OFFICIAL REPORTS

OF THE

Q R P

RESEARCH GROUP

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DEDICATED TO THE ADVANCEMENT OF LOW POWER RADIO

QRP

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EDITORIAL.

The Q R P Research Group is "on it's feet". There is no shadow of doubt about the reception which has been accorded to it from all quarters. It has come into being unheralded and, with no advertising ceremonial to assist it's send off, it has achieved a large and solid acclamation of welcome. Letters of congratulation have rolled in by the dozen; requests for membership are piling up, arriving daily from all over G, GM, GW and even from the Air Force of the B A O R.

Finally I take great pride in reporting the receipt of a letter from Mr. JOHN CLARRICOATS, of THE RADIO SOCIETY OF GREAT BRITAIN, who has been good enough to express interest in our activities and has promised to give them a suitable mention in the Society's BULLETIN.

As to the internal developments which have taken place during the month, the most important is obviously the fact that, in future, the Group will cover Tx ground as well as Rx. The official announcement of this fact will appear in the March issue of S W N but in th the mean time there is nothing to stop us making progress in this direction. Such a very welcome step has been made possible by the retirement of Mal Geddes, G2SO, who, until recently, was running the I S W L QRP Section (Tx) and also the S W N feature "QRP Club Notes".

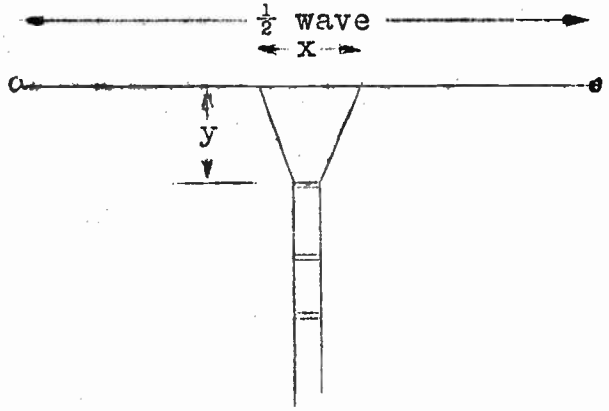
The QRP transmitter is undoubtedly the Cinderella of all amateur radio, gaining even less attention in the National Radio periodicals than does the QRP receiver enthusiast. To the best of my knowledge the ISWL Section and the SWN feature were the only regular features ever run for them. Therefore I take great pleasure in this chance of being able to build up a similar atmosphere of friendship and keen enthusiasm as that now growing so rapidly among our Rx members.

The amalgamation of the Tx and Rx aspects of Q R P is an obvious and logical step since there is no other branch of amateur radio in which there is such a bond of similarity in outlook, aims, ambitions and interests. It is one which, I know, will be received with great enthusiasm by a very large majority of our existing Rx members who have frequently expressed a desire for such an amalgamation. To the few who take the gloomy view that such a step will result in "Q R P" becoming Tx biased "like all the other radio mags" I can only offer my firm assurance that this will not be so. It is my considered opinion that, far from being a retrograde step (as a few seem to think), it is one which will benefit every QRP SWL by giving a very marked increase to the interest and extent of his hobby, and a greatly increased value and scope to the Research Group and to the pages of "Q R P".

In closing I do want to thank all those who have sent me such very nice and encouraging letters of praise. I have endeavoured to answer them individually but some are still outstanding -- If yours is among these, OM, please accept my thanks and try to realize that it is not a case of disinterest on my part. The firm I work for is not in the least radio minded and fail to see any reason why I should get home early to answer mail. So please don't give up -- keep on writing and I'll get round to you as soon as ever I can.

PRACTICAL AERIALS. (3): THE DELTA.

There are many end-fed aerial types besides those which we considered in the last two discussions, though most vary in nothing more than the feeder or matching arrangements. In order of practical values I believe the centre-fed types come next, and of these the easiest to errect is probably the Delta.



Unlike the di-pole, the delta has a continuous horizontal element. The feeders are both soldered to this same wire. At first sight it might appear to be little different from an ordinary 'T' type rig. Actually however the middle section of wire (x) has a very pronounced effect owing to the existance of "impedance", a function which we will consider more closely (together with matching) in a later discussion. For the moment we will say that to achieve an efficient aerial the feeder system must be tapped onto the horizontal at two points each having equal impedance to the feeders. The impedance at the centre of a half wave aerial is always about 73 ohms, but this is nowhere near a normal feeder impedance. The greater the distance between the feeder lines and the smaller the diameter of the wire the greater will be the impedance. Thus, a feeder of about 73 ohms impedance would need heavy guage wires very close together -- an obviously unsatisfactory arrangement. A practical and much used feeder arrange-

ment, consisting of 16 swg parallel lines spaced 5" apart may be said to have an impedance of 600 ohms. To match this into our half wave horizontal element we must equalize the impedances. Without getting involved in the mathematics of the subject we can achieve this object quite easily by spreading out the final section of the feeder lines so as to make x equal 148 / f feet and y equal 123 / f feet, the frequency f in both cases being in m/cs.

The feeder wire is best enamelled to guard against weathering and corrosion and the spacers, which should be of good weather resisting insulating material, should be spaced no more than three feet apart. Flex cannot be used as an alternative feeder material (as was suggested for the types previously described) since it has an impedance of about 100 ohms and the points of connection to the horizontal element would be very different from those obtained from the formula given. It is important that the value of x should be measured centring on the exact middle of the horizontal.

A LETTER FROM THE I S W L GENERAL MANAGER.

Frank Baldwin, G193, General Manager of the I S W L has sent the following message to all I S W L QRP operators:-

"I feel I must place on record the appreciation of myself and all at HQ for the hard work and keen spirit shown by all members of the League QRP Group. Due in no small measure to the enthusiasm of both your manager, Alec Jotcham, and your editor, John Whitehead, the success, both initial and progressive, of your monthly journal, "Q R P", is assured. May the Group long continue to flourish, remaining true to it's ideal -- the advancement of Low Power radio."

THE ATOMIC ASPECT, (2).

In the Dec. issue we discussed the action of electrons in passing through a resistance. Let us now see what state of affairs arises when a capacitor is included in a simple circuit.

Imagine that we make up a circuit consisting of two large copper plates placed close together, one connected to the pos. terminal and one to the neg. terminal of a battery or accumulator with a switch in one or other of the leads.

The chemical action in the battery is always keeping a surplus of electrons piled up on the neg. plate, leaving a deffciency on the pos. plate (an action which is of course reduced to a mere "topping up" operation when no outside circuit is in use). So, when we switch on, these electrons will surge along the wire connected to the neg. terminal until (like water finding it's own level) the surplus is evenly distributed throughout the whole system, including th the condenser plates. At the same time the deficiency of the pos. battery plates will act upon the other half of the circuit and the attached condenser plate until the electron population is equally thinned out over the whole system. The electron surplus and the electron deficiency of the battery terminals have thus passed on to the respective condenser plates. Between these plates the electrons in the dielectric (whether it be air, mica, tufnol or any of the other insulators) will be affected sufficiently to make them strain against the bonding exerted by their nuclei. But, whatever the is insulation may be, it will have been selected especially for it's property of having electrons which are sufficiently difficult to detach. If circumstances should arise such as a "weak point" in the insulation (which we should now realize is a point where some of the electrons are too easily detachable) or such as a high increase in the potential difference (ie, a great increase in the electron

surplus/deficiency ratio) the strain on the insulator's electrons may become so great that some will actually become detached and pass on to the "deficient" copper plate. In such a case the insulation is said to have "broken down", resulting in a "short". It will now be apparent that the heat generated around the "weak point" in the insulation, which is often sufficient to cause charring or actual burning, is caused by the tremendous exertion of the electrons in forcing their way through against the bonding imposed by the nuclei.

This situation is, of course, the extreme case. Normally the properties of the insulation and the potential difference on the condenser plates are so arranged that "breakdown" does not occur. In the normal case, then, the surplus and deficiency of electrons will equalise, each throughout it's half of the circuit, and will remain in that condition. If the switch is now opened and the condenser plates shorted the surplus electrons will rush over to feed the deficient protons in the other half, visual evidence of this being apparent in the fat spark which often occurs.

So much for conditions set up by a DC source. The influence has been all "one way". If the same external circuit is now connected to an AC generator it should be easy to understand how it is that a condenser does not form any barrier to the flow of AC in the circuit. An Ac generator is made in such a way that, during the first half cycle of it's armature, current flows round the circuit in one direction (say from A to B). In the next half cycle the current is made to reverse and flows from B to A. Thus, in the first half cycle, we see the same set of conditions arise on the condenser plates as we did with the DC source. The next half cycle exactly reverses the position so that, in fact, our electrons are see-sawing back and forth in short sharp surges. Though they do not pass through the condenser the electrons are (almost) continuously on the move, and ANY such movement is, in effect, "current".

I S W L SUPPLIES.

Will all Research Group members please note that all I S W L supplies and publications are now available through the editor of "Q R P" at less than you would pay at the bookstall or direct from HQ. This discount is only possible through our ability to pass on bulk orders to ISWL HQ. To maintain such a service, therefore, it is essential that you should all make full use of it, and it is well worth while to do so as it means quite a considerable saving to you.

The rates under this new scheme, INCLUDING POSTAGE will be:-

SHORT WAVE NEWS.....1/1 per copy or...14/6 per annum.
RADIO CONSTRUCTOR.....1/1 per copy or...14/6 per annum.
OP-AID.....(see below)..... 1/4.
ISWL PRINTED NOTE PAPER, 8" x 5"(per 100 sheets).... 3/4.
REPORT PADS (50 forms per pad)..... 2/6.
AMATEUR STATION RECORD CARDS (per 100)..... 3/6.

and a variety of other supplies such as ISWL envelopes, badges, rubber stamps, Data books, etc, etc, all at similar rates of discount.

OP-AID:-- The Year's best selling Radio Reference Book.

The Short Wave Listener's Annual will, by now, be well known to all radio amateurs. Since it's inception in 1946 it has become, probably, the most popular reference book ever published for the SWL. This year it is to be replaced by an even more concise and carefully devised volume to be known as "OP-AID". This book will

contain, in it's 32 pages, every detail of handy reference which made the Annual so popular and a good deal of newly assembled data. The long articles which appeared in the Annual and which were not trely reference matter have been deleted and the result is undoubtedly THE FINEST OPERATING-AID YOU'LL BE ABLE TO OBTAIN. In stiff card covers it is going to cost only 1/8 post free -- and that means 1/4 to any Research Group member who places an order through "Q R P". Publication is due in March but please let me have your orders well in advance, OMs, as there is bound to be a rush and I don't want any of MY members to be unlucky.

THE RESEARCH COUNCIL'S PRESIDENT.

I am very pleased indeed to be able to report that G2ATV, Mr C.W.C.OVERLAND, has been good enough to accept the Presidency of our newly formed QRP RESEARCH GROUP Council. 2ATV has been prominent in amateur radio activities for many years and has been instrumental in assisting more than one aspiring young club to lasting success. As will be known to all of you he is prominently concerned with the organisation and editorship of Short Wave News and Radio Constructor and has, from it's inception, been one of the Boffins behind the I S W L. His advice and guidance will be of inestimable value in shaping the destiny of our Research Group. Last month I felt a certain anxiety in reviewing our probable struggles through the difficult early stages of development; now I feel certain that 2ATV's enthusiastic interest will stear us round such snags and snares with the sure hand of long experience, knowledge and extensive influence.

OUR TECHNICAL ADVISOR.

Once again we have been extremely fortunate in having won the interest and co-operation of an ideal Technical Advisor. Mr Lionel Howes, G5AYA, has promised to give us full assistance in any "sticky technical problems" which may arise, and his advice and suggestions in this direction will at all times be of value in guiding us towards our goal of Low Power radio development.

Like the President of our Council, Lionel is a very busy person. In order to gain the maximum benefit from our advisory capacity whilst placing the least possible unnecessary strain upon it we must create and adhere to a rule that ALL QUERIES MUST BE SUBMITTED THROUGH "Q R P" who's editor will be in frequent contact with both 2ATV and 3AYA -- and, of course, with Frank Baldwin who's ambitious and energetic leadership of the I S W L will certainly maintain that League in it's foremost position among such organisations.

CONTEST COMMENTS.

R.NIXON was restricted to 20 metres having rebuilt his C-V-2 less it's first AF stage which had been giving trouble with high noise level. He says that he put in a good deal of time at the controls but found condx continuously bad and heard no real Dx through out. His main grouse, however, is with the rule excluding CQ calls. Although I suspect that he's pulling my leg he says he doesn't think that's a fair one..... Well, OM, to be quite brutal, an unreadable sig can hardly count as a message "received" can it? The ruling was included to ensure that all calls claimed were reasonably "solid" and of course the same restriction applied to all contestants. As you suggest yourself, OM, your antenna could easily be improved -- "a piece of wire round the house" is hardly likely to produce

solid Dx signals. We'll have another contest when you've got that ½-wave di-pole fixed up and see the difference then, OM.

BERT GLASS is doubtful if it is worth the strain! He logged 335 calls with 76 countries and 31 zones, 98% being CW calls. He found that 28 m/cs was flat every time he got home from work and a neighbouring 100 Kw Air Navigation Beacon on 30 m/cs didn't help matters any! Also there was the little affair of Wolves v Argyle on Saturday -- tut, tut, Bert, that's the wrong kind of contest, OM!

S.BEHARRELL comments on the bad condx round York and also on the danger to family relations when even Dick Barton has to be barred from the BC speaker while the red light is up on the Dx rig. He also wonders if a station can count on succeeding days providing it is not calling the same station again.....No, OM, I should say that would NOT do. We should be sure to end up with a complete log of a single station calling everyone else in turn. We'll include this one in the rules next time. By the way, OM, Bert's total in the trial run was 1566 (not 156.6 nor yet 1.566).

ALAN NOBLE, G1814, failed to send me his address, other than Margate, but he produced a most interesting log as full of VKs as pods are of peas. During the "alert" he gathered in the useful gen that QSLs for MP4BAB, BAE, BAO should be sent c/o IAO, SHARJAK, TRUCIAL OMAN and that 4BAB is xtal controlled on 28250 Kcs. He adds that he is sure this QRP/QRO contest is going to gain in popularity and that he enjoyed the few minutes each day that he was able to put in. This is something of a compliment as Alan's normal Rx is a 640 and he made up the O-V-1 purely for this contest. He says: "It will go back into the junk box now until I have time to make up a decent TRF set". Well, thanks for your very sporting gesture, Alan. We certainly can't let that kind of spirit go to seed so I shall have to chase ISWL HQ for your full QRA and persuade you to join our Group.

R.J.BROOKER sent in a really magnificent log. Using only 3.7 mA at 90 volts his HT wattage was the third lowest in the contest; and, though he put in probably more listening time than anyone, he certainly did not pile up his score on inumerable semi-locals. He logged some really fine calls, including HC1OY, 2JR; W6KPC; ZL3DL; ZS1GG, 4AK. His column of points scored is nice reading and summarises as follows:- 6 at one point, 3 at four points, 7 at six points, and all the rest at five points each. This combination of low wattage and good Dx paid him excellant dividends. His rig will be fully described in next month's issue.

BILL WINCHESTER in his covering letter says: "....Thanks for the contest. It was fun, but I don't think condx were very good on 10 and 20 at any time. Twenty in particular went off early in the evenings...." So that makes it pretty universal on the condx report comments -- NW, NE, SW, SE and London area -- we couldn't have had a more representative group of QTH if we'd specially picked them. Bill's 1-V-2 is a dry battery rig using 1N5G, 1H5G, 1H5G, 1C5G and I hope to be able to give you full details of it shortly.

W.C.MILLS and D.KEMP were the only QRO contestants. They both hail from Chelmsford and I am sure that you will all join with me in saying "Thanks for your very sporting gesture, OMs. It has been a pleasure to have had you with us in this contest and I sincerely hope that we shall meet you again in our next one."

In brief summary of the contest let me just make two comments. (1) In order of points gained the QRO entries came fourth and fifth so that, even without the rule requiring points to be devided by watts, they are still a long way behind the QRP leaders. I am quite sure that, with a little more detirmination, the QROs could have done a lot better, but even so the results do prove that the QRP Rx can give a fine account of itself. (2) The second point that calls for comment is the value of real "quality" Dx. The fact that it pays

to pass over the normal run of Dx without wasting time on it and to concentrate on only the "best paying" signals is shown in the reports of the winner and runner up. Bert Glass heard 29 more calls yet R.J.B. gained 466 more points.

Finally I feel there are a lot of details which want reviewing before the next contest. Many of you have been good enough to send along suggestions and if anyone else has any ideas to offer do let me have them in time to analyse the whole position shortly.

GEAR CHANGE

In return for the cost of postage Ron Nixon is prepared to send any or all of the following 2v valves to the first QRP applicant:- HL2, PM2A, PEN220A, PM1, PM2. Ron's QRA is:- R. Nixon, 14 Baslow Gardens, South Reddish, Stockport.

MEMBERSHIP LISTS

It has been suggested to me a number of times lately that it would be a good idea to publish lists of member's QRAs, thus enabling members to contact one another direct and perhaps to drop in for a chin-wag if they happened to be in the locality. Well, in the main I agree -- You are all of you assured of a thoroughly warm and hearty welcome ANY TIME you are in the editorial area. But I think some of you might prefer to remain ingognito. Will you please let me have an answer to that one in your next letters?

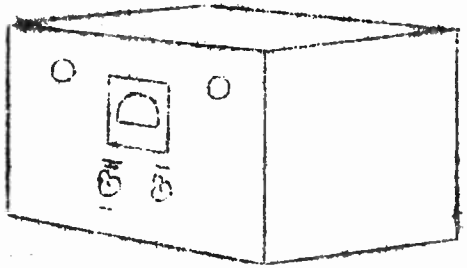
RIG OF THE MONTH, No 6: A SILENT MAINS UNIT.

A great many SWLs to whom AC mains are available still appear shy of using them for their short wave gear on account of the hum bogey. I want to stress that this is a quite baseless fear and such a lot can be missed by not making efficient use of mains, and I hope the rig described here may encourage greater use of them. The advantages to be gained are obvious even in the case of a QRP layout. No more battery worries is perhaps the most important one, while a considerable increase in signal amplification runs it a close second. To many a disadvantage may be the higher initial cost, but this can be more than covered by a couple of years battery expenses.

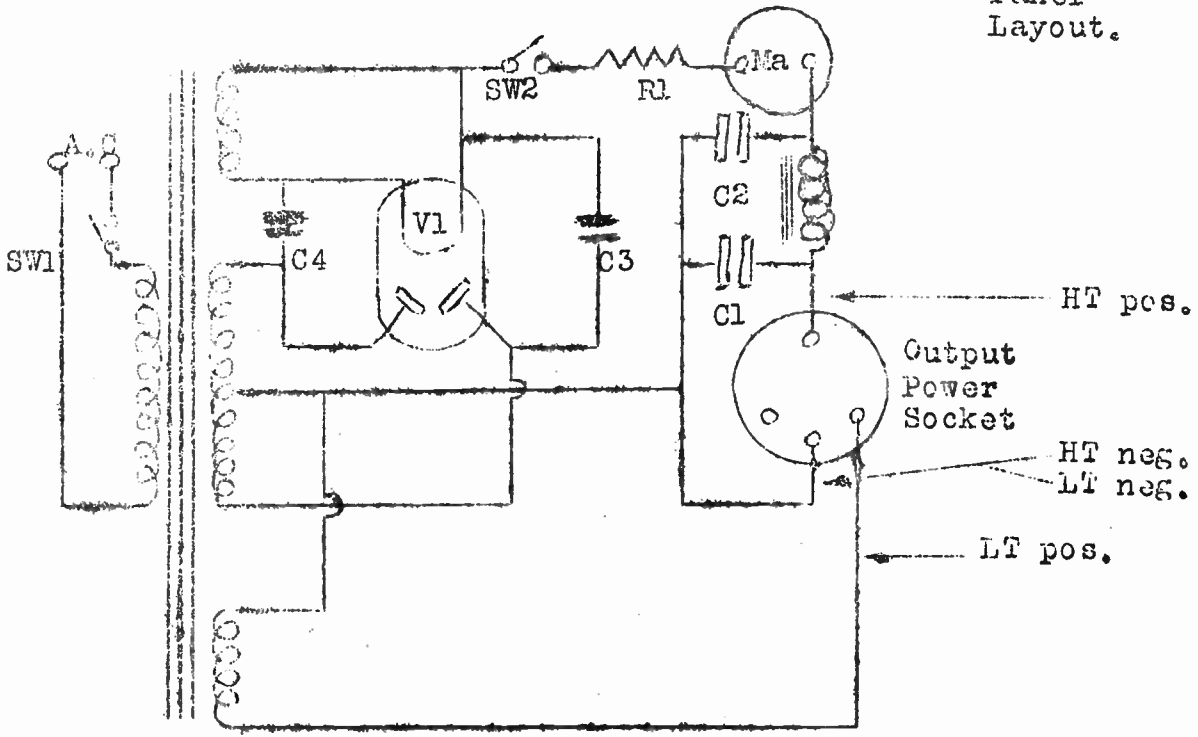
Now what are the points required for the attainment of silence? The three foremost ones are: (1) Efficient smoothing; (2) seperate unit construction; and (3) housing the unit in a metal cabinet. As a matter of fact there are more advantages to building a seperate pack than that of isolating hum alone. It enables the Rx to be much more neatly constructed and it is a tremendous aid to making Rx modifications when you have not got the bulk and weight of the mains section to contend with as well. Also there is a very great asset in that the unit can be used to drive other equipment instead of being restricted to one Rx.

For the unit described here the panel is 9" x 5½" and the pressed steel case is 7" deep which leaves more than enough room to house the chassis with ample room for air flow -- an important point in the construction of all mains gear to allow the easy dissipation of heat. The components used all came from the junk box, and the "surplus" market can safely be tapped for any components not on hand in assembling such a light duty unit. Only one item, the smoothing choke, needs more than usual care in selection; this should be a good component in the interests of hum reduction. Make sure that the laminations of both choke and transformer are tightly packed to

C1; 8.0 uF
C2; 8.0 uF
C3; .05 uF, 500 v.
C4; .05 uF, 500 v.
Ma; 0/50 Ma.
R1; 3000 Ohms.
V1; Any suitable full wave rectifier.



Panel Layout.



avoid vibration. The particular rig considered here was made up for four volt valves, but the same circuit is equally applicable to 6.3 volt use given the correct valve and transformer windings.

Now, as to the more unusual points which may be of interest. R1 was included to drop the voltage for use with O-V-1 circuits requiring about 230 volts HT. C3 and C4 can be recommended to remove that last trace of hum, while the usual smoothers, C1 and C2, were in this case, an 8 x 8 uF TCC electrolytic. Two switches were included, SW2 controlling the HT only while SW1 cuts the mains. In fact SW2 is the familiar "send / receive" control of the communications Rx and is marked as such on the panel; but it's more important function is to guard against HT surge voltages by allowing the heaters to be switched on half a minute or so before the HT. The panel is marked "Mains On / Off" for SW1. The 0 - 50 mA meter is a very useful guide to consumption when using a variety of different pieces of gear but it is not essential of course. A further refinement would be a matching voltmeter across the points x - x.

Finally, HT and LT leads are taken to a pair of four pin valve sockets on the panel (only three pins being used). Having two sockets enables an amplifier (or what have you) to be run at the same time as the Rx. Each piece of apparatus to be driven by this pack has a length of three core light duty power cable (or "cab-tyre"), the lead ending in a cut down 4-pin valve base for plugging into the sockets. This makes a neat, tidy job, but care must always be taken that the leads go to the same respective pins on ALL equipment likely to be used with the pack.

The pack has run the Rx described in the Oct issue for a long time without any undesirable hum and it has shaken the belief of more than one "batteries only" enthusiast.

CONTEST RESULTS.

Subject to final confirmation the results of the "Q R P" Handicap Contest are as follows:-)

NAME	QTH	Rx	CALLS HEARD	BAND (m/cs)	POINTS GAINED	HT WATTS	FINAL SCORE
Brooker, R.J.	Herne Hill.	O-V-1	306	28	1520	.333	4564
Glass, A.E.	Plymouth.	O-V-1	335	14 & 28	1054	.50	2108
Winchester, W.	Eastbourne.	1-V-2	264	14 & 28	1016	.80	1270
Noble, A.	Margate.	O-V-1	76	14 & 28	324	.295	1115.
Nixon, R.	Stockport.	O-V-1	84	14	111	.315	352.
Beharrell, S.	York.	1-V-2	64	14	160	1.20	133.
Mills, W.C.	Chelmsford.	H.R.O	270	14 & 28	1011	12.00	85.
Kemp, D.	Chelmsford.	R.107	148	14 & 28	493	10.00	50.

I'm sorry, OMs, but Logs and Activity and a number of items which are not such regular features will have to stand over till next month. What with so much gen on The Group and the Contest results to cater for I just can not find room this month. Some really interesting letters have come to hand too. Well, they'll all receive due comment next issue, so don't think they have not been appreciated.