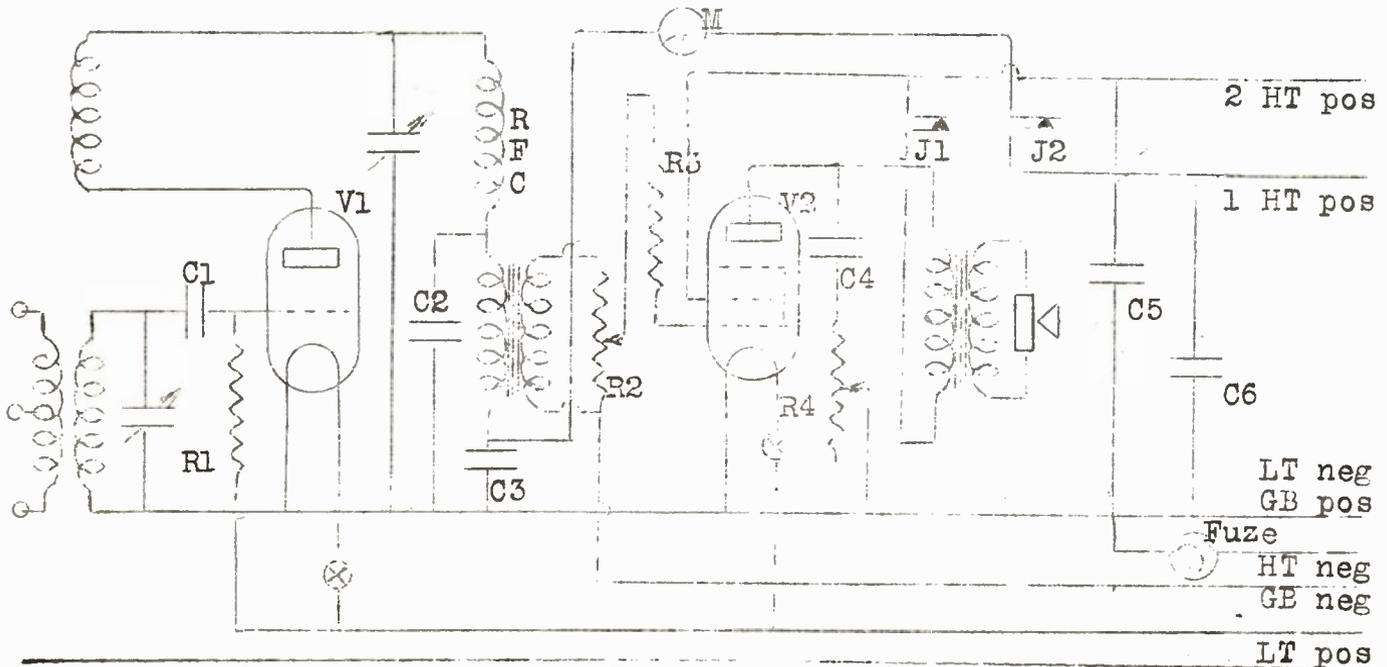
The "objects" originally drawn up were (a) to produce a RX which would be economical and use low HT, (b) to get up to, or near VHF, (c) to use the same tuning condensers and dials throughout, (d) to provide mechanical bandspread, (e) to use high or low resistance phones on either of the two stages, (f) to load an internal and, if possible, an external speaker, (g) to provide adequate reception when using an indoor antenna, and (h) to be reasonably selective.

The one modification, carried out in May 1953 was the inclusion of a volume control, partly for normal use, but mainly to enable selectivity to be maintained; and as a result, H.J.H. claims that selectivity approaches that of a "basic" super-het. "Anyway" he says "it is a grand, flexible RX and I have no desire to change it."

The circuit diagram, on page 7, will be seen to contain a minimum of resistors and electrolytic condensers, these having been eliminated to enable HT batteries to be run at a low level. One or two valves may be used at will. The 1 mA meter is used to indicate approaching oscillation, which it does on all coils used in the prototype. The tuning

COMPONENT VALUES: -

C1, .0001. C2, .0005. C3, .0005. C4, .03. C5, C6, 4 uF.
 R1, 5 meg. R2, 1 meg. R3, 100 K. R4, 50 K. RFC, Eddystone 1010
 V1, HL23. V2, Pen 25. T1, 7:1 intervalve tranny. M, 1 mA meter

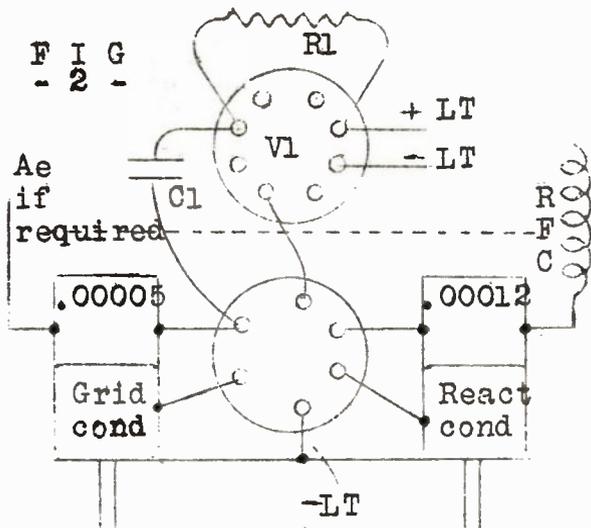


dials are Admiralty precision from Messrs J.B. Service and were easily adapted to operate the variable condensers through flexible couplers. The very low capacity variable condensers are from TR9 and No 21 receivers, the former being used for grid circuit tuning. These twin ganged condensers are not used in a normal manner -- the 6-pin coil is virtually a 4-pin across ONE section of a condenser, links being used on the additional pins to bring in the OTHER section of the condenser in

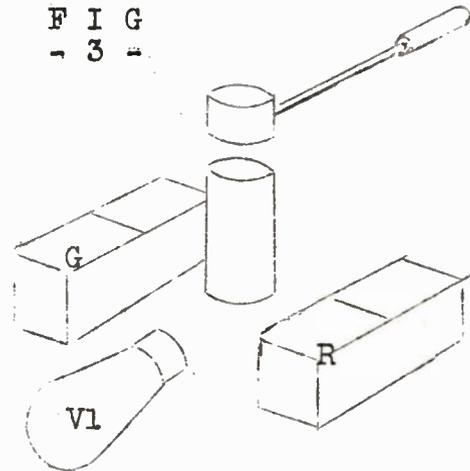
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parallel if found necessary. The LF transformer is a Ferranti high ratio (7:1) type, and the RFC an Eddystone type 1010.

As regards wiring, the principle is to get components such as fixed condensers as near to their functional points as possible and to have the longer leads remote from these points. The HL23 valve is mounted horizontally under the chassis deck with the major axis of its grid vertical. As the coil sockets come between the variable condensers and near those of the valve holder, the wiring is kept quite short -- see Figs 2 & 3. Folding Fig 2 on the dotted line will show how short the leads really are, and nicely spaced.



UNDER CHASSIS VIEW OF
DETECTOR STAGE.



RELATIVE POSITION OF COMPONENTS
PLAN VIEW FROM BACK OF CHASSIS.

The chassis is made from ply-wood and has a deck at two levels (Figs 4 & 5) so that tuning condensers and valve can be placed under the higher one and a loudspeaker above the lower, leaving room underneath it for potentiometers. An expedient found effective against hand capacity is not to couple the circuit or case to earth, but to let them "float" independantly. Only the aerial link coil is coupled to E when desired. Care should therefore be taken that components are properly insulated.

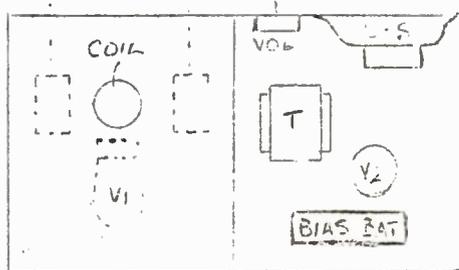


FIG 4

Plan



FIG 5

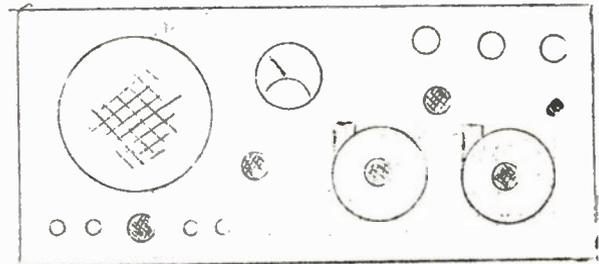


FIG 6

Panel 18 $\frac{1}{2}$ " x 10 $\frac{1}{2}$ ".

The main coil holder is centred about two diameters from the panel, so that the aerial link coil may be moved towards the panel for changing coils. This link coil is carried on a brass rod sliding in a long panel bush. It is wound in the same sense as the main coils on the top half of a 1 $\frac{1}{2}$ " formar and the 16 turns of 22 swg wire, close wound with centre tap, serve all bands.

Fig 6 shows the front panel. At the top right hand are three feed through insulators carrying leads to the aerial link coil. Beneath them is a small variable condenser for experimental purposes. Centrally over the main tuning dials is the link coil knob. Below the meter is the volume control and under the speaker are the phone jacks (left), the

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tone control (C4 / R4), and the two filament switches.

The coils (Figs 7 & 8) are wound on standard 6-pin formers, $1\frac{1}{2}$ " diameter, and are wound to the same hand with ends terminating as shown for leading internally to pins. The sketch looking at the pins from outside the coil is exaggerated for clarity and indicates by dotted line the links for adding capacity in parallel if found necessary at lower frequencies.

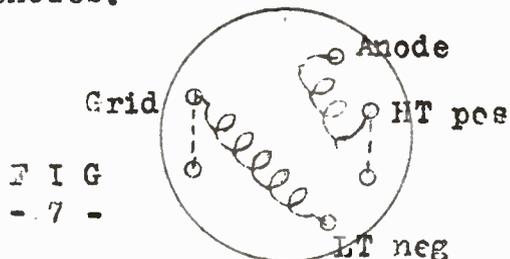


FIG
- 7 -

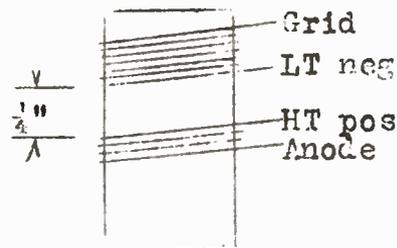


FIG
- 8 -

AMATEUR BAND COIL DATA, found in the prototype to be satisfactory without adjustment. The former diameter is $1\frac{1}{2}$ " and the tuning capacity .00005 uF. Enshelled wire is used for the coils which are spaced $\frac{1}{4}$ " except where indicated.

<u>BAND</u>	<u>COIL</u>	<u>TURNS</u>	<u>WIRE</u>	<u>LENGTH</u>	<u>REMARKS</u>
1.75	Grid	70	24	Close	Windings
	Anode	15	24	"	not spaced
3.5	Grid	35	22	"	
	Anode	10	22	"	
7.0	Grid	20	18	"	
	Anode	8	22	"	
14.0	Grid	10	18	1 inch	
	Anode	6	22	Close	
28.0	Grid	4	18	1 inch	
	Anode	3	22	Close	

Experience will show that the aerial link coupling can be varied to advantage. Keep as near to the point of oscillation as possible, &

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use the volume control if the signals are too loud. On the prototype HT consumption was about 4.5 mA when the dip meter showed 0.5 mA. As readability is not necessarily dependant on volume it is interesting to compare this type of receiver with a superhet where noise level is high

.....: SOCIETY NEWS & ACTIVITY :.....

FRED BAILEY, G3HJL, began a new Top Band rig at Whitsun and, by flogging the production line into a state of intense activity, had it ready for the start of NFD -- to his surprised satisfaction it worked first time! (Well done, Fred. Let us have the gen, OM!)

D.G.GORDON comes up with the first entry for the VHF contest and remarks that the present "summer" weather may cause an increase in his radio activities at the expense of his usual cricket interests.

DEN AUTON survived an NFD night of thunder and deluge with the A.B.C. Group and heard, among many others, 2IC/P with initials PAR, but did not realise till later that it was the fist of George Partridge.

ROGER TAYLOR, G3JAL, has been away from home on a course but has managed to get back home each weekend for the QRP Sunday net on 1880 Kc/s at 1330 GMT. He pleads for more recruits to that net, so "K please all Home Counties members".

GUY MOSER, G3HMR, seems to have been the only member of his group to turn up at the NFD site. The transmitter, apparently, was water-logged, but he kept a listening watch until midday Sunday and heard a lot of activity during the night with a good few t8 notes but many slick performances from the well-trained stations.

MIKE DRANSFIELD, G3JKO, sends entries for the "200" and for the VQ2W contests. He spends $\frac{1}{4}$ hr on the air each midday while eating his lunch and finds 2 watts ample then, but insufficient to compete with the evening QRM (In the VQ2W contest, the rule re "each month" should be regarded as Calandar Months -- ie, first to last day of each month)

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ALFRED "BUD" RUGEL, W0PPM, is our latest new member in W and, to our joy we can claim, at long last, to have found an American station that is genuinely and regularly QRP. Moreover, "Bud" promises to keep us regularly posted with news, developments and all items of interest from the States. (Believe me you get a big welcome to this Society, OM. It is four years now since I first felt the need for a "News from W" column -- but they say everything comes to him who waits!)

J.A.CUSDIN has some scathing comments on the lack of club spirit among the 100,000 inhabitants of his home town of Polegate, Sussex. (As soon as this issue is out, OM, I will get out a list of members nearest to you and maybe you could get a local "QRP" Section going.)

NORMAN BASON has settled into his new shack and, in the process, has stripped all his old gear and rebuilt his station on the basis of our recent suggestion of a O-V-1 "heart" with a variety of add-on units. Results so far seem to have been most encouraging except for the RF amplifier unit which is being obstinate (Proves the value of the unit system, OM, in leaving the rest of the job OK while you get that going)

THE LONDON SHORT WAVE CLUB, G2CLR, deserves a word of welcome as a newly affiliated club. They, together with

THE KINGSTON & DISTRICT AMATEUR RADIO SOCIETY, whose affiliation has come through as I write, bring the total of our affiliated clubs to a figure which will certainly enable us to organise something pretty good in inter-club interest during the coming season. We are especially glad to welcome the K & DARS who have always been most generous in their cooperation with this Society.

ALLAN HERRIDGE, G3IDG, is now using a QV04-7 as PA and finds it as good as an 807 on the lower freqs and better on 10 metres. Despite being rock bound on 28100 Kc/s and having to use an attic half-wave dipole, Allan has managed to cover most of G as well as a stray II.

NILS HANSSON, SM3MD, comes in as our second Swedish member, his chief interest being VHF (I am sure many of our G members would like to make a sked with you, OM, so could you let us know times and freqs?).

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.....: QRP SOCIETY SPARES SERVICE :.....
(MANAGER: G3CED, 17 Ethel Road, Broadstairs)

VALVES, ALL AT 2/C EACH: -- AC/ME, ACP4, AR8, ARP12, ATS25, AZ1, BL63, CV6, CV1065, D63, DEF19, DW2, DW44, EA50, EBC33, EB34, ECH35, EC91, EC52, EF8, EF36, EF37, EF39, EF50, EF91, EF92, HA1, HL2, HL4, HL133/DD1, KTZ77-1, L2, LP2, M34, MH4, MHL4, MKT4, ML4, OZ4A, PD220, PenA4, Pen220, PM12A, PMLLF, PMLA, PMLHF, PM2, PM2DX, PM22, PM24A, PT2A, PT15, PT225P, PT250, RL18, RV2P800, SD2, SG215, SP61, STV150/15, TTD4, U15, UAF42, UB41, UF42, UL41, UU59, UUL20, UUL33, UUY450, V25, VP133, VR18, VP35, VR54, VR65A, VR66, VR78, VR92, VR95, VR101, VVR108, VR109, VR116, VR136, VT105, VT132, VT289, VUL11, X78, 2X2, 2C34, 2D2, 21OLF, 220P/A, 215P, 215SG, 41, 1C5, 1LA5, 1LD5, 1A5, 1D6, 3B7, 50L6, 5Z4, 6H6, 6AC5, 6V6, 6AC7, 6F5, 6C7G, 6X5G, 6SL7GT, 6SH7, 6J5, 6C5, 6AD7, 6A5, 6J7, 6K8, 6X5, 6AK5, 6SN7, 7B7, 83V, 902, 12J5G, 1299A, 12SQ7, 12SA7, 12SJ7, 12SK7, 12SN7, 25A6G.

.....: QRP SOCIETY TRANSISTOR TESTS :.....

During August transistor test transmissions are to be made by stations G3IEE and G3JNB in order to ascertain the maximum possible radiation distance using the present power and equipment.

Whilst this is not a contest, all Transistor Transmitters on Top Band are invited to participate in these tests and SWLs are asked to monitor such transmissions as they may be able to receive.

SCHEDULE

DATES: Sunday, Monday and Tuesday, August 15th, 16th and 17th.

TIMES: 2130 to 2145 hrs BST.

PROCEDURE: All stations to transmit on CW for the entire $\frac{1}{4}$ hour, text as follows -- "QRP test TTX de G...." Every third round announce station QTH.

SPEED: 10 words per minute maximum in order that SWL stations may

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copy calls accurately.

FREQUENCIES: G3IEE (Kingston-on-Thames) 1875 Kc/s
G3JNB (Surbiton, Surrey) 1856 Kc/s

Other stations participating will be announced in the amateur radio press.

Stations hoping to take part in the tests are asked to inform G3JNB by post and all SWL reports should also be sent direct to him at the following address: Vic Brand, G3JNB, 137 Surbition Hill Park, Surbition, Surrey.

After each transmission the above stations will be available for QSOs with any interested parties.

.....: SOCIETY CONTEST REPORTS :.....

THE "200" CONTEST (for the GC2CNC cup now held by G2BOF) for the largest number of British Counties worked on the 1.8, 3.5 and 7.0 Mc/s bands with a power not exceeding TWO WATTS.

	<u>1.8 Mc/s</u>	<u>3.5 Mc/s</u>	<u>7.0 Mc/s</u>	<u>TOTAL.</u>
1. G2AOL	39	30	10	79
2. G2BOF	37	3	-	40
3. G3HJL	4	18	-	22
4. GC2CNC/2	-	-	2	2

NOTE: The last entry above is designated /2 as it is his second series in this contest. GC2CNC took top place in the contest with a score of 200 the year before he presented the cup.

THE COUNTIES CERTIFICATE CONTEST for an all time total of 200 counties composed of a minimum of 50 on each of the set bands working under the rules of the "200" contest above.

	<u>1.8 Mc/s</u>	<u>3.5 Mc/s</u>	<u>7.0 Mc/s</u>	<u>TOTAL</u>
1. G2AOL	76	64	42	182
2. G2BOF	69	62	44	175
3. G3HJL	11	65	-	76

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THE TOP BAND PANEL is an SWL annual contest (Jan to Dec) for the highest scores of countries and counties heard on 160 metres only with receivers whose HT consumption shall not exceed $1\frac{1}{2}$ watts.

	<u>COUNTRIES.</u>	<u>COUNTIES.</u>	<u>TOTAL.</u>
Peter Huntsman (Hexham-on-Tyne)	9	39	48
D.G.Gordon (Bournemouth)	5	36	41
Norman Bason (Peel, Isle of Man)	3	23	26
E. Gardiner (Diss, Norfolk)	5	18	23

THE C-Z CONTEST (for the Partridge Cup now held by Peter Huntsman) is an SWL event for the highest annual (Jan to Dec) score of countries and zones heard on five bands with receivers of not more than $1\frac{1}{2}$ watts.

	<u>3.5</u>	<u>7</u>	<u>14</u>	<u>21</u>	<u>28</u>	<u>TOTAL</u>	<u>ZONES</u>	<u>C plus Z</u>
Peter Huntsman	20	55	105	18	3	115	36	151
E. W. Gardiner	9	-	81	35	5	90	23	113
J. A. Stephenson	21	4	79	1	-	84	23	107
D.G.Gordon	16	3	65	25	5	70	21	91
Norman Bason	20	26	47	-	-	58	17	75

THE 145 Mc/s RECEPTION CONTEST is a new cumulative event for stns heard on 2 metres only. Scoring is by number of stns x mileage. Any type of Rx or convertor/Rx is eligible providing the TOTAL power remains within the 3 watts limit laid down by our VHF Group.

	<u>Stns Hrd.</u>	<u>Miles.</u>	<u>Points</u>	<u>Previous.</u>	<u>SCORE.</u>
D. G. Gordon	2	39	78	nil	78

MAY I ONCE AGAIN IMPLORE ALL MEMBERS ENTERING FOR ANY CONTEST TO SEND IN THEIR ENTRY ON A SEPERATE SHEET FROM GENERAL CORRESPONDENCE. Our mail has now increased to such proportions that it is virtually impossible to keep track of contest entries that are hidden among a variety of other matter. Seperate sheets enable immediate filing in the "contest" folder and the assurance that the entry will be credited correctly.

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(continued from page 4)

below and will be strictly followed --

13th July (Sailing date) at 1100 GMT on 12534 Kc/s, calling GKG for 15 minutes giving position and any important information. At 1730 GMT on 8160 Kc/s one or more test calls.

27th July and thereafter on Mondays to Thursdays inclusive at 1400 GMT on 5320 Kc/s, on Fridays and Saturdays at 1830 on 8160 Kc/s and on Sundays at 0930 GMT on 8160, Aries will call Steadfast MFH87.

To those members who have spent long hours at the Rx looking for the yacht, Steadfast HQ offer their sincere apologies and hope that during the next few weeks everyone will hear the call "Aries R for Roger"

(Ed: If it is any consolation to those who have been listening for Aries regularly, even the official stations appear to have heard no signal. The only report we have received was of a W station calling the yacht without response)

::::::::::: QRP SOCIETY - VHF GROUP ::::::::::::::

Sincere editorial apologies are due to the Group this month for having to squeeze them out despite a magnificent report from secretary Ted -- there is no doubt that the time has come when we shall, somehow, have to create more space in the mag. The Group report contained two entries for the 145 Mc/s Reception Contest which, unfortunately arrived too late for inclusion, but will be included next month. They were:

GC2CNC -- 2 stations, 117 miles = 234 points

Ted Stonestreet -- 2 stations, 6 miles = 12 points

APOLOGIES ARE ALSO DUE TO KINGSTON AND DISTRICT QRP SECTION FOR HAVING TO HOLD OVER THEIR REPORT, AND TO A NUMBER OF INDIVIDUAL MEMBERS WHO SENT IN LETTERS OF CONSIDERABLE VALUE AND INTEREST -- sorry, OMs!