

The

RADIO AMATEUR

Incorporating "SHORT WAVE NEWS"

Vol. 8
Number 4
APRIL
1953

FOR THE TRANSMITTER AND LISTENER



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The Ground Plane Aerial. Aerial Radiation Pattern—Helix. "Huna Kuwait". "Unequal Equality". Design of Mains Transformers. Around the Shacks—G3BEC. Strictly for the Beginner—Modulation. SW.BC Station List and SW.BC, Amateur Band and VHF Commentaries, etc.

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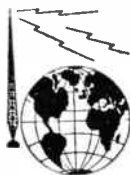
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The RADIO AMATEUR

Vol. 8 No. 4

April, 1953



incorporating "SHORT WAVE NEWS"

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Tel. CUN. 6518

EDITOR : Arthur C. Gee. G2UK.

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EDITORIAL

How much can AMATEUR RADIO afford ?

With this month's number, we commence the second year under our new title. Not that a change of title alone is of much significance. What is of more importance is the change of policy it indicated. After several years of successful trading, any alteration is indeed a serious matter, but as we explained at the time, changing circumstances demanded a new viewpoint. Readers will not be surprised to learn that the changeover has proved most successful and it is now very pleasant to be able to sit back and congratulate ourselves on having successfully completed the transition period and set the magazine on its new course, without too much way having been lost in the process.

Particularly is this so, in view of the fact that "Short Wave Magazine Ltd.," have recently announced the closing down of their monthly "Short Wave Listener." It was—as its publishers say—a "specialist SWL periodical" and with its demise we once again remain the only monthly published in this country which devotes any space at all

to the interests of the short wave listener. We ask the short wave listener fraternity to note this fact. They complain bitterly at times, that publishers and editors do not give them the consideration they would like. But it is up to them. If they would support keenly and regularly those periodicals which do cater for them, then more space would be allocated to their interests. So it's up to you. Get your friends to read the "Radio Amateur" now—and to read it regularly—and we'll promise to adequately cater for the Short Wave Listener. As we have said before, we do not think amateur radio should be divided into watertight compartments. It is illogical we feel, to classify the transmitting enthusiast, the experimenter, the SWL—whether SW broadcast or amateur band listener—into various groups and treat them all as separate bodies. No! Amateur radio is an all embracing hobby and the fewer the divisions the better. But quite obviously the keenest members will get the greatest attention from people like editors, so you SWL's just rally round and see that your friends support us in our endeavour to con-

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THE EDITOR invites original contributions on short wave radio subjects. All material used will be paid for. Articles should be clearly written, preferably typewritten, and photographs should be clear and sharp. Diagrams need not be large or perfectly drawn, as our draughtsmen will redraw in most cases, but relevant information should be included. All MSS must be accompanied by a stamped addressed envelope for reply or return. Each item must bear the sender's name and address.

Component Review. Manufacturers, publishers, etc., are invited to submit samples or information of new products for review in the section.

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ALL CORRESPONDENCE should be addressed to "The Radio Amateur," 57 Maida Vale, Paddington, London, W.9. Telephone CUN. 6518.

A Companion Journal to THE RADIO CONSTRUCTOR

tinue to provide you with some representation in the literature devoted to amateur radio.

As practical proof of our continued support for the SWL we are restarting the SW BC station list again. There has been quite a clamour for this feature and since we completed the last one, many changes have taken place, so we will start publishing this again just as soon as the necessary information can be obtained.

The passing of a contemporary ; the relapse of the B.S.W.L. from commercial patronage; the reduction in price of another contemporary; the furore over increased RSGB subscription rates; must have raised in the minds of many, similar thoughts to those which have occurred to us, viz., "Just what can the amateur fraternity afford in the future in the way of societies, clubs, magazines and so on."

In 1939, membership of the RSGB was around 3,500. At the peak of amateur radio interest in 1948, the membership figure had risen to somewhere about 14,500. Since 1948

it has been falling by several hundreds a year until now it is down to just over eleven and a half thousand. These figures, we feel, give a very good indication of the trend of things in this country—and incidentally they give a good indication, too, of the circulation figures of magazines devoted to amateur radio topics. It has been suggested to us that now our own circulation is on the increase—due to our wider editorial policy—we shall soon be entering the "quality" class of production, as some like to call the large page, wide margin, big type, style of format. Such a deviation from our present policy is very unlikely. We cannot help wondering whether the final size of the amateur radio fraternity in this country will enable expensively produced periodicals of this type to continue in existence indefinitely. We have a feeling, too, that many of the troubles the RSGB has been suffering recently are due to an endeavour to keep far too big an establishment going for the size of the organisation.

—2UK.

National Radio Show. The provisional dates previously announced for the 20th National Radio Show, Earls Court, London, 1953, are now confirmed. The show will be open to the public from Wednesday, September 2nd, to Saturday, September 12th, from 11 a.m. to 10 p.m.

* * *

The RSGB are proposing to organise an **Emergency Communications Service**, as suggested in our editorial last month. Members interested in the project should write the General Secretary marking the envelopes "Emergency Service."

* * *

SWL's please note. The first installment of our new SW BC Station Frequency List appears on page 159 of this issue. It will be continued monthly until complete. Next month, we commence a new series of articles devoted specially to the newcomer to VHF. These will be written by our well known VHF contributor H. E. Smith, G6UH.

The **overseas trips** arranged by **Harold Andrews, G5DV**, needs no introduction to our readers. This year, Harold is proposing a visit to **Austria** during the last fortnight in July. Provisional estimate of cost is £20. Those interested please write 5DV at 175 Moorland Road, Weston-super-Mare.

* * *

TOPS CW Club Member CN2AN wishes to point out that G's wanting his QSL back by air mail should mail 6d. or if by sea route 3d. Otherwise all CN2AN QSL's will go via Bureaux. His full QTH is S. P. Proskauer, Brit. P.O. Box, 57 Tangier, Morocco.

* * *

Our Cover Photo this month is of David Mitchell, ZL1MP. An illustration of the extensive "aerial farm" which goes with this magnificent rig, was published recently in our Amateur Bands feature.

THE GROUND PLANE AERIAL

by EVERT KALEVELD, PAØXE.

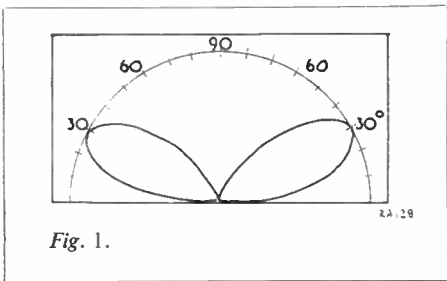
This aerial is becoming increasingly popular on 14 Mcs in particular. We have asked our contributor, who is an enthusiastic user of this type of aerial, to prepare this article specially for us.

If one wants to work DX, i.e. stations at distances greater than about 4,000 miles, it is necessary that the radiation angle of the aerial be kept as low as possible; in other words, that the emitted signal leaves the aerial at an angle with the earth which is as small as possible.

more practical scheme is to use a few resonating quarter-length wires.

One of the snags of an aerial of this type, is that in practice it frequently does not radiate freely in all directions because, being on the ground, it will in most cases be surrounded and screened by houses, trees, etc.

The solution to this difficulty is simple: we put our vertical quarter-wave as high as possible, free from surrounding objects and, to give our aerial its right height above ground, we also lift the "virtual" ground, viz the quarter wavelength "ground" wires. That is all there is to the magical "ground plane" aerial.



A horizontal half wave dipole, half wavelength high, has a vertical radiation pattern as shown in Fig. 1. The maximum radiation from this aerial in the vertical plane is at an angle of 30° with the earth's surface—not a very good "low" angle of radiation.

This figure becomes worse, the higher above ground is the aerial. Fig. 2 shows the pattern of the same aerial at a height of one wavelength above ground. The one lobe has split up into two, one at an angle of 48°—which is useless for DX—and the other at an angle of 13°—which is not too bad. But as half the energy is lost in the 48° lobe, only half the energy is available for DX purposes.

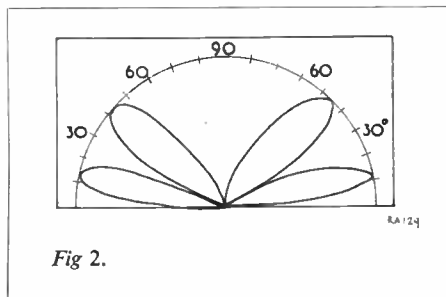
Fig. 3 shows the vertical radiation pattern of a vertical half wave aerial quarter wavelength above ground, which means that the bottom half of this aerial is actually in the ground, the electrical centre being halfway up the aerial. This is just the ideal pattern we want for DX working, viz., a very low-angle radiation in one lobe only.

Another arrangement which will work just as well as the half wavelength vertical dipole quarter wavelength above ground, is a "grounded" quarter-wave radiator where the ground forms a virtual image of the other quarter-wave. In order to be certain just where our "ground" is, we make an "artificial" ground which will act as a mirror for our quarter wave vertical aerial. A large metal surface could be used for this purpose, but a

Construction

The ground-plane is an ideal aerial for "city-dwellers." They are the fortunate ones with high houses. Heavy poles to support this type of aerial are quite unnecessary. Even for 7 Mcs a ground-plane can be easily constructed.

One very simple way of rigging up a ground-plane for 14 Mcs is shown in Fig. 4. The vertical radiator is hung from the rope halyard which supports the normal horizontal aerial.



At the lower end of the vertical radiator, the artificial ground, consisting of four horizontal wires each a quarter wavelength long, is connected as shown. These four wires should be arranged at right angles to each other and to the vertical radiator, but slight variations up to 30° do not matter very much.

To couple this aerial to the transmitter or receiver, 50 ohm coax cable should be used. The vertical radiator is connected to the inner conductor and the four ground wires are connected to the shielding braid of the coax

cable. A small egg-insulator is sufficient insulation at the lower end of the radiator, as it is a point of low voltage, but good soldered joints are recommended as the current may be appreciable. See Figs. 4 and 5. No other support is necessary, as the radiator can be kept vertical by suitably positioning the horizontal wires.

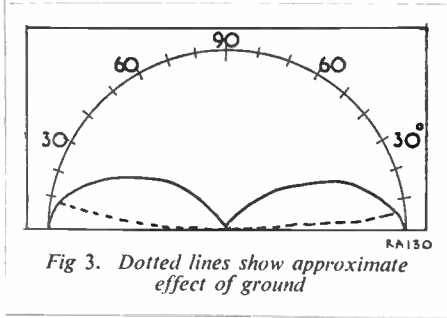


Fig 3. Dotted lines show approximate effect of ground

Another method of construction, which the author used for 21 Mcs is to use a whip-aerial from the surplus market. This is cut to the right length and by means of its insulating base, is fitted to the top of a short 3 in. by 3 in. post. On one of the sides of this square pole, as near to the top as possible, a stand-off insulator is mounted and the four radials are attached to it, together with the outer conductor of the coax. Fig. 6 shows this suggested method of construction. The 3 in. by 3 in. pole may need to be guyed. This was found necessary in the writer's case, but it might be possible to use the radials as all the guying necessary. Individual requirements will differ depending on the exact location.

Calculating Aerial Length

The correct length for the vertical radiator can be calculated from the formula:—

$$\text{length in feet} = \frac{234}{F \text{ (Mcs)}}$$

The horizontal radial length is given by:—

$$\text{length in feet} = \frac{240}{F \text{ (Mcs)}}$$

It is very important that the vertical radiator in particular should be of the right length. A long series of tests have shown that a deviation of 200 kcs on 14 Mcs gives a loss of 1½ S points, that is nearly 10 db! Though the writer does not believe too firmly in the accuracy of S points for CW signals, this average from a long series of tests shows that the aerial is mainly a "one frequency aerial" and it should not be worked much more than 50 kcs off its resonant frequency. The tuning of the aerial could presumably be made broader, by folding the radiator, but the author has no personal experience of this. It would make a useful line for experiment.

For best results, the use of a grid-dipper for determining the correct radiator length is recommended. The coax line should be short circuited at its far end with a small coupling link of one turn or so, and the resonant frequency measured with the grid-dipper, adjustments being made to the length of the radiator as required.

The horizontals are much more tolerant in regards to their length, though it is advisable to keep them as near their correct length as possible. For instance, if by checking the system with the grid-dipper, it is apparent that the vertical should be shortened by a few inches, then it is advisable to shorten the horizontals by the same amount, too. Incidentally, don't forget when calculating the length of the vertical radiator, to include the tiny length of inner conductor in the coax. This, too, is important.

Matching

The impedance of the ground plane aerial varies between 25 and 50 ohms depending upon the exact position of the horizontals. A direct connection of 50 ohm cable gives therefore a maximum standing wave ratio of 2 : 1 (50 to 25). This figure is not too bad and can be tolerated. According to the maker's figures, a 2 : 1 SWR for 50 ohm RG 58U cable gives an additional attenuation of 0.25 db per 100 ft. at 14 Mcs. If one considers that 6 db is one S point and that 2 db is the least difference one can hear, this is not too bad and is definitely nothing to worry about. However, for those possessing a SWR indicator, and wishing to obtain an absolutely correct match, the following method is recommended.

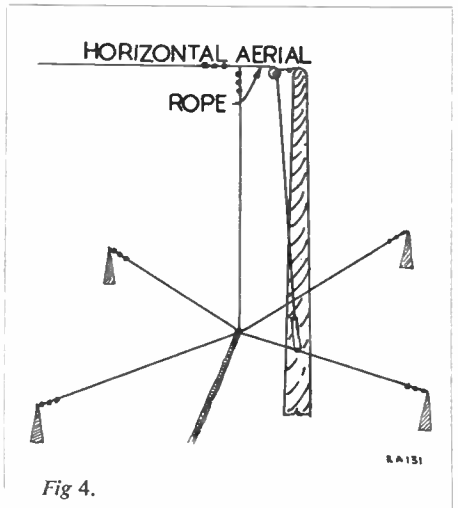


Fig 4.

The inner conductor of the 50 ohm cable is not connected to the end of the vertical radiator, but slightly up the wire—toward the top end. The radiation resistance increases as one goes up the wire, so by carefully observing the SWR it is possible to find a point where the impedance is exactly 50 ohms.

Similarly, if one goes up high enough, it is possible to find a point of 300 ohms where a twin-lead line may be connected.

One important point must be remembered: the feeder line, whether coax or otherwise, should be outside the direct field of the aerial as this may seriously mar the radiation polar diagram and the standing wave ratio of the line.

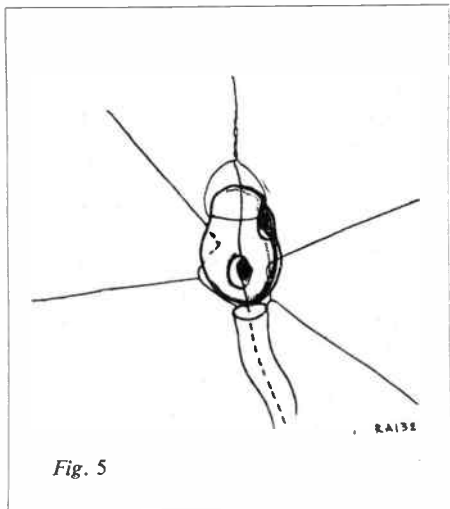


Fig. 5

Coupling to Transmitter or Receiver

Coupling to the transmitter or receiver can follow conventional lines. As with flat lines, difficulties very often arise due to insufficient coupling. Briefly, the author's method is as follows. By means of a low impedance link, a tuned circuit LC (Fig. 7) is connected to the final amplifier tank coil. This tuned circuit must of course cover the frequency of the transmitter and similarly that of the ground plane. The shielding braid of the coax feeder is connected to one side of the circuit LC—the side with the variable plates of C—and this is grounded to the chassis. The inner conductor is tapped on the coil at a point which matches the impedance of the cable. To find the right place, the following procedure is recommended:—

The final amplifier is—preferably with reduced input—tuned to the dip in plate current, indicating resonance. The aerial tuning capacitor is then similarly tuned to

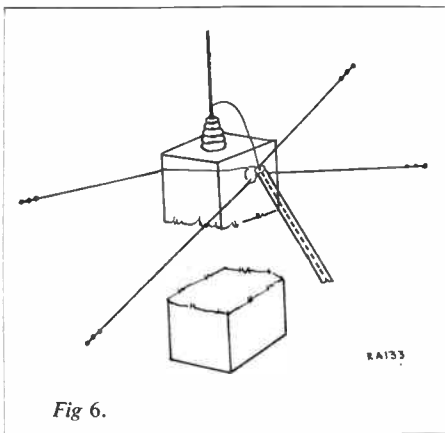


Fig. 6.

resonance which can be detected by a rise in plate current or by the glow of a neon tube connected to the fixed plates of the variable capacitor. A correct match is obtained when the dip in the final amplifier plate current occurs with the same setting of the final amplifier tank condenser, whether or not the ground plane is connected to LC. Of course, with the aerial connected, the dip will be much less pronounced.

With a six turn coil, tuned to 14 Mcs the right position was found to be exactly one turn. During these adjustments, the coupling between final amplifier and LC should be very loose.

The feed line to the aerial need not be a coax cable. As with a centre fed dipole, open wire feed lines with standing waves can also be used. This, of course, means that the feeder line should be a number of quarter waves in length. When using this type of feeder, one feed line is connected to the four horizontals, the other to the vertical radiator.

Contd. on p. 158

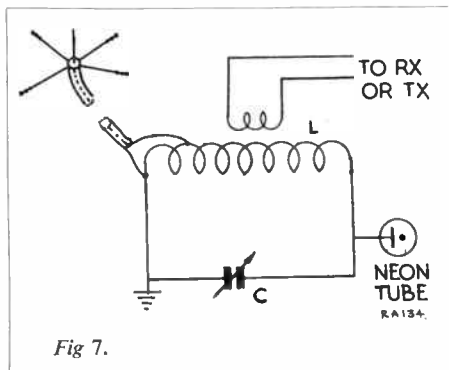
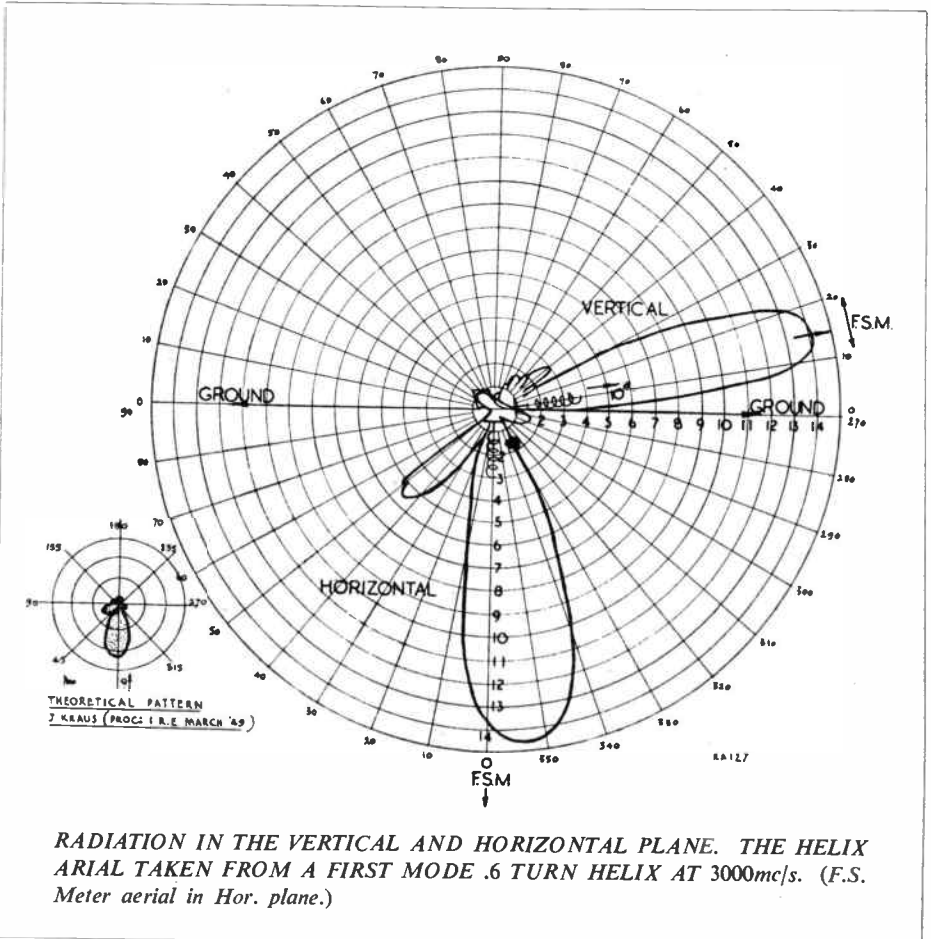


Fig. 7.

AERIAL RADIATION PATTERNS

By F. C. JUDD, G2BCX

No. 3 THE HELIX WITH AXIAL BEAM MODE



RADIATION IN THE VERTICAL AND HORIZONTAL PLANE. THE HELIX ARIAL TAKEN FROM A FIRST MODE .6 TURN HELIX AT 3000mc/s. (F.S. Meter aerial in Hor. plane.)

This pattern shows both the vertical and horizontal plane of radiation from an axial beam mode 6 turn helix with reflector. Lower portion of pattern is horizontal plane—upper portion is vertical. Whilst the polarization of radiation from a helix is circular it is possible to receive signals at normal strength with a horizontally or vertically polarized receiving aerial. In actual fact the strength of radiation over the circle of polarization

should remain nearly constant. A ratio of 1 to 1.1 has been obtained with a model at 10 cm and average ratio's of 1.17 to 1.0 down to 1.5 to 1.0 should be obtainable. This ratio is that of the strength of vertically polarized to horizontally polarized radiation. The circle of polarization will depend on the "thread" of the helix, i.e. LH thread=LH polarization and vice-versa. A helix transmitting with RH polarized wave will not be received on a Helix

with L.H. thread. The signal is very greatly attenuated.

Notes

1. The gain in directivity of the 6 turn helix in axial beam mode is approx 14 db over an isotropic radiator. Such an aerial is broad band and the directivity will hold good as the following example figures show:—

“ Based on pattern integration the directivity or power gain of a 6 turn 14 degree (pitch of winding) helix aerial over a non-directional circularly polarized radiator varies from about 10.4 db at 300 Mcs to 14 db at 500 Mcs. Between 300 and 500 Mcs the axial ratio in the direction of the helix varies from 1.05 to 1.5 being less than 1.2 for most of the range. (This refers to polarization ratio as mentioned above).*

2. Beam mode of radiation may be obtained when the number of turns is reduced to one. Four or more aerials may be fed in phase on a circular reflecting plane and/or four reflectors at right angles to each other.

3. The gain for a broadside array of four helices may be high as 20 db. Tested aerial produced 16 db at 600 Mcs and 22 db at 100 Mcs (power gain 160).

4. A tapered helix aerial may be used to improve the ratio of circular polarization. A 9 turn tapered helix two wavelengths long has a beam width of 33 degrees and a gain of 16 db. Axial ratio 1.17 to 1.0

5. Helical beam aerials may be scaled to operate at any frequency. Characteristics remain constant.

6. To obtain sharper beams a helical antenna can be used as a primary source to illuminate a parabolic reflector.

Full details of helical aerials will be given in an article by the writer to be published in this journal in the near future.

* Helical Beam Antenna's. J. D. Kraus, *Electronics*, April, 1947.

DEAD HAND OF PROPAGANDA—

SHAKE-UP FOR V.O.A. By ROY SAVILL

If a recommendation of a group of United States senators is adopted, there may be drastic changes in the programmes of the Voice of America. Experienced listeners in Britain will have noticed that hitherto more or less the same material has been pumped out throughout the 24 hours of each day in each of the many languages used. They may also have found this rather tedious.

Apparently these American senators are feeling the same thing, and say that instead of directing mass programmes from Washington and New York, the State Department should suit its programmes for individual countries.

The committee say that Americans residing abroad report, as competent observers, that some of the material seems to “talk down” to peoples who have as much practical experience as the United States and who therefore resent the implication of “superiority and preaching.” It is urged that America must avoid appearing to be too much present physically in terms of power overseas, and at the same time seeming to be distant and remote on the plane of common, cultural and spiritual value.

Those of us who recall the pre-war short-wave programmes from the United States perhaps think nostalgically of W2XAD and all that . . . of the short-wave transmissions that were in effect a world-wide outlet for the domestic programmes being put over on the medium-wave stations of the network. Is there not truth in suggesting that, so far as

English-speaking people are concerned, at least, the home-service radio programmes give a more honest and revealing picture of a nation than some specially-prepared material? If there is nothing to be ashamed of in those programmes or the picture they give, it surely is these that the authorities should use, with, perhaps a quarter-hour here and there on the present lines to act as a “plain man's guide” to America or whatever country it is.

It is more difficult to adopt this procedure with non-English-speaking listeners in the case of America or, say Britain. In the same way other-language countries would have a problem in putting over such programmes in any but their own tongue. I must confess, however, to my own greater liking for the old days of domestic programmes with announcements in various languages, and with occasional talks and news items in the same way. How wonderful it would be now with the present-day high-power transmitters. But now it is propaganda, propaganda, propaganda . . . the new disease of radio, and with it the nightmare of “jamming.”

Credit must go, however, to the countries who have found a real happy medium—such as the Netherlands with the Happy Station programmes, and Belgium with its “Goodwill” angle on the OTC-ORU broadcasts.

Not that I think there is the slightest chance of doing anything about it . . . but perhaps other listeners would like to give their views.

"HUNA KUWAIT"

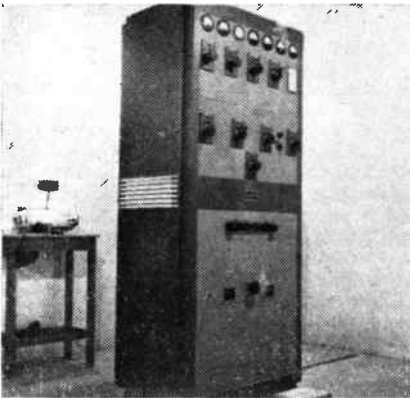
Described by D. BERRY



Front entrance to the Public Security Headquarters, Kuwait, where the station is located.

"Huna Kuwait" is the arabic call of the radio station run by the Security Department of the Amirate of Kuwait, and although its signals have been under observation for some time in England and New Zealand, it is only recently that they have been properly identified.

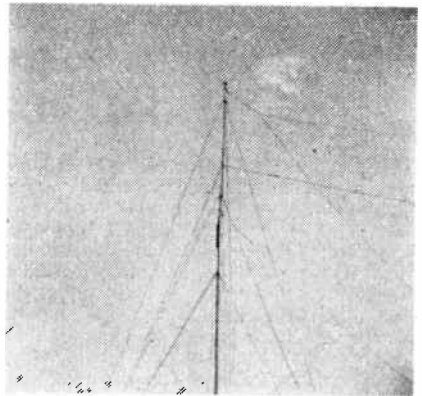
The town of Kuwait lies at the north end of the Persian Gulf, 110 miles south of Basra, and has been in existence for about 150 years, the inhabitants making their livelihood mostly by trading with the rest of Arabia, Africa and India. The climate is very dry with about



The E.T. 4331 in the transmitting room.

4 inches of rain a year. "Radio Kuwait" is under the direction of the Chief of Public Security, Shaikh Abdulla Mobarak and all the programmes are in Arabic. At present the times of broadcasting are 1630 to 1900 GMT daily, with an additional period from 0500 to 0700 GMT. The frequency at present in use is 5 Mcs, but apparently no official allocation has yet been made. At present the programmes consist solely of arabic music and tropical features, but it is hoped to start some news broadcasts very soon.

The transmitter, aerals and studio are all within the precincts of the Public Security Headquarters in Kuwait. The transmitter in use is an R.C.A. ET 4331, running about one kilowatt with two 833's in the final. Eventually



One of the aerial masts of "Radio Kuwait."

it is hoped to raise power to 5 kilowatts or more, with the installation of new equipment. The aerial consists of an untuned longwire with its two ends slung on 100 ft. masts in a roughly north-south direction. The latter also carry the various other aerals used for police work. In the studio a crystal microphone is used, together with two standard pattern tape recorders and a 50 watt Stromberg Carlsen amplifier. The announcer also attends to the everyday routine of the station. Reception reports are always welcome and are verified by letter. They should be sent to "The Broadcasting Officer," Radio Station, Security Department, Kuwait, Arabia.

“UNEQUAL EQUALITY”

by W. FARRAR, B.Sc., G3ESP

In replacing a valve in a piece of equipment, an amateur will often order it by the type number, whether civilian or ex-service, without regard to the manufacturer. This applies particularly to valves with American designations, which are produced by a large number of manufacturers in various parts of the world. It is naturally expected that two valves with the same type number have the same performance, but the following experiences of the writer tend to show that this is not always the case.

The station receiver at G3ESP, an R.107, had an annoying fault—it oscillated when the RF/IF gain was fully advanced. Backing it off about 30 degrees removed the oscillation, but of course also reduced the sensitivity. Incidentally the fault had become noticeable after some valve changes. Examination of the internal workings showed that the RF and mixer valves had their metallising peeling, so it was decided to replace these sometime. So two new ex-government valves were purchased (type VR.53, alias ARP.34, alias CV.1053, alias EF.39) and substituted in the RF and mixer sockets. The result was—no change! The oscillation still persisted—and this with four good valves in the RF and IF stages.

The problem was solved, however, and the receiver brought to its original efficiency in a very simple manner. The four valves now fitted, while nominally all of the same type, were in fact from three different manufacturers. The RF was a U.S.A. Hytron, the 1st IF a Canadian type, while the mixer and 2nd IF were of the familiar Mullard pattern. Having heard somewhere that the transatlantic types differed slightly from the original British ones, some interchanging of the four valves was done, and it was found that the set was perfectly stable only if a British valve was in the first IF stage. Finally, the two new valves were put aside and the complement made up with the old valves with the defective metallising. The Canadian valve was still inside—but *not* in the IF department—and the same applied to the Hytron.

It needs to be stressed here that all valves tried were electronically perfect. It seems therefore that slight differences do exist in the

various makes, and this might produce trouble in a highly efficient circuit, as described above.

This is borne out by two earlier experiences. During the war the writer was concerned at one time in the modification of a large number of army receivers. Among other things, one valve had to be changed for a different type. This replacement was of a type normally made by firm X. The brand new valves supplied, however, came from manufacturer Y, who normally did not make that type. It is true to say that about 90 per cent. of them were sub-standard. That is, they might have passed a normal specification, but certainly fell short of government requirements.

The other experience concerned the top band transmitter at G3ESP. In this the VFO, PA and modulator valves are all type 6V6-GT (the small glass version of this popular valve). In the course of some replacement it was found that the modulator would work satisfactorily with an RCA 6V6-GT, also with a British 6V6-G, but that when a National Union 6V6-GT was inserted, “motor-boating” was caused. This occurred with the three or four valves of this make which were on hand. Yet they showed up as perfect on an Avo valve tester.

These experiences can be summarised briefly by the following recommendation: If a valve needs to be replaced, use if possible one of the *same make* as well as the same type (bearing in mind that some ex-government valves may be identical and yet have several different type numbers, depending on the service for which they were originally intended). Moreover, if a new piece of equipment is being tested, and a certain stage is found to have an unwanted oscillation, try a valve of the same type but of different make—it might put things right.

As a footnote, it might be added that British ex-government valves do not usually carry any maker's name. In this case, comparison of the internal construction will give a good indication. If two assemblies are alike, they are in all probability from the same factory. If they differ in some respects, the chances are that they are made by different manufacturers, with possible slight but important differences in characteristics.

THE DESIGN OF MAINS TRANSFORMERS

by W. E. THOMPSON

Part 7. Conclusion.

Some mention has already been made of the desirability to maintain evenness in winding the layers of coils. It is not at all easy to do this by hand alone, though some dexterity is attained with practice. Some form of guide for the wire greatly assists the winding, and a small grooved pulley running freely on a guide rod along the direction of winding, as shown in Fig. 16, is better than nothing. It is far from ideal, but it is, nevertheless, a useful dodge to adopt. Those who have an aptitude for mechanical design and construction will doubtless have far better ideas about a simple winding machine. The author seems to recall a design for a coil-winder, with adjustable and automatic feed for the wire, being described in *Practical Wireless* some time ago.

The majority of coils can be wound on the simplest of apparatus, consisting of nothing more than a spindle with a handle on one end and a revolution counter at the other. That shown in Fig. 17 has been used by the author for many years, and is a 12 in. length of $\frac{1}{4}$ in. steel rod with an O-BA thread run down the whole length. This revolves in holes in the uprights at each end, which are made from $\frac{1}{4}$ in. by $\frac{1}{4}$ in. angle iron, ends of which are bent up and screwed down to the base-board. A piece of wood, 1 in. by 1 in. is screwed under the board, and is gripped in the bench-vice to hold the assembly secure when winding. The revolution counter was once part of an ancient Roneo duplicator, on which it served to count the number of sheets

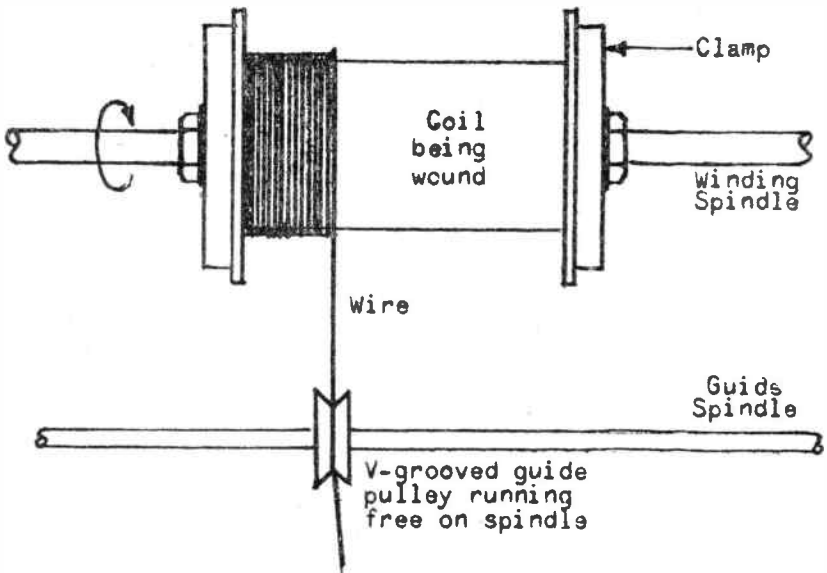


Fig. 16. Simple guide for layer winding.

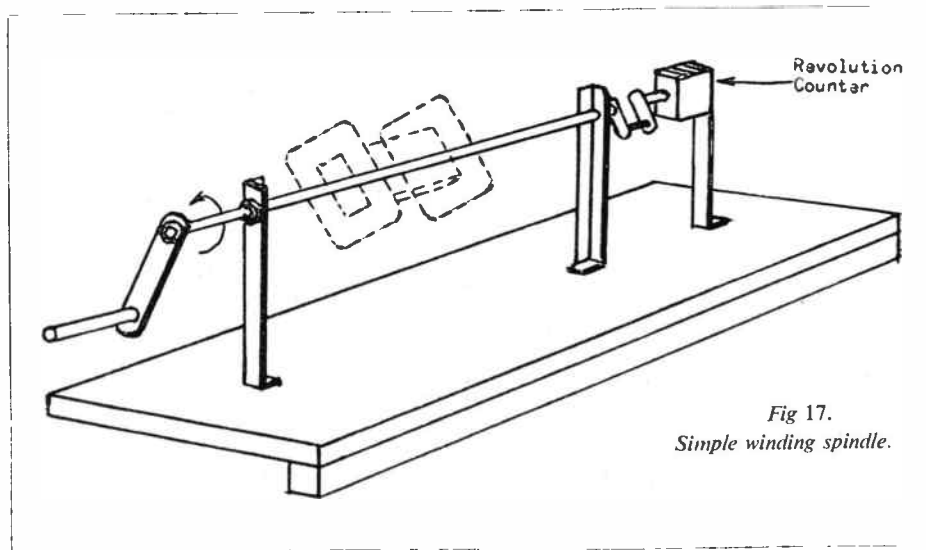


Fig 17.
Simple winding spindle.

of paper passed through the machine. It was "doctored" so that of the five sets of numerals displayed, the first four read thousands, hundreds, tens and units; the numerals on the extreme right are ignored since they now run at spindle-speed. This counter has the disadvantage that it reads in the forward direction only, so care has to be taken to allow for reversing of winding direction when it is necessary to correct overlapping turns! The simple handle and the clamps for holding the bobbin during winding are secured with O-BA nuts and washers. A cradle made of odd pieces of 2 in. by 1 in. wood sits at the back of the bench, with a piece of $\frac{1}{4}$ in. steel rod for the reel of wire to run on. It's a Heath-Robinson affair, but some first-class coils have been produced with it, nevertheless. For fast winding where thousands of turns of thin wire need to be wound, the handle is removed and the bench grindstone is hitched up to the spindle as shown in Fig. 18. The grindstone then becomes a flywheel which greatly assists the winding effort required. One has to remember, of course, that the handle has to be turned the other way!

When paper interleaving has to be inserted between layers, it is a good dodge to secure the end of the layer with a small dab of Chatterton's compound. This releases a hand which would otherwise have to hold the end of wire to prevent it from unwinding. Thick wires are apt to acquire springiness, so to secure the end turns, perhaps the best method is a loop of narrow linen tape. At the beginning of a winding, the ends of the tape

are over-wound with about 6 turns of the wire; the tapes are then pulled tight and thus secure the end turn firmly. When nearing the end of the winding, a loop of tape is laid on the coil and the last 6 turns or so are wound over the tape, leaving a free loop through which the end of the wire is passed. The wire is then pulled down so that it lays evenly against the previous turn, then the ends of the tape are pulled back as before to secure the end turn. The free ends of the tape should be trimmed off close to the winding with scissors. The method is shown in Fig. 19.

One way of bringing out thin wires so that a flexible lead-out wire is produced is shown in Fig. 20. This obviates the need for joining a flexible lead to the coil wire, but care must be taken to ensure that all wires in the pseudo-flex leads are joined together, otherwise the one wire which actually becomes the coil may not find its way to the external circuit!

Assembling the Core

It may seem that there is nothing much in assembling a few laminations into a coil, but it happens that the performance of the transformer can be degraded unless the stampings are fitted properly. As it is necessary that the inductance shall be as high as possible, the stampings should be interleaved by reversing the positions of the T and U, or the E and I, or whatever other shape is being used, at proper intervals. All stampings have some form of insulation on their surfaces; this may take such forms as thin paper on one surface only, or an insulating varnish. Some stampings are varnished on both surfaces,

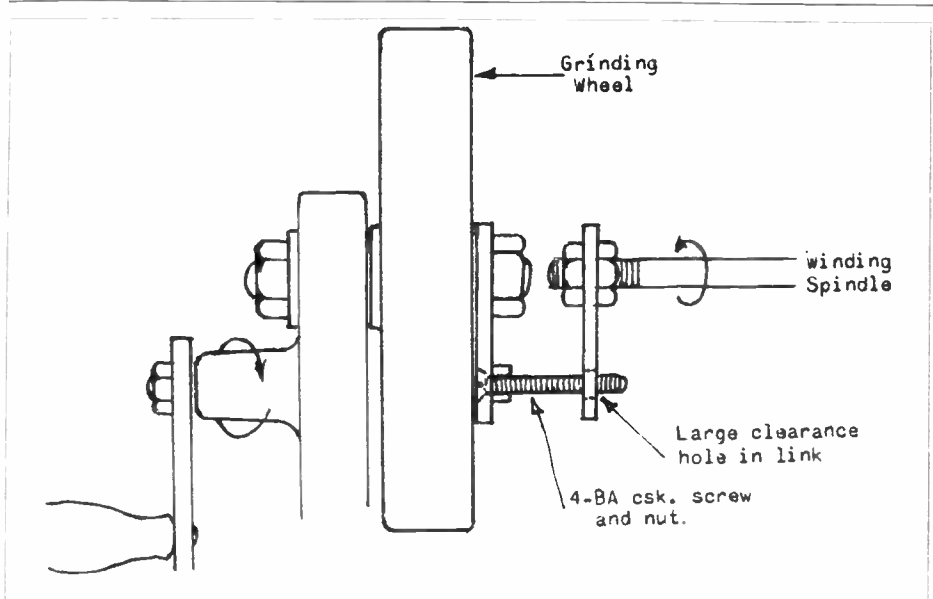


Fig.18. Method of attaching bench grinder for fast winding.

whereas others rely upon an oxide film to form the insulation. An examination of the stampings will show what type of insulation is used and how it is disposed.

The object of the insulation is to give electrical separation between the laminations. By insulating the stampings in this way, the core is broken up into a series of relatively high-resistance sheets which considerably reduce the magnitude of eddy currents. In order to

maintain this object, stampings should be assembled with the insulated sides all facing the same way; if this is not done there will be pairs of stampings in contact, and the eddy current losses will be higher. This will impair the efficiency of the transformer, since the primary current will be increased by some amount to compensate for the losses.

The stampings should be assembled in the coil as tightly as possible without causing

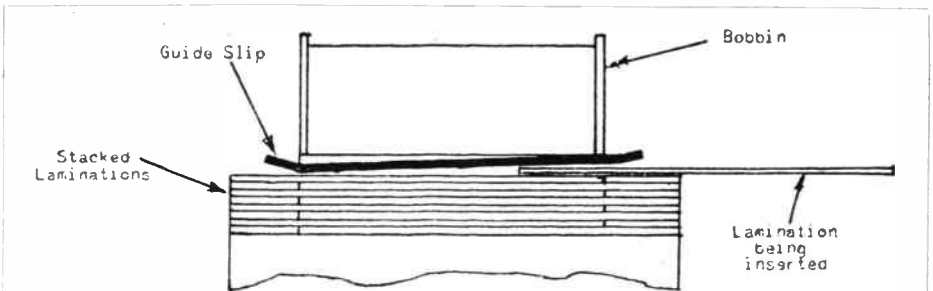
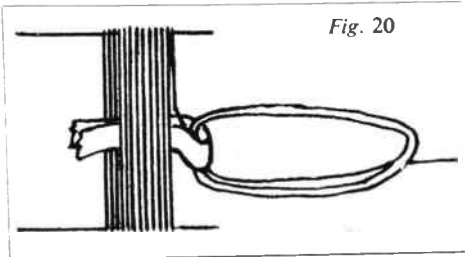
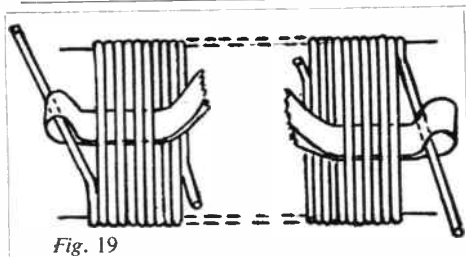


Fig.21. Inserting lamination with aid of guide slip.



damage to it. A loose core will vibrate under load, producing a continuous buzz which can be mistaken for mains hum emanating from the loudspeaker. (The same effect can be due to loose wires in the coil, but this is usually obviated by the coil being wound tightly, and the subsequent impregnation of the winding). It is the last few stampings which are the most difficult to insert, and they usually have to be carefully tapped in with a light hammer. The operation can be made easier by using a slip of lamination cut off a spare one, so that the stampings being inserted are placed between this slip and the core which is so far assembled; the inserted stamping then goes into place easier and without damage to the coil bobbin. The guide slips can be left in place on completion of assembly. Fig. 21 shows how this is achieved.

Communications and Power Transformer," Jour. Soc. Mot. Pict. Engineers, Sept., 1944) that three sets of stampings facing the same way produce the lowest average magnetising current value by reducing the end-fire effect at joints, and this method of assembly can be recommended. Certain commercial radio sets that have passed through the author's hands in the past have been known to have as many as five pairs of stampings in each group of reversals.

Apart from the fact that a loosely assembled core looks amateurish, it is necessary for joints to meet as closely as possible to keep the reluctance of the iron path low. When stampings have been inserted until no more can be accommodated in the bobbin, the core should be beaten down around all edges with a raw-hide hammer on a flat surface until all visible joints are tight, and no gaps can be seen. The clamps having been fitted, exposed edges of laminations should be painted with dull black cellulose to prevent rusting. This not only improves appearances, but assists heat radiation.

Generally, it is alternate pairs of stampings that are inserted in opposite directions, as in Fig. 22. The work of assembly can be speeded up by inserting two, three or more pairs in the same direction, and in fact this improves the reluctance of the core to some extent. It has been shown by E. B. Harrison ("High Quality

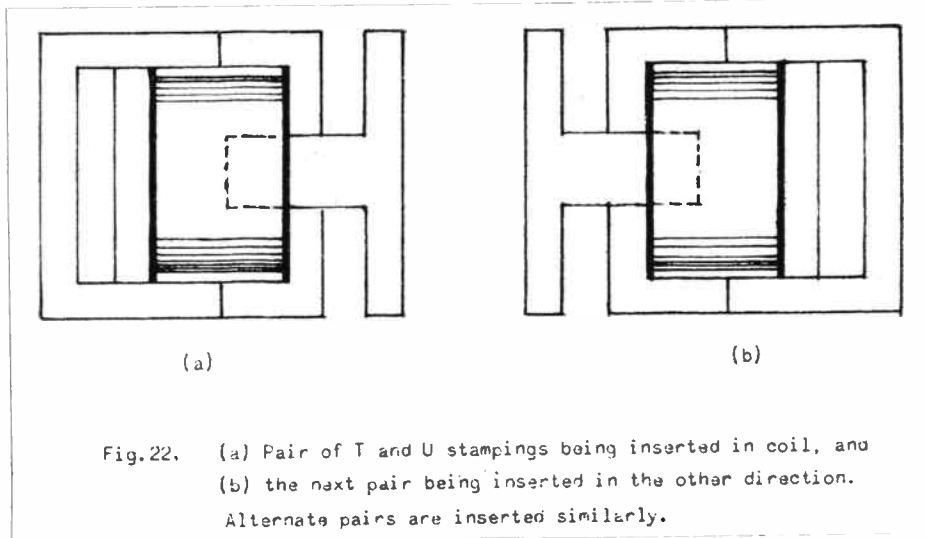


Fig. 22. (a) Pair of T and U stampings being inserted in coil, and (b) the next pair being inserted in the other direction. Alternate pairs are inserted similarly.

AROUND THE SHACKS

B. J. CLARK, G3BEC
Yeovil, Somerset



Active since May 1948, this station has, with one exception, been QRP. The one occasion was for one hour when a "ten watter" was tried out but, getting a poor report, it was put on the shelf where now, spiders play among the components! The "main" transmitter is a CO-PA; 220P and 230XP being the valves used. The receiver is an untuned I-V-I again using 2 volt filament valves. HT for the Tx, Rx and speech amplifier/modulator is derived from three separate power packs all giving 120 volts. For more than three years, 3.5 Mcs was the only band used and with one crystal (3,555 kcs) and 2½ watts FA8, CT1, EA1, LA and SM were among the twenty-one countries worked. The aerial is of unusual design, having two "tops," one 66 feet long and the other 33 feet. Feeders 33 feet long are spaced at six inches

with a "floating" wire running in the centre. The whole aerial slopes from a 60 foot mast to a 35 foot one and runs NW-SE. Recently with the purchase of two more crystals (3,635 kcs and 1,870 kcs) phone working has been used with Heising modulation and a moving coil microphone. Very good reports have been received from G's with two watts input. On top band CW, with the aerial coupled as a marconi, 23 counties have been worked including Lanark, Dumbarton, Alloa and Caithness. In all, over 1,250 QSO's have taken place from the small bedroom shack and at least 90% have been solid QSO's. The "op" has one ambition and that is to work W or VE on 3.5 Mcs with this rig and is looking forward to the time when once again he will "burn the midnight oil" in an effort to achieve this ambition.

Readers interested in QRP should join the **QRP Research Society**.

Write: John Whitehead, 92 Rydens Avenue, Walton-on-Thames, Surrey.

BROADCAST BANDS REVIEW

by JACK FAIRS

All Times G.M.T. "Nf"—New Frequency.

Our offer to run a "Countries Heard" list, in addition to the Honour Roll, does not appear to have been met with much approval, only three readers troubling to send along their scores, so unless more support is forthcoming we shall shelve the idea for the present. To turn to the brighter side it seems that, taking things all round, conditions have shown definite signs of improvement these past few weeks, and except for one or two bad spells, the real DX is beginning to seep through the QRM here and there. Let us hope it hasn't been just a "flash in the pan"!

EUROPE

England. Station GRC, 2880 kcs, is now in use for the B.B.C. European Service in German and English. ("World Radio Handbook" and J. P. Colwill, Launceston, Cornwall). MCQ on 11945 kcs carries the GOS from 1045 to 1815. (Colwill).

Greece. "Radio Jannina" is reported by Sidney Pearce of Berkhamsted, on a frequency near 7090 kcs and heard mornings to close at 0700 or sometimes 0730; sign-on for the evening transmission is at 2000 (sometimes 1930) with a marching song, and close-down is generally 2200. Another Forces Station, Kozani, was logged on 7940 kcs with S5-7 signals and an orchestral programme to 1930, when the call was "Edho Kozani." (Scribe).

Spain (Balearic Islands). "Radio Menorca" at Mahon on the island of Menorca, is included in a very detailed report from Robert Mercier of Juvisy-sur-Orge, France, who is now hearing this station on 7575 kcs (Nf) around 1900. The last frequency reported was 7410 kcs.

France. Paris on 3965 kcs (Nf) has a programme for Czechoslovakia up to 1958, and News in French at 2000. (Scribe). Stanley Coppel, Belfast, reports Paris on 4800 kcs (Nf) around 2005 in French.

Belgium. Manfred Lepple of Stuttgart, Germany, has received the complete schedule for the Belgian National Broadcasting Service for the period March 1st to April 30th, and boiling it down a little we have ORU operating as follows: 17860 kcs, 1000-1300; 15335 kcs, 1100-1300, 1700-1745; 11850 kcs, 1200-1300, 1700-1745, 1800-2100; 9745 kcs, 1700-2300; 9705 (Nf), 9655 (OTC Relay), 9144 and 6085 kcs all on the air at 2315-0300; 6000 kcs, 1800-2100, 2115-2300.

These past few weeks (February) we have regularly heard ORU on two 9 Mcs outlets in parallel during the evenings, these being 9745 and 9767 kcs. (Scribe).

AFRICA

Bechuanaland. Station ZNB at Mafeking is now operating two 300-watt transmitters, in parallel, on 8232 and 5900 kcs respectively; programmes are radiated at 1100-1200 and 1700-1930 daily, with SABC News relays at 1115 and 1700, according to "Australian DXers Calling."

South Africa. The SABC has been discovered on 9595 kcs around 1800-1930, and this seems to be the Africa Service (in English Tuesdays, Thursdays and Saturdays, Afrikaans on other days). "9.6 Mcs" is announced, but the actual frequency is just below B.B.C. station GRY (and also our 100 kcs xtal calibrator "marker point"!) and both stations are audible at the same time. (Scribe).

Tangier. The new 50 kW transmitter of "Radio Tangier Internacional" is now known to be in use on the medium-wave frequency of 1232 kcs, and *not* on 6110 kcs as mentioned last month. English programmes are broadcast on both outlets at 1100-1130 daily, 1630-1700 Thursdays, 1700-1800 Saturdays, and 1630-1800 on Sundays. (WRH).

Northern Rhodesia. "The Central African Broadcasting Station," ZQP at Lusaka, is still being heard on 4826 kcs, and is reported with "Music for Dancing" at 1725, B.B.C. News at 1800, music at 1815 and local news at 1825 (Sidney Pearce); and "Take it From Here" on one occasion at 1830 (Mike O'Sullivan, West Hartlepool).

Angola. CR6RF "Radio Club de Benguela," Benguela, was heard one Sunday around 1900 on 9502 kcs; Robert Mercier, reporting this item, adds that the xtal was absolutely necessary to overcome "the usual and abundant BC QRM," and the 9165 kcs channel seems to have been inactive for some time now.

Robert continues with a report on the seldom-heard CR6RO at Silva Porto—on the old 7582 kcs frequency. This is the "Radio Club de Bie," and he has logged it on three occasions over a period of ten days, which is a culmination of a patient check of the frequency nearly every evening for several months! The best time is around 1915, and sign-off is at 2030, though the weak signals are often inaudible for RT QRM from nearby channels. (Yes, it was March 1950 when CR6RO was last mentioned in these pages, and no-one has ever reported hearing it—to your Scribe—on the listed 7203 kcs frequency, though another source quotes the phrase: "Now using 7584 kcs *again*").

The "Radio Clube de Huambo" located in the future capital of the colony, Nova Lisboa, is again using 9705 kcs (CR6RD) and has been heard various times around 1830-2000. (Scribe). Sidney Pearce has logged the "Radio Clube de Angola," Luanda, on 7142 kcs (CR6RL) around 2000 and in parallel with 11862 kcs. The "Radio Clube de Mocamedes" operates CR6RM on 7232 kcs at 1800-2000. ("Radio Australia").

Sudan. J. O'Connor (London) has just received the latest schedule for Omdurman, which we present herewith: 0415-0445 and 1630-1930 daily, also 0800-0900 Sundays and 0800-0930, 1400-1500 Fridays. English transmissions are at 1615-1630 Sundays and Wednesdays, and 1730-1800 on Fridays. Frequencies are given as 6437 and 7600 kcs (both 6.5 kW). Our own log shows that Omdurman was heard for several days during February on 9870 kcs to close at 1930; later this frequency was changed in favour of a varying 7655 kcs (Nf), a few kcs on the LF side of Radio Sofia. Bill Griffith (Ashtead) also spotted this move, and lists them Q5, S8 at 1830 with the call "Huna Omdurman," settling for 7660 kcs.

Egypt. The Arabic programmes from Cairo have appeared on 9750 kcs (Nf) and this must be another new Tx in operation. For a few days they were on exactly 9745 kcs, and during this period severe QRM was caused to ORU on the same channel; this transmission opens at 1600, includes Arabic news at 1630, a mixture of Western and Arabic recordings, and sign-off is around 1930 or sometimes later. The news in French (1815) and English (1830) are still on 11815 kcs. (Sidney Pearce and Scribe).

ASIA

Japan. JKK at Nazaki on 6015 kcs has been reported heard around 1200 in Indianapolis carrying the AFRS Programmes of the Far East Network. (Universal Radio DX Club bulletin, "Universallite").

India. "Radio Kashmir" at Srinagar is now on 3277 kcs (Nf) to close at 1700; AIR News in English is relayed at 1530. ("Australian DXers Calling"). WRH publishes the news that "All India Radio" will, in the near future, place two more 100 kW transmitters in operation, for use with the Overseas programmes.

Sidney Pearce is logging the 1530 English news on 3945 kcs (the 10 kW VUD), the same frequency being used for the Persian programme which opens at 1730, in parallel with 4860 kcs. Ian Hardwick (Thames Line, New Zealand) hears VUD2, 3365 kcs, with Indian music from 1630 to close at 1730; Ian tells us his collection of QSL's now totals 460 from SW Broadcasting Stations, which must occupy quite a fair amount of "wall-space"—or do you just use a filing system, OM? Hi.

Pakistan. The broadcasts directed to Indonesia from "Radio Pakistan" at 1130-1215 are strong signals on 15270 kcs, and 11674 is also announced (previously 17835 kcs); a talk in English is featured at 1145. (Pearce). John Simpson (Hassocks, Sussex) lists Dacca on 6113 kcs this month, "hemmed in by jammers and R9'ers," but the identification was heard at 1530.

Mike O'Sullivan lists APK Karachi on 5990 kcs with English news at 1515, and Ian Hardwick mentions good reception on 17710 kcs when another English newscast is aired at 0700.

Indo-China (Vietnam). "Radio France-Asie," Saigon, has an English programme on weekdays on 15425 kcs at 0900-1015, which includes news at 1000. (Manfred Lepple).

Portuguese India. The Commercial Service of "Radio Goa" have sent their QSL to Sidney Pearce (who, by the way, was awaiting it for his "Countries Verified") and included the programme schedule for "31, 49 and 85 metre-bands"; transmission times are given as 0130-1630. Request programmes are featured 0730-0930 and 1230-1400 daily (except Sundays), "Concert Hall of the Air" is at 1030-1130 daily (except Thursdays), "The Old-Fashioned Revival Hour" comes on at 1530-1630 Mondays, and "Bringing Christ to the Nations" at 1530-1600 on Sundays.

China. Bill Griffith has received from Peking a list (in Chinese!) of the SW home service stations, and has managed to translate some of it. Here are his results. Chungking: 6154 and 11000 kcs. Shanghai: 5985 and 6812 kcs. Wuhan: 6645 kcs. Sian: 6400 and 9480 kcs. Mukden: 3660 kcs. (Mukden is now known as Shenyang. This one will be correct at present, Bill, as 7660 kcs seems to be the "summer" frequency for this station). The "untranslatable" ones are 6000, 7050 and 7150 kcs, and the only one of which we have previous record is 7050 which used to be listed as Sinkiang, a province in the extreme North-West of China.

No new frequencies are listed with the above for Peking, though "Radio Australia" has reported 7532 kcs (Nf), heard in parallel with 7500 and 10200 kcs around 1300; the latter is the same station that used to be on 10260. URDXC reports "Radio Peking" on 9750 kcs (Nf), also in parallel with 7500. The "11690" kcs outlet has for some time been nearer 11680, and has lately dropped lower still and measured on 11664 kcs in the United States. (URDXC).

Hong Kong. Robert Mercier enthusiastically reports reception of the elusive ZBW3 "Radio Hong Kong" on 9525 kcs. He has caught this one at 1330-1450—"propagation and QRM permitting"—and the jamming on 9530 kcs (Manila VOA Relay) at 1415-1445 often makes reception impossible. In any

case, ZBW3 is wiped out at 1450 by GWJ which commences a Rumanian broadcast at 1500, plus more jamming! Hong Kong presents recorded Chinese or Western music, with Chinese announcements, followed by English programmes at 1400 onwards (not 1300 as before).

Indonesia. English Programmes for Australia are now broadcast at 1100 by the "Voice of Indonesia," Djakarta, on YDB2, 4910 kcs, and 9710 kcs (Nf), with a 16 meter-band outlet also announced. ("Australian DXers Calling"). The 9710 kcs transmissions are very probably those of the new 50 kW Tx that was previously testing on 9866 kcs, and were noted with English for South East Asia, India and Pakistan, at 1430-1530. (Sidney Pearce). At 1530, the 11785 kcs frequency (YDF2) was heard announced as in parallel, and 9710 has been reported as being YDC6. (Scribe). Arabic programmes, at 1600-1630, have been heard on the new outlet, also the Dutch service to 1900, when the regular English hour came on the air; signals were rather weak at this time, and there is usually some QRM from "Radio Free Europe" on 9717 kcs.

Mongolia. Ulan Bator is reported heard in Japan on 6325 kcs, from around 0900 to close at 1500. (WRH).

Ceylon. The new 4 Mcs frequency of "Radio Ceylon" is listed by WRH as 4870 kcs, and is on the air at 1030-1645 for reception in the island. The previously-inactive channel of 15230 kcs is reported by "Sweden Calling DXers," relaying the "Voice of America" at 1230-1300. A recent check on the frequency failed to raise anything, however! Sidney Pearce says the 15120 kcs outlet gives the time at 0700 as "1230 pm" and then takes the B.B.C. News relay; sign-off is 0730.

Taiwan. The current schedule of broadcasts to Europe and the Middle East from "The Voice of Free China," Taipeh, are over BED4, listed on 11800 kcs, and runs thus: 1900, Sign-on, National Anthem and Programme Preview; 1905, Russian; 1920, English; 1945, Chinese music; 1950, French; 2015, Chinese music; 2020, Arabic; 2035, Mandarin; 2100, National Anthem. English for the U.S.A. is on 15235 and 11735 kcs at 0400-0500. (Details sent along by Sidney Pearce).

North Korea. Pyongyang Radio has been logged in Japan on 6200 kcs in parallel with 6250 kcs (both Nf's); the former channel is now believed inactive already. (URDXC).

PACIFIC

Australia. Ron Young asks for the times and frequencies for the "Radio Australia" Sunday feature, "Australian DXers Calling." Here you are OM. It is no longer broadcast at 1402 for the British Isles and Europe; since February 15th it is on the air at 0400 (to

the West Coast of North America) and 0530 (to Africa) on 15200 kcs, at 0800 (to Europe, New Zealand and South East Asia) on 9580, 11760 and 17840 kcs, and at 1330 or 1340 (to the East Coast of North America) on 11840 kcs. A new service to South and South East Asia is broadcast at 1400-1455 on 9580, 11840 and 15320 kcs. ("Radio Australia," Roy Patrick, Sidney Pearce and J. P. Colwill). Sidney tells us that "Radio Australia" is now issuing a newly-styled QSL Card.

Fiji Islands. "Radil Suva, The Voice of the Fiji Islands" at Suva, is reported testing on 6005 kcs at 0530-1030, relaying medium-wave station ZJV. ABC News is relayed at 0900; reports are requested to the Postmaster General, Suva. ("World Radio Handbook" and Radio Sweden).

Philippines. "Radio Free Asia" is reported by Sidney Pearce to be heard at good strength from around 1430 over DZ15 on 11940 kcs. English is at 1450 to close at 1515, and DZ14 on 6110 kcs is also announced, together with the direction that they return to the air at 1145 GMT. There are no broadcasts on Mondays. (Note: WRH lists 6110 kcs as DZ13 and 11940 as DZ17! We have a record of DZ13 changing to DZ14, and it looks as if DZ17 has, in turn, been altered to DZ15. (Scribe). Bill Griffith also reports good reception (Q4 S8) for 11940 kcs, at 1300 with a bugle-call interval signal and news in Mandarin read by a YL. There is some QRM from B.B.C. station MCQ (11945), and at 1320 they are smothered by AIR Delhi opening on the same frequency (11940), but can be heard as early as 1200 in Cantonese.

"The Peoples Station," Manila, have verified Ian Hardwick's report on their MW station DZFM with their old QSL card when the call was KZFM. They now show DUH2, 6170 kcs, as 1 kW power (increased from 250 watts), and DZFM, 710 kcs, as 10 kW. Ian also passes along the present schedule of "Radio Philippines," Manila, as being 2100-1500 daily, over DZPI, 800 kcs (10 kW) and DZH3, 9500 kcs (now also increased from 250 watts to 1 kW; also listed, without any transmission times, are DYBU, 1250 kcs (1 kW) and DYH3, 6100 kcs (250 watts). These two are at Cebu, on the island of the same name. (Scribe).

NORTH AND CENTRAL AMERICA

Canada. CFRX Toronto, 6070 kcs, was logged several times around 2300-2400, sometimes peaking Q5 S8; has news at 2330, sports results at 2340, and call "This is CFRB Toronto" at 2349. (Robert Mercier). CFRB is the MW station, both being owned and operated by Rogers Radio Broadcasting Company.

Barbados. Cable and Wireless Station ZNX32 at Bridgetown, 7547 kcs, has been a good signal with commentaries on the Cricket

Test, West Indies v. India, which commenced on February 7th. Sign-off was at 2115, at the close of play, when the announcement was given that transmissions were from 1115 local time (1515 GMT). (Simpson and Pearce).

Guadeloupe. Station FG8HA "Radio Guadeloupe," Basse-Terre, has been heard in North Carolina on 7447 kcs (measured) with French programmes around 2305-0101. (URDXC).

British Honduras. ZIK2 "Radio Belize" is reported by URDXC on 4950 kcs from 2247 tune-in to after 2315. A B.B.C. relay was heard at 2300, followed by the announcement "This is Radio Belize" at 2310 and 2315. Was logged on another occasion at 2345-0015; many "commercials" are included in the programmes, and reports from listeners are welcomed, being acknowledged by airmail letter at present, though QSL cards are being printed. The Chief Engineer is Mr. F. Turton.

El Salvador. Robert Mercier reports that the government station, "Radio Nacional YSS alma Cuscatleca," at San Salvador is, at last, testing on 9553 kcs (announced as 9555). This station was heard with fine signals after 2400, though frequent short breaks in transmission were noted; the programme included recordings by Andre Kostelanetz and they also announce as "Transmite Radio Nacional de El Salvador." 6010 kcs was also mentioned (but not audible) and a MW outlet; power is given as 5 kW on SW, 10 kW on MW. Robert says he believes reports were asked for, as he heard a long list of place-names, in the U.S. and elsewhere, being read, so they were probably acknowledging listeners' letters on this occasion. (WRH gives the QRA as: Teatre Nacional, San Salvador. Scribe).

Bill Griffith has logged Y6SAXA "La Voz Panamericana" in San Salvador on 11950 kcs with good signals at 2100, which is the first "heard" report we have had from a listener in Europe. (American DXers are still listing the SW call as YSAX and the frequency as 11945 kcs. Has anyone got anything authentic on this one yet?)

Nicaragua. YNWA "Radio Mundial," Managua, is heard in the U.S. around 2350 on 6465 kcs (URDXC). (This is an old frequency for YNWA, the present listing over here being 6140 kcs. Scribe).

Dominican Republic. Station HI9T "Broadcasting Tropical" at Puerto Plata has been logged once or twice on 6192 kcs, 2 kcs above CE619, around 2300. At other times was found on 6215 kcs to close at 2300. (Mercier. Perhaps they shift frequency at this time, OM, from 6215 to 6192 kcs.) John Simpson lists "La Voz Dominicana," Trujillo City, on 11940 and 11735 kcs in parallel at 2030-2100. The former is, of course, that well-known second harmonic of HI4T on 5970 kcs, and the

other must have been an image or something. A talk in English, "China and the Blockade," was noted by Ron Young of Chelmsford at 0200 over HI4T.

HI2G "Radiodifusora Nacional, Emisoras HIG," Trujillo City, was logged with weak signals and light music at 2145 on 9592 kcs. (Simpson).

Costa Rica. A Costa Rican station on 6200 kcs has been reported heard in the U.S. at 2300-2400. (URDXC). It is described as TIMC "Radio Guanacaste" at Heredia, and seems to announce TIRQ for MW and TIMC for SW; has fair signals but QRM from another station on the same frequency. (Would this other station be Cayenne? Scribe). **SOUTH AMERICA**

Brazil. Station ZYJ21 "Radio Borborema," Campina Grande (State of Paraiba), on 3325 kcs has been a good performer at 2230. (Pearce). ZYY3 "Radio Basil de, Campinas," Campinas (State of Sao Paulo) 4755 kcs: had a musical programme with identification after each item around 2200. (O'Sullivan). ZYY20 at Porto Velho (Territory of Guapore) was noted on 4995 kcs in Australia with a three-chime signal at 1045. (URDXC). The call used by ZYY20 is "Radio Difusora de Guapore, a Voz do Rio Madeira."

Chile. CE1173 "Radio Sociedad Nacional de Minería," Santiago, has been found on 11975 kcs (having moved from 11730) and on a last-minute check-up is on 11965 (NF); is heard with good strength around 2300. (Mercier).

Peru. OAX4J "Radio Colonial de Lima," Lima, is now heard on 9330 kcs around 0445. (URDXC). The latest edition of WRH moved this station from the above frequency to 9520 kcs.

Uruguay. CXA10 "SODRE," Montevideo, was Q5 S7 at 2315 with a football commentary on 11904 kcs. (Simpson). CXA19 "Radio El Espectador," Montevideo, 11835 kcs, turned up with S7 signals for Stanley Coppel at 2200-2220. Stanley tells us he now has an S.640 which, judging from his DX list, certainly seems to be performing pretty well.

Ecuador. HC4FF "La Voz de Esmeraldas," Esmeraldas, has been logged on 4580 kcs (varying) at 0300; sign-off was at 0404, but may vary. HC2AJ "Radiodifusora del Ecuador," Guayaquil, was noted at 0315 on 4651 kcs, and HC2BK "Radio El Mundo," also at Guayaquil was found on a varying 4675 kcs around 0230 at fair level. These three items are reported by Marvin E. Robbins, Indianapolis.

HCJB Quito, 17890 kcs was noted at 2030 when the English announcement was: "You are tuned to the Voice of the Andes, International Missionary Station HCJB, located at Quito, Ecuador, South America." (Coppel).

Venezuela. YVMF "Ondas del Lago," Maracaibo, 4800 kcs: Q4 S7 at 2340. YVMG "Radio Popular," Maracaibo, 4810 kcs: Q3-4 S6-7 from 2400. (Coppel). YVMO "Radiodifusora Occidental," Barquisimeto, 4990 kcs, carried sponsored announcements and station identification at 2315. (Young).

Conclusion

We are listing the Honour Roll this month, the scores being correct up to March 1st. We are still receiving a few very hazy claims for positions, which means that your Scribe has to dig up old lists and count them himself for the sake of accuracy. PLEASE do not repeat the same QSL's if you sent them to us last month, and to save confusion give each country a number, not forgetting the name of the station and its frequency, e.g. "(48) HCJB Quito, Ecuador, 17890 kcs."

The Editor and your Scribe thank all readers who sent along items included in these notes, and all contributions are acknowledged. Broadcast News for the June issue should be addressed to: J. Fairs, 2a Durham Road, Redcar, Yorkshire, England, and should arrive before the 27th April.

73 and Good Hunting around the dial till next time.

HONOUR ROLL

1.	Sidney Pearce	132
2.	Arthur Cushen (NZ)	127
3.	Ivor J. Street	94
4.	Roy Patrick	92
5.	Jack Fairs	91
	Mike O'Sullivan	91
6.	Stanley Coppel	86
7.	Carl Shapiro	83
8.	William P. Griffith	81
9.	Ian Hardwick (NZ)	73
10.	Manfred Lepple (Germany)	72
11.	Dr. James Kyle	67
12.	Bert Clear	63
13.	Tony Allmey	62
14.	John Whittington	60
15.	Ronald Thorndike	54
16.	Jim Symes	51
17.	Phil. Allwood	48
18.	Fred Pilkington (MM)	41
19.	Alex Mackenzie	36
20.	Kalevi Ant-Wuorinen (Finland)	35
21.	Robert Mercier (France)	34
	F. C. Boucher	34
22.	Paul R. Warner	30

A SWL's QSL RETURNS

By HAROLD V. B. VOORHIS
New Jersey, U.S.A.

Our old friend Harold Voorhis sends us these statistics on his QSL returns which we hope will encourage other SWL's.

Three years ago I submitted a report concerning QSL replies received by a short wave listener over a period of three years.

	Cards sent	Replies	Percentage %
United States ..	210	120	57
Foreign	590	235	40
Total	800	355	44
U.S.A. YL's ..	24	24	100
Foreign YL's ..	16	16	100
Total	40	40	100

I list below that report and another made out for six years—1947-1952:—

	Cards sent	Replies	Percentage %
1947-1952 period			
United States ..	370	201	54
Foreign	715	314	44
Total	1,085	515	48
U.S.A. YL's ..	70	51	73
Foreign YL's ..	23	17	73
Total	93	68	73

A total of 5,314 confirmations have been sent over period 1907 to 1952 or about 45 years—average 118 per year. The above figures are for the last six years only when 1,113 cards were sent out but 28 returned for various reasons—and these are not included in these statistics.

I consider this a good return—48% to a SWL, although postage was included with all confirmations I sent to foreign countries, which should have made the foreign average much higher than it is and higher than the U.S.A. average, where I sent not a single return postage coupon or stamp.

ON THE HIGHER FREQUENCIES

Monthly Notes and News

by H. E. SMITH, G6UH

The period February 28th, to March 5th gave some of the best conditions ever experienced on the Two metre band, and on 70 cms another "first" was achieved by Gw2ADZ, this time with ON4. As far as can be ascertained at the time of writing, G5YV seems to have worked the highest total of available DX. Between March 1st and 3rd, Harold worked 12 "ON" stations, 11 "PA's," 11 "DL's," eight "F's," three "SM's," one "OZ," and three "Ei's," additional to a large number of G stations. G5YV's best efforts were SM6ANR, SM6QP and DL7FS, all well over the 600 mile mark. More details will be found in G5YV's report. The European opening seems to have covered most of the country, but it would appear that the North-east and North were receiving somewhat better signals from the DL's and SM's. Many interesting reports have been received and full details will be seen further on in these pages.

Activity has been terrific during the good spells, and this leaves one in no doubt that the interest in VHF is growing in spite of the long periods of apparent inactivity which are in evidence at times. Before getting down to the Month's news, we should like to say one or two words on our usual topics, first:—

The RSGB and VHF

As space is limited, we can only just touch on this subject this month. So many letters have been received from readers that we cannot possibly deal with them in these columns. We should like to say however, that we are not staging a general attack on the Society, as many seem to think. Secondly, we are criticising the attitude to *VHF operation only*, and we are not immediately interested in any other aspect. We point this out because many of the letters received are from non-VHF operators, and many points are raised which have no bearing whatever on VHF. So *please* do not ask us to publish non VHF matters in these columns. It may well be that we are wasting space by bringing this matter up at all, as there seems little doubt that the Society are convinced that they are doing everything possible to stimulate interest in VHF operation. Regarding the Council, G5LC said in his Presidential Address, "They are fully conscious of their responsibilities and will discharge them well and without fail." Perhaps after all, we have been mistaken. Perhaps the scrapping of the Band Plan would be a good thing. Perhaps it is for the best that the VHF listener should have no space in the Bulletin, or that there should be no serious attempt to organise

official backing for VHF tests and study groups. If all this is so, we can only say that it's time to put the shutters up on VHF!

The VHF Newcomer

For some months past we have included this little feature in these columns and many readers have written appreciative remarks regarding it. In future issues, this feature will take a somewhat different form. We prevailed on the Editor to allow us some space in another section of the book, and we are starting a series of notes for the newcomer to VHF and the VHF listener. We hope this new arrangement will meet with approval, and in any case, it will leave more room in these pages for the reports and news.

Station Frequencies

Many listeners and quite a few transmitters have asked for frequency lists to be published. We are very pleased to publish the first list this month. (Readers will remember that we publish several lists of this nature some two years ago, but many of the frequencies in use then, are no longer current). We are indebted to G3HBW and Ray Bastin of Coventry for the help they have given us in compiling this first list which we hope will be of some assistance in calibrating the converter or making it easier to hear a certain station by knowing just where to look for him.

The VHF Listener

Now that the Short Wave Magazine Ltd., has ceased to publish the *Short Wave Listener*, it seems that we are the only journal in the country catering regularly each month for the listener. We should like to take this opportunity of saying that we welcome any VHF listener to these columns and it is our intention to encourage and assist him as much as possible. As announced in these columns last month, our Listener Encouragement Scheme is now under way and there will be two awards made each month for the most comprehensive report received. Remember that the reports will not be judged purely on the number of stations heard. Essential detail is the thing to aim at, and we hope that this scheme will not only benefit those who participate but prove to be of some real value to transmitters.

SPECIAL LISTENER AWARD for the Month of May

An advertiser in this journal, Mr. J. H. Gibbons, is interested in our VHF listener scheme and has come forward with a most generous offer. For the best listener report received covering the month of May, Mr. Gibbons will award a complete kit of parts,

including valves, for the construction of a VHF Converter. This award will of course, be in addition to the two that we shall be making. Everyone wishing to enter for this award should send in their report direct to your conductor to arrive by June 4th. We shall pass all the reports on to Mr. Gibbons who will judge all entries impartially, and decide which in his opinion, is the winner. (Mr. Gibbons is quite qualified to do this, being a Professional VHF Engineer, a Lecturer on Radio Theory, and also catering for the *Amateur and Constructor*, see advert. Box C107.).

We certainly very much appreciate this fine gesture. Such actions as this make us feel that this job is well worth while. Some interest is also being shown from other quarters, and it may well be that we shall be able to make a further interesting announcement in the near future, so rally round listeners, your reports are important and useful to the VHF operator and here is the opportunity to do some good to yourself at the same time. Now for the month's news from our transmitting reporters.

Transmitter Notes and News

MOROCCO HEARD ON 144 Mcs ?

On March 1st, G5ML (Coventry) heard a CN station on phone. The call-sign was too weak to read but there was no doubt about the CN prefix. What a great pity that the CN did not sign on CW !

G5ML took advantage of the Continental openings and many new stations were worked, including DL3FM at 579 and Gc3EBK at 5 and 9 on phone. SM7BE was called repeatedly but for some reason he could not be raised. The most outstanding signal from the Continent was ON4BZ who was received for long periods at S9 with no QSB whatever and his signals were as strong as some of the locals at five or six miles distance. On March 5th, conditions were excellent to the South and contacts were made with G3FAN, G2FTS, G3BHS, G3BNC, G8IL and Gc3EBK. During the opening G5ML had trouble with the modulator, and tried to raise some of the Continental phone stations by calling them on CW, but found that they were not replying to CW ! G5ML has now worked 40 counties and eight countries on two metres.

G6PG (Dartford, Kent.) 145.124 Mcs, also took part in the DX openings and says that the conditions were amazing. A contact was made with G2DKH/P in Co. Durham at 569 both ways. This is the best GDX yet made by G6PG. Many Continentals were heard, including DL3FM and another DL who could not be identified because of CW QRM. The most amazing thing he heard was G2WJ on two metres working DL3FM on 70 cms, and hearing DL3FM via G2WJ's loudspeaker on two metres. The new 70 cms converter at G6PG, with a 12 element stack in the roof would not pick up DL3FM.

G6PG is active on 70 cms (435.370) and is looking for contacts.

G5LK (Reigate Surrey) 144.80 Mcs, is feeling much happier now that he has at last raised his old 40 metre pre-war friend G5YV. Les says he got more than a kick out of this, especially as G5YV turned his beam South and gave up trying to raise a DL in order to work him. Other new stations worked included G3MY/P, PAØFC, ON4HN and F3JC. DL3FM was heard from late afternoon until well after midnight on March 1st, but could not be raised. G5LK says that everything is working well now, since his three grand helpers G3GBO, HBW and HZK put up his new wide spaced beam plus a calibrated cascode converter which he can put on known frequencies. Les asks the question "Where is G6UH lately?" (Well, to be quite truthful, we decided to re-build the PA stage of the TX, and this was in pieces when the opening arrived !!! This same kind of thing always happens when we go on holiday as well !!)

G5YV (Morley, Leeds) 144.21 Mcs, as mentioned earlier in these notes, put in some good work during the openings. The DL7 in the US Sector of Berlin was a really fine catch. (DL7FS 145.05 Mcs). Harold says the fun started at 1500 on March 1st, when ON4BZ came back to a CQ call. After this, there was no lack of Continentals to work until he went to bed at 0030.

On the 2nd, at lunch time, two PA's and two ON4's were worked, and in the evening many DL's, On's, PA's, G's and SM7BE were worked. This latter station was an amazing phone signal, being S9 plus 20 db's for two-and-a-half hours.

No other SM stations were heard on this evening but much time was spent looking for them, and for LA4VR who according to the SM stations, was operating on 144. On March 4th, Ei2B was worked at 40 over S9, and later Ei6A (Wicklow) and Ei3S. G5YV tells us that Gi3BIL is now on 144.010 Mcs. No Gm stations have been heard so far this year.

Ei2W (Dublin) also operating under Ei2B 144.200 Mcs, is on every night from his home QTH (Ei2B) beaming South-East and East from 2300 GMT onwards. After May 1st, Harry will be operating from the new Ei2W QTH. Ei6A is on nightly from Wicklow from 2300 onwards and is looking for G contacts. Ei6A worked Gw3FYR on March 1st, and thus the two stations qualify for the prizes offered by the VHF Research Society of Ireland for the first of the new Ei stations to "get across" and for the first G or Gw to work a new one. Ei2W records the QSO with 5GYV on the 1st, and also says that Ei3S is active every night from Dublin looking for G signals.

Gw2ADZ (Llanymynech, N. Wales), sends in short report that he worked ON4UV on 70 cms on the night of March 3rd. Phone was

used at both ends and the signals were Q5 and S9 at ON4UV and Q5 and S8/9 at Gw2ADZ. Congratulations to both stations for making the first ever Gw/ON QSO on 70 cms. We have not measured the distance but it would appear that it just falls short of the record. Bill is not yet in full active operation on Two metres, but hopes that the re-build will be complete by the time these notes appear.

G3AJP (Fritton Nr. Great Yarmouth) 144.730 Mcs, is still active only at week-ends. The beam has not yet been re-erected, but some listening has been done on the Windom aerial. Among the stations heard, PAØNL, PAØLDG, PAØJOB, PAØOP, PAØBAF, DL3FM, G2AVR, G2FCL, G3BQQ, G3IOO, G3WW, G5YV, and G8MW were all easily copied on the Windom. John confirms that G3CFK of Yarmouth lost a great part of his equipment in the recent floods, and all of his QSL cards.

G3VM of Norwich has not been on the band for some months. G2CPL of Lowestoft has been inactive due to business QRM. G3AJP mentions that a VHF Listener Bill Hines of Oulton Broad has been logging plenty of DX on the band lately. (What about sending us your list OM ?)

G3HZK (Hayes, Middx.), could not raise any of the European DX on his indoor dipole, but has managed to work some GDX at last, the best contact being with G5YV. John includes a list of Calls heard and worked, and this appears in the Calls Heard section. Many of the Continental stations were heard during the opening but although many of the carriers were received at S7, the phone could not be copied.

G3HBW (Wembley, Middx.) 144.870 Mcs, sends us an extremely useful list of frequencies for our QRG section. All of those shown in the list were all heard by G3HBW between March 1st and 4th !! In spite of his beam being partly o/c at the top, Arnold managed to work quite a few of the Continental stations. Other new contacts include Gc3EBK and G2CYN (Birkenhead).

G3EHY (Banwell, Somerset) 145.220 Mcs, sometimes operates on 145.35 or 144.980 Mcs, but only if severe QRM is present on his signals.

A solid contact was obtained with PAØNL on March 1st, and Louis found that most of February was good for two metre operation. A regular schedule was run with G5RW at over 130 miles and was worked every night except for the times when one or the other was away. The Gi3GQB schedule has been discontinued because of the fact Gi3GQB is now over this side on business and will be here for a few months. A later note from G3EHY confirms the excellent conditions between March 1st and 4th.

Several phone contacts have been made with the Continent, and contacts with Gc3EBK (Guernsey). Ei6A was heard and called on March 4th, without result. New stations worked during the period included G3DNP (Dudley), G2FCV (Warrington), G3ITI (Hull), G3DO (Sutton Coldfield), G3CNY (Nr. Wolverhampton) and Gc3EBK.

G8LN (Plumstead, London) continues his schedule with G3ANB. Plenty of DX signals were logged during the good spells, and signals from the South-West have been much above normal. G8LN says it's amazing how all the stations seem to come on when there is a smell of DX about. (Yes, it's almost as though there is some kind of bush telegraph system at work. The whole band will spring to life in a matter of minutes if any sudden opening occurs. The truth is of course, that there are always a large number of stations just listening, and waiting to "pounce." Hi).

G8LN notes that when conditions are good on 1.7 Mcs, there is usually some openings on 144. This time there was some slight delay in this occurrence, but it followed just the same.

G3WW (Wimblington, Cambs.) 144.830 Mcs, sends in a very detailed and complete report of the European opening. On March 1st, the duct stretched across from Oswestry to Holland, Germany and Denmark, and when he came on the band at 1715, stations north of a line drawn through Leicester were working the Continent like "shelling peas." by 2000 the duct covered G3WW and he was able to join in the fun. Owing to unsuspected TVI, he was unable to operate until 2245 after which he worked PA, DL and OZ2FR before the 1000 volt power pack went down to earth and dimmed all the house lights at 0025. The power pack trouble was repaired on the 2nd, and contacts were obtained with SM7BE, Gc3EBK, PAØFB, ON4XB and ON4BZ. A later report from G3WW gives details of a QSO between Gc3EBK and OZ2FR on March 5th. OZ2FR had been hearing both sides of a QSO between Gc3EBK and G5YV, and G3WW passed the message on to Gc3EBK to call OZ2FR. This he did, and obtained a report of 559.Gc3EBK also gave OZ2FR a report of 559. A very fine piece of work even if it is no record. Also on the 5th, Southern stations were being received well in Cambridgeshire, and G3WW says some of them were even using 14 Mcs and 21 Mcs beams just to get in on the fun.

G3SM (North Harrow, Middx.) raised Gc3EBK on March 4th, and heard many of the Continentals during the opening, but was unable to raise any of them. He was particularly pleased to hear SM7BE at S7/8 calling G3FZL.

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Stations from the North have also been heard well but Don has great difficulty in raising them, and he puts this down to the fact that he has a range of pylons to the East and North-east only 100 yards away from the QTH. In addition to this, the QTH is a very low one. Operation on the band has been somewhat curtailed owing to gardening QRM, and the only new station worked during February was G2BTY.

G5GX (Leven, Yorks.) decided to dismantle the Transmitter for a re-build, and had just completed the dismantling process when the band decided to open!!! (Tut-tut such language! It happened to us too!) So Malcolm had to leave all the DX to G3ITI, and from all accounts he certainly went to town on it. G5GX thinks that more of the DX was heard in the North than in the South. The countries heard in the Hull district included SM, LA, OK, OZ, PA, DL, F, ON and HB. Listening on 70 cms, G5GX heard G3FZL at 579 and thought he heard a Dutch station, but could not positively identify it.

G3INU (Clacton, Essex) will shortly be operating on the band. The receiver is already in action and Reg has sent in a few of the Calls Heard recently. Many of our older readers will remember Reg Appleby, who used to contribute to the Listener section of this journal. He has had the call G3INU for some time now, and as he says, he is getting his hand in again on the VHF bands.

G3FEX (Bramber, Sussex), 144.890 or 144.910 Mcs dropped us a note to say that he is once again active on the band. Unfortunately this arrived just too late for inclusion in our last month's issue, but we take the opportunity to put it in now. Main periods of operation are between 1830 and 2230 daily, and during the day on Sundays when possible.

G5LQ (Chiswick) also writes to say that he is still interested in VHF operation in spite of being absent from the band for six months or more. Jim says he has dusted the converter in readiness for another period of operation, but feels that he must first re-build the Transmitter.

He has been doing some listening lately and finds there is a great dearth of CW on the band. He hopes that when his new Tx is ready, some of these phone stations will come back to a mere brass pounder. (They will OM, have no doubt of it.)

QRG Section

In response to the many requests for frequencies of VHF stations, we herewith present the first one and hope it may be useful. Now for goodness sake don't write and tell us that so-and-so's frequency is 500 cycles out. We know these figures will be near enough for

you to find the station concerned, and no claim is made for a better accuracy than plus or minus 3 kcs or so. So here we are then :—
G2AOK/A(Stowe-in-the-Wold,

	Glos.)	145.35 or 145.19 Mcs
G2ASF	(Coven'y Radio Club)	144.01 "
G2BMZ	(Torquay, Devon) ..	145.34 "
G2BUJ	(Swindon, Wilts.) ..	145.24 "
G2BVW	(Rearsby, Leics.) ..	144.18 "
G2CYN	(Birkenhead, Ches.)	144.50 "
G2DDD	(Littlehampton) ..	145.19 "
G2DSW	(Southampton) ..	145.33 "
G2FCL	(Shipley, Yorks.) ..	144.33 "
G2FFG	(Shefford, Beds.) ..	144.73 "
G2FNW	(Melton Mowbray, Leics.) ..	144.40 "
G2FTS	(Hailsham, Sussex) ..	145.22 "
G2FZU	(Ilkeston, Derbys.) ..	144.48 "
G2HCG	(Northampton) ..	144.63 "
G2HOP	(Stamford, Lincs.) ..	144.49 "
		144.15 "
G3ABA	(Coventry) ..	144.55 "
G3ANB	(Brightlingsea, Es'ex.)	144.93 "
G3APY	(Kirkby in Ashfield, Notts.) ..	144.43 "
G3ARL	(Sandown, I.O.W.) ..	145.46 "
G3AUS	(Torquay, Devon) ..	145.21 "
		144.48 "
G3BEX	(Southwick, Sussex) ..	145.18 "
G3BHS	(Eastleigh, Hants.) ..	145.35 "
G3BK	(March, Cambs.) ..	144.68 "
G3BKQ	(Blaby, Leics.) ..	144.65 "
G3CCH	(Scunthorpe, Lincs.)	144.56 "
G3CFK	(Gt. Yarm'th, Nor'lk)	144.69 "
G3DIV	(Eastbourne, Sussex)	144.91 "
G3DKZ	(Leafield, Oxon.) ..	145.23 "
G3EDD	(Little Abingdon, Cambs. ...)	144.64 "
G3EHY	(Banwell, Somerset)	145.21 "
G3FAN	(Ryde, I.O.W.) ..	144.43 "
G3FEX	(Bramber, Sussex) ..	144.89 "
G3FIH	(Radstock, Somerset)	145.31 "
G3FMO	(Chard, Somerset) ..	144.98 "
G3GGL	(Bradford, Yorks.) ..	144.28 "
G3GOP	(Southampton) ..	145.01 "
G3GVL	(Derby) ..	144.16 "
G3HAZ	(Birmingham) ..	144.49 "
G3HVO	(Parkstone, Dorset) ..	145.18 "
G3HXO	(Shefford, Beds.) ..	145.10 "

This is all we have the space for in this issue, but we shall be giving another list next month. Meanwhile we shall be glad to hear from any transmitter not included in our lists. We aim to keep this section going if possible, with details of any new frequencies as they come on the band, and we hope these lists will prove useful to listeners and transmitters alike.

Listener Section

We do most sincerely thank all our listener friends for the increased support they are giving to these columns. We in our turn will do all we can to assist them, and we hope that

the Awards we are offering will provide some additional incentive. The VHF listener must always remember that he is a vital link in the chain to those who carry out serious work on these bands, and we hope as time goes on, to form a proper Listener Group who will undertake to do scheduled listening periods in certain directions. If listeners are interested enough we will run a County Table each month. Just say in your next report what you would like us to do, and if at all possible, it shall be done.

Len Whitmill of Harrow Weald turns in his usual interesting report and this time he gives us full details of his equipment. Several of our Transmitting reporters have asked for some details of Len's gear and here they are. The converter is a much modified RF27 using half a 6J6 as oscillator, EF54 as mixer, and 6AK5 as RF. No coils are used in the RF stage, it is completely capacity coupled. A 6J6 pre-amp is coupled to the RF stage by a short length of 80 ohm feeder. The aerial is connected direct to the control grids of the pre-amp. The IF is 8.4 Mcs, and the converter is fed into an S640 with 300 ohm ribbon feeder. The aerial is a 5 element Yagi (C/S), fed with 80 ohm co-axial feeder, and is about 28 ft. from ground. The beam elements are insulated from the wooden cross members by polythene tubing, and there appears to be no leakage in wet weather. For 70 cms Len uses half a 6J6 as oscillator, and the other half as a frequency doubler, with 2 matched CV/101 crystals and a Lecher Line feeding into the S640 at an IF of 8.5 mcs. The 70 cms aerial is a 6-element Yagi fed with 300 ohm feeder. The total number of VHF stations now heard by Len Whitmill now stands at 475, in 41 counties.

Ray Bastin of Coventry, well known as the second Op. at G5ML, gives us an up-to-date list of the local activity in his area. G5ML, G6YU, G6CI, G3ABA, G2ASF, G3HAZ, G3BKQ and G2AOK/A, together with their frequencies. (We have given some of these this month, others will be published in our next issue). Ray also tells us the G3BJQ of Rugby has now gone QRT owing to family illness. G2FNW is also QRT for a re-build, but hopes to be on for the Summer DX (if any). We were extremely sorry to hear from Ray that G3IS of Rugby passed away early in February. He was a very keen VHF operator and many amateurs in the Rugby area will mourn his passing. (We extend our deep sympathy to the relatives of G3IS).

Reg Russell of Southampton sends a most informative report and a most imposing list of Calls Heard. (See Calls Heard section). Reg has completed most of the re-build, and the converter is now finished. He has gone to a lot of trouble to ensure that the balance of

the 6J6 pre-amp is maintained, as he finds that this valve operates much more satisfactory if this is done. During the early part of February when the conditions were poor, Reg was surprised to find that stations up to 100 miles distant could be heard, and G2HCG at 92 miles was logged nearly every night of the month. No London stations were audible during these times. The opening to the London area started on February 15th and 16th and continued through to the early March openings. March 1st, was particularly notable for the strength of the Lancashire stations, dozens of them at S9 !

(Reg sends many more interesting comments but we shall have to cut them short otherwise we shall get into trouble from our Editor for overrunning our space again Hi).

M. McBrayne of Westcliff-on-Sea says the opening caused a bursting forth of activity in the Thames Estuary which, apart from occasional appearances of G3DAH, has been dormant for years. Things are now looking up locally however, and G3GYW (Westcliffe), G6CH (Strood) and G6NU (Gillingham) are on the band, with G3JB expected to be on any day now. The stations listed by M. McBrayne were all heard on a 6J6 mixer and 6J6 oscillator, *no RF stage*, which shows what can be done with the simplest of gear when the conditions are right.

Derek Purchase of Barnet sends in two lists of Calls Heard, a separate one for March 1st !! When one looks at Derek's lists, and considers that he is only using a four-element Yagi *in the shack* it really makes one think. Derek says "It amazes me how the PA and ON stations signals can find their way straight through a whole row of houses, I wonder how much stronger they would be if the aerial was up on the roof ?" (They would probably be about an S point *down* because of feeder losses Hi).

Well, now to those staggering Calls Heard lists.

VHF Calls Heard

L. Whitmill, Harrow Weald. Feb. 3rd.—
Mar. 3rd.

2 metres. G2AHP, AIW, ANT, ATK, AVR, BM, BMZ, BTY, DUN, DSP, DTO, FJR, FTS, FZU, HCS, HDZ, KF, PU, UJ, WA, G3AGR, BKQ, BLP, CGQ, DIV, DLU, DO, EBW, ENI, FAN, FSD, FXA, GBO, GHI, GHO, GOB, GOP, GSE, HBW, HCU, HSC, HVO, HWJ, HZK, IOO, IAI, ISA, NL, SM, WW, ZI. G4AC, DC, HT, OT, G5BC, DS, DT, LK, NF, QB, YV. G6AG, GR, LR, RH, TA, XH. G8DM, DV/A, IL, OU, TB. ON4BZ, HC, HN, PJ.

70 cms. G2DD, MV, FKZ, QY, RD, WJ. G3BKQ, GDR. G4RO. G5CD, DT, RD. G6NF.

M. McBrayne, Westcliff-on-Sea. Feb. 1st—
Mar. 2nd.

G2AEX, AIW, APY, AVR, BCB, FFG, FNW, FTS, FZU, HCG, MQ, PU, WJ, XV, G3ANB, BK, BKQ, BLP, DIV, DJX, FAN, FZL, GBO, GHI, GHO, GSE, GYW, HBW, HCU, HDZ, HSC, HWJ, IAI, IOO, ITI, MY/P, WW. G4AC, AU, DC, HT, MW, OT, G5AM, DS, LK, NF, RW, UM, WS, YV G6CH, CW, LL, NU, PG, RH, TA. G8DV/A, MW, ON4BZ, HC, HN, PJ. PAØDOK, FB, FC, FM, FP, HAK, LDG, MEL, NL, OP. PE/IPL, DL3FM, VJP. F8BD, KF.

D E. Purchase, Barnet. Feb. 1st—28th.

G2BZ, MV, WA, XV, YC, AHP, AIW, ANT, AVR, BRR, BTY, DTO, DUV, FFG, FTS, G3FD, WW, AGR, ANB, BLP, BUN, CGQ, CNF, DJX, EYV, FAN, FSD, GBO, GDR, GHI, GSE, HBW, HCU, HSC, HVU, HWJ, HZK, IEX. G4DC, GT, HT, MW, G5BC, DS, DT, LK, NF, RZ. G6JP, LR, QN, RH, SG, TA, NU, XH, YP. G8DV/A, OU, TB.

Heard on March 1st only

G2BM, KF, MQ, MV, WJ, YC, AIH, AIW, AOK/A, ANT, BRR, DTO, HCG, G3FD, MY/P, SM, WW, CAT, DJX, DKZ, EOH, FAN, FEX, FQS, FZL, GBO, GDR, GHI, GSE, HBW, HCU, HWJ, IAI, IEK, IOO, G4HT, OT, G5DS, NF, UM, YV. G6GG, CW, LL, PG, YP. G8DV/A, TB. PAØFH, FB, FC, BN, HAK, JOB, FP. ON4BZ, HC, HN. OZ2FR. DL3FM, VJP.

G3INU (Clacton). Heard between Feb. 15th and 22nd.

G2BCB, BKQ, FFG, FQP, HOP, PU, UQ, WP. G3ANB, BK, HVO, IAT, IUK, WW. G4AC. G5RW, YV. G6CW. G8MW. ON4BZ.

G3HZK (Hayes, Middx.) Heard Feb. 2nd.—
Mar. 2nd.

G2ANT, AVR, BTY, MV, XV, YB, YC. G3AGR, ANB, FQS, FSD, FZL, HWJ, HXO. G4GT. G5UM. G6CW, LR, QN, SG, UH. G8CK, SY.

R. W. Russell (Southampton.) Feb. 1st.—
Mar. 4th.

Up to 100 miles :— G2NM, UN, YB, AHP, AIW, ANT, AVR, BMZ, BUJ, DDD, FFG, FTS, HCG, HDZ. G3NL, YH, AUS, BLP, BVU, DJX, DLU, EYV, FEX, FIH, FRY, FSD, FZL, GAO, GBO, GDR, GHO, HBW, HCU, HXO, IAI, ION. G4CJ, DC, SA. G5BM, DS, FF, MA, NF, RO, RZ. G6PG, TA. G8DM, DV/A, PX.

100—150 miles :— G2XV, BVW, FZU, HOP, G3BK, WW, ABA, ANB, BKQ, FUW, IIT. G4MW, G5ML, RW. G6CW. Gc2CNC, EBK.

150—200 miles :— G3DA, MY/P, AGA, APY, CCH, ELT, EPW, IOO, IWJ. G5YV. G8MW.

Over 200 miles :— G8GL. DL3FM, VJP. F8GH. F9JR. PAØFC. ON4BZ, HC, HN, UV.

Thanks a lot everybody for the wonderful support you are giving to these columns. Please do not forget that the zero date for reports is the 6th of the month, direct to your conductor at 176 Station Road, Hayes, Middx. See you next Month. Good luck and 73 to you all.

G6UH (145.000).

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From Our Mailbag.

AMATEUR BANDS COMMENTARY

STAN. HERBERT
G3ATU

The last month has seen a gradual falling off of DX conditions on the 80 and 160 Metre bands. The DX is still there, but not in such profusion, nor quite as loud as we were hearing it in January. However, we are glad to be able to report a slight but welcome improvement in 20 Metre propagation. A little goodish DX has been leaking through from time to time and, of course, the band is staying open later as Spring approaches. By the time you read this, 20 should be doing its stuff until midnight on occasion and South American signals should be loud and clear most nights.

Our opening remarks about Top Band DX now need qualifying somewhat. After the wonderful Trans-Atlantic opening of January 11th, conditions for that path deteriorated markedly, but the weekend of March 7th-8th, saw things very much on the up grade once more. The ARRL DX CW Contest produced increased activity and conditions were good. The result was that numbers of W/VE roared in, both on phone and CW, as did other DX of an exciting kind, of which, more anon.

It does seem now that there is a fair chance of working American DX through the month of April and a Sunday morning watch on the band might well produce interesting results, always remembering that if the DX does come through, it will probably do so earlier than in the Winter. The hours between 0300-0630 are suggested times, but you've got to be keen!

In the meantime, we shall attempt to whet your appetites with a review of recent DX activity on Top Band.

One Sixty Metres

The opening of March 7th-8th, unfortunately, came too late for readers to report in this issue. We *did* receive one report (an interesting one, too) which we have been able to squeeze in and it will be interesting to see how it compares with results obtained by other chaps, which we hope will be forthcoming for inclusion in our next issue.

J. L. Hall (East Croydon) is the man in question. John had found conditions falling off badly in recent weeks, but he was on the job to see what would happen during the first weekend of the CW DX Contest. Plenty happened and J.L.H. took full advantage of the excellent conditions. Phone was heard from W1LYV, W2HCW, W3EIS, W8GDQ (three weekends running) and KV4BB. CW activity was, naturally, high and John heard VE1EA, 1HJ, 1YW, 2AIE (15 watts input), 3AAZ, five OH's, KV4AA and 4BB, ZC4XP,

plus what he calls the "usual" W1, 2, 3, 4, 8, 9 and Ø! That isn't all, though—we've kept the best till the last. KG4AF (heard on 1819 kcs, Feb 13th and on 1897 kcs, March 7th) and VP9BF (heard both on March 7th and 8th, 1816 and 1899 kcs—peaking S8) are enough to make anyone's mouth water.

J.L.H. ends by remarking that he foresees some "real" DX cropping up before long! He heard W1BB calling (possibly working) ZS3K, of all people! VP4LZ and VP9BDA are believed to be active and 5A3TZ is expected on the band any time at all. Yes, indeed.

We can add a little about the VP4. The VOA Radio Amateur Programme reports him active on 1810 and above 1900 kcs, with a 1776 kcs "rock" on its way from the States. The last mentioned frequency will make it easier for him to work the USA, but he will have to use one of the others to be any use to Europe.

The indefatigable N. C. Smith (Petts Wood) starts off saying "What an awful job it is to rise early. The alarm goes and I just stay in bed, most times." And so, Norman do we, much to our shame. Must be old age, creeping on!

The iron will did triumph on occasion and netted NCS Phone from W1LYV, 3EIS, 8GDQ and CW from VE1EA, 1HJ, 1YW and, 3AAZ, W1, 2, 3, 4BRB, 4KFC and 9PNE, K2ANR (0806) and KV4AA.

B. J. C. Brown (Derby) pulled in VE1EA, 1HJ, W1AHX, 1BB, 1LYV, 2WC and 3EIS, OK, EI9J and a new County (Westmoreland) in the shape of G3CRJ.

R. Balister (Croxley Green) was pleased with his O-V-1, which got him CW from VE1HJ, W1LYV, 1THX, 3EIS, OH, OK, GC, GI, GM and G5PP/P (Rutland).

K. B. Ranger (Strood) uses an even smaller receiver—an O-V-O, on which he hooked OK1KFU, GI, GM and GW on the key.

R. Winters (Melton Mowbray) has now taken delivery of his S640 and has been having fun. He has his new 40-ft. steel aerial mast as well, but the first efforts of his five-man team to get the thing up (it weighs 3 cwt!) were unsuccessful. A further attempt, using a block and tackle, will have done the job, we hope, by the time you read this!

Richard mentions the G5PP/P Rutland expedition. He heard them both on CW and Phone and had a confirmation by return post. The QSL revealed that 'PP used a 500-yd kite—supported vertical. Future /P operation is planned for Radnor (April 2nd), Montgomery (April 3rd) and Merioneth (April 4th), while

G2BJN will be working portable in Rutland throughout Easter Week.

G3HMR (Westmoreland) who is working under difficulties with a poorish aerial, surrounded by the high local scenery, managed to work G3ATU. Heartened by this piece of DX, Guy got cracking and worked OH3NY and so feels that life is still worth living. We should imagine OH3NY was somewhat bucked too—he's been gunning for Westmoreland for long enough!

G3HDQ (Woodford, Cheshire) who is doing well on the HF bands, decided to have a crack at Top Band working. He organised a good ground system, one of the essentials for the band and has worked considerable "GDX," using a 68-ft. Zepp with strapped feeders with, later, a 34-ft. folded section added at the far end. This added piece does not affect the performance on 20, but seems to produce better day-time results on Top Band.

Results in the first four weeks show a creditable total of eight countries (HB among 'em) and 45 counties. W signals have been heard, but not so far worked.

G2UK passes on some useful information from Mal Geddes ZE3JO, ex-G2SO. Mal tells that ZE3JP has special permission to operate for a week or two on 160. He came on for the G/W Tests and it may be that he will continue on the band for a while. Up to the present, there have been no reports of him being picked up over here.

G3ATU (Roker) has been suffering from a full-blooded attack of extreme laziness. He worked ZC4XP (0230—1810 kcs) and, having got the QSL, is resting on his laurels.

Further "gen" via the VOA Programme concerns ZL1AH and ZL1MX, who are running a Top Band sked with VE1EA, WIBB and others. Recently, both ZL's heard VE1EA and several W's but no sign of the ZL boys was heard in "W." Both ZL's, we believe, work around 1889 kcs and the early Sunday morning periods are the ones to concentrate on.

Which snippets terminate Top Band doings for the moment.

Twenty Metres

"Deplorable" is just about the right word to apply to the present DX state of 20. Although a small amount of DX is seeping through from time to time, the operative word is "small." Back in 1947, when we were working our first DX, using a crystal-oscillator and an 807 PA into an odd length of wire, it was a regular occurrence at this time of the year to contact VK up to about 2100 hrs. When VK faded out, W, VE, CE and assorted South Americans such as PZ and CP would roar in through the early hours, to be replaced by dozens of strong W6's and 7's or else ZL, KH and KM6. DX of some description came through all day

long—in fact the whole thing was too easy.

In case this little resume has depressed some of our readers, we hasten to point out that the same conditions are bound to occur again in the course of the next few years. Think what you have to look forward to! But there *will* be an awful lot more QRM!

In the meantime, let's take a look at results as they are right now.

D. E. Nunn (Hove) remarks on the usefulness of DX contests in providing new countries. The recent ARRL Phone affray, for instance, put him up four, with ZD4BK (0830), OQ5RU, M1MA and DU3CL (0730). 39 countries were heard in all, others including MI3US, W5VSS, ZS6DW (2000), VQ2, CR6, SU, JY1XY, CO2SG, VP5AK, KG6ADX, KA3RR, OD and KG4AL.

The score in now 90 C, this in a year-and-a-half.

P. M. Crawford (Darlington) is hoping to get a new receiver shortly. In the meantime his "Hambander," plus an efficient aerial system, continues to pull in most of the available DX. On Phone, EL2P, CO2CE, CR6, FQ8AJ, HK4FV, HP1AP, KA2IM, M13 and I1AHR/9A2 (San Marino) are fair examples, as are VK3LN, 6DX, HH2FL, VK1JC, FB8BA, ZL2BV and UAØMR on the key.

R. Goodman (Edgware) found conditions much improved. His O-V-O actually pulled in 28Z-98C on the band in just two months.

Ron found so many W's active during the Phone DX contest, both on 20 and 75, that he stopped logging them!

Phone on 20 shows CO6CA, CR6, EL9A, HK5DR, HP1AZ, KL7, KG4AO, KG6ADZ (0830), MP4KAB (0830), OQØDZ, OY2Z, PJ2AK (1950), VK7NB (0900), VP5AO (2130), YS1MS (2030), ZC1AB (wonder where he hangs out?), ZD2RRW, ZE4JA, ZL2BE and ZS3K, to mention the best.

P. D. Lucas (Redhill) has now passed his Morse test and will shortly sit his R.A.E. (Good luck, and nice work on the morse.)

He found a good opening to FQ and OQ5 and pulled in phones OQ5EB, 5FO, FQ8AJ, ZD3RRW, M13MK, SU1MR, VP9BE and PJ2AK. PY7CT, KP4GN and an FA were on CW.

P. Hunt (Ellistown) is on the war-path on all bands with a 20 metre Zepp and 1155, which combination pulled in phone from OY2Z, VK6RU, HR1SO, KG6AG, CO2WD/Air, FP8AG, FQ8AK, CR6, ZS6ZU/P (5 and 9 plus), and two really nice ones, VR2GC and ZK2AB (Niue).

P. M. White (Williton) who is now getting used to his R1155, found things quiet, but he *did* find three new ones, ZS6ZU/P, ZD4BK and VQ2DT. The most consistent signals on

Phone emanated from EA6AR, KV4BB, YV5AB and the two old faithfuls, VP's 6FO and 6SD.

Conditions during the DX Contest were poor and resulted in "gotaways" such as ZE, KG6 and KA.

V. Doidge (Callington, Cornwall) got in on some good openings and in one month, collected 74 countries, including nine new ones, all on Phone, making the 1953 total 22Z-98C (27Z-118C in all). The best are CO2GE, CR4AI, CR7AG, CX2CO, EL2R, FM7WD, HH3FL, HR1KS, TI2RC, KZ5WA, VP9AD, VQ5BU, YI3WH, ZS3AB and IIAHR/9A2 (San Marino), who does count as a separate country.

C. J. Goddard (Warwick) had the bad luck to contract flu and receiver trouble more or less simultaneously, but EL2A, a new one, did something to cheer him up. Other Phone came from CN2AN, KV4BB, MI3KG, OX3BI, VK3ARW, VO6R, ZS6 and ZS7C. On CW, catches were EA8BM, ODSAD, OX3UD, TF, PJ2AA, UI8AA, ZC4 and ZS6ZU/P.

John says he's in a mess with his KG6's, so we'll try to put things right. There are, or were, two countries using the KG6 prefix. These are the Marianas group of islands, comprising Guam, Saipan, Tinian, all prefixes being in the sequence KG6A to KG6H, followed by the Bonin and Volcano group, using KG6I and later, JAØ. The only sizeable island in this group is Iwojima. There was a station active on Iwojima in 1948 who signed W7KMV/Iwo, but he left after a short but active stay out there. Hope that helps to clear things up.

J. A. Stringer (Holywood, N.I.) found several new ones. On Phone, they were VK2QR, KZ5FL, MI3US and SV1AA (this one is interesting—he may be on Crete). Others were W7HAD, 7LVI, 7AJS, VE5GF, KT1JS/AM, LU7AAT and endless PY's. New ones on CW were VS7NG, KV4AA and CX6AD. Lots of ZS and PY also heard.

Bill Hardie (Hawick) had more listening time of late, owing to a poisoned finger (Ill wind, Bill?) and he heard some good DX (for his locality, which is surrounded by hills). His best Phone was from CR6BX, IIAHR/9A2, KA3IM, KP4, KV4, MI3JV, MP4KAC, SU, VP9AV, ZD4BK (due to leave for the UK soon), ZS and a good catch—OQØAV in Ruanda Urundi. Information gleaned from the Swiss SW Programme has it that there are three active stations there. OQØ's AV and DZ use Phone, while OQØCZ keeps the CW boys happy. Ruanda Urundi does not yet count separate for DXCC, etc, but we imagine it will do before long.

B.H. asks about the status of ZS2, 3, 7, 8, 9; yes, they're all separate.

D. L. McLean (Yeovil) refers to the "old faithful," despite poor conditions, especially early mornings. Only once did it open at that time and KG6, VK and ZL came through. Best times were 1700-1900, with CR6, EA9, FB8BA (14198-1700), 8BG (14133-1940), FF8CN, 8GP, KA2IM (14292-0900), KG6ADZ, HZ, PJ2AG, VE4RO, 5FG, ZD1SW (14220-1850), ZD4, ZS in numbers, ZS3AB, 3N and 6ZU/P.

D. Wilson (West Hartlepool) is rejoicing in a little freedom after a session of exams. His efforts on CW netted him several new countries—AP2K, FF8GP, HC1JW (2130, on an otherwise dead band), LU, MP4BBD, PJ2AA, ST2AM, VK2 and 3, VP4LZ, VS6QL, VU2CQ, 2JG, YV5AB and ZS5QV brought the CW score to 51C. Phone produced CR6AC (a new one), KZ5TB, 5WA, MI3, MP4KAC, PJ2AA, VK2, 6, VQ2DT, 2WS, YV5AB and sundry HZ, OD, KP4, VP6 and ZC4.

Derek wonders about SI1MR, heard working "G's." Would appear to be SU1MR, who is very active these days.

H. Lee (Oslo) took delivery of his new receiver, a Norwegian "Radionette," but had the bad luck to lose his aerial and most of a chimney stack in the recent gales. Result—he is using an indoor five-metre dipole, on which he picked up phones CN8MZ, MI3US, OY2Z, VO6N and W5VSS (Oklahoma).

N. C. Smith collected some choice ones with CE5AW, CR7LU, FI8AB (1445), HC1JW, LUØAAW, OA4ED, UAØKKB (0840), VP8AL (2250), VU2AT, 2JG, ZS2MI (1740) on CW and FM7WD, OQØDZ, VE7VO, 7ZM, VQ3CH, VS1EG, 2BS, 6CL (1240) 7FV, ZS3AB, KL7 and many others on phone.

B. J. C. Brown's efforts on phone notched him a new one in ST2NW (1920), CR6, FF8AT (1920), HP3FL, OQØDZ, SU1MR, VK2, VK7JB, VP9H, VQ2, W7LVI (Wash.), YV1CA and ZL2BE, while CW was good for CT2BO, CX6AD, KG4AF, LU, MP4BBK, VK2 and VS2DH.

R. Balister was pleased with the improvement in 20, which brought him phone from CS3AC, SU, VE4RO, K1FBH/VO2 and several other VO's, VK3LA, W7LVI, ZD4BK and ZL2BE. CW catches were FQ8AP, KG6GX (1200—a new one), KL7AMT (1500), KP4, OD4AB, W5, 6 and 7PGS (Wyoming).

K. B. Ronger mentions the outstanding signal from ZL2KF on phone at 1300 and logged VK7KB, VK2, 3, CO2WV, CM9AA, CR4AI, EA6AR, FF8, FQ8, ZD4 and ZS6ZU/P. On CW, his O-V-O pulled in CO2OM, FQ8AA, FM7WD, HC1JW (2130), VP6BM, ZD2FFD, 2HAH and ZS3Q. As Keith remarks, not too bad. 24Z-74c on the O-V-O is it for this year.

R. Winters got in on the end of a QSO involving one of the "Portable VO2's" and suggests that the current influx of "W's"

into that fair land may be something to do with Moose hunting !

He gathers that CN8 stations are not allowed to work OE's. Presumably the position is similar to that in the USA where the FCC regulations bar communication with certain countries which have themselves forbidden their own amateurs to work the outside world. "W's" for instance can not work Austrian natives, but they *can* work the MB9 and OE13 boys.

R.W. sends in a comprehensive Phone log with CO2WV, CR6AI, CT3AN, EA9BE, FI8AC, HK4FV, HZ1AB, KG4AO, OX3BD, VE4RO, ZD4BK and ZS6Z as the best. W3HXE/MM was heard en route for Hamburg, from where he will, sail for Japan. R.W. queries AJ3AL and AJ5AE, heard passing traffic. They are both US MARS (Military Affiliate Radio System) stations and were, presumably, just outside the band. "AC5" is one of the same bunch, so if you hear one, it isn't Tibet or any such juicy spot !

Forty Metres

The "W" boys are now on phone in the band, but our guess is that they will find the going mighty tough on the whole.

CW remains the "decent" way of raising DX and there is plenty to raise at that, but phone enthusiasts have recently been hearing some quite surprising things. Read on and you'll see what we mean.

K. J. Gurney (Aylesbury) decided to make a 40 metre coil for his receiver and promptly logged phones' CR4AE, CS3AC, KG4AF, KV4BB, TI2RC, VP6, YV5FL, ZL2JB, 2QY (1100 !), 3JD, 4EJ, ZS6BW, 6DW (0400) and KC6QY (1015 !). The times of hearing the ZL and the KC6 show just how good things can be on the band.

P. Hunt heard CW from W5, YV5AB and KP4AC.

J. A. Stringer mentions CR4AG, heard on CW regularly, around midnight. Other CW was ZL, SV0WB and lots of PY and W.

ZE3JO is active on CW and recently worked KH6ARA and KH6CT.

N. C. Smith's latest researches brought to light CO, FF8, FP8, LU4ZC, 4ZI, MP4HBK, OA4ED, U18KBA, UJ8AG, VE8MY (0730), VK2HZ (1940), 4HR, 5FM, 6WT, VQ2GW, VS6CG (1750), W6RW, 6DFY (1530), 7VY (1550), ZD2DCP, 4AB, ZL (every morning) and ZS7D (1740) on CW and uncovered W1ATE, 4ESK, VP6 and CO2OZ on Phone.

B. J. C. Brown also got ZS7D (1920) and some W's.

R. Balister reports CW from EA9BD, FF8AR, SUIRS, OD5AD, VK6DJ (1930), VP9GX, VQ4HJP (1830), YI2AM, ZL and ZS3K (2000), with PX1A and ZB2B, both of whom he regards with deep suspicion.

J. L. Hall found some exotic ones. FK8AB (0740) was a new one for him. Other CW was MI3AB, ZS3E, VP8AW, DU7SV (1650), VS6CG and VS7LB, Phone DX was W6UGA (heard working ZL4HJ and ZK2AA !), HRIKS, XE1DZ and XE1TR. The 40 Metre score is now 184C, with 110 confirmed !

Other Bands

Principally 80 Metres, where things have been quite good.

N. C. Smith fancies he heard ZK2AA at 0750 on CW, but sigs were just too weak to be sure. CT3AN, VE, W and 10 ZL's were easy, as were KV4BB, VO6T, VP65D, and W's on Phone.

Norman heard G3HLS working AC1AA on 14 Mcs CW and Phone. He suggests it may be a UM8 under cover in Tibet, on his way through the Iron Curtain !

Other "gen" which has strayed from 20 is of VK1HM, on Phone around 1450, very difficult, through the QRM. W's were heard calling HL1MV (Phone-1330), YI2KE, active shortly, is the wife of YI3WH. Norman hears rumours of VR6 activity, which sounds interesting says KL7GO is active on 40 CW and just missed ZC5VS (1600) on that band. Bad luck.

K. J. Gurney talks of "a little 80 Phone DX," by which he means CM9AA, HR1BG, KV4, OY3PF, VP3CJ and VP9BDA !

D. L. McLean heard lots of W's and a 4X4 on 80 Phone, and did even better on 21 Mcs where he snagged CR4AI (1630), FF8GP, VQ2, 4, ZD9AA (1455), ZE2JK, VE, PY and numbers of Africans.

P. M. Crawford got AP2L, PJ2AD and ZD9AA on 21 Mcs CW.

J. L. Hall pulled in some impressive CW on 80, his pick being VSTNG (0055), ZS2A, 2HI, 3K, CE3AG, 4AD, VQ4CW, 4HJP, FF8AG, VP9BF, LU4ZI (Deception Islands), VP8AP, W6RW, and 15 ZL's.

R. Goodman heard lots of American Phone DX on 80, but his plum was YN1WC, heard at 0445 on SSB, working W4's.

H. Lee, using the same band, heard VO6I, VE1CR, 4X4AT and a couple of strange characters, MR7P and DY6T, talking with American accents and discussing teleprinters !

P. M. White hears a KP4 net—4AC, 4ES, 4ID and 4RC regularly around 3910 kcs. VO and VE also come in well.

R. Balister took a quick look on 21 Mcs and caught VQ4RF on Phone (1530).

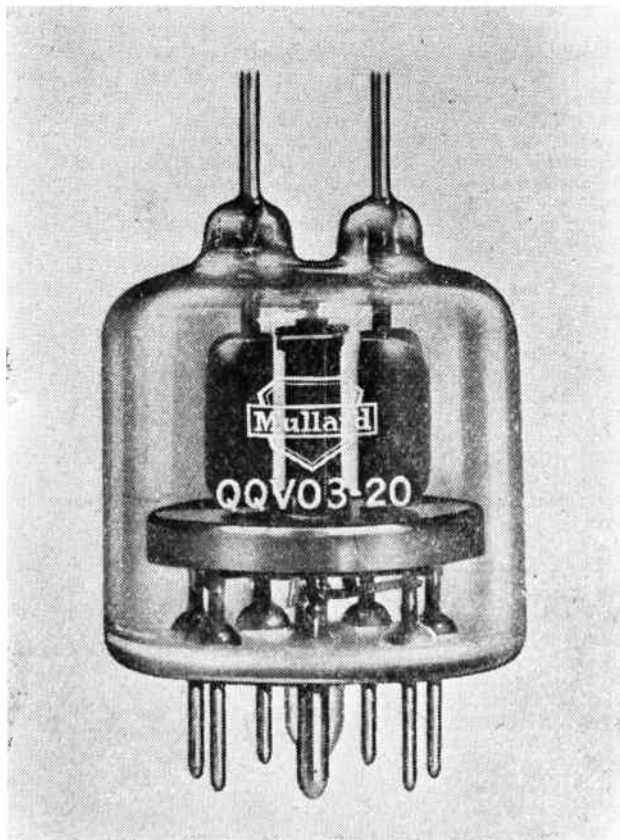
And that terminates the proceedings for another month. For the benefit of those of you who like a little advance notice, we give the deadline for reports for the next two months. Please send your "gen" to reach the address below by the first post on April 8th and May 8th, for the next two issues.

Roker House, South Cliff, Roker, Sunderland, will do the trick.

TRADE REVIEW

MULLARD QQVO3-20

*A new RF Power
Double Tetrode
suitable for the
UHF's*



A new high performance Double Tetrode, especially suitable for use on the new UHF wave bands, recently allocated for Business Radio, Radar-Sonde and Television-Link equipment, as well as the 70 cms amateur band, is now being marketed by the Communications and Industrial Valve Department of Mullard Ltd. It is the QQVO3-20, and is intended for wide-band operation as an RF class "C" power amplifier or multiplier in low-power mobile transmitters working at frequencies up to 600 Mcs. At 200 Mcs the new valve is capable of providing a power output of 42 watts. Under reduced input conditions, 22 watts can be obtained at 400 Mcs and approximately 12 watts at 600 Mcs. As a result of new and important design features the QQVO3-20 has the outstanding advantages of high anode efficiency, excellent power gain, low filament consumption and small physical dimensions. In addition, being of the all-glass technique, it does not require the complex circuitry that is normally associated with existing UHF valves of this class. Its small

size and low power consumption makes the new valve of particular value for use in compact mobile communications equipment. It is constructed on the B7A base.

Operation as Class "C" Push-Pull Amplifier for CW Telegraphy or for FM

Limiting Values

V _a max.	.. .. .	600 V
p _a max.	.. .. .	2 × 10 W
V _{g2} max.	.. .. .	250 W
p _{g2} max.	.. .. .	2 × 2 W
p _{g1} max.	.. .. .	2 × 0.5 W
I _k max.	.. .. .	2 × 55 mA
I _k (pk) max.	.. .. .	2 × 250 mA
V _{g1} max.	.. .. .	-75 V
R _{g1-k} max. (fixed bias)	.. .. .	50 Kohms
R _{g1-k} max. (auto bias)	.. .. .	100 Kohms
Max. temperature of pins	.. .. .	180°C.

Full technical data on the QQVO3-20 can be supplied on request from the Communications and Industrial Valve Department, Mullard Ltd.

STRICTLY FOR THE BEGINNER

by O. J. RUSSELL, G3BHJ

Part 5—FURTHER STEPS IN MODULATION

The simple choke modulation system previously discussed, is capable of perfectly good results. In case doubt is expressed, several amateurs have been personally known to have used such systems, and the writer has used it on several different rigs in the past, and as it so happens is currently employing Heising choke modulation at the moment. In fact correctly adjusted, one can obtain 100% modulation as previously explained, and no magic improvement for the same carrier power would be obtained by investing in the most modern push pull Class B modulator. Of course with a Class B modulator one would have far more audio available thus enabling a higher carrier power to be used, but within the power limits of available Class A modulator tubes, choke modulation does enable a perfectly reasonable carrier to be modulated as well as by the more elaborate systems. As discussed a single 6L6 can be induced to modulate a PA running at some 20 watts input.

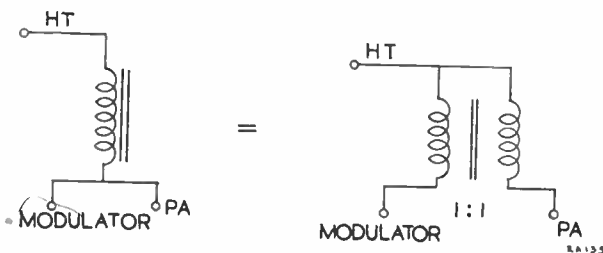
secondary) to the output (using the mains input side), so that matching is difficult.

This brings us to the weak point of the choke coupled Heising modulator, which is that matching is not possible in the simple form previously discussed. Effectively, the "transformer ratio" of the choke is one to one. Electrically speaking in fact, the choke is an auto-transformer of 1 : 1 ratio, and Fig. 1 shows how electrically the choke may be represented as a 1 : 1 transformer. Fundamentally, the Heising choke modulation system is in fact a "genuine" transformer coupled system! This immediately raises the question of a tapped choke. Clearly a tapped choke may be used also as an auto transformer, and the taps would enable impedance matching between the modulator valve and the PA to be effected. To take a simple case, a centre tapped choke can be regarded as the equivalent of a 2 : 1 transformer, and in Figure 2 we see how such a choke may be used as a two to one step up transformer. Electri-

Fig. 1

CHOKE COUPLING IS IDENTICAL TO THE USE OF A ONE TO ONE TRANSFORMER.

Electrically the choke is a unity ratio auto-transformer



The above argument is not without significance, as we are not all blessed with wealth sufficient to purchase all the trimmings for an elaborate high output modulator complete with massive modulation transformer.

Eventually we may all arrive at such a set up, but in the meantime the exercise of a little ingenuity can enable excellent if somewhat more modest results to be obtained at small cost! One favourite piece of ingenuity practiced by amateurs is the "mains transformer" modulator. It is possible to use a mains transformer in a pukka push-pull modulator circuit, and again many amateurs have used this principle. Unfortunately however where most transformers fall down is in the fact that the usual run of mains transformer voltages when used in this way provide a rather excessive step-down ratio from the push-pull side (using the high voltage split

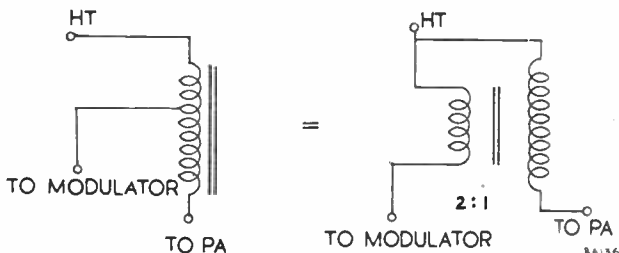
cally, such an arrangement is an exact equivalent of a 2 : 1 step up transformer, and its efficiency is precisely the same as any normal transformer with two windings.

It is thus clear that all that is needful to make the Heising choke modulator into a modulator capable of impedance matching the modulator to the PA, is a nice husky tapped choke with a generous inductance, a nice fat core and consequently the ability to handle several watts of audio. Tapped chokes of this type are not readily available, but the tapped primary of an ordinary mains transformer does provide the tapped winding having the requisite properties for a passable modulating device. As a mains transformer is usually capable of handling quite a number of watts of power at 50 cycles, most small transformers will be found serviceable. It is true that in their proper function as mains trans-

Fig 2.

A centre-tapped choke may be used as a 2:1 transformer.

Electrically it is a 2:1 auto-transformer, and is equivalent to a conventional 2:1 transformer with two windings.



formers, the presence of a steady direct current from the modulator valve and PA was not reckoned in the design! Hence if a choice is possible select a fairly husky component! A further possibility is to use one half of a high voltage winding in conjunction with the tapped primary to extend the range of impedances that can be matched.

Thus if a tapped primary rated for 200 volts, 230 volts and 250 volts is available, the step up ratios available are 200 : 230 (= 1 : 1.15 step up), 200 to 250 (= 1 : 1.25) and also 230 to 250 (= 1 : 1.09 approx.). Conversely the primary taps can be used to give step DOWN ratios of 250 : 230 (= 1 : 0.92), 250 : 200 (= 1 : 0.80) and 230 : 200 (= 1 : 0.85 approx.). Thus the availability of two taps provides for seven different transformer ratios (including the 1 : 1 condition as with a plain choke). The lowest ratio available is 1 : 0.85 (step down), while the highest ratio is 1 : 1.25 (step-up). In terms of impedance matching, if RL is the load impedance that is required by the modulator valve, then the lowest impedance we can exactly match is given by RL multiplied by (0.85)², and the highest impedance we can exactly match is RL multiplied by (1.25)². As (0.85)² is 0.723 approx., and (1.25)² is 1.56 approx., this enables a useful degree of impedance matching to be achieved. With a modulator valve requiring a load resistance of 5,000 ohms, we can match into PAs presenting impedances from some 3,600 ohms up to some

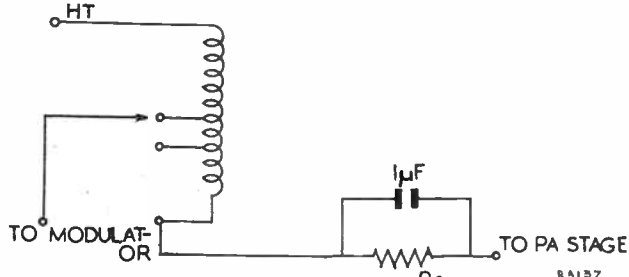
7,500 ohms merely by selecting the correct combination of taps. Furthermore, even if an exact match is not possible, we can achieve a much closer and efficient match than is possible with a plain choke. If we happen to have a spare mains transformer handy, then we may achieve a quite efficient well matched modulation system for say a 20 watt rig at no expense at all! Listen on the top-band some time to G2BFQ, who uses a mains transformer to match his modulator to the PA.

Incidentally, it should be explained that the impedance presented by the PA is calculated quite simply from Ohms Law. The PA is regarded simply as a resistance, so that the anode voltage applied to the PA divided by the plate current in milliamperes gives the impedance in thousands of ohms. To take an example, a top-band PA or crystal oscillator drawing 35 Ma at 260 volts is a load of 7,430 ohms. If we modulate this with a 6V6 requiring a load resistance of 5,000 ohms, the tap position giving 7,500 ohms will be a very precise match. In fact as a Class C PA is for all intents and purposes a purely resistive load to the modulator, it is substantially constant over the whole range of modulation frequencies. This is in marked contrast to such items as loudspeakers, and headphones whose effective load impedance varies greatly over the audio range. Consequently the problem of effectively matching a modulator to a

(Contd. on page 158)

Fig 3.

The voltage tappings on a mains transformer primary enable a modulator to be matched to a P.A. stage. Even if full matching cannot be achieved, a more favourable match than with a plain choke may be obtained.



CLUB NEWS

Club Secretaries are invited to submit notes for this feature by 6th April, for inclusion in next month's issue.

Chester and District Amateur Radio Society. Hon. Sec.: Norman Richardson, 1 Victory Villas, Upton, Chester.

The Club meets every Tuesday at 7.30 p.m. in the Tarran Hut, Y.M.C.A. Grounds, Chester. Newcomers will be especially welcome. We have one of the finest clubs in the North-west. Our exploits are well known; last year we were co-winners of the M.C.C. on the receiving side we got a 1st and 3rd prize in a competition run by the N.W. Radio Association.

We also came 4th in the RSGB regional low power field day, just to mention a few of our achievements. Twice we have made (and have had) recordings for the Voice of America played over their networks.

The Club call, G3GIZ. O.K. on C.W. but rebuilding on phone. The Tops C.W. Club meets in our H.Q. quite often.

G2YS is one of our most respected members, his exploits are well known. Others of mention include 2ATZ 3HPM, GW3HEU and G3IEG for one of the sweetest "Keys" you ever heard. New licences include 3IT7 and G.W. 31WM. A new member is Chippy Carpenter ex-MD2B. Club strength is 33 including 11 calls. I hope you can make sense out of these hurried few lines and would appreciate it if you could give us a write up with the information in these few lines.

Also on Friday, April 10th, at 7.45 we are holding our annual dinner at the Bars Hotel, Chester. Tickets can be obtained from me, price 9/-, all radio amateurs are welcome.

Barnsley and District Amateur Radio Club. Hon. Sec.: P. Carbutt, G2AFV, 33 Woodstock Road, Barnsley, Yorks.

On Friday, March 13th, an interesting and very useful explanation of Class A, B and C amplification was given by Mr. W. Lee. (G6LZ).

Future Lecture: April 10th, General Survey of T.V.I., by D. Westwood, B.Sc. (G8WF). *Lecture Rooms,* King George Hotel, Peel Street, Barnsley.

Southend and District Radio Society. Hon. Sec.: Mr. Chapman, 20 Leigh Hill, Leigh-on-Sea, Essex.

On Friday, March 6th, Mr. B. R. Webster gave his talk on "Commercial Receivers." His discussion of Diversity Reception, Gate Circuits, Double Frequency Changing and the like was most illuminating. Such methods will, I think, remain a desirable but unattainable goal for most amateurs.

On Friday, March 20th, Mr. S. F. W. Asquith, A.M.Brit.I.R.E., A.M.Inst.E., gave us a talk on "The Principles and Use of the Cathode Ray Oscilloscope" with practical demonstration. This was most interesting and instructive.

Mr. Asquith will also shortly be giving us a talk on "Methods of Frequency Measurement" with practical demonstration. Later on he hopes to show us a 420 Mcs. oscillator to illustrate the use of Lecher Wires.

This Society owes a deep debt to the four masters of the Municipal College for their kindly interest and help.

The dates of our proposed visits to the Telephone Exchange and to the Power Station will be announced in our next circular.

Do not forget to have your construction programme well in hand for the competition for the Hudson and Pocock Cups in April.

A sub-committee is now arranging details for the Hamfest in May.

Also fast approaching is the National Field Day, early in June. This year it is intended to have an "A" station in Thundersley Glen and a "B" station at Hockley. A special transmitter is now in course of construction.

Tops CW Club. Hon. Sec.: J. P. Evans, GW8WJ, 2 Ffordd Ty Newydd, Meliden, Flintshire.

Firstly, don't forget the Midlands Topfest at the "Black Horse" Wolverhampton on the 11th inst.

Other topfests will be arranged for the North-west, at Chester, in August or September and for the South, at Guildford, in the autumn. Watch these columns for further details.

April "QMF" will contain two antenna tips and also a tip on eliminating key-clicks. There will also be a complete write-up on our recent "Flood Fund" organised amongst Tops home members. There was an excellent response and we were able to give assistance to three Hams who suffered loss to gear during the floods. Copies of the RSGB "Bull" were also forthcoming from G3CKL, 3GLV and QW8WJ, to replace "Bulls" damage or lost in the flood water.

The membership has now reached 250 and is still growing. Call-sign badges at 5/- apiece have been selling like hot cakes and have even been on demand by our overseas members, OH2YV, DL3MO, DL7AH, CN2AN E19Y, E175.

George Haylock 2DHV reports that he too has contributed articles to the "Radio Amateur." Some of you may have noticed that our president Angus Taylor, 8PG published an article on "GDO" in last February copy of "Radio Amateur."

Slade Radio Society. Hon. Publicity Officer: M. D. Fowler, 25 Crossway Lane, Perry Barr, B'ham, 22B.

In February there was a film show which included items of general interest as well as more technical ones. This was well attended by members and visitors. On March 6th, there was a lecture on Radio Fundamentals, which covered the basic theory of valves and cathode ray tubes.

The preliminary arrangements for the coming season's D/F contests have now been completed. The double midnight D/F contest introduced last year will be held again this year.

On April 17th, there will be a lecture and demonstration of an Electric Guitar. This will be held at the Church House, Erdington, commencing at 7.45 p.m. Visitors will be welcome.

The morse class continues to be held from 7-7.45 p.m. before each meeting. Further details may be obtained from the Hon. Sec.

Cambridge and District Amateur Radio Club. Hon. Sec.: T. Davies, G2ALL, Meadow Side, Camberton, Cambridge.

The April meeting of the Club takes place at the Jolly Waterman, Cambridge at 8 p.m. on April 10th, 1953.

Subject for the evening is a talk by Mr. P. A. Tremaine, G8PE, on Television Interference.

East Surrey Radio Club. Hon. Sec.: L. G. Knight, Radiohme, 6 Maderia Walk, Reigate, Surrey.

At the February meeting held on 26th at club H.Q. an interesting lecture was given by the Club Treasurer Mr. Dennis Lloyd on a home constructed electronic timer.

A further lecture has been promised by Mr. S. E. Martingelle, G2MV, to take place at Club H.Q. on April 22nd, when he will lecture and demonstrate the Polar diagrams of popular beam aeriels.

Torbay Amateur Radio Society. Hon. Sec.: L. D. Webber, G3GDW, 43 Lime Tree Walk, Milber, Newton Abbot.

At the last meeting, Tom Smith, G3EFY. (C.R. for Devon) demonstrated an automatic control unit which is used by Gordon Martin, G3GWH, to control his 144 and 430 Mcs transmitters and receivers. A modified form of telephone dialling is used.

G3EFY also discussed the technical operation of the four main types of relays used in amateur radio work, and showed a number of stripped-down types.

Region nine representative Herbert Bartlett, (G5QA), was also present at the meeting.

The Society hopes to co-operate with the local RSGB

group in respect to NFD, and plans to help with the organisation of the RSGB Hamfest which this year, will take place in Torquay during the autumn.

At a meeting held on March 21st, it was discussed how the Society could co-operate with its RSGB members in the matter of manning the two NFD stations usually maintained in the Torbay area.

In view of the shortage of available qualified operators it was decided this year to maintain only the "A" station, which will be operated on 1.7 Mcs and 7 Mcs at Milber Downs under the call G3GDW.

A committee of four members was formed to enquire into the possible date, time, and place of the Devon Hamfest, due to be held this year in the autumn at Torquay. Suggestions as to the type of programme are welcomed from all members of the Society.

The AGM of the Society will be held at the next meeting, on April 18th, 1953, when there will also be a Junk Sale in aid of the Society funds. Members are asked to bring all their unwanted junk on this date.

The Society meets at 7.30 p.m. on the 3rd Saturday in each month at the YMCA, Torquay, and visitors are always welcome.

Coventry Amateur Radio Society. Hon. Sec. : K. Lines, 142 Shorncliffe Road, Coventry.

The Society has been pleased to welcome several new members during the past few weeks, and plans for a varied programme for the summer months are being finalised. This will include BBC visits, a MARS/CARS Field Day and a social event of great importance, as well as lectures and demonstrations.

The MARS/CARS Annual Inter-Club Contest will take place on April 19th, when Coventry hope to regain the trophy from Birmingham.

Club Night-on-the-air continues on the 2nd Thursday of each month, and is a popular event, usually mustering 10 or more stations on Top Band.

The 21st annual dinner, which took place on February 27th, was very well attended, and members, with their wives and guests, enjoyed a happy evening.

Future programme at the YMCA, Queen's Road, at 7.30 p.m., is as follows :— April 13th : "Readers' Digest". April 27th : "A Multipurpose Power Supply" —lecture and demonstration by Ray Bastin.

The Television Society. Hon. Lecture Sec. : Mr. G. T. Clack, 43 Maudeville House, Notre Dame Estate, S.W.4.

Thursday, April 9th : "Aspects of Television Programme Planning" Cecil Madden, M.BE (BBC Television). Friday, April 24th : The Fleming Memorial Lecture.

Admiralty Electronics Society. Hon. Sec. : W. J. Green, G3FBA, c/o Electrical Engineering Dept., Admiralty, Bath.

The February 3rd, meeting was held at the Beau Nash Rooms, and the talk given by Dr. A. A. Robinson of Messrs. Ferranti's on Electronic Digital Computers. The talk was decidedly "un-electronic" and dealt with the use of binary notation and the various types of storage, with particular reference to the so-called "Electronic Brain" at Manchester University. At the

conclusion, the vote of thanks was proposed by Sir Hamish Maclaren, director of electrical engineering, Admiralty, who complimented the lecturer on the successful manner in which he presented such a new and highly technical subject.

On February 27th, Mr. R. Heath, chief engineer, Messrs. Peto Scott Instruments, assisted by Messrs. Knight and Shearing, presented a talk entitled "Television from the Manufacturers' point of view." Details of the make-up of costs, etc, and the amount per set which was left for research, were given and the difficulties of economic manufacture of components and TV sets were given with great lucidity. At the conclusion, the vote of thanks was proposed by Mr. J. E. Barrett, who thanked Mr. Heath and his staff who had provided such a detailed talk and had gone to great pains to bring a generous display of equipment from the works. This session concluding meeting will be on April 8th, when Dr. Vaughan Jones of Messrs. Ferranti Ltd., will give a lecture on "Colour Television."

G6UR is now active on 7 Mcs, mainly early in the mornings and 'ZZR and '3FBA are active on "Top Band" '2AWA is active on 80 when at home—mostly alternate weekends.

East Grinstead and District Amateur Radio Club. Hon. Sec. : L. E. Miller, 30 Forest View Road, East Grinstead, Sussex.

At the Annual General Meeting held on Thursday, March 12th, at Portland Hall, Mr. R. A. Lord was re-elected Chairman. It was decided to continue the morse instruction classes and the lectures on transmitter theory.

Meetings are now to be held every Thursday evening at 7.30 and a series of lectures on fault-finding, accompanied by practical demonstrations, are to begin shortly.

An ambitious programme is envisaged for the coming year, it is hoped therefore that it will attract many new members.

South West Essex Radio Society. Hon. Sec. : B. W. Le Grys, G3GOT, 75 Shaftsbury Road, Romford, Essex.

Meetings are held weekly at 367 Rush Green Road, Romford on Tuesdays at 8 p.m. These meetings are very informal and we invite any interested persons to come along and have a "natter." The club transmitter can be heard on Top Band fone and CW under the call G3FZF on club nights and at irregular intervals during the week.

Bradford Amateur Radio Society. HQ : Cambridge House, 66 Littel Horton Lane, Bradford.

The Society is coming to the end of another successful season, and is now looking forward to the summer season. The RSGB members of the Society are operating two stations for National Field Day and we look forward to seeing and making the acquaintance of any local enthusiasts during the weekend, June 13th, 14th.

The Society meets fortnightly on Tuesdays at 7.30 p.m. and each meeting is preceded by 30 minutes of morse instruction. The next meeting dates are April 14th, and 28th, and May 12th.

Anyone wishing to join the Society is invited to attend one of the above meetings at Cambridge House, Little Horton Lane, Bradford, or to communicate with the secretary, Mr. A. R. Bailey, (G3IBN), Scarr Croft, Parkside, Bingley.

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DATA PUBLICATIONS
57 Maida Vale, London, W.9



Further Steps in Modulation.*(Contd. from page 154)*

Class C stage is straightforward and minor mismatches of impedance values can be tolerated.

Incidentally, the stage considered, taking 35 Ma at 260 volts, represents a power input of 10.1 watts! This can be fully modulated by the 6V6 which can provide $5\frac{1}{2}$ watts of audio with 300 volts on the plate, and as previously described, the HT to the modulated stage can be cut by a by-passed series resistor to the operating value. Again, the 6L6 can provide 11 Watts audio and reference to the valve data book, will reveal that it then requires a load of 4,200 ohms. Applying the same reasoning as before, this will match into loads from 2,900 to 6,570 ohms with the tap system described.

BOOK REVIEW

TELEVISION PICTURE FAULTS. By John Cura and Leonard Stanley. 68 pages, 150 actual screen photographs, over 16,000 words. Price 3s. 6d. Published by Television Times Ltd.

Messrs. Data Publications (Amalgamated Short Wave Press, Ltd.), 57 Maida Vale, Paddington, London W.9, are the sole radio trade distributors of the book.

This excellent collection of John Cura's "Tele-Snaps" is designed to appeal to the non-technical home viewer and the technician alike; its two-fold objective is undoubtedly achieved. It is excellently produced, great pains obviously having been taken to secure clear reproduction of both text and photographs.

Twenty-three chapters provide considerable information on almost every abnormal condition one is likely to encounter in picture reproduction. The first describes how to tune a receiver correctly on a picture signal; the second shows tuning procedure with the aid of Test Card "C." There follow nine chapters dealing with Control Faults, covering Picture Proportions, Brightness, Contrast, Focussing, Line and Frame Hold, Line and Frame Linearity, and Limiting. Later chapters discuss Scanning Coil faults, Picture Positioning, Tube faults, Magnetic Distortion, Time-base Faults and Miscellaneous Faults. The following five chapters are concerned with Interference and cover electrical apparatus, electro-medical apparatus, car-ignition, aircraft flutter and RF radiations, and the final chapter illustrates correct reception by means of actual screen pictures.

John Cura and his co-author Leonard Stanley have divided these chapters into several parts, each dealing with a particular aspect of a specific fault. Their written descriptions of the faults depicted in the "Tele-Snaps" are clear, yet free from irrelevant matter or confusing technical terms. A feature of the text is that the material most likely to be understood by the non-technical reader is printed in heavy type, while the more technically-minded are given their information in lighter type. The book concludes with a useful Glossary of Control Names, and a sensible Index.

The authors' claim they are able to give only a brief guide to each fault. Having regard for the amount of information they have collected within the covers of a very reasonably-priced book, one must acknowledge the modesty of their claim.

Ground Plane Aerial.*(Contd. from page 127)*

For tuning and coupling to the transmitter, reference can be made to the various amateur radio handbooks, as the ground plane behaves in this respect like a dipole with tuned feeders.

Results

In order to make comparisons, the author used two dipoles at right angles to each other and his ground plane, in a series of tests on 14 Mcs. These indicated a definite superiority of the ground plane over the best direction of the dipoles, for DX working. It was far and away better than the dipoles in their worst radiation paths. The three aeriels were so arranged as to be immediately interchangeable so that good comparisons could be made.

For distances up to 3,000 miles the ground plane was either equal to or slightly less (one S point) which was to be expected due to the low angle radiation. For DX, however—distances over 3,000 miles—the ground plane is astonishingly good. One example may be quoted. Many tests with VS6 indicated that on the best dipole signal strength was S4; while the ground plane gave S6 to S7. Another phenomenon often encountered was that the ground plane was much less subject to either quick or slow fading so often met with in DX work. Funnily enough, the ground plane seems best during bad to moderate conditions. During really good DX conditions, there seems to be little or no difference between the dipoles and the ground plane.

One word in conclusion about the use of the ground plane as a receiving aerial. By means of a relay in the link line, the ground plane can be connected to the receiver as well as to the transmitter and the results are such as to make it well worth doing. Short skip signals as so often encountered during summer evenings on 14 Mcs are attenuated by 1 to 2 S points, while the weak F2 layer DX signal is increased by 1 to 2 S points thus giving a relative increase of 2 to 4 S points. The old saying goes "You can't work them if you can't hear them," but if you can hear them before the other stations have noticed them, you are certainly ahead of your competitors, as the author has often found out.

Do try a ground plane for DX. It is easily erected, easy to tune and a real beauty for DX.

SHORT WAVE BROADCAST STATION LIST

(T) denotes Tentative Frequency or Station Under Construction.
(V) denotes Frequency liable to Variation.

(E) denotes Experimental Channel.
(I) denotes Inactive at the time of publication.

Kcs.	M.	Call.	Location.	Kcs.	M.	Call.	Location.
2200	136.0	TGAR	Guatemala City, Guatemala.	3430	87.46	YVLI	Maracay, Venezuela.
2260	132.7	YDB	Djakarta, Java.	3435 (V)	87.34	YUD3	New Delhi, India.
2300	130.0	YDG2	Surakarta, Java.	3440	87.21	YVMC	Maracaibo, Venezuela.
2320	129.3	YDL2	Padang, Sumatra.	3460	86.71	YVLD	Valencia, Venezuela.
2335	128.5	YD16	Djember, Java.	3469	86.46	APL	Lahore, Pakistan.
2340	128.2	ZYV30	Uberlandia, Brazil.	3470	86.46	YVQI	Barcelona, Venezuela.
2350	127.7	YDW	Pontianak, Borneo.	3480	86.21	YVLE	Puerto Cabello, Venezuela.
2370	126.5	YDG6	Madiun, Java.	3490 (V)	85.96	CR7AB	Lourenco Marques, Mozambique.
2390	125.5	YDN	Kutaradja, Sumatra.			YVRA	Maturin, Venezuela.
2415	124.2	YDA2	Bandung, Java.			APL	Lahore, Pakistan.
2430	123.0	YDK2	Palembang, Sumatra.	3495	85.84	YUD2	New Delhi, India.
2450	122.4	YDJ3	Djogjakarta, Java.	3520	85.16	YVLG	Maracay, Venezuela.
2467	122.0	YD13	Surabaya, Java.	3550	84.51	YVOC	San Christobal, Venezuela.
2480	121.0		Araraquara, Brazil.	3660	81.97		Shenyang, China.
2500	120.0	WWV	Washington, U.S.A.	3850	77.92	EQO	Teheran, Iran.
		MSF	Rugby, England.	3860	77.72		Cape Town, South Africa.
		YDH	Semarang, Java.	3900	76.92		Hyderabad, India.
2510	119.5	HLKB	Pusan, South Korea.	3915	76.63	APL	Lahore, Pakistan.
2830	(V) 106.0	HC5FX	Cuenca, Ecuador.	3930	76.34		Rome, Italy.
2880	104.2	GRC	Daventry, England.			EPP	Teheran, Iran.
3130	(V) 95.84	YSIA	San Salvador, El Salvador.	3945	76.05	VUD6	New Delhi, India.
3200	93.75		Frederikshaab, Greenland.			YDH2	Semarang, Java.
3205	93.66	FIQA	Tananarive, Madagascar.	3955 (I)	75.85	HVJ24	Vatican City.
		YDD	Djakarta, Java.	3960	75.75	YDL	Padang, Sumatra.
3230	92.88	YDS	Menado, Celebes.				Salamanca, Spain.
3240	92.59	YDI	Surabaya, Java.	3965	75.66		Paris, France.
3250	92.31	VUD	New Delhi, India.	3970	75.57	VUD	New Delhi, India.
3251	92.28		Dar-es-Salaam, Tanganyika.			EQO	Djeddah, Saudi Arabia.
3255	92.17	ZYR62	Marilia, Brazil.	3980 (I)	75.38	EQO	Teheran, Iran.
3265	91.87	ZYK21	Recife, Brazil.			YDI2	Surabaya, Java.
3270	91.75	YDM	Bukittinggi, Sumatra.	4000	75.00	JJY	Kemigawa, Japan.
		VP4RD	Port of Spain, Trinidad.	4052 (I)	74.01	YNJJ	Jinotepe, Nicaragua.
3275	91.60	ZYR31	Bauru, Brazil.	4200 (V)	71.43	HC5AO	Cuenca, Ecuador.
		ZQP	Lusaka, Northern Rhodesia.	4203	71.38	HC4AS	Bahia, Ecuador.
3277	91.54		Srinagar, Kashmir (India).	4285 (V)	69.65		Pyongyang, North Korea.
3290	91.19		Johannesburg, South Africa.	4470	67.12	HCINE	Quito, Ecuador.
3295	(T) 91.04		Rio de Janeiro, Brazil.	4580 (V)	65.59	HC4FF	Emeraldas, Ecuador.
3300	90.90		Kaduna, Nigeria.	4590 (V)	65.37		Pyongyang, North Korea.
3310	90.63	YVOG	Trijillo, Venezuela.			HC2AJ	Agana, Guam (AFRS).
3320	90.36	ZEAF	Salisbury, Southern Rhodesia.	4651	64.50	HC2AJ	Guayaquil, Ecuador.
		YVQV	Barcelona, Venezuela.	4675 (V)	64.17	HC2BK	Guayaquil, Ecuador.
3325	90.24	APD	Dacca, Pakistan.	4705 (V)	63.76	HC6BT	Ambato, Ecuador.
		ZYJ21	Campina Grande, Brazil.	4713 (V)	63.70	HC2GI	Guayaquil, Ecuador.
3330	90.09	YVQL	El Tigre, Venezuela.	4750 (V)	63.16	HC1BF	Quito, Ecuador.
3332	90.00	YDG	Surakarta, Java.	4752	63.14	YVMA	Maracaibo, Venezuela.
3335	89.86	VUD6	New Delhi, India.	4755	63.10	ZYV3	Campinas, Brazil.
			Srinagar, Kashmir (India).	4760	63.03	YVKV	La Guaira, Venezuela.
		APL	Lahore, Pakistan.	4765 (V)	62.96	HC4FA	Portoviejo, Ecuador.
		ZYR59	Presidente Prudente, Brazil.	4768 (V)	62.93	HJEF	Cali, Colombia.
3340	89.82	YVMU	Carora, Venezuela.	4770	62.89	YVMV	Punto Fijo, Venezuela.
3345	89.68	DZB2	Manila, Philippines.			CR6RI	Dondo, Angola.
		ZYN22	Salvador, Brazil.			HC5SB	Rilbamba, Ecuador.
3350	89.55	YVKU	Caracas, Venezuela.	4775	62.83		Rangoon, Burma.
		YDP2	Medan, Sumatra.			HJGB	Bucaramanga, Colombia.
3356	89.39		Johannesburg, South Africa.	4777	62.79		Taegu, South Korea.
3360	89.34	ZQI	Kingston, Jamaica.	4780	62.75	YVLA	Valencia, Venezuela.
3365	89.15	VUD2	New Delhi, India.			ZOY	Singapore, Malaya.
		YDQ	Makassar, Celebes.			HC1PM	Accra, Gold Coast.
3370	89.02	YVMJ	Maracaibo, Venezuela.			HC4OF	Quito, Ecuador.
			Johannesburg, South Africa.	4783	62.72	HJAB	Chone, Ecuador.
3378	88.81	YVQO	Puerto la Cruz, Venezuela.	4785	62.70	ZYM8	Barranquilla, Columbia.
3380	88.76	YDO	Bandjarmasin, Borneo.	4790	62.63	YVQC	Sao Luiz, Brazil.
3390	88.50	YVKX	Caracas, Venezuela.	4795	62.62	YVQ8	Ciudad Bolivar, Venezuela.
		YDA	Bandung, Java.	4797	62.57		Zanzibar, Zanzibar.
		QQ2AC	Elisabethville, Belgian Congo.			HJFU	Armenia, Colombia.
3395	88.34	APK	Karachi, Pakistan.			YSDR	Santa Ana, El Salvador.
3400	88.24	YVKP	Caracas, Venezuela.	4800	62.50	YVMF	Maracaibo, Venezuela.
			Port Stanley, Falkland Islands.				Johannesburg, South Africa.
			Cabimas, Venezuela.			HC4HV	Paris, France.
3410	87.97	YVML	New Delhi, India.				Jipijapa, Ecuador.
3420	87.72	VUD2	New Delhi, India.			ZYS8	Lagos, Nigeria.
		YVOK	Merida, Venezuela.	4805	62.43	HJDU	Manaus, Brazil.
		CR7BM	Lourenco Marques, Mozambique.			ZYR61	Medellin, Colombia.
3425	(E) 87.59	CR8AB	Goa, Portuguese India.				Taubate, Brazil.

(TO BE CONTINUED NEXT MONTH)

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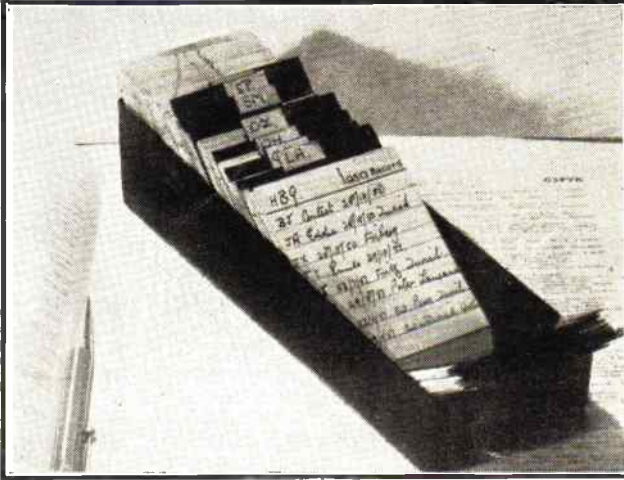
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