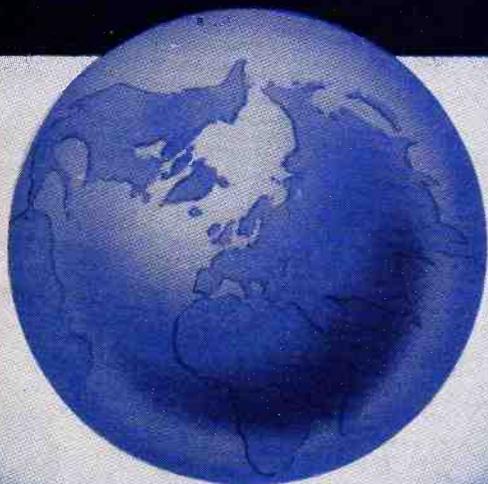


2/-

SHORTWAVE

Magazine



EXCLUSIVELY FOR THE
RADIO EXPERIMENTER &
TRANSMITTING AMATEUR

VOL. IX No. 12 FEBRUARY, 1952

H. WHITAKER G3SJ

10 YORKSHIRE STREET, BURNLEY Phone 4924

RESISTORS. New and Unused Erie and Dubilier. We have secured another fine parcel of these and offer as follows. $\frac{1}{2}$ watt 8/6 per 100, $\frac{1}{4}$ watt 12/6 per 100, 1 watt type 9 insulated 15/- per 100, 1 watt standard type 15/- per 100, 2 watt 20/- per 100, 5 watt 25/- per 100. All well assorted values between 100 ohm and 6.8 Meg. Or sample 100 as follows, 20 $\frac{1}{2}$ watt, 25 $\frac{1}{2}$ watt, 20 1 watt insulated, 20 1 watt standard, 10 $\frac{1}{2}$ watt, 5 5 watt, with a range of at least 30 different values at 14/- post free.

WIRE WOUND. 5 watt. Values in ohms. 15, 20, 25, 50, 75, 100, 150, 175, 200, 250, 500, 750, 1000, all with wire ends at 6/- per doz. assorted.

U.S.A. GROVES, U.EI. Vitreous. 25 ohm 5 watt, 175 ohm, 200 ohm and 3k, 7 watt, 175 ohm 10 watt, 2k 20 watt, 5k, 8k, 10k, 15k, 25 watt all at 1/6 each. Groves. 11 $\frac{1}{2}$ in. vitreous 25k and 50k 80 watt, at 3/- each. R.C.A. Bk and 1 1/2 watt at 3/- each. U.S.A. screw in type element for 4336 Tx 5/6 each.

OSCILLOSCOPES. By well known British Manufacturer. In black crackle steel cases, size 12 x 8 x 6 ins. For AC mains 230/200v 50cy. Tube size 3ins. (green). Hard valve time base continuously variable from 5 to 250,000 c.d.s. Push-pull "x" deflection circuit with T.B. wave form brought out to separate terminal for wobulator work or synchronising. Provision for fly back suppression. Push-pull "y" deflection circuit, level from 15 to 300,000 c.p.s. All usual controls and provision for using a D.C. volt-meter to measure the amplitude of an A.C. waveform. Separate synchronised amplifier and no control interaction. Complete with all test leads and instruction manual. They are brand new and boxed in original cartons, and represent an un-repeatable bargain at £19/10/0. Carr. paid.

ELECTRONIC KEYS. 230v 50cy. A.C. Mains. Our own production. Grey crackle steel case 9 x 7 x 6 ins. Employs in all 5 valves. Controls for dot, dash, and spacing, with speed control continuously variable from below 10 wds. per minute to 60 wds. per minute, with perfect formation of characters. This is precision first class operating made easy. Carr. paid £12/10/0.

CRYSTALS. 1000 kc Valpey, Biley or Somerset, standard $\frac{3}{16}$ in. pin spacing, 20/- R.C.A. 100 kc sub-standards, 20/-, Western Elec. 500 kc Ft 243 holders with $\frac{3}{16}$ in. pin spacing, 7/6. Full range of Western I.F. freqs. 450, 465 Kc, etc., 12/6 each. Amateur and Commercial bands. G3 SJ Xtals are precision lapped, and acid etched to final freq. Are available in either Ft 243 holders, $\frac{3}{16}$ in. British, $\frac{3}{16}$ in. U.S.A. or $\frac{3}{16}$ in. P.5 holders. Your own choice of frequency 2 Mc to 10 Mc inclusive. We will despatch to within 1 Kc of your chosen frequency at 15/- each, accurately calibrated with freq. clearly marked. Slight extra charges for decimal point freqs. We also undertake the calibration, or re-gridding of your own crystals at extremely reasonable and nominal charges.

This month's special offer. 7290 Kc $\frac{3}{16}$ in. 10x type standard British holders, G.E.C., Standard, etc. at 7/6 each.

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U.S. SIGNAL CORPS. Light weight speed Keys. J.38 with cranked arm. 3/9. Ditto with short circuiting lever 5/-, U.S. Signals J5a Flame proof 3/-, R.A.F. Mk2 Nr2 2/-, U.S.

ATKINS 465 Kc I.F. TRANSFORMERS. Dust core tuned 4/6 each, Ditto Wearite 552 type, 465 Kc 6/- each. Weymouth P2 miniature I.F., 465 Kc 4/- each. Wearite coils P type. The following only now available at 2/- each, PA 4, 5, and 7. PHF 5, 6, and 7. P04, 5 and 6. AF, RF, BF, Weymouth Coils. The following at 2/6 each, DA1, DA3, DA6, KA1, KH1, KO1, DH6, DOI, DO3, DO6, HO1, HO4, KO2, KA2, HA4, MSC3, Q1 IF filter, CS3 W3 Three wave super het. per pair with circuit 4/-. Weymouth and Wearite coil packs are also available, details on receipt of enquiry.

THIS MONTH'S BARGAIN. 7B Tx. G.E.C. INPUT 230V 50cy. Crystal Osc. and Doubler. (Det R9) Push Push Doubler Det 19, Push Push doubler Det 19, Power Amp. Det 19, KT66 Modulator. Standard rack and panel complete with power supply. 2 U52 Rectifiers. All stages tuned Grid and anode. Link coupled throughout. Completely enclosed, weight approx. 80lb. Relay for push to talk. Provision for remote HT switch. Frequency coverage approx. 100 to 120 Mc. Easily adapted for 144. Oscillator will function on 8 mc xtals. All stages are meter jacked. Filament and HT pilot lights. Microphone jack. This is a complete Tx with all valves, and beautifully built. Input about 50 watts, Tune/Operate switch for tuning up on low power. This is a really exceptional bargain at £8 Carr. Paid. 30/- extra Ireland.

PANEL MOUNTING TOGGLE SWITCHES. Brand new single pole 8/- per doz.

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HAMMERLUND. Variable 00047, solid brass construction with quartz insulation. Rotor on dual ball bearings, $\frac{3}{16}$ in. spindle, extended for front or back mounting, Brand new, 7/6 each. A.R. Car Battery Chargers 230/50cy. 6 or 12v, output at lamp. Metal rectification 39/6, carriage paid.

DUAL FIXED AIR GAP CONDENSERS. Tech. Rad. San Francisco. 70Mmf \pm 130Mmf \pm 2in. spacing, Micalox insulation. Ant. or Tx loading. Two in a box at 5/- per box post free.

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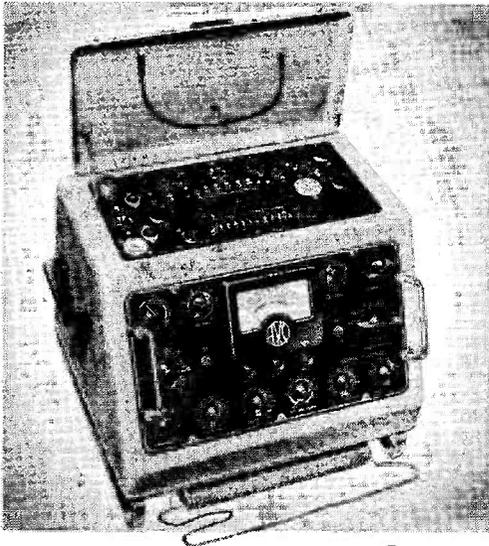
VALVE HOLDERS. All ceramic. Octal with flanges 1/4, 807 do 1/3, 4 pin UX Lock-in Johnson 4/-, British 5 pin 6/- doz., British 7 pin 4/- doz. B7G complete with valve screen and valve retaining spring 2/3. B8G Amphenol 8d. 805 Lock-in 6/-.

CONDENSERS. Silver Mica Approx. 10 assorted values including 1000v wkg at 4/6 per doz. Flat mica, 0002, 002 350v, 005, 0047, 006 1000v at 3/6 per doz. Mica 2500v wkg Sangamo etc. 12/- doz. assorted. Mica 5 Kv wkg Sangamo etc. 0004, 0006 and 001 2/- each. Mica 001 and 002 Muirhead 4 Kv at 30 Mc 4/- each. All high voltage mica are bakelite cased. Paper and oil. 4mf 2000v wkg 6/- 4mf 1500 wkg 4/-, 4mf \pm 2mf 2000v wkg 8/-, 10mf 1000v wkg 6/-, 6mf 1000v wkg 4/- 4mf 500v wkg 2/-, G.E.C. 25 350v wkg Tublar 12/6 per original box of 100. Bias. One doz. assorted 6/-, 100 Assorted, every conceivable type included, Mica, metal can smoothing, bias, bath tub, high voltage types at 15/- Post free. We will be pleased to have your enquiries for any type condensers up to 20 Kv wkg, we carry exceptionally good stocks including U.S.A. all types.

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Type 104. 12v D.C. input, outputs 250v 65mA, 6.5v, 2.5A, D.C. P.M. rotary on chassis with cover, size 8½" x 4½" x 6½", 7/-, post paid. Type 87. input 24v. output as Type 104. 6/6 post paid

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5H, 200mA, 100 z ... 5/6 8H, 250mA, 50 z Potted 10/-

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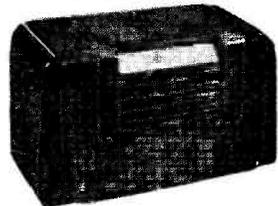
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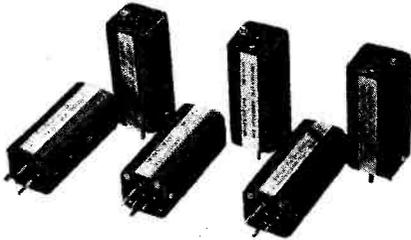
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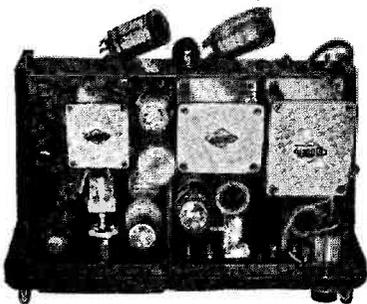
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Short Wave Magazine, Volume IX

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SHORT WAVE MAGAZINE

FOR THE RADIO AMATEUR & AMATEUR RADIO

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Published the Friday following the first Wednesday each month at 55 Victoria Street, London, S.W.1. Telephone: Abbey 2384
Annual Subscription: Inland 24s. Abroad 24s. post paid.

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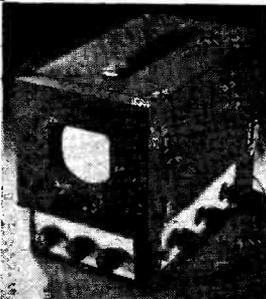
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The
SHORT WAVE
Magazine

FOR THE RADIO
AMATEUR AND
AMATEUR RADIO

E D I T O R I A L

Economics

During the last two years, and particularly in the last twelve months, publishing costs have risen steeply and alarmingly—especially in regard to paper, the raw material of publishing, which is now about twice the price it was a year ago, and promises to go higher yet.

All publishers are faced with the same problem, and for us the solution became one of two alternatives: Reduce the size, or increase the cover price.

We have chosen the latter course, not because it is the easiest (quite the reverse), but because thereby we can also enlarge SHORT WAVE MAGAZINE and so make it a much more attractive proposition to the reader.

Hence, effective with the next issue, which is No. 1 of the new volume, the MAGAZINE cover price will be advanced to 2s. 6d. But it will also be much bigger in terms of page area, with a completely re-designed cover, and of much improved layout and appearance inside. We shall have more space for features and articles we have long wished to bring within the orbit of SHORT WAVE MAGAZINE; and altogether our objective has remained, as it always will, to give the reader the best possible value for money.

When they see the MAGAZINE in its new format, we feel sure readers will agree that we have taken the right course.

*Austin Fook
G6FO.*

The Structure of a National Society

AN EXAMINATION OF PRESENT PROBLEMS AND SOME PROPOSALS FOR THEIR FUTURE SOLUTION

By AUSTIN FORSYTH, O.B.E. (G6FO)
(Managing Editor, *Short Wave Magazine*)

BACKGROUND

THOSE readers of *SHORT WAVE MAGAZINE* who are also members of the Radio Society of Great Britain will be well aware that recently there has been something of a boil-up, with an "exchange of views" carried out in the public print, and no marks gained by either side.

It is widely, but quite erroneously, supposed that this is some new angle on a long-standing disagreement or quarrel between the National Society and *SHORT WAVE MAGAZINE*, and that we are attempting to sabotage the RSGB for nefarious purposes of our own.

In fact, there has been no disagreements, no arguments and no quarrels—because there has never been any discussion on which a disagreement could be founded. Such contacts as may have occurred have been purely personal and social, with but slight efforts for any sort of co-operation.

The reasons for this strange state of affairs will not be very obvious to the RSGB membership at large, though they have been quite clear to those directly concerned for at least the last five years. These reasons come down to the factor of competition; as it has turned out for the National Society, this has meant a critical and disparaging attitude on the part of important sections of its membership, mainly in regard to the *BULLETIN* in comparison with the *MAGAZINE*. For us, it has meant on the one hand abuse for "not supporting the RSGB" and on the other a demand for a "new society for Transmitters Only." We, for our part, are in the additional difficulty that while the majority of RSGB members are readers of the *MAGAZINE*, we have quite as large a body of readers who are not, and have no interest whatever in the matters to be discussed here.

Hence, until recently our policy had been to hold a balance between these interests—which indirectly has been of

the greatest service to the RSGB itself, as thereby the Society has been protected from a great deal more public criticism than it would have had if our columns had been open for correspondence of this sort. This is an important point which has been completely lost sight of by practically all those who have vilified us for not "supporting" the national society. During a very trying period for the RSGB, we gave it the best sort of support it could possibly have had—by preventing the *MAGAZINE* from becoming the focus for public criticism of the Society. (And if anybody challenges us on this point, all the letters are still on file!).

However, looked at from the point of view of the RSGB hierarchy, the very existence of *SHORT WAVE MAGAZINE*—quite irrespective of its policy line—started to become an embarrassment and a menace as long ago as 1946. Why? Because the *MAGAZINE* provided, as it still provides, so much of what is required by the licensed operator and the potential amateur transmitter. This is a general statement which we do not propose to argue out in detail here, but we believe it to be true. At any rate, its effect is that for years now there has been *no need* for licensed amateurs to join the RSGB or renew membership, and it would be true to say that the steady decrease in RSGB membership is at least partly due to many members having to decide (for economic or other reasons) between RSGB membership and a *MAGAZINE* subscription.

If these trends are not very obvious to the casual reader or the lukewarm RSGB member "out in the country," they are to those who shape the Society's policy, as they are to us. If our reasoning is accepted as fitting the facts, it will also be clear why, on the RSGB side, the existence of *SHORT WAVE MAGAZINE* came to be looked upon as a menace. In this atmosphere, and with such a condition of mind, any question of real

co-operation became difficult, if not impossible, whatever lip-service may have been paid to the principle of co-operation. There would be the feeling of giving away information to the MAGAZINE, and therefore advantages, and in countless ways it would almost subconsciously become policy on the part of RSGB Hq. to avoid co-operation, rather than to seek it—as, in fact, has happened.

More recently, it also became RSGB Hq. policy to disparage SHORT WAVE MAGAZINE and publicly and privately to impute to the writer personally the most unworthy motives, without attempting any sort of analysis of the situation or seeking in what way a basis of co-operative working could be evolved. It has been assumed that we are “anti-RSGB” and that the MAGAZINE, or the writer, was only waiting for an opportunity to start a rival organisation. In fact, the writer has never been anti-RSGB in the concept of a national society, and it is only the RSGB Hq. group who have ever said that it was we who intended to start a new union! What we have done is to report “as a matter of public interest” that there was a feeling afoot for the idea of a new society.

Representation

A holier-than-thou attitude has been sustained by the RSGB hierarchy on the topics of Representation and Commercialism. Large claims have been made before the membership in connection with such matters as licensing. But all the RSGB can do, and has ever done, in this respect is to negotiate with the Post Office on matters of detail. And it is fair to say that they have discharged this responsibility with credit and success. But given that amateur transmission is, in the first instance, to be permitted at all—which is a high-level Government decision in broad principle—it is then for any organisation or undertaking active in the field of Amateur Radio to negotiate with the GPO, as the issuing authority, on the points of detail—such as bands, power, restrictions, the form of the licence and so on. And as we have said already, such negotiations are not the monopoly or prerogative of any particular body; and it is as well that the RSGB membership should understand this, whatever inspired remarks may have been made at the opening of the recent Exhibition. In the past, our own attitude

has been that while we have always felt free to take up points with the Post Office, we have considered that, as the RSGB has undertaken and discharged this responsibility to the general satisfaction, a third party would merely complicate matters, delay proceedings and perhaps embarrass the authorities. But the decision to adopt this line of policy has been our own, and in no way has it been, nor could it have been, imposed upon us.

Commercialism

On the subject of Commercialism, of which SHORT WAVE MAGAZINE has been so frequently accused—as if it were a grave social failing or misdemeanour, instead of a tax-paying asset to the community—there is a great deal of confused thinking and misrepresentation, about which much could be said. But of what there can be no doubt is that the RSGB has, by a gradual process, itself been allowed to become a commercial publishing concern, competing in many directions on the open market. There can be no valid objection to this on our part so long as the membership understands what is going on, and the RSGB Hq. group itself refrains from using the term “Commercialism” as an epithet to disparage its competitors with those of its membership who do not appreciate the true position.

We have already drawn attention to the heavy losses which these publishing activities have incurred, are incurring and will incur in the future. It is probably fair to say that the only publishing venture which has ever shown the membership a profit was the RSGB “Amateur Radio Handbook,” which sold by the 100,000 during the war when the Society had a clear run and no competition of any kind—when, in fact, there was a large market and nothing else on offer. The Society’s reserves were all built up during this period. They will now have to be used to meet the loss on adventuring in the present highly competitive publishing field, for which the RSGB Hq. group has neither commercial experience nor a mandate from the membership.

Responsible Comment

We conceive it to be our duty and one of the functions of the MAGAZINE, as an independent publication, to comment on anything which seems to us to touch upon Amateur Radio, in the sense of “fair comment on matters of public

interest." It is astonishing that this should be questioned by anybody, or that it should be imagined that the RSGB, because it is a national society, should be immune from public criticism of any kind. What would newspaper readers think if recent public criticism of the Air Ministry regarding the supply of new aircraft types for the Royal Air Force had been avoided or suppressed on the grounds that it might weaken the authority of the Air Staff with the Ministry of Supply? Or if details about the provision of winter clothing for the Commonwealth Division in Korea had been held back for fear of upsetting the relationship between the War Office and the troops? Or if comment about the affairs and organisation of a particular trade union had not been permitted in print because all the members of that union were not readers of the newspaper concerned?

That such an article as this could come to be written at all is itself a reflection on the post-war management of the Society's affairs, and this, in turn, suggests that some new approach is called for, more in keeping with the needs of the times and less related to the procedures of the past. The whole pattern has changed and the RSGB—or, for that matter, any other similar national organisation—has long since ceased to be, by right, the final arbiter in the affairs of Amateur Radio. A healthy and competitive press has come into being, to fish in the same pool. And there are now a great many licensed operators who no longer need to join *any* organisation for the active pursuit of their hobby.

It will by now be fairly evident to the patient reader that actually the atmosphere for co-operation between the Society and the MAGAZINE has never really existed—that in the circumstances it could hardly be expected to exist, if our reasoning is sound and our arguments are fair.

There are those who do not want co-operation; those who would like it but cannot see how it is to be brought about; those who believe that co-operation is unnecessary and that competition (as between the RSGB and the MAGAZINE) is a good thing; and those who imagine that what "co-operation" means is the exchange of polite platitudes in the public print.

But we for our part believe that a workable basis for co-operation—with-

out the necessity for full agreement on anything and everything on both sides—is vital for the well-being and progress of Amateur Radio in the future.

How, then, in view of all that we have already said, can this desirable state of affairs—the undoubted desire of the majority—be brought about?

Before going on to discuss and enlarge upon this theme, it might be as well to emphasise that the writer of this piece is himself an RSGB member, and has been for a great many years; that for long before the war he was an active worker in the Society's interest in various capacities, as well as being a keen contributor to the BULLETIN; all this can be seen from issues prior to 1938. Of all the people who are now writing, talking and arguing on the topics being discussed here, the writer might, with due diffidence, point out that he is one of the few with a long record of actual pre-war service to the Society! This is a curious reflection on the turn of events.

In case this is not by itself sufficient to refute any suggestion that this article amounts to "outside interference in the Society's affairs by a commercial interest," let us also remind the reader that the majority of RSGB members are also readers of SHORT WAVE MAGAZINE, and a number of them have shown themselves to be deeply interested in the matters we are discussing. What the recent correspondence and "exchange of views" has also shown is that, almost without exception, they were quite unaware of the background detail we have tried to fill in here, merely assuming that SHORT WAVE MAGAZINE, and the writer in particular, had some dreadful purpose in mind which could lead only to disaster. Hence, totally erroneous conclusions, of massive proportions, have been drawn and few have been prepared to believe that what we have been working for is strength and unity, with genuine co-operation all round on a basis that is mutually acceptable. This is the sort of thing which not only needs repeating several times, but also calls for some concrete suggestions to put it into practice.

* * * *

CONSTITUTIONAL FACTORS

A national society of any kind, to be truly representative, must be broadly based. This is only possible if its system of effective government (as distinct from its system of local repre-

sensation—quite a different thing) allows for the voice of the individual to be truly heard. Not by correspondence through some distant unknown personality, but through personal contact. Local representatives can do nothing if they have no authority with the centre. They tend to become, and to be regarded, merely as workers for the cause, with no voice in the conduct of its affairs; therefore, they have no real standing with those whom they supposedly represent, because they can get nothing *done*.

Causes of Weakness

If at the centre the elected Council is a working body, the field of choice is immediately narrowed to a comparatively small group of individuals—those who live within reach of London and have sufficient time for the Society's affairs (for it is unquestionably true that the load on a working Council is now very heavy). A restricted field of choice for the governing body means one of two things—either individuals from the same group or area tend to “come up for Council” over and over again, and some of the most suitable candidates (taking the country as a whole) never come forward at all, or there is a tendency for change for the sake of change within the relatively narrow field of choice. The membership at large is presented with a list of names of people who are quite unknown to them and on whose relative merits they are quite unable to form any opinion.

In either case, the result is the same—fundamental weakness at the centre.

The ideal state, where the Council consists of individuals of great experience, business ability, commercial knowledge and an understanding of “what people want” is not really attainable in an amateur organisation such as the R.S.G.B. The reason for this, obviously, is that most people have a living and the hobby-interest must necessarily take second place.

But it is possible to suggest an organisation which would come much nearer this ideal than the present system of management.

The R.R. Council

This is that the Regional Representatives should function as the elected governing body, with an executive committee at the centre for the conduct of the monthly business, this committee controlling the permanent staff respon-

sible for the day-to-day conduct of affairs. In brief, the R.R. Council would meet quarterly, and the Executive Committee monthly, the President of the Society being the chairman of the R.R. Council, and elected by the R.R.'s from amongst themselves.

The immediate effect of this change would be that the system of regional representation would begin to mean something. An R.R., elected by the membership of his region, would go to Council meetings armed with local knowledge and the authority to make himself heard; not as an adviser, but as a member of the Governing Body. The local member would have a representative, in most cases known personally to him and for whom he had voted, with power to act. The field of choice for the governing body would be immeasurably widened and local elections in regions—with possibly rival candidates pledged to this or that policy or course of action, and known personally to the electors—would become of real importance and interest to the members concerned.

The result would be broadly based representation, a much more experienced and confident governing body, and a more positive interest in its own affairs on the part of the membership. The R.R. Council, as the governing body, would lay down the policy line for the guidance of the Executive Committee, which in turn would control the permanent staff and see that policy was carried out. Even if the Executive Committee were to consist (as it would have to) largely of members within reach of London it would work as a committee and not as the governing body.

The change of emphasis would make a considerable and a most important difference in another respect. By separating the governing body from the permanent staff by an executive committee, the authority and strength of the governing body with the permanent staff would be increased and the impression prevailing among the membership that “the whole show is run by one bunch of chaps on an old-boy basis” would be finally removed.

(It is true that the most recently elected Council is more broadly based, but this in no way affects the validity of the main argument put forward in the preceding paragraphs; for one thing, it is still supported by a very low total vote, and for another it is

more than questionable whether a *working* Council drawn from the country as a whole could possibly be got together on a regular *monthly* basis, which is what the present system demands.)

In the Regions, the R.R.'s could form their own local councils consisting of the elected representatives of groups of members within their areas, so that ultimately each individual member could, if he so wished, have a direct say in the Society's affairs. This is quite a different matter from merely having a vote under the existing system of election.

Of course, were the membership at large to demand an organisation in the form outlined here, there would be an immediate bleat of "It can't be done" and "Altering the Articles of Association" and "The need for decision on the spot," and so on. But if the membership wants it, and believes such an organisation to be desirable and sound, then it can be done.

* * * *

PUBLISHING ACTIVITIES

This is an aspect of the matter which, while of great importance, is one on which many people would suppose that we have an axe to grind. Well, we are in business as commercial publishers in this particular field, and we are not alone in that respect. The RSGB publishing activities are competitive in some degree, since in recent years the Society has aimed to get into a market beyond its own relatively restricted membership.

But the point here is not the competitive aspect, so much as whether publishing activities on the part of the Society are desirable, or even necessary at all. This is the more debatable when it is realised to what extent the membership subsidises—and will be called upon to subsidise still further—the publishing adventures which have been so misguidedly embarked upon since the war. With the enormous increase in publishing costs during the last two years or so the Society's publications do not pay their way. Commercial competition has compelled the RSGB, in deference to the attitude of large sections of its membership, to plunge heavily with the BULLETIN. In the near if not the immediate future, this will either have to be pruned down drastically or more money found for it—from a declining membership.

But there is a solution to this

problem, too. The Society could now be re-modelled on the lines of an outstandingly successful organisation which, though operating in quite a different field and with a very much larger membership, is yet similar in many respects to the RSGB.

The Royal Automobile Club is the obvious example. The R.A.C., as will be known to a great many readers who are members or associate members, is accepted as the "body governing the sport" and also, jointly with other motoring organisations, as the negotiating authority with the Government. But the difference is that the R.A.C., while being a membership association, is not a commercial publishing organisation beyond its yearly Handbook and circulars to members. The R.A.C. leaves the interest in motor publishing to commercial concerns who, while competing among themselves, support the R.A.C. as the "body governing the sport." This would never have been possible if, independently, the R.A.C. had set out to produce a lush monthly publication of its own, offered on a members-only basis as a subsidised competitor with the tax-paying commercial publications.

Yet that is the very situation which now exists in the Amateur Radio field, with all the waste of money and effort which is entailed thereby.

Supposing that, in fact, the RSGB were to be organised on the lines suggested here—as a broadly-based representative organisation, operating not as a publishing concern but as the "body governing the sport," what would be the result?

Without analysing the financial position in detail now (though that has, of course, been done to check the facts) the Society could offer better services to members at the same cost, or probably even a lower subscription rate, and at the same time gain, as a right, the support of SHORT WAVE MAGAZINE in the widest sense and in the fullest degree.

To be more specific, it would mean

- (a) That we would provide, free, ample regular space for the reporting of the Society's affairs,
- (b) We would accept the RSGB as the authority for the conduct, organisation and judging of all Contests,

- (c) We would recognise the Society as the sole competent negotiating authority with the Post Office,
- (d) We would merge our own QSL Bureau organisation with that of the RSGB,
- (e) We would form, jointly with the Society, a Technical Committee to decide and direct the development of new techniques in the amateur field,
- (f) We would examine, with the Society, the feasibility of book publishing (for the Amateur Radio market) on a 50/50 cost-profit basis,
- (g) We would take the necessary steps to guarantee continuity, to give both parties the necessary protection against unforeseen calamity.

The main effect of these proposals, which are far-reaching and, of course, call for much consideration as to detail,

would be that both organisations would maintain their separate identities and interests, while at the same time working together on the basis of mutual co-operation for the furtherance of their respective interests. The result would be a strengthening and unification of the amateur movement without breaking with the traditions of the past or endangering the future.

* * * *

We invite comment on the general principles discussed here, and a selection of letters which seem to us to be constructive, whether for or against our proposals, will be published in forthcoming issues of *SHORT WAVE MAGAZINE*. It is not supposed that all the factors involved, one way or the other, can be settled immediately and there must be ample time for the fullest discussion, publicly and privately, in the interests of all concerned. In any case, the first essential is to see whether the principles are acceptable.

We have been asked by many, and challenged by some, to put forward constructive proposals.

Here they are!

THE W2ZXM/MM EPIC

During the early days of the New Year, the world was following with the most urgent interest the happenings to the American freighter *Flying Enterprise*, Capt. H. K. Carlsen.

Shipmasters, no matter how competent and capable, are very rarely qualified radio operators. But if Capt. Carlsen had not been an experienced amateur himself, he would not have been able to communicate with the outside world—the ship's regular radio equipment was dead because power was off—and all the operations connected with the location of the ship and getting her under tow would probably have been made so difficult as to have become impossible. Reliable communication between the *Flying Enterprise* and her escorts was the essential factor, and it was only because Capt. Carlsen was W2ZXM/MM (and so had battery-operated gear of his own) that this

communication link could be established.

So behind the story of the *Flying Enterprise* as published, there lies, for all radio men, professional or amateur, a still more enthralling story of technical knowledge, operating skill and bold improvisation—and it is fair to say that only a man of the calibre of Capt. Carlsen, with his exceptional ability and resourcefulness as a shipmaster, aided by his personal experience as a radio amateur, could have brought his ship as far as he did.

For the particular reason that he holds a call-sign, we are glad to add our tribute to the gallantry and skill of W2ZXM/MM. The names of Capt. Henrik Carlsen and his ship *Flying Enterprise* will in due time be put on the long roll of those who have inspired the traditions of the sea. Let us hope that his call-sign also will be remembered in the years to come.

Always mention the Short Wave Magazine when writing to Advertisers—It Helps You, Helps Them and Helps Us

Two-Metre 16-Element Stack

DESIGN AND CONSTRUCTION

By **W. C. BRADFORD, A.M.Inst.E.**
(GM3DIQ)

AFTER some months of working on two metres, using the evergreen four-element closed-spaced rotary beam at GM3DIQ, it was decided that the results obtained merited the installation of a much more efficient aerial system. Accordingly, all the available literature on VHF aerials was read avidly and much thought put into the final design. The result is the beam shown in the drawings and photograph.

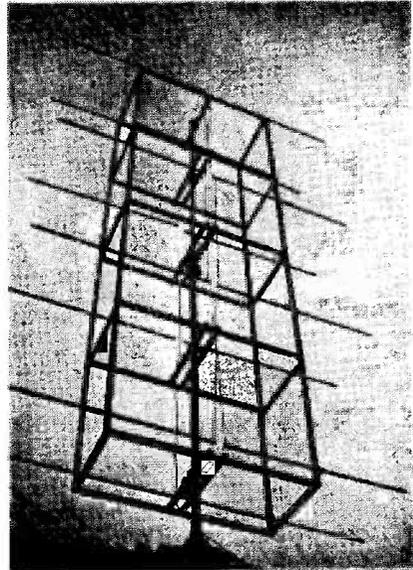
As in most amateur construction these days, the cost of such an array was a primary consideration, and the design finally settled on seemed to hold out possibilities of being both reasonably cheap and very strong. Mechanical strength was a very necessary consideration, since the QTH in Stevenston is 420 ft. above sea level, with no higher ground for miles, and therefore subject to the full force of the westerly gales from the Atlantic. The final cost was approximately seven guineas, which, it is suggested, is not prohibitive. The only items not bought by the writer were the two supports for the thrust bearing and the bearing itself. The bearing was picked up in a nearby scrapyard and the bearing supports were contributed by a friend in the local workshop.

The Mechanical Design

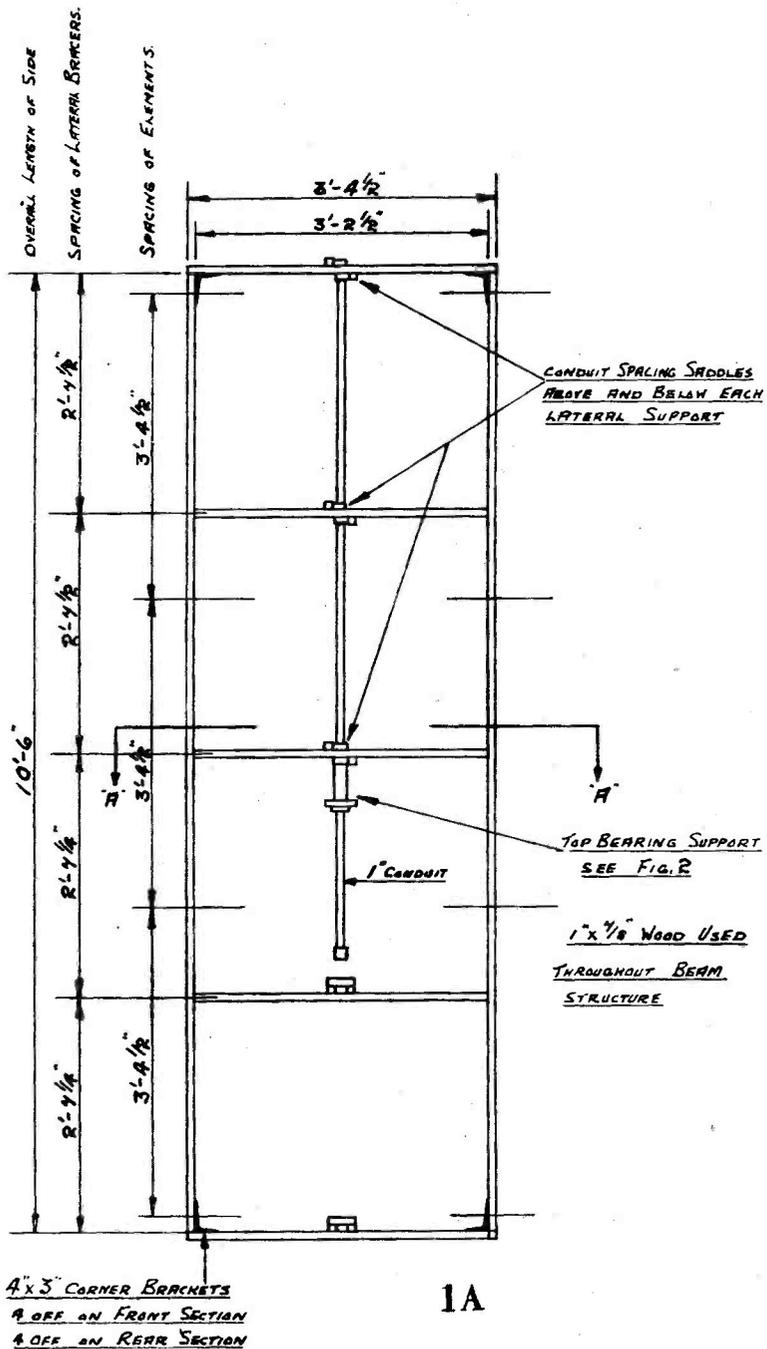
To commence construction, lay out two of the 10ft. 6in. lengths of wood and two of the 3ft. 4½in. lengths. Join these, using the 4in. x 3in. shelf brackets, being sure to see that the spacing between the 10ft. 6in. sections is 3ft. 3½in. exactly. This forms the front "panel" of the beam structure, and the rear panel is built up in the same way. Next, insert the six 3ft. 2½in. spacers at the points shown in the drawing, pinning them to the sides using 4in. galvanized nails. This is quite permissible since, as will be seen later, the

This useful article describes, with ample detail by way of drawings, the mechanical design and construction of a multi-element stacked array for VHF working. Since this beam is operated at a very exposed location, constructional strength has been an essential consideration in the design.—Editor.

main corner members (10ft. 6in. lengths) cannot pull off the spacers. The two sections, front and back, are now joined, using the other eight 4in. x 3in. shelf brackets at the top and middle of the structure. Four are put at the top so that the sides of the structure will be rectangular, and the other four are used at the middle so that it is perfectly rectangular when looking down on the beam. This takes up four of the 1ft. 5in. lengths of wood. The other six lengths are now inserted in the structure, using 4in. galvanized nails. Taking six of the 1ft. 7in. lengths of wood, the 1in. conduit spacing saddles are screwed into position, and these lengths are then mounted above and below the front and rear spacers *and off*



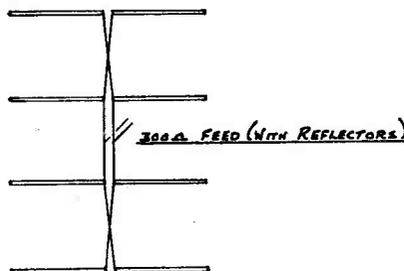
The GM3DIQ beam, constructed as described in the accompanying article, in position and ready for operation.



centre so that the 1in. conduit will lie in the centre of the structure. The other four 1ft. 7in. lengths of wood are then mounted on top of the lower two sets of spacers, such that clearance is left for the 1½in. conduit. Four small pieces are placed so that a clear square hole is left in the centre to take the 1½in. conduit.

The 1in. conduit is now placed in position through the saddles and cut so that it is flush with the top of the structure and about two feet projects below the upper thrust-bearing support (see Fig. 2). There should be a coupling on the lower end of the conduit, and this should be pinned to prevent it turning off. The top of the 1in. conduit is sealed by a wooden plug. The finished structure should now be as shown in the drawings marked 1A, 1B, 1C and 1D.

The whole frame is weatherproofed, using the new plastic enamel on the market. This gives an excellent finish and, what is sometimes more important, it gives the finished job a really nice "look," so that the XYL won't be too displeased! After the paint has dried, the ¾in. saddles are placed in position, the radiator saddles being on the outside of the structure and the reflector saddles on the inside, thus leaving the back of the frame unobstructed to allow the array to be slid up a roof for mounting and, at the same time, giving



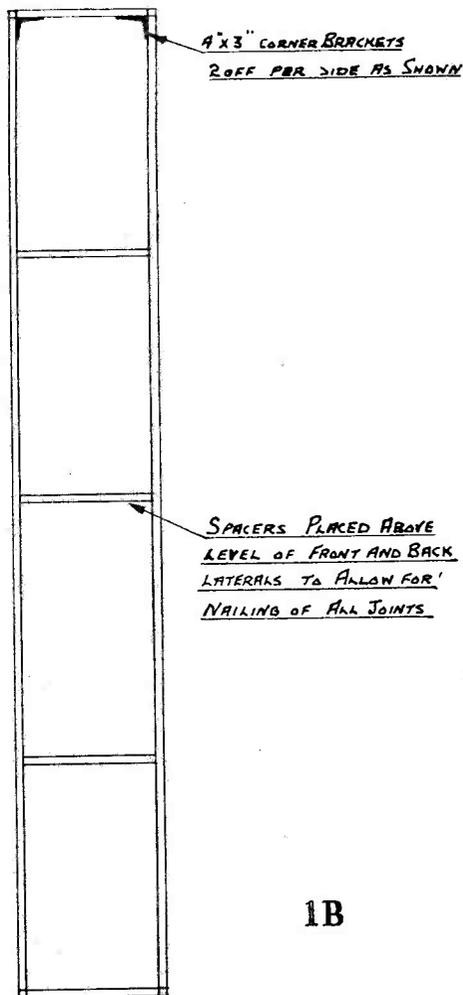
METHOD OF FEEDING ELEMENTS

RADIATORS - 38" LONG

REFLECTORS - 40.5" LONG

HORIZONTAL SPACING = 39.5" CENTRES

VERTICAL SPACING = 40.5" CENTRES



1B

SIDE VIEW SHOWING WOOD ONLY
AND OMITTING CENTRE SUPPORTS

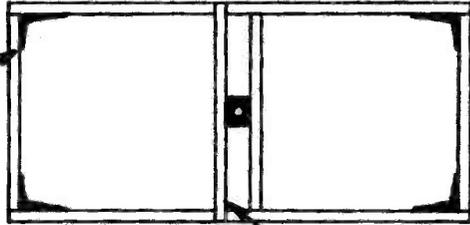
the required seventeen-inch spacing between radiator and reflector.

The Element Layout

When cutting up the five lengths of aluminium tubing for the sixteen elements, care should be taken to measure all the tubes first, as, if you don't, you may be left a couple of elements short. Taking each of the

1C

4" x 3" CORNER BRACKETS
7 OFF AS SHOWN IN
CENTRE SECTION OF
BEAM STRUCTURE



1'-4" CENTRE SUPPORTS MOUNTED OFF CENTRE
TO TAKE CONDUIT SPACING SADDLES

SECTION "AA"

1D

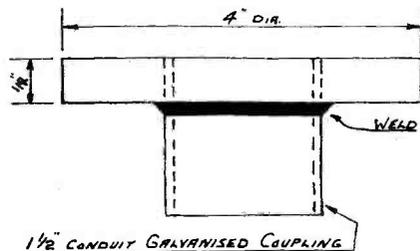
eight radiators. holes should be bored near the end to accommodate the inter-element feedline in use in each element. The wire used at GM3DIQ was 3/16in. dia. aluminium line, thus obviating corrosion between wire and elements. The elements are now placed in position and the feedline laced through the elements. As a point of interest, the feedline at GM3DIQ was bent down and up through the elements, so that the feedline lay alternately above and below the centre line of the elements. Thus, the feedline at the two crossover sections was spaced the diameter of the elements, and no insulators were required. The feed impedance of the beam is just under 300 ohms. The feedline in use at GM3DIQ is 72 ohm coaxial cable with half-wave phase inverter to 288 ohms, this giving a standing wave ratio of approximately 1.2 to 1. The construction of the half-wave phase inverter is shown in Fig. 3.

Mounting the Array

The beam at GM3DIQ is mounted through the roof of the shed forming the shack. The fixed pipe is 1 1/2 in. galvanized conduit secured by saddles, and lashed, to the roof joists and projecting through the roof. The beam was hoisted into position and placed over the 1 1/2 in. pipe. This is a simple matter, due to the light weight of the structure. With the thrust-bearing and bearing flange in position, the 1 1/2 in. pipe is lifted up through the lower two sets of spacers and the bearing flange screwed on. This holds the frame in

position while the 1in. conduit is being secured to the necessary length of 1in. conduit pushed up the 1 1/2 in. pipe from underneath. Again, all couplings on this 1in. pipe are pinned and locked in position. The 1 1/2 in. pipe is now lifted up and the beam hoisted the required height above the roof-top. If the 1 1/2 in. conduit is not to be guyed, the coupling between lengths of the pipe should consist of about fifteen inches of 1 1/2 in. bore steam pipe, secured by eight 1/2 in. Whitworth screws tapped into the conduit *and no more*, since clearance must be left for the 1in. conduit.

The 1in. conduit should be projecting below the 1 1/2 in. conduit by about one



LOWER BEARING FLANGE SUPPORT

MA
166

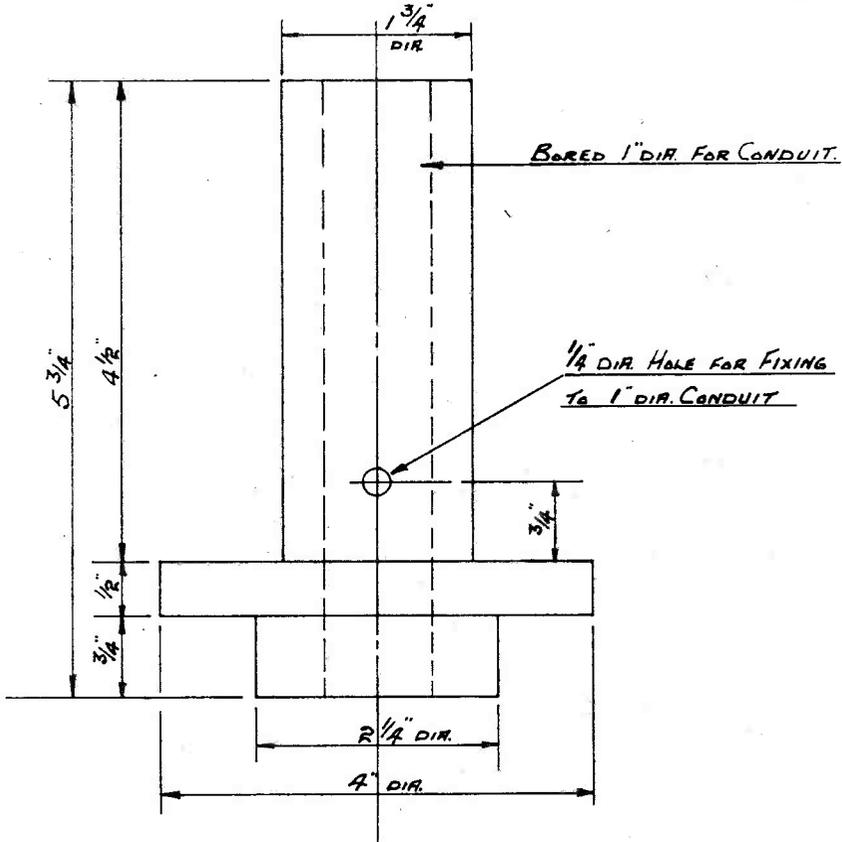
FIG. 2.(B)

foot to allow for attachment of drive gear. (A prop-pitch motor would be excellent for this.) The beam turns very easily and can be operated by hand if some braking method is incorporated to hold the beam in the desired direction. Little or no trouble has been experienced due to high winds, since the bearing is in the centre of gravity of the structure. If about three feet of co-axial cable is left slack before securing it through the

roof, there should be enough for a good three revolutions of the beam.

On test, the array has shown up excellently with a beam of about 40° to the half-power points and a gain of approximately 15 dB.

In conclusion, the author wishes to point out that brass screws should be used throughout the beam structure, as it has been found that steel screws rot the wood very quickly. A table is given



TOP BEARING SUPPORT
FOR RANSOME & MARLES LT 2 1/4"
THRUST BEARING

FIG. 2. (A)

MA
165

OUTPUT IMPEDANCE = 288 Ω.
TO BEAM ARRAY

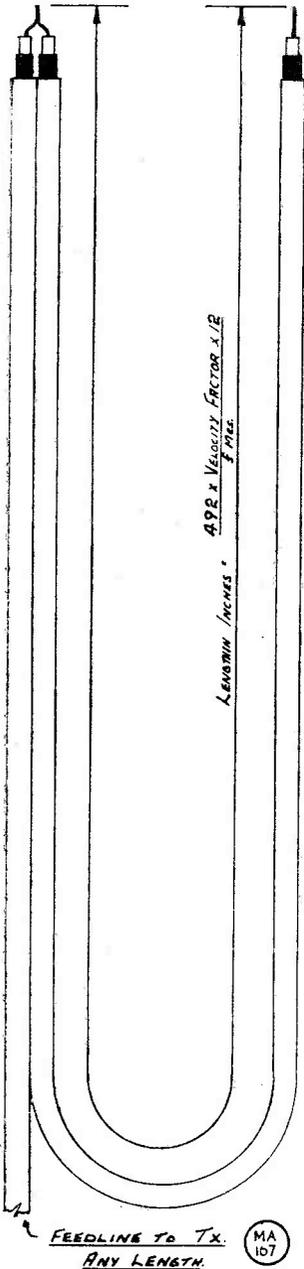


Fig. 3. The half-wave phase inverter, 72-ohm coax to an impedance of 288 ohms. Note that the length of the phase inverter should include the clips securing the coax to the array feed-line

showing the details of the wood lengths and the cost of materials, all of which should be obtainable through any local workshop. No trouble should show up in the operation of the beam, since there is so little to go wrong, the design being simplicity itself.

LENGTHS OF WOOD

- 4 at 10ft. 6ins. long of 1in. x 3/4in. wood.
- 4 at 3ft. 4 1/2ins. long " "
- 6 at 3ft. 2 1/2ins. long " "
- 10 at 1ft. 5ins. long " "
- 10 at 1ft. 7ins. long " "

TOTAL COST

	£	s.	d.
2 lengths 1 1/2in. galv. conduit	1	12	4
3 " 1in. enam. "	18	0	
5 " 3/4in. alum. "	1	16	0
120 feet of 1in. x 3/4in. wood	1	5	0
16 shelf angles 4ins. x 3ins.	6	0	
6 1in. alum. spacing saddles	5	0	
16 3/4in. " "	15	0	
Brass fixing screws	8	6	
Total	£7	5	10

INCREASE IN PRICE

As announced on the Editorial page in this issue, *Short Wave Magazine* is to cost 2s. 6d., in an enlarged and improved format, with effect from the next (March) issue, No. 1 of Vol. X.

In accordance with the usual trade conditions, the cost to direct subscribers will be advanced to 30s. post free for a year of twelve issues.

Readers who are already direct subscribers will, however, not be affected by the increase until their next renewal falls due. We shall also accept new (home) subscribers at the old rate of 24s. per annum until February 29. For overseas readers who wish to become direct subscribers, this date is extended to March 31. Payment of subscriptions can be made in any currency exchangeable with sterling.

Direct subscription orders, with remittance, should be addressed to: The Circulation Manager, *Short Wave Magazine, Ltd.*, 55 Victoria Street, London, S.W.1.

Predicting Propagation Conditions

PRACTICAL CONSIDERATIONS AND DATA REQUIRED

By R. M. PREVETT (G3EKG)

FOR the past year the writer has been making use of ionospheric prediction charts to forecast the times of reception and strengths of signals from many parts of the world. The predictions have, in nearly all cases, been surprisingly accurate, thus allowing a more efficient use of operating periods (as far as DX is concerned). It would seem that most amateurs have only a sketchy knowledge of ionospheric prediction, and so it is hoped that the discussion here will provide some interest.

It is not proposed to go into the elementary theory of ionospheric propagation, since this is adequately dealt with in the radio handbooks and textbooks. Therefore it will be assumed that readers are familiar with the meaning of such phrases as "Maximum Usable Frequency," "Skip Distance," "E and F Layers," and so on.

There are two main factors which govern the possibility of radio communication over any particular path by means of reflection by the ionosphere. These are:

(a). The Maximum Usable Frequency (MUF) for that path;

(b). The absorption encountered by the signal while travelling over that path.

If the MUF is lower than the operating frequency, the signals will pass through the ionosphere and not return to the earth. Therefore, the operating frequency must be equal to, or preferably lower than, the MUF. Under these conditions the signal will be reflected by the ionosphere and returned to earth, thus completing one hop. The maximum distance which can be covered in one hop is about 4000 kilometres, so that in order to travel a greater distance the signal must perform two or more hops. As the signal travels away from the

For most of us, trying to work DX means no more than going on the air when conditions seem right and pushing out a call. It is not always realised that there is a science, albeit at present a somewhat inexact one, of ionospheric prediction. Broadly, this means foretelling in advance what conditions are going to be. Much learned thought is given to this problem, and it is fair to say that, within limits, reliable predictions are possible. These limits are such as to enable long-distance Service and commercial circuits to be set up in advance with reasonable certainty. Our contributor goes into the matter from the practical point of view and discusses his own experience in making predictions for DX working on the 14 mc band.—

Editor.

aerial it will undergo some form of absorption—in other words, it will lose power. If the absorption is great, the signal may become so weak that it cannot be detected at the receiving end; the remedy is to increase the transmitting power until the signal is detectable, but amateurs are restricted in the amount of power they may use, and thus, as far as they are concerned, that particular path is "dead." So it is seen that, to make a prediction for any path, we must know the MUF and the amount of absorption to be expected over that path.

MUF Prediction

Charts are published from which the MUF can very easily be predicted in advance for any path at any time of the day. Thus, if we are interested in 14 mc transmission to South Africa we merely refer to the charts and find out at what times of the day the MUF is greater than 14 mc for that month, and we know then that the band will be open to South Africa for that period. For example, during December, 1950, the MUF was greater than 14 mc between about 0620 until 1900 GMT. (See Fig. 1). However, due to absorption, amateur communication would not be possible between England and South Africa over the whole of that period.

There is a term often used in the text books which is related to the MUF; this is the Optimum Working Frequency (OWF), sometimes called OTF (Optimum Traffic Frequency). The value of the

OWF is always 15% lower than that of the MUF; the reason being that the MUF is subject to a certain amount of fluctuation about its predicted value, and consequently it is better to use an operating frequency rather below the MUF, *i.e.* use the OWF, to avoid sudden fades. The prediction charts give MUF values from which the OWF is found by means of a conversion table. Having found the times during which the band is open for a particular path, we must then estimate the amount of absorption to be encountered on that path.

Types of Absorption

There are two main types of absorption. As a radio wave travels out from the aerial its intensity decreases with increasing distance; also, when travelling *via* the ionosphere, energy will be lost at each reflection at the ground. These, and some other forms of energy loss, are constant for a given path; that is, they do not vary with the day or season but only with the *distance* the wave has travelled.

The other type of energy loss is due to ionospheric absorption; this occurs principally in a region which exists at a height below that of the E-layer, and is known as the D-region. Absorption in the D-region is dependent on the angle at which the sun's rays strike the earth, and is thus greatest at noon in those latitudes where the sun is vertically overhead, and negligible at night. D-region absorption also varies with frequency, being greatest at low frequencies and least at high frequencies; and it varies with the 11-year sunspot cycle.

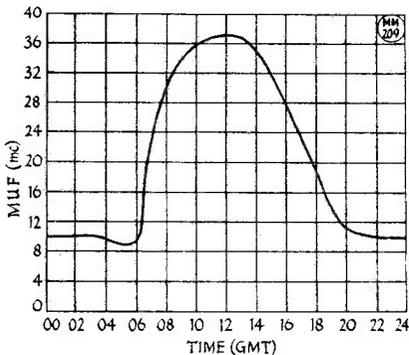


Fig. 1. Showing MUF plotted against time for the path London-Cape Town during December 1950.

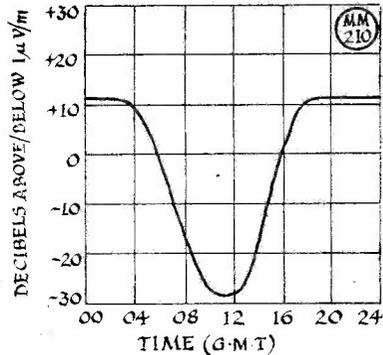


Fig. 2. Predicted field strength in London during December 1950 of a 14 mc CW transmitter located in Cape Town and radiating 100 watts.

being greatest during the sunspot maximum period. All forms of absorption can be predicted fairly accurately and easily, and, knowing their values, we can estimate the field strength to be expected in any part of the world, affecting a transmitter located in England, under given conditions. It must be emphasised that the predictions are only valid under normal ionospheric conditions. During periods of ionospheric storms both the MUF and absorption are affected, the former usually decreasing and the latter increasing, thus combining to make communication difficult if not impossible.

Fig. 2 shows the predicted field strength in London of a 14 mc transmitter located in Cape Town and radiating 100 watts from an omnidirectional aerial, during December, 1950. The field strength is given in decibels above (and below) one microvolt per metre (usually abbreviated to $1 \mu\text{V/m}$). Assuming that a change of one S-point on the signal strength scale corresponds to 6 dB, it is quite simple to convert the scale of Fig. 2 into an S-scale. Suppose that $1 \mu\text{V/m}$, *i.e.* zero on the scale of Fig. 2, represents S5, then + 12 dB on the scale represents S7, and so on. Unfortunately, the matter is not quite as simple as this, because we have to consider atmospheric and receiver noise! The intensity of these noises may quite easily be greater than that of the signal, making communication impossible. However, this subject is dealt with in full in the next part of the discussion.

It has been shown that, with a knowledge of the MUF and the absorption factor for a given path, it is possible to predict the field strength due to a particular transmitter at any point on the earth. It was mentioned that a further factor, namely, the prevailing noise level, must be considered before the prediction is of use. In general, there are two sorts of noise present in a receiving system: man-made and otherwise. In the former category are included car ignition noises, power leaks, and so on; in the latter category we have, in order of importance, atmospheric noise, receiver or set noise, and cosmic noise.

Origin of Noise

Atmospheric noise is caused by lightning flashes; these radiate energy over a wide band of frequencies and consequently some of the energy will be transmitted over long distances by way of ionospheric reflection in the same manner as the normal radio waves. So, in many cases, thunderstorms occurring in quite distant places will have an effect on the noise level in a receiver.

Receiver noise is due to the random motion of electrons in resistances, and to the irregular fluctuations of the anode current in valves. It is of great importance because the amplitude of the receiver noise sets the limit to the sensitivity of the receiver. The normal communication receiver has a noise level such that a signal having an *intensity* of $1 \mu\text{V}$ at the aerial terminal will give an output which would be classed as S5-S6. Since the aerial also has some resistance, noise will be developed in it, and for a signal to be receivable it must have a strength greater than that of the noise due to the aerial. In the case of the usual forms of horizontal aerial, a field strength of about $1 \mu\text{V}/\text{m}$ will give an intensity of $1 \mu\text{V}$ across the receiver input terminals, *i.e.* it would be an S5 signal.

Cosmic noise is due to radiations arriving from outer space in the same manner as does light. Its effects are only of importance on the higher frequencies, 28 mc and above. Although these radiations are merely a nuisance to those interested in normal communication work, they are of great importance in radio astronomy, a branch of physics which has received much attention in the last few years.

The most important form of noise is that originating in the atmosphere. The

receiver and aerial noise sets a limit to the maximum sensitivity of the receiver, and we have seen that in the average case this limit is about $1 \mu\text{V}/\text{m}$; however, atmospheric noise very often produces a field greater than $1 \mu\text{V}/\text{m}$, and so a signal giving a field of only $1 \mu\text{V}/\text{m}$ would obviously not be receivable.

Making a Prediction

Summarizing, we see that to make a complete prediction for one path, the following steps should be carried out:

- (1) The OWF found for each of the 24 hours and a graph plotted of OWF *v.* Time (similar to Fig. 1).
- (2) A graph plotted of Field Strength *v.* Time.
- (3) Noise level plotted on the same graph as in (2).
- (4) The difference between the signal and noise levels is an indication of the expected signal strength.

This figure is then plotted (with an eye on the OWF) against the time of day. The signal strength scale can be in S-units; this graph then represents the final prediction, as in Fig. 2.

To make matters clearer, it is proposed to give a worked example. The full line in Fig. 3 represents the field strength in London of a 14 mc CW transmitter located in Cape Town, and radiating 100 watts from an omni-directional aerial; the graph is for December, 1950. The dotted line gives the strength of the field at London due to noise. Comparing this graph with that of Fig. 2 above, it will be noticed that in this case the field strength of the signal is much higher, and yet the conditions involved are identical. The reason is that in this case we are dealing with a CW transmitter, whereas in the previous case it was a phone transmitter. The *actual* field strengths are, of course, the same, but the readability of CW signals is greater than that of phone signals and consequently the CW signals are given a greater *effective* field strength (actually + 17 dB).

Analysis of the Curves

Referring to Fig. 3, it is seen that at about 1600 hrs. the field strength of the signal and the noise are equal, and so we should just be able to read the signal; we might call this value S3. At 1700 hrs. there is a difference of 13 dB between the two field strengths; this represents an increase of just over two S-points, so that signals at this time

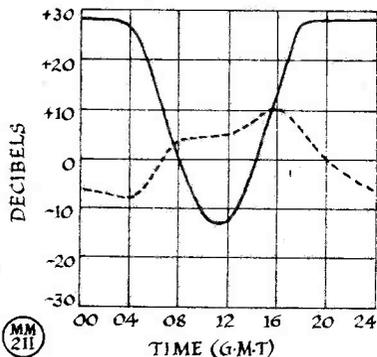


Fig. 3. Illustrating the effect of noise. Compare with Fig. 2. It should be noted that the noise factor plays an important part in determining the effectiveness of the path.

should be at about the S5 level. At 1900 hrs. the MUF drops below 14 mc. and so after that time no signals will be receivable. Fig. 4 is produced by plotting the signal strengths, as found from Fig. 3, against time of day; and so Fig. 4 represents the completed prediction.

It will be noticed that this prediction refers to the signal strength in London, due to a transmitter in Cape Town. The converse is not necessarily true; the reason is that the noise level in Cape Town may not be the same as that in London. In actual fact, in this case there was little difference, but in some instances there is considerable divergence and consequently the signal strength at the far end is not the same as that in Britain, even though the equipment used at both stations is identical. In other words, if you give S7 to a VU2 who is running 25 watts into a dipole, and he gives you S5 when you have 150 watts fed into a three-element rotary, don't say it must be his receiver—it may be the high noise level at his end! In this matter, the predictions are very helpful, because they will tell you whether your signals are receivable at the far end regardless of the strength of the DX signals, and you will thus save yourself the trouble of fruitless calling—although there is always the temptation of calling "just to see"!

The Variables

The predictions when made out as above are really only correct for one set of conditions; what is right for one

station may not be for another located in the same area, due to differences in aerials, receivers, man-made noises, and so on. In the next section it is proposed to show how to prepare predictions for a given set of conditions.

The last paragraphs have shown how a prediction applicable to amateur working was constructed. When the writer first used prediction charts he found that predictions for some routes were quite satisfactory, but on other routes they definitely did not fit with the actual results obtained. Comparing the predictions with actual results for a period of four months over sixteen routes to most of the areas usually worked, brought to light several facts which should be taken into consideration when preparing the predictions.

First, it must be remembered that the predictions are only valid for days of "ionospheric quietness." When conditions are poor or erratic the predictions do not necessarily hold. Some indication of conditions can be obtained by listening to the twice-hourly broadcasts of WWV (details of this service are to be found in various magazines and handbooks). It is also believed that Radio Australia broadcasts a weekly programme concerning ionospheric conditions.

Most amateurs use aerials which give some form of directional effect; long-wire users find areas hard to work, due to blind spots in the aerial radiation pattern. Such effects must be borne in mind when preparing predictions. A high prevailing noise level due to local power leaks will cause errors, as will an insensitive receiver or a badly mismatched aerial. The following method

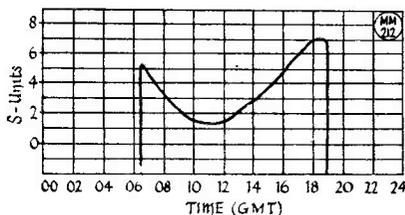


Fig. 4. Final prediction having regard to the circumstances discussed by the author. The expected signal level in London of a ZS station radiating 100 watts on 14 mc during December 1950. This prediction was made some three months earlier from published data, as explained by G3EKG in this article.

of correction of predictions was used by the writer and found to be satisfactory.

Practical Results

A normal prediction was prepared as shown in the previous article; then a number of QSO's were obtained with stations in the area for which the predictions were made. The results were compared with the predictions, and these were adjusted accordingly. For example, in the last section we saw that during December, 1950, a 100-watt 14 mc CW signal originating in Cape Town should have a strength of about S5 in London at 1700 hours. In practice, at a particular location, it might be found that most ZS1 signals were about S7 at that time; therefore, we should add 12 dB on to the field strength parameter, *i.e.* the field strength parameter would read + 12 dB higher for all times of the day. Suppose now, in the same example, the predicted signal strength in Cape Town of the G station was S5 and that in most cases the G station received a report of S5: Then since the field strength parameter for both stations is the same (assuming the G station to be 100 watts), the adding of 12 dB to the field strength parameter (in order to make the prediction of signal strengths from Cape Town fit with the actual results) would give erroneous readings for the report

the G station would expect for his signals in Cape Town—because the G station would then expect S7 and would, in fact, only get S5. In this case, the field strength parameter is probably correct, but the noise parameter requires adjustment; the noise parameter for G would be lowered by 12 dB and the noise parameter for ZS1 left as it was. Once these corrections have been made, they are, of course, valid for future years; if it has been necessary to lower the G noise parameter for the ZS1 route for December, 1950, by 12 dB, then this must also be done for December, 1951. So after using the charts for a year, most of the discrepancies will be ironed out and the work involved in the preparation of the charts considerably reduced.

Local Value Only

It will be appreciated that a complete prediction table, covering several areas, is really only useful to the person who compiled the table because of the effects mentioned above. The table shown here was worked out by the writer during October, 1950, for 14 mc CW work during December, 1950; readers might find it interesting to compare these predictions with results they obtained during that month. The table was constructed for a 150-watt station in England using a centre-fed six-half-wave

SAMPLE PREDICTION TABLE
FOR 14 mc BAND IN DECEMBER 1950

Col. (a) Expected S-level of DX station in G. Col. (b) Expected S-level of G Station at DX, in both cases under conditions as stated in text. Figures underlined indicate predicted Optimum Working Frequency to be below 14 mc.

Time	South Africa	Buenos Aires	Japan	New Zealand	West Australia	India	USA East	Hawaii	West Indies
	a b	a b	a b	a b	a b	a b	a b	a b	a b
00	---	---	---	---	---	---	---	---	---
01	---	---	---	---	---	---	---	---	---
02	---	---	---	---	---	---	---	---	---
03	---	---	---	---	---	---	---	---	---
04	---	---	---	---	---	---	---	---	---
05	---	---	---	---	---	---	---	---	---
06	---	---	---	---	0 0	6 5	---	---	---
07	4 3	---	---	<u>1 0</u>	0 0	5 4	---	---	---
08	3 2	7 8	6 6	<u>5 4</u>	0 0	4 3	---	---	---
09	2 1	5 7	6 6	<u>4 3</u>	0 0	4 3	---	---	---
10	0 0	3 5	<u>6 6</u>	4 4	1 0	4 3	---	---	---
11	0 0	1 2	---	5 5	2 1	5 4	7 8	---	6 6
12	0 0	0 0	---	5 6	4 3	5 5	6 7	---	5 5
13	1 0	0 0	---	5 7	5 4	6 6	6 7	---	4 4
14	2 1	0 0	---	5 7	5 5	6 6	5 6	---	3 3
15	3 2	0 0	---	5 8	5 5	6 7	5 6	---	3 3
16	4 4	0 0	---	<u>5 8</u>	5 6	6 7	5 6	---	3 3
17	5 6	0 0	---	---	6 6	7 8	5 6	5 6	4 4
18	<u>6 7</u>	2 2	---	---	---	---	6 7	4 5	4 4
19	<u>7 7</u>	4 3	---	---	---	---	7 7	---	5 5
20	---	<u>5 4</u>	---	---	---	---	8 7	---	6 5
21	---	---	---	---	---	---	8 7	---	7 5
22	---	---	---	---	---	---	9 7	---	8 6
23	---	---	---	---	---	---	<u>9 8</u>	---	<u>8 6</u>

long-wire aerial, running NE/SW, and assumes the DX station to have a power of 100 watts into an omni-directional aerial. Column (a) gives the expected signal strength in England of the DX station, and column (b) the anticipated report of the G station in the DX areas. Where a blank occurs, the MUF is below 14 mc; figures underlined indicate that the MUF is above 14 mc but the OWF is below 14 mc (in these cases, signals may be normal or possibly not receivable, but are generally erratic). It was found that these predictions, in some cases, were not altogether accurate; for example, no signals were heard from Japan. However, this was the first December forecast which the writer had made, so some errors could be expected; also, conditions appeared to be erratic most of the month, so perhaps the predictions were not to blame!

The information required for the com-

pling of these predictions is not published for circulation to the general public in this country. It is, however, obtainable from the United States Government Printing Offices in Washington, D.C. There are two separate sets of data required:—

(a) Predicted MUF values, which are published every month, three months in advance. (CRPL-D series).

(b) Information concerning absorption and noise values; this is contained in the National Bureau of Standards Circular 462, which also contains detailed information on the use of the MUF charts and much other interesting material.

It is hoped that this treatment has interested readers, in particular the DX fraternity, and that those who undertake the preparation of their own predictions will find them as useful and fascinating as the writer has done.

ELECTRONIC TELEVISION PIONEER HONOURED

J. D. McGee, O.B.E., Ph.D., M.Sc., A.M.I.E.E.

E.M.I. Research Laboratories Ltd., announce that Dr. J. D. McGee was among the recipients of the Order of the British Empire in the New Year Honours List.

Dr. McGee is a senior scientist with E.M.I. Research Laboratories Ltd., and was one of the team that evolved the all-electronic Emitron Television system, which provided Britain with the world's first public television service.

He was born near Canberra in Australia in 1903 and entered St. John's College, Sydney University, in 1923. He took his M.Sc. degree and was awarded the University Medal in Physics. Dr. McGee was also awarded a research scholarship by the Royal Commission for the Exhibition of 1851 to Clare College, Cambridge, where he worked under the late Lord Rutherford in the Cavendish Laboratory from 1928 to 1931 on Atomic Physics. He took his Ph.D. degree in December, 1931.

In January, 1932, he joined the staff of E.M.I. Research Laboratories, and has since worked mainly on electronic tubes used in television, and in particular on the development of camera pick-up tubes. He was responsible for the development of the original Emitron Camera tube as used from the inception of the London Television Service. This type of tube is still in use by the R.B.C. at Alexandra Palace today.

XTAL XCHANGE

The few simple rules for insertions in this space, which are free, were given on p.677 of our January issue. All dealings should be discussed direct.

G2KB, 7 Abbotsfield Cott., Wareside, Nr. Ware, Herts.

Has QCC Type P5 crystal 14078kc, certificated. Wants similar type 7011-7013 kc.

G3BMX, 55 Greenwood Mount, Leeds, 6

Has QCC Type P5 crystal 3573 kc. Wants 100, 500 or 1000 kc bar.

G3CJU, 164 London Road, Newbury, Berks.

Has numerous crystals 5350-6450 kc, and 500 and 1000 kc bars, all $\frac{3}{16}$ in. mounting, no certificates. Wants any crystal for 1.7 mc, centre preferred; any 3.5 mc band crystal not within 5 kc of 3760 or 3780 kc; any frequency 8001-8100 kc.

G3NCM, 23 The Circuit, Cheadle Hulme, Cheshire.

Has QCC Type P5 crystal 7055 kc, certificated. Wants 100-1000 kc bar.

G8RC, Montazah, St. Charles Road, Brentwood, Essex.

Has QCC 3545, 3595 and 7380 kc crystals. Wants 400 kc bar.

G8WP, 31 Lascelles Hall, Kirkheaton, Huddersfield.

Has QCC Type P5 crystals 1813 and 1918.5 kc, certificated. Wants mounted 100 kc bar, with certificate.

Lt./Cdr. (E) E. W. Burgis, R.N. (ex-G6FB), R.N. Air Station, Abbotsinch, Paisley, Scotland.

Has QCC Type P5 crystals 7011, 7018, 7026, 7033, and 7046 kc, no certificates; also ex-A.M. 7040 kc crystal, $\frac{3}{16}$ in. mounting, and 500 kc bar. Wants crystals QCC Type P5 or similar in ranges 1715-2000 kc and 3500-3600 kc.

DX COMMENTARY



By L. H. THOMAS, M.B.E. (G6QB)

WE have to report a very satisfactory mixed bag this month; there is no epoch-making DX to talk about, but plenty of interesting happenings on all bands. If your one passion is the collection of new countries, you had better put yourself out to graze until about 1955, but if you can still rouse some interest in some of the other multifarious aspects of Amateur Radio, and even of "DX," then you may read on.

The New Year has not been at all kind to us, as far as DX conditions are concerned. The last time we ran a WAZ Marathon was in 1948, and we well remember working 31 Zones in the first week of the year. Now here we are in 1952 with no one claiming more than 16 Zones by January 16! Entries have started coming in, but we want more and more of them. This is not an affair that is going to steal your sleeping time or lash you into a frenzy every time you go on the air—you have a whole year in which to work (we hope) 35 Zones and perhaps 150 countries. Get weaving, and send in your present score, however small.

The Post-War Four-Band Table is also in need of more and more clients. As formerly, we intend to shuffle it from time to time so that its order of merit shows the top scorers on each band. And we should like as many

overseas entries as possible for this, please! We already welcome W2QHH and HC2JR on board—how about some of you VK's and ZS's?

Top Band News

Apart from the Trans-Atlantics, there have been quite a few developments on the Top Band, so we will cover the subject right away. As a full report on the present series of *Magazine* W/VE tests will appear when they have run their course, we will only summarise the happenings briefly. Up to the time of writing, it appears that the best session

Calls Heard, Worked & QSL'd

was that of December 23, although it seemed very disappointing during the early stages.

Several British stations have already got across, the honours once more going to GW3ZV and GW3FSP (although 'ZV' was not active on the morning of the 23rd). Stations known to have made contacts across the Atlantic include G2AJ, 2PL, 3COJ, 3ERN, 5JU, 6GM and the two GW's. G5JU (Birmingham) pulled off a nice one by working W9CVQ, who immediately sent off a QSL saying "I could hardly believe my ears when I heard you rolling through, clear as a bell and with very little QSB." Nice work, this!

G6GM (Holsworthy) tells us that W2MX and W2EQS reported him only RST 239 at 0600, but he had built up to 579 and peaked at 0800. He actually worked W2EQS at 0819 GMT—would that be the latest-ever for a QSO of this sort? This, by the way, was on December 23; January 6 was disappointing by comparison, except that several people heard KV4AA on that morning.

GW3FSP also worked W9CVQ on December 23, and confirms that conditions were poor at the start but warmed up nicely just before sunrise.

ZB1BJ (Hamrun, Malta) has been active on One-Sixty and heard by several G's, but at the time of writing he had not made a QSO. He reports GW3ZV (589), G6GM (579), G2UN, 3BKR and 6LB (569), all on the morning of January 6.

4X4CJ (Tel-Aviv) has sent a last-minute message via G5FA, to the effect that his P.M.G. has refused permission for him to operate on the Top Band and that therefore the whole thing is off. Hard luck.



VE1EA, Windsor, Nova Scotia, "right on the edge of the ocean," is well known as a consistent signal when it comes to Top Band DX. His receiver is an RME-69 with DB-20 preselector and his station a good example of neat, individual design.

As some slight compensation, OH3NY is very much there and has raised quite a lot of G's. EK1CW is likewise pretty active when his work allows it. He mentions G6GM at RST 599 with G2YS and 6LB at 589—all around 0600, which time, he finds, is very much better for G's than late at night. EK1CW says he heard FA8BG (his "local") on the band—has anyone else logged him yet? 'CW uses 100 watts into a half-wave Zepp running NE/SW.

GW3FSP (Neath) now tells us that F9AW and F7AR are operating on 1.7 mc. He worked the former, who proved genuine enough, and he says that others

will appear shortly. This was almost certainly the first GW/F contact on One-Sixty; first G to work the French station was probably G2AJU. But now something even better from Dewi: On January 12 he and GW3ZV both worked ZC4XP at 2030 GMT. The ZC4 wishes it to be known that he is active on the band, and also that he has heard MD2BC and SU1JP up there! What exciting times we do live in

G2YS (Chester) reports HA4SA and YU3SLI as a couple of Gotaways, though he has no difficulty in working OK's. G2HKU (Sheerness) also mentions OK1DC, heard at 589, and

EK1CW as pretty consistent at week-ends.

DX on Eighty Metres

By comparison with the Top Band, Eighty has been a local affair, except to the few DX workers who keep extremely quiet about their doings. We have heard some of these boys piling up the most amazing DX on this band, but we can't altogether blame them for being reluctant to publicise it. (All the same, there would be no harm in telling us what they had already worked!)

G2YS found a new one in the guise of 3V8AB (3540 kc at 2220 GMT); he also worked W6SAI, who, with W5BE, was audible until 0900 one morning. G3FXB (Hove) finally made his WAC on the band, with PY7WS. Other interesting ones were CT2BO (3550) and OY2Z, who seems genuine—in fact, 'FXB says that EI9J has a QSL from him. KG4AD and SU1FX have been heard, and someone was calling an FF8.

FOUR BAND MARATHON

(January 1—December 31, 1951)

Final Placings

Station	Points	3.5 mc	7 mc	14 mc	28 mc	Countries
G3ATU	303	41	90	152	20	158
G6QB	284	34	69	139	42	156
G2AJ	284	39	65	129	51	141
G5JU	282	34	73	128	47	141
G3FXB	279	37	85	133	24	144
G5BZ	264	35	63	149	17	154
G6QX	251	45	80	104	22	126
G5FA	222	31	75	109	7	120
G3ABG	203	30	65	83	25	103
GM2DBX	191	1	30	95	65	113
G2BW	182	15	44	93	30	103
G8KU	156	16	29	100	11	105
W2WC	148	22	35	84	7	91
G6TC	137	14	37	71	15	77
G8IP	133	12	50	63	8	86
G3COI	115	20	21	72	2	79

G2VD (Watford) makes a welcome return to the fold. He worked VQ1RF at 2345 on December 7 and says he sounded genuine enough, but we still understand that the authentic one was never on Eighty; however, proof will be forthcoming in due course, no doubt. 'VD also collected OY2Z for a new one. G5JU worked PY7WS, who has been quite active on 80. G6QX (Hornchurch) reports nothing new—just VE, W and OY2Z.

G3ATU (Roker) finds, to his joy, that the VS7NG he worked up there was the real one after all; 'ATU was his second G on 80, G8KP being the first. G3FPQ (Bordon), using 18 watts to a 6L6 PA, raised CT3, EK, FA, FC, OY and lots of Europeans; gotaways were HP1AW, PY7WS, 3V8AB and some 4X's. GM3EDU (Alexandria) worked the doubtful VQ1RF, also ZC4XP and 4X4CJ.

G3DOZ (Feltham) seethes with mock-indignation and asks "How dare you suggest that 20 kc of the band be set aside for the DX-crazed? The DX-hunters have all of 10 and 20, what they can hear on 40, and now they are elbowing us off the Top Band—so leave 80 alone!" Never mind, 'DOZ—but watch out that the DX-bug doesn't get you some time.

G3GUM (Formby) says that G8KP gave him a list of 80-metre DX that he, personally, would have been very pleased about on Twenty—but he doesn't tell us more, and G8KP keeps silence. G3FYY (London, N.W.2) alludes to the peculiar conditions we mentioned last month, with no G's audible. He says that between 2000 and 2230 that is the normal state of the band. Personally, we should say that TV is largely responsible. 'FYY does think, though, that G activity as a whole has fallen off, probably on account of bad conditions. As he says, you can always work DL's, HB's and OK's, but GM, GI and EI, at similar distances, are just not to be found.

Next comes a note from VP5FR (Jamaica) saying that he wants G and other European contacts on phone. His usual frequency is between 3780 and 3800, and he hears the G's, but they are hard to raise.

Finally, a brief salute to W2QHH (Hamilton, N.Y.). Some time back he was involved in a bet about working 50 countries on 80 metres; his score is now

90, with 89 confirmed! With a maximum power of 35 watts, this strikes us as pretty fierce going, and we offer Howy our hearty congratulations on it.

Forty Metres

There's no need for us to comment on the shocking state of this band at present. Working the DX in the cracks is becoming a proper nerve-jangling pastime and one that we indulge in as seldom as possible. Some of the regulars still succeed in doing well, though, and more power to their elbows! G5FA (London, N.11) raised IS, SU, ZB1 and 2, VQ4, ZL and EA9, his gotaways including VS6, CR5, ZS, OX and a W6 at 2330. On phone he raised 4X4AK and FA8MF.

G2BJN (Loughborough) worked TF, PY, VE, VQ4 and WØ, mostly in the mornings around 0800. G3FXB says "the only stuff approaching DX is CN8, CT2BO, TF5TP, PY, ZB1 and W." He heard a few ZS's around 1900 and ZL's in the mornings, with odd Central and South Americans late at night, but thinks the band has been in a shocking state. GM3EDU managed ZD2, CT2 and 3, VE8 and TF—he thinks the band may be improving at last.

G2YL (Walton) asks whether we have heard "the prize liar" VP5XR, who explains his loud signal on Forty during the *early afternoon* by "Input 1 Kw. and Beams Rottary"! Worth an edition of Clots' Corner all on his own. YL says she never *did* believe that you couldn't put up a 40-metre rotary! Also mentioned, PILLS, the Dutch weather ship, QTH 45 N., 16 W.

And there is no more news worth quoting for this band, so let us hope it wakes itself up a bit now that we are past the shortest day. (At the time of writing, it does seem a little better).

The Twenty-Metre Band

And so we come to the DX-ers' last hope—poor old Twenty again. For most of the time it's been neither one thing nor another; short-skip has not been so bothersome, but its absence at times has not made the DX any better. We have had several of those days that make one glance at the aerial switch to make sure it isn't in the wrong position.

G2AJ (Biggin Hill) raised ZS2MI for a new one on phone, others being KG4AC, CX6AD, PJ5RE, FF8AG, VP4LZ and VP8AI on CW, with EAØAB, JA2JW, VO3BM and YI3BZL on phone. With his score at 16 Zones, he heads the WAZ Marathon on its first lap. GW3FSP

raised ZS2MI on CW, and VQ1RF (1800) on phone. He also mentions his 9B3AA type who is active again; he now says QSL *via* 9S4AX, and the buzz is that he is in Bulgaria.

G6BB (London, S.W.2) returns to the fold after a period of reduced activity. He managed to find VQ1RF, and comments that a call on his frequency produced no results, whereas another one 5 kc off rang the bell. BB wonders whether there is the slightest chance of getting a QSL from UAØKFD (possibly by writing direct). It would bring him a WAZ Certificate. The QSO was made years ago, and it seems hard luck that he can *never* get a WAZ unless that card turns up.

G2HKU (Sheerness) collected F9JD/FC, FQ8AE and LZ1AR. He now has his 110-sticker for DXCC, with 113 confirmed out of 128 worked. G2YL mentions PILLS (*see* also 7 mc) and 9B3AA, the latter saying "Unlis in the Balkan."

G3FXB found most of the so-called DX was just bread-and-butter stuff, and singles out CO7AH, EA9AP, some FF's, KG4AF, VQ2GW, ZE3JO and the like for mention. The Gotaways—much more interesting—were CR5AD, EAØAB, ZS2MI, EQ3UU and VP8AI. Others heard were T12TG, long way round at 1400, and JA, KG6 and KR6 at 1000. FXB has just collected his WAE and BERTA, as well as cards from XU6F and F8EX/AR.

G2BW (Walton-on-Thames) opened up on January 1 with FL8BC (how we would like him) and followed with EAØAB and KG4AF. He is spending most of his time on a TVI-proof final, which is coming out nicely. G5BZ (Croydon) says ZS2MI doesn't seem to hear G's, but he did get FD8AA for a new one. He remarks that it is very pleasant not to be called incessantly by Russians, but laments the general spread of the phones, down as low as 14060. In fact, he suggests that we should all call CQ together on top of phones heard below 14100; it should be effective when short-skip is evident! Finally, 'BZ wonders whether anyone has worked "4U-AI" in Kashmir (14060, T7, at 1300 GMT).

G2VD is also exasperated by ZS2MI, who says he will not answer stations calling on his own frequency, and then usually does. He puts the phone encroachment down as low as 14050. We *must* get together and provide a good CW barrage up as far as 14100; we have noticed less and less use of

that end of the band recently. 'VD says "Oh for the day when Ten comes into its own again—a gentleman's band if ever there was one."

G5JU mentions FK7WF on the band, but we are wondering if he means FM7WF? As a matter of interest, he worked the following on all four bands during 1951: CT, DL, EA, F, G, HB, I, LA, OE, OZ, OK, PY, VE, W, YO and ZC4. He had no contact on any band with CP, OY, XE or XZ.

G6QX (Hornchurch) worked "the usual," but says January 4 was peculiar. Between 2230 and midnight, with the dial apparently dead, he worked ZS2 and 6, PY, LU, CE and EA8 in rapid succession. G3ATU mentions ZS2MI, both phone and CW (QSL via ZS6BW). He worked VK9XK during the month, and says FB8XX has been heard again after months of silence. On the subject of conditions, 'ATU says that if they really are due to get worse for another two years or more, it's a fine opportunity to read some good books.

G6YR (Southport) thought conditions were terrible, but seemed to do pretty well, raising FY7YB, FF8AC, EA0AB, KG4AD, ZD2FFB, ZD6DU, ZS8MK

and many more. Among his Gotaways were FO8AC (1600), FM7WF (1930), FK8AC (0900), FL8BC (0730), JA's, KR6's and ZD7AR (1830). Does anyone know about this last one?

G3FPQ's 24 watts brought in AP2K, EA8JR, VQ4AO, ZC4DT, ZE5JA and some 4X's. G5FA collected VP9G, KH6IJ, KL7PB, F9JD/FC, JA2GU and CT3AE, to quote a few. 'FA witnessed the presentation of the Lloyd's Medal to Capt. Carlsen (W2ZXM/MM) and says "If ever I saw a real ham, he certainly was."

G3COI (Wolverhampton) says that, despite the conditions in 1946/47, he thinks the DX has been easier to work this past year because the band has not been so heavily populated. G6AY (Leicester) confirms that cards for ZS2MI should go to ZS6BW, and adds that '2MI will be active there until April, 1952. ZS6BW has a stack of cards, but will QSL only on receipt of a card.

G2NS (Bournemouth) worked EA8BE, ZE3JI and ZS1FD, and heard EA0AB, FB8BB, F18KY, FY7YB, and other quite nice pieces. 'NS's working hours are restricted to 1400-1600 GMT.

The News from Overseas

We have already alluded to W2QHH and his fabulous score on 80 metres. He tells us that he has worked GW3ZV on the Top Band, and is hot-foot after a *Magazine* DX Award—No. 2, if possible (G2PL has No. 1). The only thing that even makes it tough for him is those 15 Top Band countries—he has to go 3000 miles to start! Howy would like to know who the operator of FB8ZZ is (meaning his home call-sign).

SU1FX has had two rapid changes of QTH; his XYL and junior op. have been evacuated, but he has now got cracking again with a compact 40-watter (we see the point!) He has been on 80, but has only worked locals like ZC4 and 4X. If anyone wants him up there, look around between 2100 and 2300 GMT. He and SU1GB have both been listening on the Top Band, without results as yet. (It's daylight there by 0500 GMT). Some of the MD2's have gravitated into SU, so there has actually been an increase in activity of late.

Concerning a recent note about the VQ2 QSL Bureau, we regret that there was a slight misunderstanding. It is *not* Box 199, Livingston, but Box 332, Kitwe—the QTH of VQ2HW. Apologies for the slip, and we hope the above

WAZ MARATHON, 1952

STATION	ZONES	COUNTRIES
G2AJ	16	45
G6QB	16	25
G2VD	15	50
G6QX	15	43
G5FA	13	43
G2BW	13	28
G5BZ	13	18
G6YR	12	24
G3FXB	11	24
G3FXA	10	15
G3GUM	6	14
C6TC	4	10
GM2DBX (Phone)	3	11

NOTE: New entries in this table must not include QSO's dating back more than two months from the time of entry. Regular reporters should send in their score month by month—three months' failure to do so will be taken to indicate loss of interest and the score will be deleted.



G2FPC, Edmonton, London E. 18, started as AA 2FPC in 1938, when what were then known as "Artificial Aerial" licence calls were granted to experimenters who, for one reason or another, were not on the air under full or Open Aerial tickets. (All G2-plus-three's are in this category). Present transmitter at G2FPC is Wilcox-Gay VFO into 6L6-807-814 running 120 watts, modulated by a pair of 807's, all housed in a 6-ft. wooden rack. Activity is mainly on 14 mc CW and phone, receiver is an Eddystone 504, and the aerial a 20-metre folded dipole made of Telcon 300-ohm ribbon.

straightens it out. 'HW says the static is terrible now; they have terrific electrical storms there in the Copper Belt, and the shack is a good place to keep away from. Activity is increasing, and he says there soon won't be a G who hasn't worked VQ2.

Another slip, but not ours this time. We were informed that the only legitimate ZB2's were ZB2A and ZB2C. We remember raising an eyebrow at the time, thinking of ZB2I. We have now heard from him, to say that *he* is the second one and that there is no ZB2C. On behalf of our misinformed informant, we apologise. ZB2I is situated in the town and badly screened by the Rock; ZB2A is almost at one extremity of the Rock, and DX reception there is vastly different.

VK5WO (Laura, South Australia) was in this country with the RAAF for two years, and is most anxious to make contact with Brighton, Padgate, Staver-ton, Moreton Vallance, Hixon, Lindholme, Ludford Magna, Gamston and Millom (but we wonder how many of

those places, apart from Brighton, can conjure-up any activity?) ZE3JO (Salisbury) describes conditions as "putrid," but he has been working some quite good DX from his new QTH with his 270-ft. aerial—now 33Z and 99C.

A really hot one for the DX-hounds now . . . VS1ED (G2FRM) is already on Car Nicobar Island, where he has set up VU5AB. He says he will be active on Twenty CW for about six months. He will be rock-bound (no frequency given) and will *not* answer calls on his own frequency. We haven't heard him yet—have you?

EQ3UU reports on behalf of "The Teheran Gang," which comprises EP3SS, EQ3FM, 3SAM and himself. They had a flying visit from G2APN, who was also good enough to tell us the news. 'APN took them a copy of our last issue, which pleased them so much that he came away with a new 4-65A! EQ3UU says that they consider, out there, that the G's are the best operators on the air, even when they are busy "pouncing," and adds a remark

which should bring a modest blush to the cheek of G3TAU!

Expeditions

Still on the subject of EQ3UU, we have the news that he will be operating from Kabul at YA3UU, from January 19 for fourteen days. That will hardly help you now, unfortunately, but at least it might be good news to anyone who worked him—he was genuine!

Other expeditions have come to our notice, *via* the bush telegraph, and, again, all of them happened too soon for us to give you advance notice. EA8AW was to have been on the air from Rio de Oro on January 20, and EA9DC from Ifni on January 25. There was also talk about ON4QF's mystery-tour, which hasn't happened yet, but we don't know where he was going or when.

Then we learn that the story of PX1AA and his motor-bike was a trifle far-fetched. The "motor-bike" was, in reality, a Jeep. He had a mobile 60-watt rig therein, and the receiver was a converter working into the car radio. Phone contacts were made with the Jeep parked high up the mountains; CW from a hotel in Andorra city. (Thanks to G3CMH and others for this information). All this has no connection with the type reported by G5FA—this one signed PX1A and said he was operating mobile with *one kilowatt*—on 7 mc!

Records and Recordings

Although that paragraph in December about the playing-back of recordings came from an official source, we have now been asked (again officially) to publish the following statement: "No objection is raised to the recording of amateur transmissions which fall within the scope of the PMG's licence. If, however, it is desired to re-transmit the recordings, care should be taken to ensure that no messages are sent that are not permitted under Condition 8 (i) of the Amateur Licence, that the call-sign of the station from which any such message originated is not re-transmitted, and that the re-transmission is not sent for reception by anyone other than the person who originated the message."

General Patter

VQ3SS returns to Africa on February 14 and expects to be stationed in Nairobi, as VQ4SS. He visited many people to whom he had given their first

FOUR BAND DX TABLE POST WAR

Station	Points	3.5 mc	7 mc	14 mc	28 mc	Countries
W2QHH	495	90	90	209	106	209
G6QB	478	49	92	202	135	220
G2AJ	433	42	81	192	118	211
G5BZ	392	47	87	197	61	201
G2VD	392	41	77	168	106	176
G5FA	361	33	108	147	73	162
G6BB	306	36	80	136	54	147
G3FXB	301	38	89	145	39	153
HC2JR	293	3	15	143	132	183
G6YR	255	16	33	105	101	152
G8VG	253	31	74	122	26	140
G2YS	246	38	45	123	40	136
G2BW	232	19	49	133	31	139
GM2DBX	215	5	31	99	80	119
G6TC	212	17	58	109	28	117
G3GUM	208	28	38	141	1	152
GM3EDU	197	37	41	96	23	116
G2HKU	179	1	46	118	14	179

VQ3 and VQ4 contacts, and looks forward to meeting them again over the air. Furthermore, he hopes to be active on Forty and Eighty. We have to thank G3PR (Birmingham) for this news—PR is an old friend who graduated at the time that VQ3SS was G3SS. He now wishes to fire a shot or two at those individuals who apply the law of the jungle in their DX-chasing, and wishes us more power to the elbow in our condemnation of these foul creatures!

GM2DBX (Methilhill) still wields his phone to good effect, but had the bad luck to lose his aerial in a gale. So far he is the only Phone entrant for the 1952 Marathon, and would like some company—offers, please? G6QX also lost one end of his aerial, and says "Never pass galvanized wire rope over an aluminium pulley."

G3GUM remarks that the Top Band is now the only one not haunted by the blue chin and garlic-laden breath of the well-known pest Al Ocique, who, he



VQ3SS, centre above, was a recent visitor to this country; he will shortly be heard as VQ4SS. On the left is G3EJO, with G3PR on the right of the photograph.

suggests, is a distant relative of our demented friend El Bugg, who shares his rooted objection to Morse.

Ten Metres

We have just two reports on the ten-metre band this month. G3HCU (Chiddingfold) worked, during December, HC1FS and IOY, KP4CC, OQ5BA, PY's, VE, VK2, 3, 4, 5 and 6, VQ1 and 2, VU, W's, ZB1, ZD4, ZE, ZL and ZS, plus lots of Europeans—all on phone. He runs a three-element rotary and an 813 PA in a band-switched rig. It seems to work, too, judging by the above! GW3FSP raised VQ1RF twice, also VK, VQ and ZS. Considering that the band has been wide open on several occasions, we are surprised at the lack of reports. Are some of those ten-metre rigs getting rusty, or what? But what a pity there's never any CW activity.

QRP Corner

G2DYY (Cleckheaton) was interested in the articles by G3EJN and G3ANQ, which have given him new encouragement. He lives in the centre of a ring of large towns and finds that 10 watts maximum stands little chance during normal working hours unless the QRO fellows spend a little more time listening on the channels that they permanently occupy.

G5OQ (Tunbridge Wells) harks back to our query, "Could it be done today?" and refers to a real QRP feat of his in 1937. He made contacts with three different GM stations (all over 400 miles) with a crystal oscillator and six volts HT from a grid-bias battery. Shortly afterwards he worked a GI station with 3 watts input, but discovered afterwards that only one foot of aerial was in use. So the outside aerial was then completely disconnected and earthed, and an

S5 report obtained straight off the tank coil! (Which shows why good screening is necessary for TVI purposes).

GM3EDU is keen to know the exact conditions of the LABRE "Worked All America" Certificate. We can't find them at the moment — would some holder of that award be so good, please?

We say a final farewell to 1951 with the last of the Four-Band Marathon Tables. Congratulations to G3ATU on having maintained his handsome lead all through the year, and thanks to the others who have faithfully reported each month. And now please get busy on the 1952 WAZ Marathon, which is of a much less exacting nature. Take them as they come, but do, please, report them each month.

Well, that's the shape of things for this month. Lots of news, even if there's a scarcity of super-DX. Let us have next month's news in by the deadline, **first post on February 13**. The one after that will be *March 12*.

Address it all to "DX Commentary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. Until next month, 73 and Good Hunting.

MUMETAL SCREENS

We have been asked by a correspondent to suggest a source of supply for Mumetal for screening purposes. We would be glad if readers could let us have some suggestions.

OBITUARY

It is with deep regret that we have to record the death of Harold Gregory, G2FBP, of Palfrey, Walsall, on December 18, 1951. He was a keen and active amateur whose loss is mourned by many friends at home and abroad.

Random Jottings

By THE OLD TIMER

HOW much more interesting Amateur Radio could be if we bothered less about Christian names and found out more that really mattered about the other fellow. It's strange, but we have worked DX stations more or less consistently for years—ZL's, VK's and the like—and we still don't know, for instance, what their jobs are, or even whether they are tall or short! The other day we had a personal contact with an amateur who is a professional fire-eater on the variety stage; our next radio QSO was with a ZL who works in an ice-cream factory. What a chance for a really interesting contact between those two!

WORKING "ALL BANDS"

There is probably no other hobby which shows such diversity of interest or demands such versatility from its followers. No one succeeds in using its resources to the full. As an example, we should like to know how many stations in this country are equipped for *all bands*—meaning everything from the Top Band to Seventycems (we will take it no higher than that). Such a station would really demand at least three completely different types of equipment—in regard to receivers, transmitters and aerials. It is already the custom to use a separate transmitter for the Top Band, but a complete "station" for it is really an advantage. Of course, the VHF's demand different technique altogether, and it is quite impossible to share their equipment with that used for the DX bands.

ENCROACHMENT

It is time to record the fact that telephony stations are becoming more and more unscrupulous about the way in which they overlap into the CW parts of our bands. One often hears them, for instance, below 14100 kc. Considering that they have at least 250 kc of the band in which to disport themselves exclusively, it seems hard that they should start to invade the CW man's territory of a mere 100 kc. Fundamentally, it is a great pity that telephony takes up so much room and causes so much more interference than

CW. Maybe one day we shall realise yet another dream—the development of a receiver which is deaf to either Phone or CW, at the turn of a switch.

LEADING IT IN

All kinds of fairly tidy shacks are marred by a dreadful birds-nest of wires in the vicinity of the window, which sometimes has to be kept slightly open in the coldest weather to allow feeders to be brought in by some clumsy means. We know of quite a few stations where the problem has been neatly solved by the removal of a pane of glass and the substitution of a Perspex panel, which can be very easily drilled to suit any requirements. Wires can be brought straight through the holes, or pairs of small lead-in insulators can be clamped on either side by means of threaded rod. This is one of those schemes that are so obvious that they don't occur to many people at all.

OPERATING COMFORT

Another fairly obvious refinement that can be applied to any station is the provision of a comfortable operating position, preferably with the receiver "let into the bench" on a slope, so that its panel presents roughly a 45-degree angle to the operator. This, it is true, involves a little carpentry, but it is well worth while. The scheme of using a smallish operating desk carrying just the receiver, VFO, key and microphone is an excellent one; the various parts of the transmitter may be rack-mounted or may stray over another bench. Considering how much time most amateurs spend at their operating position, some of them are content to remain extraordinarily uncomfortable.

KITCHEN TABLE STUFF

Those who are horrified at the idea of complicated metalwork may take heart from the fact that very efficient layouts can be built up from modified surplus gear (in which the metalwork has already been done for them) and the judicious use of wooden panels and baseboards. It is not *everything* that needs screening, even in these days of TVI. Many surplus units, such as the well-known TU's, can be converted to jobs far removed from their original function, and we have seen them used as speech amplifiers, power-packs and aerial tuning panels.

HERE & THERE

Index, Vol. IX

The next issue of *Short Wave Magazine* will contain a detailed index covering the current volume, of which this is the 12th month. Though *Short Wave Magazine* will be in its new appearance and the enlarged size in March, the Index to Volume Nine will be in the present size to match the bound volume.

Eric Megaw, ex-GI6MU

Many an Old Timer will remember GI6MU of the middle 20's, in the van of those who were blazing the trail to the higher frequencies. The call-sign has been re-allocated long since, but it is of interest to note that Dr. Megaw, who took his science degrees at Queen's, Belfast, has recently been appointed to the important post of Director of Physical Research, Admiralty.

"Letters to the Editor"

With the increase in size of the *Magazine* commencing with the next (March) issue, we are very glad to say that we shall, at last, have enough space for Reader Correspondence as a regular feature. In future, all "Letters to the Editor" (as distinct from those for our regular-feature contributors) will be looked at as potential material for the correspondence columns, and will be used accordingly—unless the writer asks specifically that the letter should not be published. We will welcome letters for publication on any topic connected with short wave radio, asking only that letters intended for publication be factual and right to the point! Selection will, of course, be at the sole discretion of the Editor.

The Call Books

We understand that stocks of the Foreign Edition *Radio Amateur Call Book* are now completely exhausted, but that a certain number of copies of *The G Call Book* are still available at 1s. 6d. post free. The Autumn (or "Fall") edition of the *Call Book* proper—the

full 400 pages of the QTH lists of the world—has also nearly run out of stock, but a few copies can be supplied at 20s. post free.

Royal Visit to Ceylon

During the forthcoming visit of Her Royal Highness Princess Elizabeth and the Duke of Edinburgh to the Dominion of Ceylon, the Radio Society of Ceylon will be represented at an Exhibition to be opened by the Princess on February 16. To mark this very special occasion, the Singalese society is "going big" with a fine 250-watt phone transmitter operating from the Exhibition, under the specially allotted call VS7RSC, on the 7, 14 and 28 mc bands. To overcome the difficulty of local electrical noise within the Exhibition—which was such a problem with GB3FB last year—remote reception is being arranged at VS7JB's station, with a VHF relay link into VS7RSC. One of the operators will be young VS7XG, son of G8VG (Dartford, Kent). So look out for VS7RSC from February 16 onwards.

Dutch Reorganisation

We are informed that an "Exclusive-PA Club" has come into being in Holland under the short title V.R.Z.A. As we understand it, this is because previously decisions affecting the transmitter-membership of VERON could be made by individuals who are not themselves amateur operators. Presumably, therefore, VRZA is a break-away from VERON. The QSL Bureau address of the new organisation is Box 190, Groningen, Holland, and the QSL Manager is PAØHJK.

Small Advertising

The attention of readers is drawn to the wide coverage obtained through our Small Advertising columns — which always make interesting reading, even if there is nothing you particularly want to acquire. Readers having disposals, or a turn-out of gear in mind, would be well advised to use our Small Advertising space.

VHF BANDS

By E. J. WILLIAMS, B.Sc. (G2XC)

ONCE again the time has come for your conductor to make his annual retrospective report on VHF activities. 1951 was in many ways an outstanding VHF year; fresh records were set up both on Two Metres and Seventy Centimetres, and many new paths blazed. But if we forget the glorious VHF openings of June and September, the picture changes completely and 1951 would have to be recorded as rather a poor year. Over the first four months, for instance, there were only two nights which could be called really good. These were March 4 and April 5. The former was really excellent and provided some 300-mile contacts. A small contest which we organised early in April coincided with a spell of very poor conditions (as usual!), but the appearance of EI8G on the band during the latter half of the month, and GC2CNC in May, helped to awaken enthusiasm in those who were gradually returning to Two Metres after their annual hibernations.

The opening days of June will not be forgotten for many a long day. The great openings across the North Sea which permitted the five- and six-hundred mile contacts with OZ and SM were something of which we had all been dreaming for months, if not years, and seemed almost too good to be true. The night of June 4, when ON4BZ worked 56 British stations, was perhaps the climax of the period. In mid-July a brief spell of good conditions enabled G3APY and G5BY to set up a new

Review of 1951—

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world's record on Seventycems. In general, however, July did not reach the level of June, and the appearance of GD3DA/P on Snaefell at the end of the month was probably the greatest excitement. August was disappointing, but with September came a return to some excellent conditions. This was particularly true from about the middle of the month, and the opening hours of the European 2-metre Contest organised by the PA's were blessed with a duct (or something) which enabled some 500-mile contacts to be made. From mid-October, conditions deteriorated rapidly. However, before this, on October 9, G5YV was able to work F8MG for the best European two-metre DX so far. Our annual Two-metre Contest again was run under poor conditions.

From time to time, controversial points have arisen and been discussed in these columns. This may be an opportune time to summarise these and also to clarify your conductor's personal opinion on them. The Zone plan has come under fire more than once, mainly from those who reside in the London area and who feel the frequency allocated to their Zone in the Plan is not proportional to the activity in the Zone. With this we agree, but the only solutions to this seem to be either to shift the frequency allocation of the neighbouring zones (a move which would be highly unpopular in those zones) or, to use part of the, at present unused, high-frequency end of the band. While admitting the difficulty, we feel that without the Zone Plan the position might have been far worse.

VFO-technique has also been a major topic of discussion, but on that there seems to have been fairly general agreement. Personal opinion of G2XC is that sticking to *one* frequency has advantages which far outweigh the occasional advantages which would accrue by fitting round the band at will. In general, the "flitterer" makes his gains at the expense of the other occupants of the band, and tends to destroy the

spirit of *friendly* competition which at present is such a grand feature of VHF working.

From time to time, correspondents have reported instances of what are considered to be one-way transmission paths. Your conductor is far from convinced that such conditions exist. It must be remembered that in many cases the transmissions concerned are not on identical frequencies, that fading occurs and will not necessarily synchronise on different frequencies, that local noise level can obliterate a weak signal, that incorrectly matched beams can have different gains on transmit and receive, that all transmitters and receivers are not of equal efficiency, that some operators are more skilful than others, and so on. While all these possible explanations exist, it is considered there is not sufficient evidence to justify a statement that one-way propagation conditions can occur.

Finally, there has been some discussion on the effects of height on the efficiency of a VHF station. Here your conductor must repeat what he has said before, namely, that height *above sea level* is no criterion. Height *above surrounding country* is quite another matter, and is, of course, of major importance. But the surrounding country usually varies in height in different

directions, and any attempt to assess the comparative "goodness" of two sites is likely to be a very complicated matter. Hence, even the BBC need to make *practical* tests of various sites for their television transmitters.

And there, we must leave 1951. Doubtless new records will be set up in 1952, and equally doubtless new points of controversy will emerge. It is highly desirable that discussion should arise from time to time, particularly on technical matters, as without it many of us are inclined to accept orthodox theory without further consideration. Only by taking theory and testing its application to practical experience can any real advance be made.

Propagation Note

On more than one occasion since he has been in charge of this feature, your conductor has put forward his theory that much of the abnormal tropospheric propagation of VHF waves was due to partial reflections in regions where the refractive index of the air was gradually changing. The more rapid the change, then the larger the magnitude of the reflected component. Only when the refractive index exceeded a certain critical value could refraction alone explain VHF reception at DX distances. The "ducting" theory depends on

TWO METRE ACTIVITY

SUPPLEMENTARY LIST

(This list should be used in conjunction with that published on page 620 of the December 1951 issue)

G2AOK/A	Stow-on-the-Wold, Glos.	G3EHY	Banwell, Somerset	G3HZF	
G2AVR	Bexhill, Sussex	G3EJR	Whitehaven, Cumb.	G3HZK	
G2BZ	Park Lane, London	G3FKO	Bath, Somerset	G3IAI	Northampton
G2DHV	S. E. London	G3FOQ		G4AP	Swindon, Wilts.
G2FO	Stockton, Durham	G3FRY	Cheltenham, Glos.	G5CM	Selsey, Sussex
G2XS	Mansfield, Notts.	G3FSL	Barnwell, Glos.	G5QL	Watford, Herts.
G2YB	Reading, Berks.	G3FTR	E. London	G6BO	Harrow, Middlesex
G3AMM	Scunthorpe, Lincs.	G3GFV		G6UH	Hayes, Middlesex
G3AVO/A	Watlington, Oxon	G3GHC	Kidderminster, Worcs.	G8DV/A	
G3BRQ	Little Chalfont, Bucks.	G3GOP	Southampton, Hants.	G8HK	
G3BW	Whitehaven Cumb.	G3GTH	Hampstead, London	G8KL	Wolverhampton, Staffs.
G3BNC	Southsea, Hants.	G3GVC	Purbrook, Hants.	G8LY	Lee-on-Solent, Hants.
G3CCP	Shrivenham, Berks.	G3HEA	W. London	G8ML	Cheltenham, Glos.
G3CHY	Ashton, Lancs.	G3HSD	Bristol, Glos.	G8VA	Leicester
G3CWW	Hendon, Middlesex	G3HUQ		GM3BDA	Airdrie, Lanark
G3DA	Speke, Lancs.	G3HWC		GM3DDE	Largs, Ayr
G3DEP	Ryde, I.O.W. (Hants).	G3HXS	Long Marston, Herts.	GM3DIQ	Stevenston, Ayr
G3DDM	Petersfield, Hants.			GM3OL	Dunfries

The above list is based on call-signs reported for this issue of "VHF Bands"
Where gaps occur we would be glad to have the QTH

refraction and not reflection. All this was considered in much detail in "VHF Bands" for February, 1949, and, as on other occasions when the idea has been mentioned, it brought a spate of criticism from those readers who had come to accept the "ducting" explanation as the final word on the subject. They were, in fact, amazed that anyone with scientific knowledge should have the effrontery to challenge the experts.

Since then, however, it has become apparent that the professionals to whom your conductor was referred had also realised that there were many tropospheric VHF phenomena which super-refraction would not explain, and in the past year or so a number of papers on the subject have been published in various technical journals in all parts of the world. Atmospheric turbulences which give rise to scattering of metric and centimetric waves is one of the theories now generally accepted. A short article on this appeared in "Research Report" in *Science News* 20, published by Penguin Books in May, 1951, and more extensive treatments will be found in the *Proc. I.R.E.* The main reason for our comment here is, however, the appearance in the *Journal of Applied Physics*, October, 1951, of a paper by J. Feinstein, of the National Bureau of Standards, Washington, on "Tropospheric Propagation beyond the Horizon." In this it is pointed out that field strengths deep in the diffraction region (i.e. well beyond the optical horizon) are many orders of magnitude greater than those calculated on normal

theories, even when allowance has been made for refraction produced by a standard atmosphere. In addition, the turbulence theory, which was an outcome of the acceptance of this fact, still does not explain these abnormal fields at all adequately. Feinstein then proceeds to the point that a discontinuity in the characteristics of a medium traversed by a wave gives rise to a *reflected* as well as a transmitted wave. What is more, a gradual change in medium properties produces the same effect in principle, although the magnitude of the reflected component will be much smaller. Since the atmosphere possesses a gradient of refractive index, such partial reflection must occur. By this mechanism, wave energy is delivered to areas far beyond the line of sight of the transmitter.

All this in October, 1951. But it is exactly what your conductor said in October, 1946, when, in collaboration with G6DH, he read a paper on "Five-Metre Propagation Characteristics" to the Radio Society of Great Britain. This is the second occasion on which your conductor has been 5 years ahead of the "experts," the other occasion being the explanation of the "hissing phenomenon" in 1939. (We shall want an extra size in hats soon!).

The VERON (I.A.R.U.) Contest

Some of us are probably under the impression that this country is the main centre of VHF activity in Europe. It may, therefore, come as a shock to discover that the British entries in the VERON 2-metre Contest of last Sep-

TWO METRE CALLS HEARD

G3EHY, Banwell, Somerset.

G2BZ, 2DTO, 2OI, 2WJ, 3BGR, 3EDD, 3FD, 3FIH, 3FMI, 3FRY, 3FSI, 3GFV, 3GHC, 3HAZ, 3HSD, 3HXS, 3IAI, 3RW, 3WW, 4HT, 5DS, 5TP, 6NB, 8HK, 8OU, GW2ADZ, 8UH, (December 14 to January 14).

G3VM, Norwich, Norfolk.

WORKED: DL3VJ, G2FKZ, 2XV, 3ABA, 3AJP, 3AUS, 3CFK, 3DIV/A, 3FOQ, 3GDR, 3HBW, 4KO, 4PV, 5DS, 6LI, ON4BZ, PA0AD, 6BP.
HEARD: G2BN, 2FVD, 2HCG, 3DUP, 3FZL, 3IL, 4HT, 6NB, 6XM, PA0FC. (December 12 to January 12).

G4HT, Ealing, Middlesex.

WORKED: G2AVR, 2FZU, 2HCG, 2HIF, 2NM, 2OI, 2UQ,

2YB, 3ABA, 3BNC, 3DAH, 3DIV/A, 3EDD, 3EHY, 3FAN, 3FEX, 3FMK, 3FTR, 3FUW, 3GHO, 3GVC, 3HUQ, 3HXO, 3HXS, 3HZF, 3VM, 4MW, 5RW, 5UF, 6CI, 5YU, 8HK, 8IL, 8KL.
HEARD: G2FWW, 5BD, (December 10 to January 12).

G3FAN, Ryde, Isle of Wight.

WORKED: G2HCG, 2NM, 2WJ, 2XV, 3ARL, 3BHS, 3CGE, 3DDM, 3DEP, 3GAV, 3GOP, 3GSE, 3GVC, 3HVO, 3HXS, 3WW, 4HT, 5CM, 5HN, 5NF, 5TP, 6NB, 6XM, 8DV/A, 8LY.
HEARD: G2YB, 6KB, 8OU.

3FD, 3FRY, 3GSE, 3GHI, 3GXM, 3HXS, 4HT, 5DS, 8DM, 8DM/A, 8ML, 8VZ. (December 3 to December 20).

G2HDZ, Pinner, Middlesex.

WORKED: G2AOK/A, 2AVR, 2FNW, 2XC, 3BRQ, 3EDD, 3EHY, 3ENI, 3FD, 3FSG, 3GHS, 3GTH, 3HAZ, 3HCU, 3HEA, 3MI, 5DS, 5LK, 6BO, 6NB, 6VN, 6XM, 8KL, 8OU.
HEARD: G2OI, 2XS, 3HXO, 8HK, 8VA, GW2ADZ. (November 7 to January 7).

GW5MQ, Mold, Flint.

G2FO, 2FZU, 2OI, 3AMM, 3APY, 3BLP, 3BW, 3CHY, 3DA, 3HWC, GM3BDA, 3OL, GW2ADZ. (December 13 to January 13).

tember made up only 15% of the total: 42 entries were received from DL, and 33 from PA. The British entry totalled 19. But we have the feeling that this could give rise to a misleading conclusion. The fact that the top seven scores come from G or GW suggests that only a very small proportion of the G stations active sent in contest logs.

Apparently many competitors complained that the period of the contest (two complete week-ends) was too long. VERON explain that their reason for making the Contest of such lengthy duration was to increase the chances of "hitting" at least one good spell of conditions.

In order to assist in solving the problem of the effect of height above sea level on the performance of a VHF station, the contest organisers have listed the 15 longest contacts made during the contest. But, they say: "The conclusions from this list we better leave to the reader." From that, it may be realised that the conclusion is not very definite! Unfortunately, the heights of many of the stations concerned in the list are not given, but we feel reasonably safe in assuming that the PA's and probably the ON's will be low-lying, but surrounded by generally flat country. Making that assumption, it is correct to say that at least 90% of the stations in the list were either on high ground in hilly country, or on low ground in flat country. Conclusion, therefore, seems to your conductor to be what he has been saying for some time, that height *above sea level* is not the actual factor that matters, but height *above surrounding country*. The list of the first 20 competitors points to the same thing. PAØPN, with 50 watts and aerial a mere 12 feet a.s.l., is only 23 points behind DL4XS/3KE with 500 watts at 1800 feet up. G3WW, on his 6-foot mountain, is in second place, 83 points behind G3BLP high up in the Surrey Downs but close to the thickly-populated London area.

Of the 15 longest QSO's, no less than 6 were made during the first hour of the Contest, 11 were made during the first 24 hours, and all during the first week-end. The best was between GW2ADZ and DL4XS/3KE over a distance of 550 miles at 0001 GMT on September 22.

Entries were received from DL, F, G, GC, GM, GW, HB, ON, OZ, PA and SM. Contacts were also reported with stations in OE and FA.

THE REGION 1 (I.A.R.U.)

CONTEST

ORGANISED BY VERON

September 22/23 & 29/30, 1951

LEADING POSITIONS		
1	G3BLP	519
2	G3WW	436
3	G2NH	406
4	G2ANT	393
5	GW5MQ	372
6	G5YV	362
7	GW2ADZ	349
8	HB1IV	338
9	DL4XS/3KE	331
10	PAØFC	322
11	PAØPN	308
12	G5DS	295
13	G2XC	293
14	ON4HC	290
15	DL3NQ	278
16	G5DF	273
17	DL3FM	268
18	PAØWO	248
19	PAØAD	240
20	G5MR	221
21	G3CGO	203
22	DL6RL/P	196
23	DL6BU	192
24	F9DI	187
25	G5UF	186
26	DL3JI	185
27	DL3MH	183
28	PAØWI	180
29	SM7BE	179
30	G3CWW	176
	PAØHA	176
	PAØNL	176
33	OZ2FR	175
Total number of competitors:		125

That Reliability Table

As G3WW points out in a critical letter to your conductor, the Reliability Table which we launched recently was doomed to failure. Yes, your conductor thought so too, but the arguments put up by those who favoured the idea were such that it was felt the scheme had to be given a trial. Only three entries were received for it, but there was a considerable volume of criticism. G2HIE, one of the chief instigators of the scheme, summarises four of the major points which have been raised against the idea. First, winter was not the ideal time to initiate the scheme; secondly, not everyone is prepared to maintain schedules; thirdly, increased activity does not necessarily result, as a winning station could keep off the air at other than schedule times; and fourthly, the likelihood of finding a station regularly at distances beyond the first obvious choice is negligible. The third of these points is probably the most serious, and there are those who would go further and say that it has a harmful effect on

both activity and on the friendly spirit which should exist on the band. The tone of several letters received this month leave no doubt that both these things have been happening. The Reliability Table was in many ways similar to the "Best Twenty of the Month" table which we tried out about a year or so ago. This table also gave rise to a certain amount of bad feeling and received little support. It is therefore quite clear to your conductor that the vast majority of two-metre operators do not favour this type of monthly contest, and the table is therefore cancelled. At the same time, many thanks to G2HIF, G3FRY and G4HT for sending in entries.

News of the Month

GM3DDE (Largs) writes for the first time. As this auspicious event is due to his being laid up with a 'flu bug, we almost felt inclined to wish him continued illhealth in the hope of receiving still further letters! Commenting on G2HIF's "moans and groans regarding only working two stations in 7 hours," he says that up in Largs he has only worked 5 stations in about 3 years! Some of them have, of course, been QSO'd many times, and they include even EI2W. Largs is about 30 miles west of Glasgow, but great difficulty is experienced in working into that city. In fact, the beam at GM3DDE has to be turned *away* from Glasgow and signals are received by reflection off the Isle of Arran. Many aerial systems have been tried, including some quite elaborate ones, but they have not solved the problem of the lack of signals. The receiver is a G2IQ-type working into an S640. GM3DDE considers that many would-be VHF operators are deterred by a belief that gear for these bands is difficult to construct.

Also from North of the Border comes a welcome letter from GM3BA/A (Salsburgh). He is, of course, at the new BBC TV station up there. His first lodgings were on *gas*, but he hopes to move to more suitable quarters near Motherwell. His Wallman converter has been tried out at GM3EST on a Zepp aerial and the Glasgow stations heard at good strength. However, GM3BA says that activity up there is not good. Regarding equipment, he feels the GM stations would do better if stacked arrays became more general. On this question, GM3BA comments that, before leaving Daventry for GM,

he did some tests on his aerial which proved very definitely that it is essential to have the same amount of RF in each of the radiators in a stacked system if maximum horizontal gain is to be achieved. When a stack is fed at the bottom, there tends to be less RF at the top than the bottom. Centre feeding improves this, but if there are many layers in the stack, it would be advisable to feed at several points in parallel. The difference in results is said to be very worth-while.

EI2W (Dublin) has been inactive, due to a bad cold and pressure of office work. He is moving QTH in the spring and is preparing a 32-element beam which he hopes to have working by April. Then he will be after the first EI/W contact on Two. He joins the Five Band Club.

Like many others, GW5MQ regrets that he has not been as active as usual. On Two he has worked G3BW for a new county in the annual table, and on 70 centimetres has continued a schedule with G3APY, contacts now reaching 29. A sudden influx of QSL cards has improved the proportion of "In" to "Out," and has enabled GW5MQ to send off a number of reply cards.

G3EJR (Whitehaven) hopes to put Cumberland on the 70 cm map with 15 watts to a pair of 616's in parallel push-pull, using $\frac{1}{4}$ -wave tuned lines. For receiver he has an APS13 awaiting modification. G3EJR is, unfortunately, located at the bottom of a valley, but says he is determined to "have a go." A portable expedition to the mountains may be undertaken in the summer.

G5YV (Leeds) writes to express his astonishment at the high position he would have had in the *Magazine* Contest had his entry been in time. Permission has been received to erect a lattice tower and, as soon as the weather permits, a start will be made. He is going to try a 4-over-4 system as a start. Looking forward to next summer's DX, G5YV enquires for details of two-metre activity in EA or CT1.

G2FJR (Spalding) asks for more beams to be pointed his way. He is on nine evenings out of ten and hears many Midland stations working amongst themselves, but never looking round the band afterwards. He has a 12-element stack which is waiting for suitable conditions to work some of the DX. A 70 cm Tx is ready and a converter for that band in preparation.

G6YU (Coventry) is active most even-

ings on Two. On December 12 he worked PAØAD, and on January 6 had a good contact with G3EHY. A new 4-over-4 has been erected, and it shows about 6 dB improvement on the previous 4-element single-tier Yagi.

From Bath, G3FKO reports "nothing new." He asks for a crusade to create more activity, and explains his own inactivity is due to working in Rugby and living (one week-end in three) in Bath. He hopes soon to be active on Two under the BTH Radio Club call from Rugby. G3FRY (Cheltenham) is taking the opportunity during this slack season of building a new modulator. He is, however, active most evenings between 1900 and 2000.

TWO METRES	
ALL-TIME COUNTIES WORKED LIST	
Starting Figure, 14	
From Fixed QTH Only	
Worked	Station
54	G2OI
53	G3BLP (500)
52	GW5MQ (186)
51	G3EHY (310)
48	G2AJ (408)
47	G2NH, G3BW (122), G5WP, G6NB, G8SB
46	G4HT (476), G5BY
45	G5YV, G6XM (356)
44	G3ABA (222), G5MA
43	G2XC, G3WW, G3COJ, G5DF
42	G5BD
41	G3BA, G3DMU (192)
40	G3BK, G3CGQ, G3BM, G5DS (297), G8OU
39	G2IQ, G4SA, G5LI (285)
38	G3APY, G3VM (208)
37	G6YU (130)
36	G2FNW, G3CND, G6CB (312), G8LP (258)
35	G2FQP, G3FAN, G8IL (212)
34	G4RO, G5IU
33	E12W, G2HDZ (238)
32	G3AVO/A, G3FZL, G6CW, G8OY
31	G2AHP (249), G3HAZ, G5KP
30	G5NF
29	G5UM (218), G6C1
28	G2DLJ/A
27	G3DAH, G3GSE, G3HBW, G3HCU
26	G2FVD, G3BNC, G3FIH
25	C4MR (155), G5SK, G8VR
24	G3FD, G3FXG, G3GBO, G8K1
23	G5PY, G6GR
22	G3AEP, G3BPM, G3CWW (221), G8IC, G3BDA
21	G3AGS, G5MR, G6XY
20	G3EYV
19	G3SM, G5LQ (176)
18	G4LX
16	G2AOL, G3FRE, GC2CNC, GM3EGW
15	G2DVD
14	G3CYY

NOTE: Figures in brackets after call are number of different stations worked. Starting figure, 100.

G3EHY (Banwell) finds this season of the year the most interesting from the point of view of studying propagation possibilities. He notices, on the other hand, that many of the prominent stations during the DX periods of the year are now conspicuous by their absence. He feels this is the ideal time of the year for radio as a hobby, as gardening, outdoor sports and so on no longer claim the spare time. A few of the diehards remain on the band. Amongst the better spells during the past month, G3EHY noted December 16 to 21, and January 5 to 7.

GW8UH (Cardiff) has been hearing quite a few stations, ranging from Cornwall to Surrey, but only G3EHY and G8IL have been worked. The transmitter is a 522, and the converter the G2IQ-type. A 3-over-3 rotary serves as aerial 26 feet up. He is on 145.44 mc, and main period of activity is Sunday, 1830 to 2000.

G3FAN (Ryde) reports that when W3OZA/MM returns next time he may be operating on Two Metres. He wants to know if this would be counted as a new country — the quick answer would be "No," but, of course, it would depend a great deal on where the ship was at the time of the QSO. G5CM (Selsey) is reported active with an EF50 in the final and an indoor aerial.

G2HIF (Wantage) was luckier with contacts in early December, the yield being 41 QSO's. He is surprised at the number of under-modulated signals heard on the band. Plans for the future include a 75-watt Tx. G3AVO/A (Watlington), whose shack is a converted coal-cellar with stone floor and brick walls, has found it rather cold going. He is now rebuilding the gear into such a form that the XYL may accept it in the living-room! Some damage occurred to his feeders in recent gales, and he hopes to repair this with the help of a ladder or two. (What's a broken leg in the cause of VHF?)

G6JK (High Wycombe) sends on some news from the Antipodes, where VK2AH is reported to have worked ZL3AR on 144 mc over a distance of nearly 2000 miles. Also, on December 31, VK6BO worked VK5GL over 1300 miles. At the same time, the 50 mc band has been wide open for DX. G6JK himself has been busy building and unbuilding converters.

G5NF (Farnham) thinks DX would have been possible on quite a few nights had there been activity in the right

places. On December 16 he worked several French stations, and managed ON4BZ on December 18. G3BLP (Selsdon) asks us to make it clear that his height above sea level is 450 feet, and not at the somewhat greater elevation that some people imagine. He has still higher ground to both east and south. He is interested to note that comparatively low-lying stations occupy 2nd and 3rd places in the VERON Contest, and 3rd and 4th in the Magazine Contest. He congratulates G3EYV on putting in a word for the Cascade circuit. To be fair, says G3BLP, there is only about half-a-dog biscuit in it, and that is in favour of the Cascade. This difference is probably too small to be significant, and it is really a matter of personal taste.

G2HDZ (Pinner) remaining quite unrepentant regarding his criticism of the Contest rules, nevertheless congratulates the winners. G3EYV also offers his congratulations, and was surprised to find himself so high. He has built a G3EJL-70 cm converter, plus variations by G2XC, plus variations by G3EYV. Results are not satisfactory! In conjunction with G6TA, he is working on a converter chassis with permanent mixer/oscillator but with facilities for plugging-in various RF stages to enable rapid checks to be made on different circuits.

G2DHV is now on 144.99 and 145.206 mc with 21 watts to a 4-element Yagi.

The transmitter is at present using an RK34 final, but an 832 PA will be added shortly. G4HT (Ealing) found conditions fair for the time of year. He worked G2OI eleven times. He suggests a better Reliability Table would be obtained by each contestant adding up his total mileage each month. Other comments from G4HT include one that some of the "Phone only" stations who have no use for CW would probably be surprised at the number of stations that have called them from rare counties. In the first six days of January, G4HT worked 14 counties.

G5QL (Watford) hopes to be active soon on 144.7, 144.9 or .4535 mc. He joins the Five Band Club.

G3WW (Wimblington) replies to some of the Contest comments. He suggests that G5UM has disqualified himself for future contests by disclosing that he intends to use his telephone number as his reference figure! To G2HDZ's remarks he replies: "This is a hobby and not a business deal." News of G3WW is that one side of the feeder is broken 58 feet above ground. G3VM (Norwich) was on for the December opening and worked DL, PA and ON as well as having an excellent QSO with G3AUS in Torquay. DL3VJ, who was also contacted, had only been on Two for 14 days and was using but 10 watts input. On the same evening, G3IL (Bristol) was a good signal with G3VM, but was only testing. During the good spell around January 5 an excellent contact was made with G3DIV/A. To G2HIF, with his 2 contacts in 7 hours, G3VM replies that often in the past three years he has had no contact in 7 weeks!

G2OI (Eccles) has been fairly active with a view to finding out what could be done during a bad season. A severe gale in early January did some damage to the aerial arrays. Previous to this, southern stations were heard on many occasions during December and early January. He supports our remarks regarding those who are able to be active every night from tea-time to bed-time. G2OI is usually on the band after 2300. Regarding 70 cm, he again presses for a narrow band for DX working, this time suggesting 432 to 433 mc, which was internationally suggested some time ago.

Sayings of the Month

"None of us are getting any younger, and when I come home I feel like my

TWO METRES COUNTIES WORKED SINCE SEPTEMBER 1, 1951 Starting Figure, 14	
Worked	Station
43	GW5MQ
42	G3EHY
37	G3BK, G3WW, G5YV
36	G4HT
34	G2XC, G5MA
33	G4SA, G5DS
32	G2NH, G3FAN
27	G2HDZ
26	G8IL
25	G2AHP, G3VM, G6YU
21	G2FVD, G2OI, G3BNC, C6CB
20	G2FOP, G3FD
19	G3AVO/A, G3CWW, G3GHO
18	G4MR, G8VR
17	G3HCU, G5ML
16	GM3EGW
15	G6CI

Note: This table will run for one year until August 31, 1952

slippers and a look at the TV" (G2O1) "I am disappointed with the Contest report. Only the first three are mentioned at all out of the 51 who troubled to send in entries" (G3WW) "What's been wrong with publishing an activity list lately instead of filling several pages with who-did-what in a contest a couple of months back?" (G3FKO) "I was considerably shaken to find I was the only critic of the rules" (G2HDZ) "Thank you for elevating my 4-ele Yagi into a 4-ele stack" (G3EYV) "Doubtless you'll get other criticisms" (G2HIF) "It is good to hear that another Five Band Dinner is projected" (G3EHY) "Banish Micawberism

and let yourself be heard" (GM3BA/A). New VHF CC members include G2FVD, G3CVO and G5DS, making 96 in all.

In Conclusion

Your conductor would like to express his regrets for being absent from Two Metres for such a long spell in December and January, and can only assure everyone that it was quite unavoidable. Many thanks to those who have written this month and given him such a vivid picture of what the band has been like. Next month's reports should reach us by February 13 and addressed: E. J. Williams, G2XC, *Short Wave Magazine*, 55 Victoria Street, London, S.W.1.

Starting on Seventycems

SOME NOTES ON THE RECEIVER PROBLEM

By W. J. CRAWLEY (G2IQ)

IN a leader, entitled "Evolution" (*Short Wave Magazine*, August, 1949), the Editor drew attention to the remarkable results that had up to then been obtained on 145 mc. Looking back over the past years at the improvements made since September, 1948, and the ease with which amateurs have settled down in the band, it certainly does appear remarkable. What was to most of us three years ago unknown, distant territory, has now become our normal habitat, and we have become as used to the "feel" of it as if we had been there always.

Nobody who works on Two will deny that it is a grand band. What the writer wishes to stress, however, is the fact that we started right. We used stabilised transmitters; during a long activity the writer cannot recall having heard a note worse than T6. We used selective receivers; rush-boxes and direct detection weren't given a second thought—in fact, receivers in use at most stations on Two have better performance figures than the average communications receivers have at .14 mc. Directional aerials of increasing gain and selectivity are in use at practically all two-metre

stations. The excellent results obtained could not have been achieved otherwise. We started in the right way.

Making a Start on 420 mc

Increasing interest is being shown in the 70 cm band. Very encouraging results have already been obtained by a handful of pioneers, and there appears to be no reason why we should not do as well on 420 as on 145 mc if we start right. One is reminded of the advice that is often given in Yorkshire to newly-married couples: "Start as tha means to go on."

Many VHF workers have declared that they would not come on Seventycems until they could put out a decent crystal-controlled signal and possessed a receiver capable of receiving something beyond the electric blanket next door. This seems to the writer to be the correct attitude, provided that it does not lead to lassitude, and is more likely to produce results ultimately than is rushing on the band with self-excited oscillators and insensitive receivers. It depends on what we expect from the band. If we are content to work on schedule over line-of-sight paths, then simple apparatus is all we require. But there is no future in that type of activity. If, on the other hand, we wish to establish 420 mc as a *communication* band that we can work from the home QTH, we shall have to start right as we did on Two.

Fortunately, the two bands are harmonically related, and only one more stage need be added to the two-metre rig for fundamental operation of the PA; indeed, enough RF may be

obtained by running the two-metre PA as a tripler. Valves for 420 mc operation present the greatest difficulty, and those especially designed for working up to these frequencies do not usually lend themselves easily to power amplification but rather to self-excitation. However, with patience, about 4 to 5 watts may be squeezed from an 832 working at 18/20 watts input for a start.

Receivers for 70 cm

The really thorny problem comes up when one starts thinking about receivers for this band. We are reaching the region where, whilst valve technique is still useful, valve types available are very few. Several valves are capable of giving gain as RF amplifiers at 420 mc, but not many will give a gain of signal-over-noise! Most actually retard the signal-to-noise ratio of the receiver in that the added gain is not sufficient to compensate for the additional noise they themselves generate. The Lighthouse types, so called because of their construction, are the exception and are capable of improving the Noise Factor of receivers at these frequencies by several dB.

The alternative appears to be the use of a receiver with the mixer as the first stage. Because of transit time losses, the conversion gain obtainable from a triode mixer decreases and the generated noise increases as the frequency, and at 420 mc diodes, preferably crystal-diodes, are superior. Although designed for use on much higher frequencies than these, on the score of generated noise crystals are superior to valve diodes at the comparatively low frequency of 420 mc. Transit time losses are negligible in crystals, but other effects cause them to give a conversion loss as mixers. The overall noise figure of a complete receiver with crystal mixer depends upon the mixer conversion loss, the noise temperature factor of the crystal used and the noise factor of the IF amplifier, expressed in the equation:—

$$N.F. = L (F_i + t - 1)$$

where L = Conversion loss
 t = Noise Temperature ratio (1 for a perfect crystal, but usually between 2 and 3)
 F_i = Noise Factor of IF strip

It can be seen from the above that one of the main factors to consider in designing a sensitive receiver for Seventycems is the IF amplifier, as this has direct bearing on the overall noise factor of the receiver. This is some-

thing that at 145 mc and lower we have not had to calculate, because at those frequencies a *gain* is realised prior to the IF amplifier. In turn, the noise factor of the IF amplifier will depend upon the frequency and the bandwidth, but mainly upon the first IF valve and its associated circuitry. With modern RF pentodes, it is not difficult to make an IF strip for, say, 20-30 mc with a noise factor of as low as 4 dB, and suitable valves for this application are types EF54 or 6AK5.

Since the crystal mixer must inevitably produce a loss, every dB gained in the IF amplifier signal-to-noise is a gain in the whole receiver.

Taking the theoretical case of a receiver with an IF amplifier of noise figure of 2.51 or 4 dB, a crystal mixer having a conversion loss of 4 and noise-temperature ratio of 2, then the overall noise factor of the receiver will be:

$$NF = L (F_i + t - 1) = 4 (2.51 + 2 - 1) = 14.04$$

or less than 12 dB. This figure is by no means the ultimate at the present stage of receiver design, but represents something which is well within the capabilities of the amateur constructor. For purposes of comparison, it may be mentioned that *very few* general coverage receivers show as low a noise figure at very much lower frequencies. Therefore, it is not being too optimistic to assert that there is no reason why receivers for 420 mc should not be as sensitive as the low-frequency receivers in general amateur use.

INFORMATION IN INDUSTRY

Much of the success of the drive for industrial productivity depends on the speedy provision of accurate information in the scientific and industrial fields. Recognizing this fact, the Department of Scientific and Industrial Research has recently made available to Aslib a special grant to establish a Consultant Service in the library and information field.

This service, drawing upon the existing resources of Aslib, and backed by new research into information techniques, is now available to advise those who are considering the establishment of special libraries and information services in industry and research establishments, and to assist the development of existing services. Details regarding this service and other facilities provided by Aslib can be obtained from the Director, Aslib, 4 Palace Gate, London, W.8.

ABSTRACTS OF INTEREST

CURRENT TECHNICAL DIGEST

Each month we present brief references to useful practical articles appearing in the overseas radio press. These publications can be obtained on a sterling subscription basis on application to: Gage & Pollard, Publishers' Agents, 55 Victoria Street, London, S.W.1. We are informed that single copies of the periodicals mentioned can NOT be supplied.

QST, December 1951

An electronic break-in system in which complete station control is performed by the key is described by W5LVD. The author points out that any system requiring physical switching by the operator is annoying and fatiguing. The oscillator is not keyed in the true sense of the word, but is "disabled" when the key is up for any length of time. The receiver is muted, and the main aerial changed over from send-to-receive, all by the actual operation of keying. The ancillary apparatus consists merely of relays, battery, and the two halves of a 6SN7.

RADIO AND TELEVISION NEWS, November 1951

A simple two-valve volume compressor is described by Ed. Miller under the title of "The Ham-Lim." This has a fairly flat frequency response between 100 and 5000 cycles, anywhere within its operating range up to 15 dB. of compression. It is claimed that the instrument can be correctly set up with the aid of nothing more elaborate than a normal low-voltage DC voltmeter. Whether the modulator following this device is fitted with negative peak-clipping or not, it is claimed that a limiter of this type will allow more complete usage of the carrier by the modulating source, and, consequently, a louder signal at the receiving end.

RADIO ELECTRONICS, November 1951

A short note by Alfred Haas gives a useful suggestion for a mixer circuit such as might be needed for work with an oscilloscope or signal generator. A double triode is used as a double cathode-follower, the cathodes being tied together to deliver the combined output. The advantages of this scheme, apart from its simplicity, are a low input capacity and high input impedance; low output impedance; high stability, and cheapness.

RADIO AND TELEVISION NEWS, October 1951

A compact 20-metre beam aerial is described by W8MGP. This is unusual in that it uses two folded dipoles driven 135 deg. out of phase. Between them is a $\frac{1}{2}$ -wave transposed matching section of 300-ohm twin-lead. For this simple combination the author claims a forward gain of 8 to 10 db. and a back-to-front ratio of 50 dB, together with broad loading over the entire band and a lack of critical adjustments. The main feeder, it is stated (if it has an impedance of 100 to 150 ohms) carries a very small standing-wave ratio. The back-to-front ratio is varied by adjusting the $\frac{1}{2}$ -wave matching section.

PROCEEDINGS OF THE I.R.E. August 1951

Amateurs who believe in the necessity of accurate measuring equipment should be interested in the

bridge-type RC oscillator described by F. B. Anderson. This instrument is continuously variable between 20 cycles and 3 mc, with an accuracy of setting of the order of 1 per cent, using ordinary components. The practical limits of the frequency range obtainable with one of these oscillators are stated to be 0.01 cycles and 10 mc. The frequency control is a two-gang linear potentiometer.

QJ December 1951

The "Minipak," described by Ron Pickett, is a power supply, using three miniature valves, built on a chassis only slightly larger than the base of the transformer itself. Extremely good regulation (better than most VR systems) is claimed for it, and its output is completely adjustable. The only "conventional" smoothing employed is one single 12 μ F electrolytic; there is no choke, the rest of the ripple being eliminated by the use of two triodes, one being used as a variable series resistor and the other as a DC amplifier. The published curves show that the regulation, up to the overloading point, is phenomenal.

QST December 1951

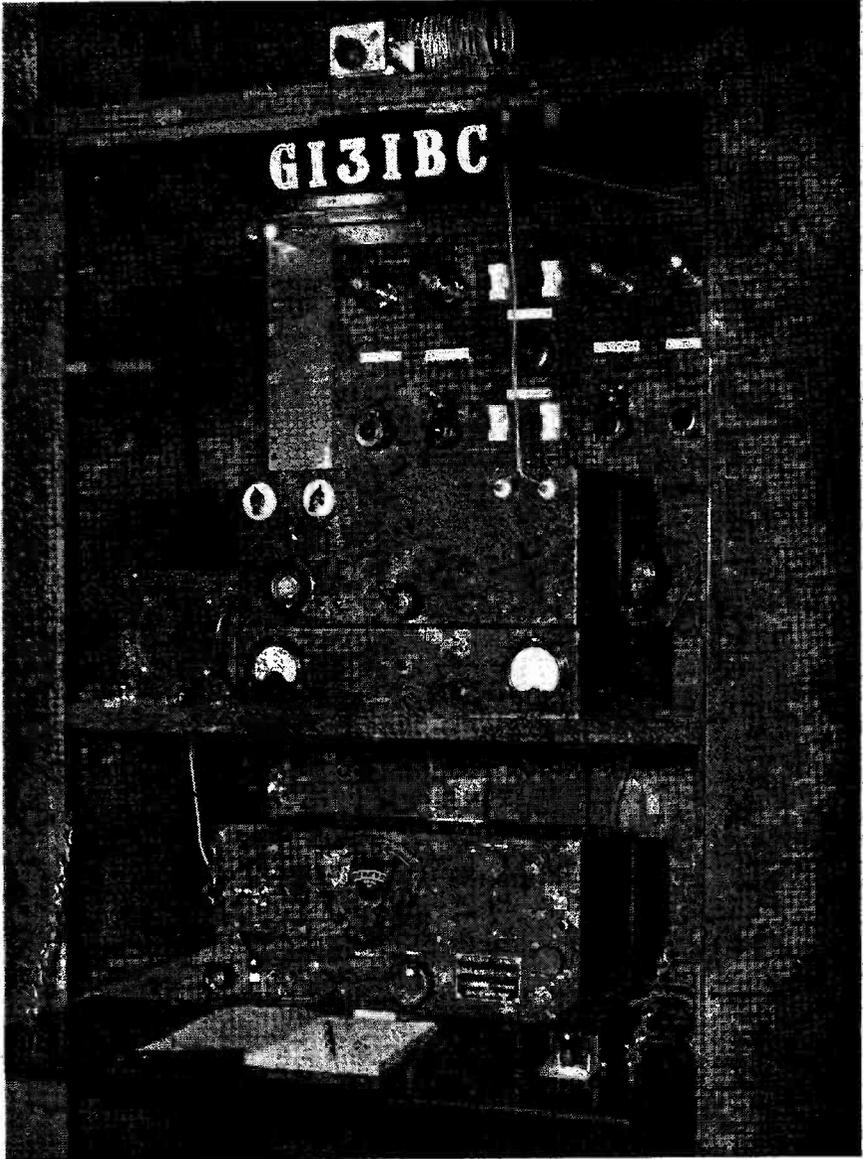
An old friend of ours appears again in an article on "The End-Fed Hertz," by W4ADE. This is not what was once called the AOG aerial, but a well-planned use of end fed for the benefit of those whose physical location favours such a design. One end of an aerial, the length of which is a half-wave or a multiple thereof, is brought in to a properly designed and shielded aerial coupler, co-ax fed from the transmitter tank circuit. A switchable dummy load is also provided for correct adjustment of the coupler. While not recommended in locations where TVI is troublesome, it is pointed out that excellent results can be obtained from this system, which has, at least, the merits of simplicity, flexibility and cheapness.

RADIO ELECTRONICS, August 1951

A possible revolution in VHF technique is forecast in an article on "Miniature Magnetron for VHF TV Receivers," by Fred Shunaman. This experimental tube, constructed by the General Electric Co. of America, will operate with less than 200 volts. It is, in effect, a diode with eight plates connected alternately to two end rings. These eight "vaness" form a cylinder, 0.18-in. in diameter, round a cathode whose diameter is 0.1-in., actually forming two interleaving anodes of four vanes each. The magnet used is two horseshoe magnets butted together to form a perfect ring. This is fitted over the tube and turned to the position at which anode current is at a minimum. Though designed as a local oscillator for VHF receivers, it is also suitable for low-power transmitters, and even for portable operation.

Read Short Wave Magazine Regularly and Keep in Touch

The other man's station G13IBC



WE do not often feature a Club station in this series, and in this instance it will be the layout of the equipment and the fact that it is all home-built which will be of particular interest.

G13BC is the call-sign of the Co-operative Radio Society, Husband Memorial Hall, Frederick Street, Belfast, Northern Ireland. The Club has an expanding membership, now around the 60-mark, with a strong SWL section. The Hon. Secretary is W. F. Jordan. BSWL-4002, with G13SG as Treasurer. The transmitting fraternity, consisting of a number of enthusiastic local G1's, have organised such activities as Morse classes, lectures, constructional programmes, and so on. The main objective of the Society is, in fact, to help, advise and encourage the SWL.

Station G13BC is built into a cabinet, as shown in our photograph opposite.

and at present consists of a VFO-Doublers-PA arrangement running 25 watts on 3.5, 7 and 14 mc. The receiver now in use is a home-built superhet, replacing the BC-348. The aerial is a centre-fed Zepp, and good facilities exist "on site" for the erection of aeri-als.

Meetings and activities on the air take place two nights a week, with the SWL members of the Society as an enthusiastic group of supporters.

The honorary secretary (address as above) would be very interested to exchange ideas and information as to Club activities with the secretaries of other established Clubs; as he puts it, "We in G1-land do not have much opportunity of making contact with similar Clubs across the Channel." Well, there is much that could be done along these lines, and we feel sure that there are Club organisations over here which would be only too glad to help Belfast.

MULTICORE RECORD EXPORT SALES

Figures produced by Multicore Solders Ltd. Statistics Department show that record sales of ERSIN Multicore Solder were achieved in export markets during 1951. The increase in actual solder length compared with 1950 exceeded four thousand *miles*, more than the distance from England to the United States!

During the year extra packings were developed for markets having particular requirements and, in some countries, ERSIN Multicore Solder, with its three cores of flux, is now being wound on reels locally, the material being initially despatched in bulk from England.

The introduction during 1951 of television services in some South American countries has led to an increased demand for ERSIN Multicore Solder in these territories. The establishment of electric lamp manufacture overseas has also stepped-up the demand for the types of ERSIN Multicore Solder made for this purpose.

In the near future, when the works specially built by the Government Development Corporation at Hemel Hempstead for Multicore Solders Ltd. comes into operation, an even larger output will be available for overseas markets and re-armament requirements.

RECORD INCREASE IN TELEVISION LICENCES

Approximately 12,525,900 broadcast receiving licences, including 1,113,900 television licences, were current in Great Britain and Northern Ireland at the end of November, 1951. There was a record increase of 81,950 television licences over the previous month's figure.

Motorists are reminded that they need a separate broadcast receiving licence for a wireless set fitted in a car.

CHANGE OF NAME

At an Extraordinary General Meeting held on December 17, a resolution was made and adopted that the registered name of the Company of A. H. Hunt, Ltd., should include a reference to the products in which the Company are specialists and which enjoy a world-wide reputation as "Hunts Capacitors."

Therefore, the name has now been changed to A. H. Hunt (Capacitors) Ltd.

PHOTOGRAPHS

Readers are reminded that we are always glad to see good photographs—which can be any size, print or negative, but must be *clear* and *sharp*—of Amateur Radio interest, for possible publication in these pages. Payment is made for all such photographs used, immediately upon appearance in print.

The Month with the Clubs

FROM REPORTS RECEIVED

An encouraging sign of vitality within the Club movement is the increase in the number of broadsheets and News Letters which are sent to us with the monthly notes. This month we acknowledge receipt of the following: *G3BRX* (Wanstead and Woodford); *News Letter* (Midland); *Calling W.A.R.S.* (Wirral); *Brighton Link*; *QRV* (R.A.F. Amateur Radio Society); *CQ-TV* (British Amateur Television Club); and *QLF Newsletter* (West Kent Radio Society). It would be appreciated if all Clubs publishing their own journal were to put us on the circulation list. Several others were received last month, but the report on MCC held out the usual Club Notes.

We have to apologise for a slight error in one of the tables in connection with MCC. The actual result of the first MCC, in 1946, was: 1st, Coventry; 2nd, Cheltenham; 3rd, Grafton. The second and third places were wrongly credited to West Cornwall and Rhigos (through reading the wrong way across a column in a previous table!) Rhigos, of course, did not show up until the 1948 contest, but they still hold second place on overall points, although their credit is 9 points and not 10 as stated.

And so to this month's reports, from 30 Clubs. Next month's deadline is **first post on February 13**. Reports should be addressed to Club Secretary, *Short Wave Magazine*, 55 Victoria Street, London, S.W.1.

Birmingham & District Short Wave Society.—The AGM was held in December, and the 1952 Officers elected. G2BON is Chairman, A. O. Frearson Secretary (note QTH in panel) and W. Neal Treasurer. Meetings will take place on the second and fourth Mondays at the Colmore Inn, Church Street, technical lectures being given on the fourth Monday. Next events: February 11, talk on Microwaves and VHF; March 10, talk on Short Wave Listening and keeping a Log.

East Surrey Radio Club.—At a recent meeting G3BLP gave a lecture on Two-Metre Circuits and Allied Equipment. It is hoped that this will stir up some VHF activity among the newer members. The AGM and the first technical meeting of 1952 were held during January. Meetings are at the Barn Room, Lesbourne Road, Reigate.

Kingston & District Amateur Radio Society.—The new year opened on January 2 with a very successful Junk Sale at which 44 members were present. Radio Theory classes began on January 11 and will continue fortnightly from that date. On February 27

there is a lecture on The History of Amateur Radio, by G6CL, and the future programme includes Film Strips and talks on a wide variety of subjects. Headquarters are at Penrhyn House, 5 Penrhyn Road, Kingston on Thames.

Kirkcaldy & District Amateur Radio Society.—Meetings are held on the first and third Wednesdays at 285 Links Street, Kirkcaldy, and are well attended, but there is still room for more members. During the next few meetings it is proposed to build a new modulator for the Club Tx. The next meeting date after publication is February 20.

Lowestoft & Beccles Amateur Radio Club.—This Club has been active for one year, and meets monthly. Alternate meetings are held on the second Wednesday, in Lowestoft, and on the second Thursday, in Beccles. Recent events included a Junk Sale and the demonstration of a GDO. The Club will warmly welcome anyone in the district who is interested in Amateur Radio.

Midland Amateur Radio Society.—The high spot in recent

activities was the Annual Dinner, well attended both by members and by distinguished visitors. The usual "swindle" was held, and proved as popular as ever. The YL's and XYL's were present in numbers, and this social event was looked upon as some small compensation for their tolerance throughout the rest of the year.

North Manchester Radio Club.

—At the recent AGM the committee was re-elected, and they hope to provide an interesting programme for the season. The Club Tx, G3HOX, should be on the air soon. New members will be welcomed to the Morse class, lectures, and so on, which are held at the Domett Street Schools, Blackley, Manchester.

Pontefract Area Transmitting Group.

—The fortnightly meetings continue with great success, next dates being February 14 and 28. Round-table "ragchews" on matters of current interest are held at most meetings. Slow Morse practices are under way on Sundays (1990 kc at 1030), followed by a "net" for an hour or so.

Shefford & District Radio Society.

—The AGM was held on January 11, and recent attractions have included lectures by Belling-Lee (Interference) and Decca (High-Fidelity and Long-Playing Recordings). The former secretary is now in Germany, and hopes to be on the air again soon. Note new Secretary's QTH, in panel. Headquarters—20b, Wharfe Buildings, Bridge Street, Shefford, Beds.

Slade Radio Society.

—The AGM and a lecture on CRT Manufacture were the last events of 1951, not forgetting the social evening for the Christmas season. Future lectures will cover the Generation of Electric Power (February 15) and Nuclear Physics (February 29). A special meeting will be held shortly to discuss arrangements for this year's D-F Contest. All meetings are at the Parochial Hall, Broomfield Road, Erdington, at 7.45 p.m. Visitors are always welcome.

Spen Valley Radio & Television Society.

—Forthcoming events are as follows: February 13, Annual General Meeting; February 27, lecture on Electronics in Warfare, by Mr. W. G. Merriman. Meetings are at 7.30 p.m., in the Temperance Hall, Cleckheaton.

Torbay Amateur Radio Society.

—Members of the Dart-



Coventry emerged as winners of our Sixth MCC, with G2LU as the Club call. Here are some of the team, left to right; G5GR (Chairman, C.A.R.S.), G2LU, SWL Liggins on the receiver, and on right with that winning smile G3FAB, whose fine fist and steady operating have been such a feature of previous MCC events.

mouth Amateur Radio Club joined forces with Torbay to hear G2GM lecture on The Basics of a Three-Stage Transmitter, and the President, G5SY, was welcomed back after a long indisposition. At the January meeting G2GK talked on Aerial Couplers, and in February R. J. Whitnall will speak on Links in the High-Quality Chain. All meetings are at 7.30 p.m. on the third Saturday at the YMCA, Castle Road, Torquay, and visitors are always welcome.

Wanstead & Woodford Radio Society.—Five weekly meetings were held in January, including two Practical Nights, a Question Night, a Junk Sale and a talk on VHF Gear. All members, new or old, will be welcomed at these Tuesday meetings at Wanstead House, The Green, E. 11. February 19 is a practical evening. February 26 a transmitting night. Next meeting on the 12th, there is a talk on Signal Tracers.

Warrington & District Radio Society.—Recent meetings have included the showing of Mullard Film Strips, a talk on NFB, and the Annual Dinner and Presentation of Trophies. The AGM was also held in January. Recent

visitors have been W's from the Burtonwood Air Base, as well as amateurs from London and the South.

Worcester & District Amateur Radio Club.—After twelve months' rest, G8JC is again Hon. Sec.—note new address, in panel. Future meetings will take place on Thursdays, at 7 p.m. at the City Library and Museum, when old and new members will be welcomed. An open Meeting is being held shortly—to be advertised by posters. New members of both sexes and all ages will be heartily welcomed by the Club.

Eastbourne & District Amateur Radio Society.—This Club now meets on alternate Thursdays at the new Headquarters, Swallow Cafe, 333 Seaside, Eastbourne. Next meeting after publication is February 21. The January meetings took the form of a Film Strip lecture and a Junk Sale. Note new Secretary's QTH, in panel.

Hounslow & District Radio Society.—This Club has again obtained the use of Grove Road School for its meetings on alternate Thursday evenings. the

next being on February 21 at 7.30 p.m. A Top Band portable transmitter, mainly for Field Day use, is under construction.

81 Reserve Centre Amateur Radio Club (R.A.F.V.R.)—This Club is a re-organisation of the former Club at No. 83 R.C. (Stanmore). Any member of the R.A.F.V.R. living in or near the London area is invited to apply for membership. The Club meets every Monday at 7.30 p.m., at 77 Hallam Street, W. 1, but the Club station, G3HAP, is available for use every evening of the week. Good canteen facilities are provided; later it is hoped to add a "Junior Section" to the present 150-watt transmitter, for the use of those not yet licensed to use the full power.

Gravesend Amateur Radio Society.—At the recent AGM G3HLF and G3EJK were elected President and Chairman. The future programme is to include lectures from the Mullard Film Strips, and demonstrations of equipment. Every effort will be made to have the Club Tx, G3GRS, in regular operation.

Clifton Amateur Radio Society.—There has recently



The 1951 MCC was certainly a co-operative effort for the Surrey Radio Contact Club. Operators pictured above who ran G8TB into third place are, left to right: G2DN (one of the OT's on 160 metres), G6LX, G3BLP, G2FI, G3FWR, G3IAS, G3DVQ and G8TB. And G2KU and G3BFP (not shown) also lent a hand.

been a good increase in membership and attendance. Past events have been the second half of a lecture on Valves, the Christmas Party, and a lecture on Wave Filters by G3FLP. The Party was highly successful, with an attendance of about 50; representatives of other Clubs also attended, and a Film Show was given.

Downham Men's Institute (Radio Section).—Meetings are held every Wednesday at 8 p.m. at Durham Hill School, Downham under G2DHV, who is the Instruc-

tor and Club Chairman. Lectures in general theory and servicing are given, and practical work is also undertaken. Members of the class are welcome to join the Ravensbourne Club, whose station G3HEV will be in operation during the Durham Hill Schools Exhibition next May.

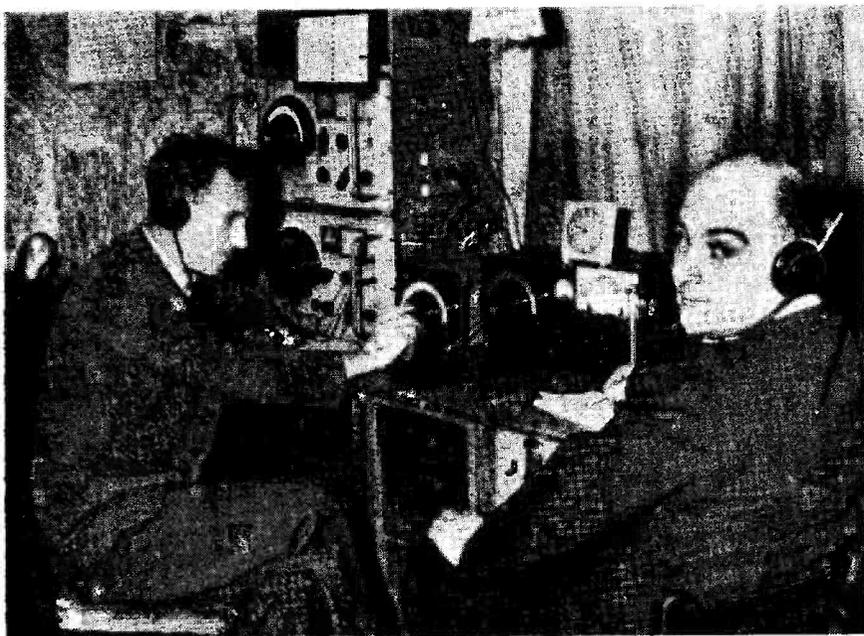
Hartlepoons Amateur Radio Club.—This Club has been in existence for over two years, but now reports for the first time. Meetings are held at la Hope Street, West Hartlepool, every Tuesday at 7.30 p.m. A licence

is hoped for, and the Club already looks forward to the Seventh MCC! February activities will include talks by members and by a visitor from the Tees-Side A.R.C.

Leicester Radio Society.—The Annual Dinner and Dance on January 11 was a highly successful affair, and trophies were presented; one to the Club by G2CUR, and one to G3AFZ, by Mrs. Ridgeway. A wandering camera recorded most of the major and amusing events of the evening. New members are always welcome—meetings are



This is the party of operators who gained second place for West Cornwall in the 1951 MCC. Left to right: G3DIY, G3FVD, G3FVS and G3FWC. It is not the first time that West Cornwall has figured in the leading three.



Surrey Radio Contact Club gained a place for the first time in the Sixth MCC. They were third with G8TB, on left above, with G6LX in the cans.

at the Holly Bush Hotel, Belgrave Gate, Leicester on the first and third Mondays.

Liverpool & District Short Wave Club.—The Hon. Sec. reports this Club as being in a "fine flourishing condition." The New Year started with a lecture by G3DOK on Radar Detection; this will be continued in February. The Club Tx, G3AHD, has been given several "airings" and some good contacts have resulted. Morse classes are held on Tuesdays, 7—7.30 p.m. The Club News Sheet has got under way and its contents suggest that some of the locals are well monitored!

South Manchester Radio Club.—New premises have been acquired, at Ladybarn House, Mauldeth Road, Manchester 14. They fill a long-standing need and give the Club a separate room for the operation of its station G3FVA. Meetings are held on alternate Friday evenings, the subject for February 15 being TV and TV1.

Surrey Radio Contact Club (Croydon).—This Club is elated by its recent success in gaining third place in MCC, coupled with several successes by individual members. At the last meeting G2IG spoke on high-

selectivity phone reception and illustrated his remarks with a double-conversion superhet. For February 12 the subject will be Aerials. Meetings are on the second Tuesday, 7.30 p.m. at the Blacksmiths' Arms, South End, Croydon.

West Kent Radio Society.—Among the interesting lectures given by members was a recent talk on Two-Metre Technique, by G2UJ and G4FB. Another subject that stimulated much argument was "Sites—Do They Matter?" (by G4IB). A Quiz brought together teams from the Club and from the newly-formed Association of Kent Radio Amateurs. The latter gathered the honours after a hot contest. The Annual Get-Together was also held, and was a most successful event.

Coventry Amateur Radio Society.—Forthcoming events are a lecture—"Mathematics Made Easy"—on February 18 and the Annual Dinner at the Opera House on February 29. On March 3 there will be a lecture on FM. Meetings are at the YWCA, Queens Road, at 7.30 p.m. A slow Morse period is held every Club night, and transmissions are also made on 1830 kc on Wednesdays, 2000—2015, from G2LU and G3HDB/A alternately. The Club also held its first "night on the air" on January 10, with nine club-member stations operating and other members at each station.

Derby & District Amateur Radio Society.—At the AGM new officers were elected, and the financial position was pro-

FEDERATION OF SUSSEX SOCIETIES

A meeting will be held at the Golden Cross Hotel, Western Road, Brighton, on Sunday, March 16, the object of which will be to form a Federation of Sussex Radio Societies for their mutual benefit. Any Sussex organisation which has not already become acquainted with the scheme is invited to send representatives. Full details may be obtained from G. W. Morton, G3DRC, 42 Southfarm Road, Worthing.

nounced so sound that the subscription has been reduced! Meetings are held weekly in the Clubrooms in the sub-basement of the Derby College of Art, Green Lane, Derby—Wednesday is the night. The Annual Dinner and Social will be held on February 29 at the Iron Gates, Derby.

Newbury & District Amateur Radio Society.—The December meeting was in the form of a

Home Built Equipment contest and bring-and-buy sale. The contest was won by A. H. G. Smith with his "bike radio"—a large number of stations has been logged on the set using its rod aerial. Second was A. W. Grimsdale with a miniature modulator, suitable for the B2 and rigs up to 25 watts. Third was J. Chown with a small Top Band and 80-metre miniature Tx. Thanks go to Messrs. Hensford, Hill and

Woodhouse of the Reading Radio Society for judging and for the very fair and ingenious marking system devised by them. The Committee are preparing a varied programme for the coming months which will include a number of visits to places and installations of interest, outdoor activities, i.e. field days, and so on. Meetings last Friday of the month, Railway Hotel, Greenham Road, Newbury.

NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE.

BIRMINGHAM: A. O. Frearson, 66 Wheelwright Road, Birmingham 24.
COVENTRY: K. Lines, G3FOH, 142 Shorncliffe Road, Coventry.
CLIFTON: R. E. Brown, G3GZH, 210 Edward Street, London, S.E. 14.
DERBY: E. Shinumin, Leafmore Mount, Derby Lane, Derby.
DOWNHAM: W. H. F. Wilshaw, 4 Station Road, Bromley, Kent.
EASTBOURNE: W. A. Allwright, G2AON, 55a Lattimer Road, Eastbourne.
EAST SURREY: I. Knight, G5LK, Radiohme, Madeira Walk, Reigate.
GRAVESEND: R. Appleton, 23 Laurel Avenue, Gravesend.
HARTLEPOOLS: L. M. Arrowsmith, 51 Alverstone Avenue, West Hartlepool.
HOUNSLOW: J. Clarke, 124 Springwell Road, Heston, Middx.
KINGSTON: R. Babbs, G3GVU, 28 Grove Lane, Kingston, Surrey.
KIRKCALDY: J. Taylor, GM2DBX, The Pharmacy, Methilhill.
LEICESTER: A. L. Milnthorpe, G2FMO, 3 Winstler Drive, Thurleston, nr. Leicester.
LIVERPOOL: A. D. H. Looney, 81 Alstonfield Road, Liverpool 14.
LOWESTOFT: E. J. Hartley, G3DDK, 1 Boyscott Lane, Bungay, Suffolk.
MIDLAND: H. B. Bligh, 52 Norman Road, Birmingham 31.
NEWBURY: A. W. Grimsdale, 164 London Road, Newbury.
NORTH MANCHESTER: H. B. Shields, G3GB, 10 Deal Street, Newton Heath, Manchester 10.
PONTEFRACT: W. Farrar, G3ESP, Stanton, Hensworth Road, Ackworth, Pontefract.
SHEFFORD: R. J. Roper, 294F, Married Quarters, RAF Henlow, Beds.
SLADE: C. N. Smart, 110 Woolmore Road, Birmingham 23.
SOUTH MANCHESTER: F. H. Hudson, 21 Ashbourne Road, Stretford, Manchester.
SPEN VALLEY: N. Pride, 100 Raikes Lane, Birstall, Leeds.
SURREY (CROYDON): S. A. Morley, G3FWR, 22 Old Farleigh Road, Selsdon, South Croydon.
TORBAY: W. A. Launder, B.Sc., G3FHL, 15 Cambridge Road, St. Marychurch, Torquay.
WANSTEAD: J. Binning, G3AJS, 150 Upton Park Road, London, E. 7.
WARRINGTON: S. Wood, G3EZX, 12 Thelwall Lane, Latchford, Warrington.
WEST KENT: L. King, G4IB, Glenisla, Maidstone Road, Lower Green, Pembury.
WORCESTER: J. Morris-Casey, G8JC, 4 Kennels Road, Station Road, Fernhill Heath, Worcs.
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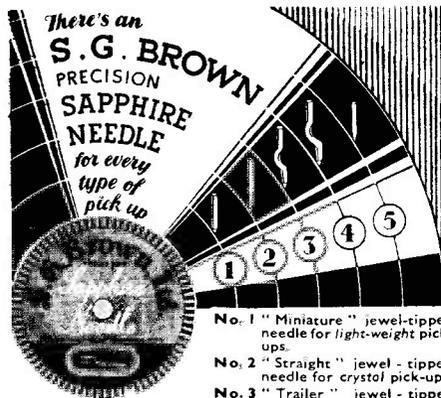
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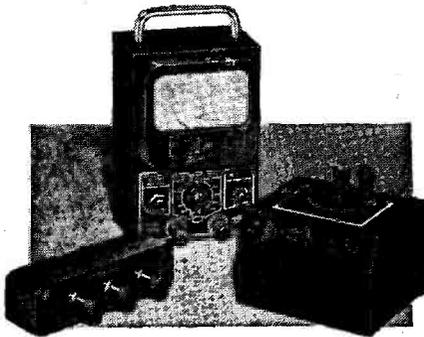
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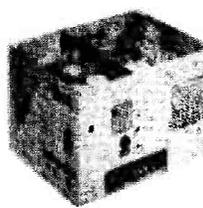
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SITUATIONS VACANT

AIR TRAINERS LTD., Bicester Road, Aylesbury, require Engineers, Junior Engineers and Assistants in their Electronics Laboratory for Design and Development work on Servo Systems, Power Supplies, AF and FR Amplifiers, and similar equipment. Applicants who should be able to use the usual electrical test equipment and who have had experience with Services Radio or Radar, are invited to send details of age, education, experience and salary required to The Personnel Manager, or telephone Aylesbury 922 for an appointment.

READERS' ADVERTISEMENTS

3d. per word, min. charge 5/-, payable with order. Box numbers 1/6 extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1

WANTED. AR88 in perfect condition, or Eddy-stone 680, must be as new. Please write price and details. Hillel, 57 Ashstead Road, Clapton, E.5.

HK2576—2 required to purchase, or part exchange pair of new 813's, offers to G3BCW, 4 Estcourt St., Devises, Wilts. (Tel. 378).

Transmitter wanted—Q Max B/40 or other make of compact design, in perfect condition. Please state power output and fullest details. All replies answered. Write Box: 1031.

SALE. Ten 813's, twelve HK5A's, six 832's, new, £3. each. Six 866's, Four 803's, 12/6 each. TH100 85/-. Reasonable offers considered where quantity required. Box No: 1045.

G3HVO offers £15 for BC221. Selling bandspread 10 metres, £15. BC342 receiver, 2RF, Xtal filter, internal 115v. pack with auto to 230v. £20. R9'er, ten metres, 6AK5, 25/-. UMI Modulation Transformer 30/-, 150-watt ten-metre transmitter 6V6-6L6 p/p T740, with heater transformer, no HT. 66. RME DB20 preselector, A.C., 1.7-30 Mcs. £10/10. Cossor 3332 4in. scope FB internal power supply, time base etc, £10 TUSB 80/40m VFO, as QST. £2/10/-, 1181 gear less valves, modulator, £5. Mod. power supply £4 PA Unit (2m) £2. Control unit, £2. Will exchange new Empire portable typewriter for BC221, also want 2 metre parts. 5 Hightwood Road, Parkstone, Dorset. (Carriage extra).

THE amazing VRL receiver. 19 valves, 1.5-29 Mc, 10/100/1000 kc crystal calibrator, NL crystal filter, loudspeaker, etc. £30. 47 Lindsworth Road, Birmingham 30.

FOR SALE. Radio-Gram. Solid Walnut 4ft. 4in. x 2ft. 3in. x 3ft. 1in. comprising: Unit 1, RF unit, 3 stages: Unit 2, power supplies for RF Unit: Unit 3, power amplifier 2-p/5-400's working in Class A driven by 164V: Unit 4, power supplies for amplifier: Unit 5, Short wave converter. Essential circuits are metered. Separate cabinet contains 12ins. "Hi-Fi" mains energised speaker. Accessories—Shaftsbury bio-transverse mike, Garrard auto-changer, Rothamel pick-up, separate cutting head and blanks for home recording, electric baking oven for blanks, spare valves and vast quantity of radio spares. Cost about £300—accept £80. Apply, 6 Gordon Road, Beckenham, Kent. (Phone. Bec. 2934. After 6 o'clock p.m.).

**SMALL ADVERTISEMENTS
READERS'—continued**

SALE. Vitavox K/12/10 speaker, £4.10/-.
Gardiner's special high fidelity output transformer for push-pull PX25, 6L6's etc, secondaries 3 to 15 ohms, £2/10/-, Gardiner's mains transformer, 280v, 120 mA, 4V6a twice, 4v2a, £2/5/-, Pair 815's, £2/5/- each. All excellent, as new, post free. SAE details, G3ESV, Upholland College, Wigan, Lancs.

SALE. S27, as new, alignment perfect, offers round £35. Wanted. SX28 or AR88. Panadaptor. Any condition, cheap. Box No. 1034.

BULLETINS wanted to complete collection: July 1925 to June 1926, August 1926 and February 1928. Also complete volumes of QQT for 1927 and back, and of CQ for 1945, 1946 and/or 1947. Also QCC P5 Xtals, any frequency Top Band. G3IDG, 95 Ramsden Road, London, S.W.12.

WANTED BC221, mains operated. Box: 1036.

WANTED: Post-war American transmitter—no ex-Service—Collins 32V2 preferred. Willing to pay good price. Box: 1035.

QTR Selling. 150 watt Rig, Thermador transformers, 10 valve SS Super, VFO, Lot #35. Offers? parts sold separately S.A.E. GM2FJT, 35 Dumbarton Road, Stirling.

WANTED. ET4336 filament transformer, 2.5v twice, 10v. all with cT. Also TU61, Radio Constructor Vol 2, No. 3, Vol 1, No. 3, 4, Write G3DQT 42 Berylands Road, Surbiton, Surrey.

WANTED by amateur, communication receiver, good condition internally and externally, price reasonable. Lech. 141 Bradford Road, Bolton, Lancs.

WANTED R1392A. VHF Receiver for 144 mc. also Field Strength Meter 1-95-A, preferably unmodified. Good price if good condition. For Sale: SX28, best offer over £45. recent recondition and aligned. Box No. 1037.

358X—9-1000 metres, Xtal filter, Handbook. Nice condition, £15. Transmitter, 150-watt, complete £5. 16 Coniston Road, Reddish, Stockport.

OFFERS wanted. HRO Senior, seven coils, four bandsread. Goodman's 12in. loudspeaker. Pair new PX4 and 832. Parker, Bungalow, Pitt Place, Great Baddow, Chelmsford.

AVT-15 RCA Tx for lightweight aircraft, 2.5-6.7 mc., Xtal-controlled, internal 12v vibrator supply, antenna relay, meter and loading circuit, complete with valves, plugs T-17 microphone, spare vib. transformer, booklet, no xtals, £5. Hallicrafter S38 AC/DC post-war communication Rx, 110 or 230v, manual, £16. APS-4 radar remote indicator and amplifier in carton with CRT, amplifier tubes shockmount, unmodified, £5. RF head for SCR720, (10 cm. AI radar), with two 726 Klystrons and pre-amp tubes, unmodified, £5. BC929 indicator (SCR 729) with 3BPI CRT and 7 valves, less antenna switching motor, circuit supplies, using 6X5, 2X2, 6G6, 6SN7, 6H6, £3. APS-13 420 mc. Tx/Rx with 17 valves, dynamotor, manual, unmodified, brand new in original packing. Modification article QST May '48 Offers over £10. Wanted 6SR7, 6SF7, BC348 Case. Box No. 1038.

WANTED B2 transceiver in good condition, details to G3IDR, 300, Signals Unit, R.A.F. Ahlhorn, c/o B.A.O.R. 25 (In U.K. during March).

Short Wave Magazine, Volume IX

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TEN Valve, 1.7—7.5 mc, N.I., speaker, etc. 1 revalued, spares, £14. 10-metre converter, £1. 3FP7 CRT, 10/-. G3EQM, Standard Motor Co., London, N.W.10.

SUPER-PRO, 450 kc/20 mc, power pack for 110/230 AC, good condition, £25. Or exchange for AR77. Also BC342N, £15. Prefer buyer collect if possible. Ingram, 49 Lime Tree Avenue, Broadway, Worcester-shire.

BC221 frequency meter, fitted lab built stabilized power pack. New and unused. £25. Sixty copies *Short Wave Magazine*, 24 copies QST, all mint. Offers? G5KA, 30, Albemarle Crescent, Scarborough, Yorks.

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HAMMARLUND Comet Pro Rx, £10. R103 Rx, £4. 18ft. Lattice tower with beam motor mounted, £10. 117 Fairview Road, Cheltenham.

VALVES price each 2/811 £1, 6/35T 15/-, 2/TZ40 15/-, 1/837 15/-, 12PT15, 6/-; at 5/- 2-RK34. 2-KT8, 2-10, 7-6K7, 2X66, 2BL63, 26N6, 3-6G5; at 4/- 2-VR53, 2VR57, 8 EF50, EP54, 4-9001, 7-9003, 3-9002. The lot £20. Jackson U.S.A. Electronic GP meter (similar AVO), 12.5mV DC input, 4.5 mT AC, all ranges to 1000, £20 new, or offers? 4in./100 mA meter, £2. AVO Model D, £5. needs slight repair. 3 Cottingham Close, Kingsclere, Newbury.

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BC348 230v AC, £16. Eddystone 358 230v AC 12 coils, £15. Gram. amplifier, push pull, 8 watts, £5. 39 Kingsbury Road, Birmingham 24.

AR88D good condition, buyer collects, £40. QCC Xtals 3545, 3613, 7072kc, 17/6. each. G4NB, 4 Seneschall Road, Coventry.

EXCHANGE new 6J6, for 522 driver and modulation transformers. Xtals etc. for sale. S.A.E. list. G3EJR, 40 The Oval, Mirehouse, Whitehaven, Cumberland.

BC312N for sale good condition recently realigned, converted AC mains, £12. B50 Rx, 550 Kc to 23 mc, needs realigning good condition, less p/pack, £5. Radiovision 10/20 metre converter with p/pack, perfect condition £5, or exchange for HRO Senior, plus cash. Box No. 1040

SMALL ADVERTISEMENTS
READERS'—continued

SALE. Self-Contained Table-Top Tx Phone/CW 50w 1.5 to 17 mc. instruction manual, £21. Eddystone 358x receiver 9 to 2000 Metres instruction manual, £20. Universal Avonminor, £5/10/-. Wanted B2 Tx/Rx. G2DFH. Pendennis, St. Erth, Cornwall.

AVO Minor Universal, £5/10/-. Philco Car Radio, A/L/M bands, push-pull output, 6 volts. £14. Triplett valve tester 1213, covers B7G, £9. All perfect. Offers considered. 27 Highbury Avenue, Salisbury. (Sal.: 4305).

SALE—S.27 FM/AM Receiver. Good condition, realigned and tested, handbook. Offers over £20, or S.A.E. for details to Box No. 1041.

SALE AR77. 540 kc—31 mc, £25. Elm Tree, Bridge Street, Mansfield.

SELLING up. Canadian VRL Rx, £20 or offer. Other good gear and parts. Buyer collect. Woodhead, 199 Doboct Road, Sheffield 11.

WANTED by ham—National HRO receiver. Good price offered for good condition. G2AOW, 32 Endell Street, London, W.C.2.

BC939A or BC729 Antenna Tuning Units wanted. Highest prices paid. State condition. Box No. 1033.

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CRT's valves, condensers, potentiometers and other components, selling in £1 and £2 lots. S.A.E. for lists. Taylor, 74 Gresham Road, Staines, Middlesex.

HRO Bandsread coils wanted covering 10 and 20 metre amateur bands. Rowan, 343 Merville Garden Village, Belfast, N. Ireland.

WANTED—HRO in "mint condition" complete with power pack, coils and speaker. Re-aligned or "improved" receiver of no interest. Write full details and price, Box: 1043.

SALE—UM1 Transformer; Elstone transformer 450-0-450, 5v 3A, 6v 4A, 6v 5A; ball mike; Quartz crystals, 7009, 7080 kc Meters, 0-5, 0-50, 0-150, 0-200 mA Offers to B. Cutter, Spinney Cottage, Melbury Abbas, Shaftesbury, Dorset.

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FOR SALE 1155 Rx in working order, all valves except KTW62. This Rx is rough but not damaged. Ideal for spares. Price £4 carriage paid. G. Sourbutt's, 25 Mellor Street, Burslem, Stoke-on-Trent.

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SMALL ADVERTISEMENTS READERS'—continued

HALLICRAFTERS SX28-A. 0.55—42 mc. Excellent condition, handbook. Will exchange for AR88-D. Must be in good condition, S-meter, handbook essential. Or would sell. No dealers. Box No. 1032.

ADVERTISER, active amateur, with some capital, seeks working partner, with view to starting retail radio business. Write in confidence to Box: 1044.

AMATEUR requires general-coverage or UHF communication receiver in very good condition. Jones, 23 Norman House, Wyvil Estate, London, S.W.8.

HALLICRAFTERS S36 or similar wanted, new condition essential. Mason, 21 Compton Place, Carpenders Park, Nr. Watford.

EXCELLENT HRO with b/s coils, amateur bands, not war surplus model, £32 cost double. Eddy-stone 1000/1000 kc calibrator, as new, £5. VFO 80/40/20 bandswitched in receiver type cabinet with own power pack, stabilized, £12. Wanted BC221. G2ZD, The Moorings, Hastings Road, Bexhill. (Tel. 1796).



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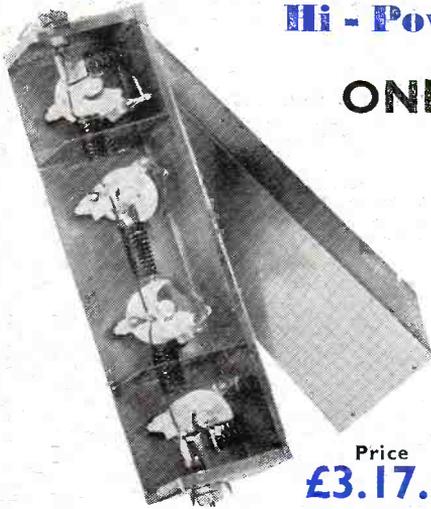
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