THE T&R

BULLETIN

A JOURNAL FOR

RADIO EXPERIMENTERS

Vol. 16 No. 2 AUGUST 1940 (Copyright) Price 1/6

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Government demands for highly sensitive receivers have made it imperative that we ***SUSPEND*** for the time being, the sale of communication receivers to the general public. This does not preclude the sale to amateurs who desire to purchase an instrument for work of ***NATIONAL IMPORTANCE.***

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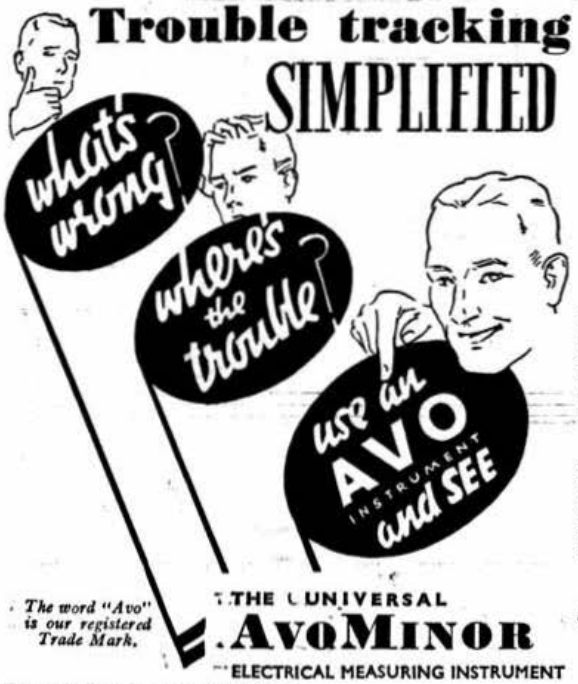

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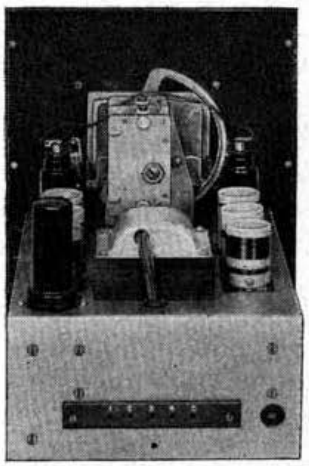

The instrument incorporates the latest all-metal tubes of Raytheon manufacture and is complete with self-contained power pack and full instructions are given for the connection of the equipment to any all-wave or communication receiver. Three wave-ranges cover, with overlap, continuously from 17–200 metres, switch provided. The latest silver-plated Yaxley Switches allow of the instrument being (*a*) switched on and in use ; (*b*) switched off completely and out of use ; (*c*) heater filaments switched on, but instrument out of use, ready for immediate action without waiting for heaters to warm up.

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	300 kc/s.	50,000 kc/s.
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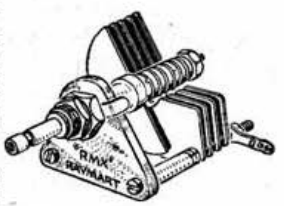
Quartz ...	1.0	1.1
"RMX" ...	4.1	3.2
Micalex ...	11.9	18
Porcelain ...	70	85
Moulded material	100	260

(Calculated from power factor with quartz taken as unity at 300 kc/s.)



STANDARD TYPE			PRICE
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THE T. & R. BULLETIN

OFFICIAL JOURNAL OF THE RADIO SOCIETY OF GREAT BRITAIN

DEVOTED TO THE SCIENCE AND ADVANCEMENT OF AMATEUR RADIO

Hon. Editor: ARTHUR O. MILNE Secretary-Editor: JOHN CLARRICOATS

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CONTENTS

A UNIQUE ACHIEVEMENT

BARELY a year ago the Council were faced with the fact that 3,000 copies of the reprinted first edition of *The Amateur Radio Handbook* had arrived at Headquarters. War was imminent, yet confidence reigned. That there was justification for this sanguinity became apparent six months later when it was reported that the whole of the reprint had been sold.

Then arose a major problem—would the Council be justified in reprinting again or would it be in the best interests of the membership if an attempt was made to prepare a new edition?

It was fully realised that whilst a reprint would command a sale in many quarters the need for a thorough revision was desirable. But how could such a gigantic task be undertaken, bearing in mind that every man Jack of the Handbook Committee was engaged on vital Government work and Headquarters staff was reduced to two members!

However, as many hundreds of readers now know, all obstacles were overcome and less than three months after the first revised chapter had been sent to our printers the new edition was on sale—the precise date was July 23.

This achievement, which we believe will rank as one of the greatest in the long history of the Society, was brought to fruition only through the unflagging energy of the Handbook Committee, who, on many occasions, worked into the wee small hours after a full day's labour in other fields.

The decision to enlarge the scope of the Handbook by the introduction of new chapters covering "Workshop Practice" and "Crystal Band Pass Filters" has already earned high praise from many quarters, whilst the inclusion of much new data on such important subjects as Valve Technique, Frequency Measurement, and Receiver Design more than compensates for the "go slow" order given to the author of the "Transmitter" and "Aerials" chapters. That "order" (self imposed by the Committee) does not mean that these two important chapters have been neglected in the revision, but it *does* mean that for obvious reasons, many new developments which we should like to record, must for the time being remain undisclosed in print.

The Ultra-High Frequency chapters have been subjected to special attention for the reason that this aspect of amateur work is arousing considerable interest among all classes of radio men. To-day, with U.H.F. equipment in common use, it behoves every member to brush up his knowledge of the subject against the time when it may be needed. The Handbook Committee realised when revising these chapters, that a good deal must be left unsaid, but in keeping with their avowed intention of producing a manual as comprehensive as present circumstances permit, they have included as much new material as sagacity reasoned was essential and permissible.

(*Continued on page 60*)

A NOVEL ROTARY 56 Mc. BEAM AERIAL FOR RECEPTION

By L. H. WEBBER (2CPW)

SUBSEQUENT to the construction, early in 1939, of a two-valve quench receiver, a number of aerial experiments were carried out in the 56 Mc. band. The outcome of these tests (brief details of which follow) was the construction of a beam aerial structure which could be employed in either the vertical or horizontal plane and which, in either position, was fully rotatable.

The experiments were carried out with the assistance of Mr. J. Noden (G6TW), to whom the writer expresses his indebtedness. The transmitter at the latter station employed an input of 1·5 watts and was used in conjunction with three different aerial systems, viz., a fixed vertical dipole, a rotatable horizontal dipole, and an 87 ft. horizontal end-on wire. The first aerial employed for reception consisted of a fixed vertical half-wave dipole which was later adapted to allow of its use at will in the horizontal plane, its direction then being N.E./S.W. A second aerial took the form of a half-wave vertical dipole and reflector, the whole rotating through an arc of 180°.

A summary of the results obtained from the three arrangements showed that the addition of a reflector increased signal strength by between one and two "S" points. Further, the controllable orientation of the second system resulted in a definite gain of up to 1·5 "S" points, depending upon the position and type of transmitting aerial. It was obvious that a definite advantage would accrue if the three aerials could be combined into a single system. The problem was finally solved as described.

The Mast

In the original experiments it was necessary to raise and lower the mast in order to carry out adjustments. Therefore to obviate this drawback it was decided to make the new design of the lattice type and strong enough to be climbed. The mast, which is shown in Fig. 1, comprises two lattice sections, each 16 ft. long, with a third section 10 ft. long. The side members are made of 2 in. by 2 in. timber, the cross and diagonal members being 2 in. by 1 in., held together with 2 in. and 2½ in. round wire nails. Although the mast has a base of 2½ ft., greater rigidity would be obtained if this could be increased to 4 or 5 ft. Space limitations, however, did not permit of a larger base being used. The horizontal members in the bottom half were spaced 2 ft. 6 in. apart, and in the upper half 2 ft. At the top of the upper section is fixed a platform, having in the centre a hole slightly larger than the single mast, which carries the rotary beam.

Four feet below the platform is fitted a horizontal cross member, in the centre of which is driven a 4 in. nail pointing upwards and entering the end of the single mast. The top end of the single mast is drilled to a depth of 6in. to take the brass tube, in the bottom of which is placed a ½ in. steel or brass ball. Reference to Fig. 2 will make clear these details.

The Platform

The platform is 15 in. long, 3 in. wide and 2 in. thick. At each end steel bands are fixed, 1¼ in. wide and $\frac{1}{16}$ in. thick. A $\frac{5}{8}$ in. diameter spindle is passed through the centre of the pulley and platform, the securing nut in the platform being fitted flush with the top. The length of spindle below the pulley is about ⅛ in. longer than the depth of the top of the tube to the ball, as fitted in the single mast previously mentioned. The cords operating the rotating gear are taken down the inside of the mast and fastened to a similar sized pulley fitted in a convenient place, about 4 ft. from the base.

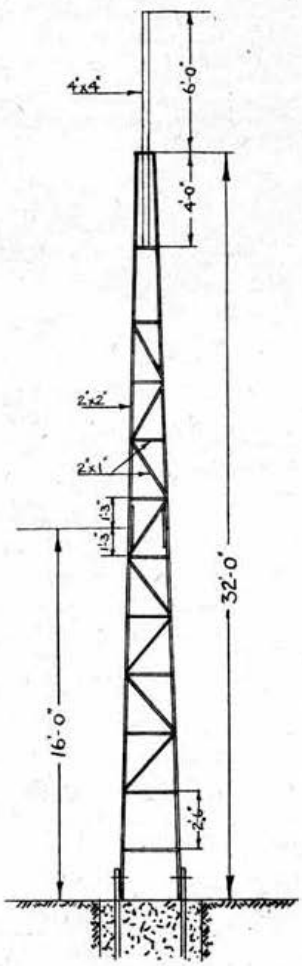

Fig. 1.

Constructional details of lattice mast used for 56 Mc. rotary beam aerial.

The Main Beam

The construction of the main beam, which measures 2 in. by 2 in., can be followed by reference to Fig. 3. It will be noticed that between the two collars the wood has been rounded off for the purpose of facilitating easy rotation from the vertical to the horizontal position.

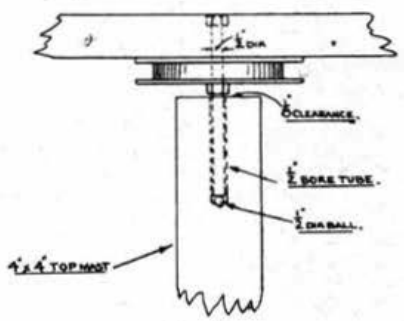

Fig. 2.

Details of bearing used to support rotating element.

Two short arms about 10 in. long are mounted to the outside of one of the collars, at the ends of which cords are fitted. These pass down inside the mast to the base and enable the position of the aerial to be altered as required. The arms are fitted on either side of the collar, one of which points upwards at an angle of 45°, and the other downwards at a similar angle, assuming the aerial is in the horizontal position. Dowel pegs projecting about 2 in. are fitted in the rounded portion of the main beam, and act as stops.

If an arrangement consisting of dipole, reflector and director is fitted, it will be essential to have the top single mast not less than 6 feet clear of the top of the lattice mast, as the point of balance of the main beam brings the aerial proper very close to the mast.

The Aerial and Feeders

The radiating members are made of copper tubing, each arm being 4 ft. 1 in. in length, suitably mounted on porcelain stand-off insulators, a gap of 6 in. being left in the middle. The "Y" portion, terminating in the feeders, is also 6 in. long.

The original feeders consisted of twisted flex dipped in hot beeswax to effect weather proofing, but when these were used a strange effect was noticeable during periods of heavy rain following thunderstorms. A sizzling sound was produced in the telephones; the strength, which was often as high as S4, depending upon the nearness and severity of the storm. The effect gradually diminished as the rain lessened.

The feeders now in use consist of rubber-covered 18 S.W.G. tinned copper wire, of a total diameter of $\frac{3}{16}$ in., and twisted to give approximately 3 turns per 2 in. length. At the point of fanning-out for attachment to the aerial each leg is passed through one half of a rubber ball, as shown in Fig. 3. This arrangement has proved very effective in reducing the peculiar noise referred to, whilst lessening the accompanying drop in signal strength.

Reception was most consistent and satisfactory when the aerial was in the vertical plane, with a vertical dipole in use at the transmitting end. If one end of the link used a vertical and the other a horizontal dipole, the signal strength fell from S8 to S3, but with both aerials in the horizontal plane the average strength was S5 to S6.

Conclusion

The writer will appreciate hearing from other members who have constructed rotary beams for 56 Mc. and higher frequencies. Only by the pooling of electrical and mechanical ideas can the art make full progress.

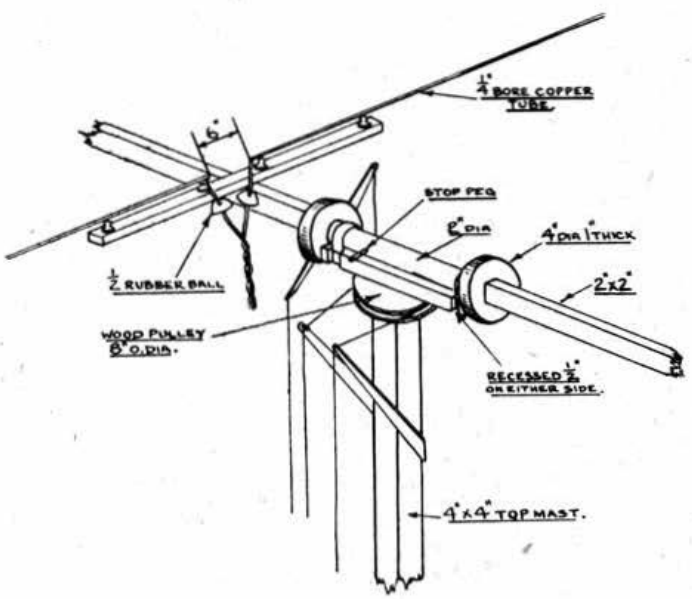

Fig. 3.
Rotating beam assembly.

THE IONOSPHERE & RADIO TRANSMISSION*

PART II

We have pleasure in publishing, by the kind permission of the U.S. Department of Commerce, further extensive extracts from Letter Circular 575. Part I appeared in the July 1940 issue.

Regular Variations of Ionosphere Characteristics

THERE are three principal types of variation of critical frequencies which are fairly regular with time. These are diurnal variations, seasonal variations, and year-to-year variations with the sunspot cycle.

The diurnal and seasonal variations of the critical frequencies of the normal E layer are particularly regular. The critical frequencies vary with the altitude of the sun, being highest when the sun is most nearly overhead. Thus the diurnal maximum of the E critical frequency (fE) is at local noon, and the seasonal maximum is in midsummer. At night this layer usually does not reflect waves of frequencies higher than about 1,000 kc.

The diurnal and seasonal variations of the critical frequencies of the F_2 layer at Washington are quite different from those of the E layer. The winter F_2 critical frequencies exceed any regular critical frequency found during the summer. In the winter a broad diurnal maximum occurs in the daytime, centred around 1.00 p.m. local time. In the summer a broader diurnal maximum centres about sunset. During the night the winter critical frequencies are usually lower than the corresponding summer values. Thus the highest F_2 layer critical frequencies occur during the winter day, and the lowest F layer critical frequencies occur during the winter night; the summer day and night values are between.

The F_2 virtual heights are much lower during a winter day than during a summer day. The F virtual heights at night are about the same in winter as in summer.

The seasonal effects in the ionosphere synchronise with the sun's seasonal position, not lagging a month or two as do the seasons of weather. Winter conditions in the F_2 layer obtain during a period of several months from about October to March, and summer conditions for a period of several months from about April to September. Around the equinoxes there is a transition period of a month or two in which the change occurs between winter and summer conditions; in these transition periods the ionosphere characteristics (except for the effects of sporadic E—see later) fluctuate between winter and summer conditions, and are thus more erratic than during the rest of the year.

There are important changes in ionosphere characteristics in the 11-year sunspot cycle. From the sunspot minimum in 1933 to the sunspot maximum in 1937 the F and F_2 layer critical frequencies doubled (for most hours of the day), and the E layer critical frequencies became 1·25 times as great. A consequence is that the best radio frequencies for long-distance transmission were approximately twice as great in 1937 as in 1933 (except for summer daytime, when they were about 1·5 times as great). In about 1944 they will return to minimum values.

The condition of the ionosphere varies somewhat with latitude. For all latitudes of continental United States the differences from the Washington values appear to be negligible, but the values in Alaska and in the Canal Zone are somewhat different.

Applications to Radio Transmission

From the vertical-incidence critical frequencies and virtual heights of the ionosphere layers, at any given time, it is possible to calculate the upper limit of radio frequency that can be transmitted over any distance. The calculated values of maximum usable frequency are found to agree with direct observation of radio transmission over such distances. The maximum usable frequencies are nearly the best frequencies to use (see "Optimum Frequencies").

When radio waves are transmitted along the earth over any distance they strike the ionosphere obliquely (Fig. 1). Such obliquely incident waves can be reflected back down with lower ionisation densities than can vertically incident waves. It results that the larger the angle of incidence (angle of wave path with the vertical), *i.e.*, the greater the transmission distance, the higher is the upper limit of frequency of waves that can be reflected from a layer of given ionisation density or critical frequency. This upper limit of frequency, for transmission *via* an ionosphere layer for a particular time and transmission distance, is called the maximum usable frequency. It may be calculated roughly, to a first approximation, by multiplying the critical frequency of the layer by the secant of the angle of incidence.

The accurate calculation of maximum usable frequencies from vertical-incidence critical frequencies is complicated. For convenience, typical values for the conversion are given in the following table:—

TYPICAL AVERAGE RATIOS OF MAXIMUM USABLE FREQUENCY TO CRITICAL FREQUENCY (FOR ONE-HOP TRANSMISSION)

	Distance, km.				
	500	1,000	1,500	2,500	3,500
Winter—					
Midnight F ...	1·2	1·5	1·8	2·8	2·9
Noon F_2 ...	1·2	1·6	2·1	2·9	3·4
Summer—					
Midnight F ...	1·2	1·4	1·7	2·4	2·8
Noon F_2 ...	1·2	1·5	1·8	2·5	2·9
Noon F_1 ...	1·3	2·0	2·7	3·6	—
Noon E ...	2·0	3·4	4·4	—	—
Sporadic E* ...	2·5	4·2	5·1	—	—

* *Sporadic E transmission has no critical frequency. The values given are ratios of maximum usable frequency to the approximate upper limit of frequency of the stronger sporadic E reflections at vertical incidence.*

To obtain the maximum usable frequency for transmission over a given distance by way of a given layer, multiply the critical frequency by the

* *Letter Circular LC575 of the Department of Commerce, National Bureau of Standards, Washington, U.S.A.*

ratio given in the table. Where blanks appear in the table and for distances over 3,500 kilometres the distance is too great for one-hop transmission, *i.e.*, transmission over such distances requires multiple reflection from the ionosphere with intervening reflection from the ground. Information is given below on such multi-hop transmission, for which calculations must be made separately for each hop.

The distance, at which a given frequency is the maximum usable frequency, is also the minimum distance over which that frequency is receivable. This minimum distance for any frequency is called the skip distance; at any less distance it is impossible to receive on that or higher frequencies (except for sporadic or scattered reflections—see later).

The highest maximum usable frequencies (in north temperate latitudes) occur during the winter day, and the lowest during the winter night. The summer values for both night and day lie between these two extremes except as modified by sporadic E or scattered reflections.

Maximum Usable Frequencies over Long Paths

Since the local time of day, and hence the ionosphere characteristics, may vary a large amount throughout a long transmission path, it is necessary to consider what part of the path determines the conditions of transmission. For single-hop transmission, *i.e.*, for transmission by a single reflection from the ionosphere, it is the region half-way between the transmitter and receiver whose conditions determine the transmission, because it is there that the reflection from the ionosphere takes place. In the case of multi-hop transmission, *i.e.*, when the radio waves are reflected from the ionosphere, then from the ground, then back to the ionosphere, etc., the determining conditions are in the middle of each hop.

The maximum possible distance of transmission by a single hop, *i.e.*, reflection from any one ionosphere layer, is limited by the geometry of the earth's surface and the layer, and also by absorption or other limitation at the ground of those waves which are nearly tangential to the earth's surface. It is found in practice that the minimum angle with the ground of the radio waves transmitted or received (overland) averages about 3½°. From these considerations the geometry indicates that the maximum distance along the earth by a single hop is ordinarily about 3,500 kilometres for the F_2 layer, and about 1,700 kilometres for the E layer. Single-hop transmission may sometimes be possible at greater distances than these, while at the same time multi-hop transmission over the same path may be more efficient.

Calculation of the maximum usable frequency for multi-hop transmission is necessarily somewhat complicated. In the first place, it is necessary to consider the time of day of the locality where each reflection from the ionosphere layer takes place. The maximum usable frequency is the lowest one of the several corresponding to the times of day at the localities where reflection takes place, *i.e.*, at the midpoints of the successive hops.

Because of the variation of ionosphere characteristics with longitude, different frequencies may be necessary for transmission in different directions from a given place. For example, around sunset in winter, lower frequencies are used in transmitting eastward than in transmitting westward from the same location. This does not mean, however, that different frequencies would be necessary or desirable in opposite directions over the same path.

For very long paths in which widely different longitudes (*i.e.*, times of day) are involved it sometimes happens that the waves travel different parts of the way by different layers. For such cases it is necessary to take account of the heights of the different layers to determine the lengths of the several hops.

The waves reaching a given point may be a combination of waves having travelled by different numbers of hops. For each of these it is necessary to take account of the time of day and to consider which layer is effective for the locality where each reflection from the ionosphere occurs.

Optimum Frequencies

It is found that in general (especially in the daytime) the absorption is greater, *i.e.*, received intensities are less, as the frequency is lowered below the maximum usable frequency. Thus it requires much greater power to get satisfactory communication on frequencies very much below the maximum usable. On the other hand, it is necessary in practice to use a frequency somewhat below the monthly average because of the variability from day to day, which is generally within 15 per cent. of the monthly average.

Fair efficiency of communication is usually provided in the daytime by frequencies down to about 50 per cent. of the maximum usable frequencies, and at night by frequencies down to somewhat less than 50 per cent. of the maximum usable frequencies. Definite limits cannot be set, because there are large irregular variations of absorption with time. At frequencies near the maximum usable frequencies there is relatively little difference between night and day absorption. As the frequency is lowered, however, the daytime absorption increases relatively much more rapidly.

It is desirable therefore to use frequencies not much below the maximum usable. A satisfactory general rule is to use a frequency between 50 per cent. and 85 per cent. of the monthly average maximum usable frequency for the given distance and time. It is not ordinarily possible to keep changing frequency continuously, so some such range of choice is necessary. Below 50 per cent. the received waves may be too weak for use, and above 85 per cent. communication will be impossible on some days because of the variability from day to day.

The optimum frequencies were much higher in 1937, the time of sunspot maximum, than in 1933, the time of sunspot minimum. The next sunspot minimum will be about 1944, and it is likely that the optimum frequencies will decrease till then, reaching values somewhere near those of 1933.

(*To be concluded next month*).

G.P.O.

Uncle George is much improved
Since his Tx was removed.
Freed from BCL aggression,
He walks the street with self-possession!

Dud.

PORTABLE MOBILE ON 1.7 Mc.

By C. H. L. EDWARDS (G8TL), A.M.I.E.E.

The following account of portable mobile experiments carried out prior to the outbreak of hostilities will interest all readers who have in past days worked on " the top band."

THE writer has decided to record details of some pre-war mobile experiments carried out by him on the 1·7 Mc. band in the hope that they will be of interest to fellow enthusiasts. Tests were also carried out in a like manner on 56 Mc., but for the purpose of this article, only the former band will be dealt with.

Car Equipment

The car used for the tests was a 1939 Morris Eight, in which was fitted an Ecko broadcast receiver. This proved a very useful asset, as the H.T. supply to it was obtained from a small rotary converter fed from the 6 volt car battery, giving a smoothed output of 240 volts at 60 mA. By means of suitable switching the H.T. was brought out to a small distribution board fitted to the dash, to which was also connected the 6 volt terminals of the battery. A spare battery was carried under the bonnet, the leads from which were also connected to the distribution board.

The transmitter and receiver were mounted in a wooden box measuring 16 in. × 8 in. × 8 in., which fitted comfortably in the passenger-well under the dash. This was divided into two parts, the top housing the receiver, and the bottom the transmitter. In the lid were mounted the aerial loading coil (with its associated condenser) and a small absorption meter for frequency checking, the indicator lamp of which was screwed to the front of the panel. This latter piece of equipment was found to be necessary, because as the transmitter was made regenerative in order to secure maximum output from the low power available, it became essential to maintain a continuous check on the operating frequency. Room was also found for a 'phone monitor to check speech quality.

Transmitter and Receiver

The transmitter which was of the modulated crystal oscillator type also proved to be quite capable of producing good c.w. as well. Originally two 6L6G's were used, but these were later replaced by two 6V6's which were found to be more efficient on the lower H.T. voltage. Additionally they were more economical in filament current consumption. On the side of the box was fitted a 3,000 ohms sliding resistor by means of which the H.T. voltage could be varied if lower power was desired. The microphone which was of the ordinary Post Office solid back type, was mounted in a bakelite tooth denture box cut to suitable size, the lid being secured by three small screws after the microphone itself had been suspended in the box. A file handle completed this unit, excitation being obtained from the car battery. The send-receive switch was also mounted on the transmitter panel. This changed over the aerial and switched both H.T. and L.T. to the transmitter and receiver as required.

The receiver, when first constructed, employed a straight detector and A.F. circuit with reaction, but an untuned R.F. stage was added later which gave a little more gain. It was not possible to screen this stage, as great difficulty was experienced in wedging in the extra components needed. The valve line up was as follows: R.F. (S610), Det. (PM6D) A.F. (DE5), all of which were old 6 volt valves found around about the shack. The output was wired for two pairs of telephones plugged into the front of the panel. Two H.T. and two L.T. leads fitted with small plugs were brought out for connecting into the distribution board on the dash. The complete unit could be loaded into the car and wired up in under one minute. Practically the whole of the gear used was collected from the junk box, the two 6L6's being the most expensive item.

Aerial Arrangements

For supporting the aerial, three 7 ft. lengths of 1 in × 1 in. oak were used. These were cut in the centre and rounded off to take a conduit ferrule, so that they could easily be packed away into the back of the car when not in use. Two masts were carried on the front bumper and one on the centre at the back, wooden cleats with wing nuts being constructed to slide over the end of the bumper for clamping the masts into position. No other support or guide wires were used yet the masts were found to stand up securely when running the car at speeds up to 65 m.p.h.

The only aerial used was an end-fed Hertz 28 ft. in length, loaded to resonance by the coil and condenser, mounted in the lid of the transmitter. The aerial was made in the form of a V over the top of the car, and anchored to an insulator on the roof, from

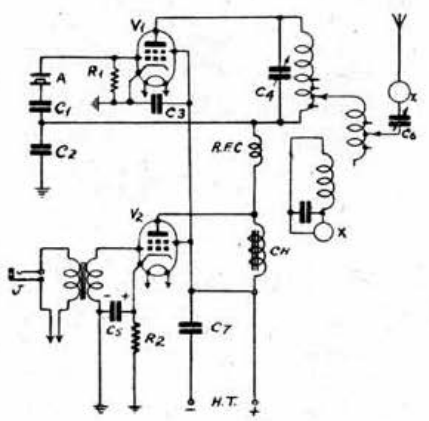

Fig. 1.

Circuit diagram of Portable Mobile 1.7 Mc. transmitter used by the author.

C1	.01 μF.	R1	100,000 ohms.
C2	.00025 μF Mica.	R2	650 ohms., 5 watts.
C3	·006 μF.	A	Crystal.
C4, 6	.0002 μF.	J	Microphone Jack.
C5	25 μF.	RFC	2 mH. choke.
C7	.1 μF.	CH	12 H., 125 mA., 250 ohms. Choke.
X	Indicator lamps.		

V1, 2 6V6 valves.

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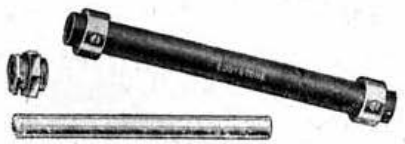

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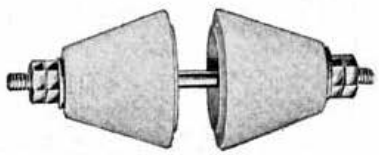

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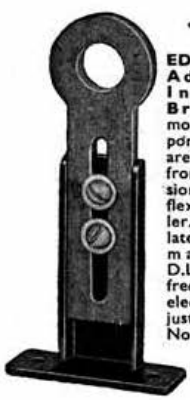
No. 1093. 60 m.mfd. high-voltage type. Minimum, 4 m.mfd. Maximum, 59·5 m.mfd. D.C. flash-over, 2,300 volts. 4/11
No. 1131. 160 m.mfd. Minimum, 4·75 m.mfd. Maximum, 161 m.mfd. D.C. flash-over voltage, 1,000 volts 6/6



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which point it was brought inside by means of an insulated wire, *via* the window, as shown in one of the photographs.

Practical Tests

First tests were carried out from the writer's garage during the winter of 1938, when contacts were established with G4AT and G6NG about four miles distant, both of whom gave Q5 R7 reports. The car was then taken on to the road and a five miles circuit of the district made with 2CKJ assisting. Unlike 56 Mc., no falling-off in signal strength was reported when passing under trolley bus wires or close to steel constructed buildings, in fact

Fig. 2.

The aerial system used by G8TL for Portable Mobile experiments on 1.7 Mc.

consistent S7 signals were reported during the whole of the test. A report was later received from a listener in Southend (32 miles distant) who was able to hear perfectly both sides of a conversation.

A schedule was next arranged with G2CD, 2XP, 4AT and 6HU for the following Sunday, but this was eventually cancelled because the writer and 2CKJ were continually stopped by the mobile police on the Southend road who were suspicious of our intentions! We found this to be our one trouble, until eventually it was settled amicably at Police Headquarters!

One of the most interesting and widely advertised tests was one carried out in the early morning in conjunction with the fixed stations G2XP (Ilford), G3ZJ and G4AU (Charlton) and G4DD (Shortlands). The proposed route was from Ilford to Barking thence *via* Blackwell Tunnel to Blackheath Common. On leaving Ilford, mobile contact was made with all stations, a report of S7 being received from G2XP and an average of S5 from the stations across the Thames. The first stop, made in a road near the Tunnel, brought many householders out of doors apparently because our transmissions were breaking through on their BCL receivers! Discretion being the better part of valour, we moved on and passed through the Tunnel without further incident.

After staying an hour on Blackheath Common collecting reports, we commenced our homeward journey. As expected, all stations disappeared when entering the Tunnel, but as G4AU had reported that he thought he was able to trace our carrier when we were transmitting on the outward run, we arranged to transmit continuously during the return journey so that he could confirm his findings. On entering the Tunnel and in order to give a long transmission we reduced speed considerably, with the result that we were followed through by "the Law" on a cycle! In order not to choke him with our fumes we accelerated, and when we again surfaced we changed over for reports without giving him a further thought. We arrived home at 02.30 G.M.T. after quite an interesting test, but next morning the writer was called upon by the C.I.D. to explain what we had been doing under the Tunnel during the early hours; apparently we had been requested to stop for investigation by the mobile officer, instead of which we had accelerated! We were also given a place of honour in the evening paper—being described as the I.R.A.!

As a point of interest G4AU reported that it was not our carrier, but hiss level on his receiver, which caused the earlier reading on the "S" meter.

Another test of interest was a two hours' contact with G8SK (Enfield) over a maximum distance of 25 miles, continuous contact being made at all speeds up to 60 m.p.h. It was found that on practically all occasions, the S strength increased when proceeding downhill, and reports were always better at the bottom from stations both behind and in front of it, than when working on the crown.

These findings were being investigated when hostilities broke out, and have therefore, not yet been completed. A new five valve superhet was also in course of construction. This was to replace the three valve straight in order to increase our working range,

(*Continued on p.* 60.)

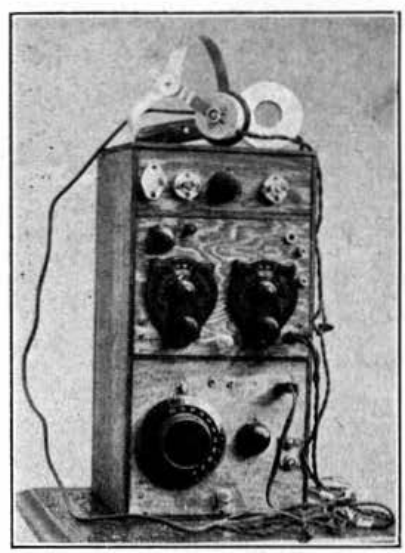


Fig. 3.

A view of the 1.7 Mc. portable equipment used by the writer for mobile tests.

"RADIO ROYAL"

By F. H. MARTIN (2CDT)

This contribution, from the pen of an ex-assistant news editor at Radio Royal, gives readers first hand news of yet another job where the radio amateur is putting his practical experience to a severe test.

IN the heart of England's rural countryside, approached by a maze of twisting lanes, and naturally hidden by towering beeches, rise the huge aerial masts of one of Europe's most modern and best-equipped receiving stations.

During the past year many newspapers in this country have awakened to the wealth of news crowding the ether at all hours of the day and night, in a miscellany of tongues. Thus, a new job has been found for the radio amateur who, in addition to his valuable technical knowledge, has command of one or more foreign languages.

G5KI, Radio Relations Officer of the huge Allied Newspapers Group, controls the listening station, "Radio Royal," serving the largest group of papers in the world. Here, day and night, a total of 94 valves unite in bringing news to the desk of the news editor whose duty it is to decide which items shall be telephoned or teleprinted on the direct wires to the head office in London.

Photo by permission of Graphic Photo Union.

The Main Listening Room at Radio Royal.

The 15-tube receivers in use would delight the heart of any amateur. Each signal is tuned with perfect clarity—given moderate conditions—from the sneering tones of "Lord Haw-Haw," to the high-speed "on-the-spot" commentaries from the Americas. Even simple crystal receivers attract attention of visitors.

Tokio, Madrid, Melbourne, Pittsburg, Ankara, Montevideo, Moscow, Oslo—the staff of expert linguists knows them all. There is always some news item to be drawn from the air. The linguist turns the dial, "Is this new?" he asks the news editor as he hands him a translation.

Between the regular news broadcasts the linguists search for the unusual for then it is that such "pirates" as the I.R.A. transmitter is heard, or, perhaps, the German Freedom Station hurling insults at the head of the Reich. Quick to seize upon a point of interest the listener discovers that Bremen or Hamburg has gone off the air. Then the office is told to expect news of R A.F. activity over Germany.

Selectivity plays a great part in pic' 'ng up the distant broadcasts. Accuracy in reporting is essential, so it is necessary to use receivers with a selectivity point of 2 kc' nose (30 dB down—4 kc. off resonance).

Two aerials are in constant use, a double-V resonating on the 31-metre band and running E.W. and a vertical resonates at 19 metres. A simple switching arrangement enables either to be brought into use as occasion demands.

Although headphones are used almost exclusively, it is possible to put all receivers on to powerful loudspeakers.

An asset, which has already proved invaluable, is the Telecord. This device enables each linguist to make a permanent record of an important broadcast and to play it back immediately after reception, checking up on his accuracy in translation.

Carefully filed and indexed are the recorded voices of their Majesties the King and Queen, Mr. and Mrs. Chamberlain, Mr. Winston Churchill, Lord Chatfield, Herr Hitler, Field-Marshal Goering, Dr. Goebbels, "Lord Haw-Haw," "Horace, the Humbug" and many others.

It is a fascinating occupation, as any of the linguists will verify. International tension over military or diplomatic moves is their "meat." DX does not bother them. It is the country in the news which matters. First, find out what that country is telling the world then, what does the world think? In this way newspapers can supplement the stories of their own correspondents in the various capitals, with up-to-the-minute accounts of events actually happening as the broadcast proceeds.

The amateur with his short-wave receiver can keep himself well informed as to what is taking place in the world. If he understands a foreign language so much the better, because all countries are broadcasting in tongues other than their own. But he has no excuse to miss anything of importance, because English is the *one* language which dominates the foreign news broadcasts of every country.

EXPERIMENTAL SECTION

Manager : A. M. H. FERGUS (G2ZC)

DESPITE the enforced inactivity, in a Society sense, of many members, the Section still continues to receive applications from new members, which, to say the least, is most encouraging.

The Transmitter and Aerial Groups admittedly are dormant, but the Receiver and Propagation Groups are in full operation, with all available members doing their bit.

Publication of the new Edition of the Society's Handbook is warmly welcomed by all Section members. Those responsible for its production deserve and receive our congratulations. That it will prove a *vade-mecum* to all genuine experimenters goes without saying.

G2ZC.

Propagation Group

The latest " Aurora " Group letter budget raises the question of the possible effects of the moon on radio transmission conditions. In this connection it has been well established that there is a daily lunar magnetic variation, probably due to a tidal effect on an ionised layer in the atmosphere, but the effect of the moon is extremely small compared with that of the sun, and the writer is doubtful whether any similar variation in radio conditions would be sufficiently great to be recognised in the large day-to-day changes resulting from solar activity.

The G.M. has also been asked how the Daventry stations are received within the skip zone. From personal observations made in Portsmouth it is found that the 19-metre Daventry signals are quite well received both day and night and, in spite of bad flutter fading at times, are usually 100 per cent. intelligible. It is probable that this reception is due to scattering, a more detailed account of which will be given in an early issue of this journal. Stated briefly, however, the effect is caused when the waves from a transmitter pass through the E layer, either on their upward path or after reflection by the F layer. In this latter case the scattered rays travel back by the same route, *viz.*, up to the F layer again and then reflected down. The actual signal received is thus an integral effect of scattered signals coming from sources spread over a very large area if the transmitting aerial is omni-directional, or from those parts of the E layer, illuminated by the beam in the case of a beam-controlled transmission.

G2XC.

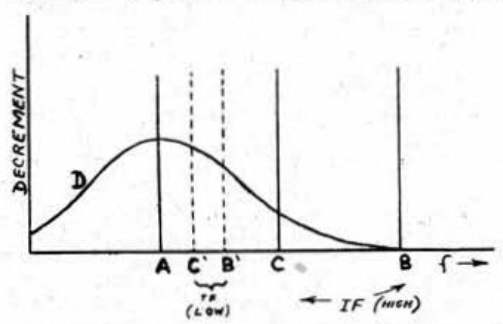
Receiver Group

The following notes from C. N. Blatherwick (G3VU) may be of interest to members who are contemplating joining the R.A.F. as Radio Mechanics, as questions are often asked about the principles of the superhet receiver.

In such a receiver the incoming signal from the aerial is passed to a radio frequency amplifier and then on to the frequency changer or mixer valve, which can be termed the " heart " of the receiver, for on its performance depends the main properties of the instrument. Its purpose is to accept two frequencies at once, one from the R.F. amplifier or aerial and the other from the H.F. oscillator and also to produce a beat frequency equal to the difference between the two. On this resultant or intermediate frequency depends the selectivity, quality and degree of second channel interference. Second channel interference is an effect brought about by the fact that the local oscillator in the receiver can beat with two possible signals, *i.e.* the local oscillator frequency plus the I.F. or the local oscillator frequency minus the I.F. The cure for the trouble is to pass the signal frequency through an amplifier whose selectivity is sufficiently great to cut out a signal which is at a frequency equal to twice the intermediate frequency off resonance. In the diagram which shows this more clearly, A represents the wanted signal, C is the local oscillator frequency and B is the frequency of the interfering signal. If the R.F. amplifier can be arranged to produce a selectivity curve D, there will be no interference, but if the I.F. is reduced from AC to AC^1 then the interfering signal B^1 is brought in by the R.F. amplifier at a strength very little below that of the required signal. In practice it is only necessary to increase the I.F. until second channel interference disappears ; however, as the I.F. is increased so does the amplification in the I.F. stages of the receiver decrease, so that the sensitivity is reduced. Consequently a compromise is chosen so that within the limits of practical R.F. amplifier selectivity the I.F. is kept as low as possible. Another point to remember is that the majority of receivers are arranged so that the high frequency oscillator is on the high frequency side of the incoming signal, an arrangement which gives greater selectivity because the R.F. tuning circuit attenuates more rapidly on this side of resonance.

On the practical side it is important to know how to align a superhet, the general procedure for which is as follows :—a small signal generator is required to align the I.F. stages, or if the receiver is equipped with a crystal, it can be used to control an oscillator. A.V.C., crystal filter and beat oscillator switches should be switched off and the gain controls set at maximum. The H.F. oscillator valve should then be removed and the I.F. oscillator voltage applied to the grid of the mixer through a small condenser (.01 μF), after which the I.F. trimmers should be adjusted to give maximum output.

For R.F. alignment a high frequency signal



Sketch showing how second channel interference is eliminated.

generator should be connected through a 500 ohm resistor to the aerial terminal of the receiver, and if the input is designed for a doublet aerial the second aerial terminal should be earthed. As the calibration of the receiver is important the H.F. oscillator padder and trimmer should be adjusted until the dial readings correspond to their correct frequencies. The padders are adjusted only when recalibrating the L.F. end of each band whilst the trimmers are used only for aligning the H.F. end. It will, however, be necessary to adjust each padder and trimmer several times as an adjustment to one will upset the conditions for the other.

Next month it is proposed to publish some advice regarding the practical aspects of servicing superhets.

G5HF.

Cosmic Notes

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

THE Science Service Research Aid Announcements for the three weeks ending June 15 give the following information :—

Sunspots

Sunspots were fairly numerous towards the end of the period, over 100 being counted by both Tokio and the U.S. Naval Observatory on several days. No unusually large groups were reported.

Magnetic Elements

A moderate disturbance was recorded on May 26 lasting into the following day. Conditions were slightly disturbed on May 28. A quiet period followed until the late evening of June 5 when a moderate disturbance began. This condition continued until the early hours of June 8, being characterised by irregular oscillations. June 9 was moderately disturbed by long period pulsations. A further moderate disturbance began at 08.01 G.M.T. on June 14.

Radio Conditions

The critical frequency for the F_2 layer at Washington, U.S.A. (midday local time), was as follows :—May 29, 7,200 kc. ; June 5, 8,000 kc ; June 12, 8,000 kc. On the last date sporadic E ionisation was evident, frequencies as high as 9,000 kc. being returned at vertical incidence from an equivalent height of 160 km.

Ionospheric Irruptions

With reference to the use of the above term as suggested in the May, 1940, "Cosmic Notes," Mr. A. M. Braaten (W2BSR) writes pointing out that the fade-out is an effect of the irruption and not the irruption itself. This is, of course, quite true ; and Mr. Braaten has suggested that the term, "Irruptive Fade," might be used when talking of the so-called "Dellinger Fade." The same correspondent also comments that these fades were first recognised by British observers and not by Mögel, although Mögel was the first to publish his observations. The writer of these notes must point out that his remarks on this topic were an exact quotation from a letter from Greenwich Observatory, and he is not in a position to be able to decide whether Mr. Braaten or Greenwich are correct. However, the query is being passed on to the Observatory officials and further comment may be possible next month.

Ham Coincidence No. 6

Writing from one of H.M. destroyers, L./Tel. W. Borton, ZB1Z, tells of a thrilling sea rescue and Ham Coincidence, following the evacuation of the B.E.F. from France. Shortly after picking up survivors from a vessel which had been bombed, there came a tap on the door of the W/T office and an individual with very picturesque clothing enquired, "Are there any radio amateurs aboard ?" After a long ragchew two more of the not quite extinct tribe were located among the survivors. Although all were shaky after their terrifying experience we understand the effect of a pair of head telephones was wonderful to behold. Mr. Borton sends his greetings to 2CFN, G5DS and G6CG, the three amateurs in question.

* * *

After preparing this paragraph for publication we had the pleasure of meeting A.C.1 Ken Peattie, 2FQG, who advised us that he also was rescued by the same destroyer. The bombed ship was the *Lancastria*.—Ed.]

Ernie Dolman, 2DCG, on a visit to G6CL two days after returning from France.

Lieut. John Swinnerton, G2YS, R. Signals (of Coventry), recuperating after Dunkirk

Silent Key

JOHN KARLSON—SM6UA

John Karlson—the Grand Old Man of European Amateur Radio—is no more. "Smua" as he was affectionately called by his many hundreds of amateur friends had for the past 15 years typified all that was best in our movement. A charming personality, an endearing host and a staunch believer in the powers of ham radio to increase international goodwill, John Karlson by his actions and his deeds helped to place Swedish amateur radio among the high pinnacles.

His love of the key, his ready willingness to give help to all who needed it, and his youthful memory made him an outstanding personality wherever ham radio was discussed.

His son, SM6UB, is to carry on his father's work after the war.

On behalf of all members who shared his friendship we extend to his wife, relatives and friends our deepest sympathies. J. C.

KHAKI AND BLUE

A topical feature in which we publish information concerning our members serving in H.M. Forces. Items for inclusion in future issues should reach the Secretary-Editor not later than the first day of the month preceding date of publication.

L.A.C. Donald Biggs, G6BI, writing from Wiltshire, reports having met G3XN, 8LT and 2PS. He has had a very interesting time on new development work. His present duties, which are shared by G6WL, 8BA and 2CQJ, include air operation. He sends 73 to all old friends. The officer in charge of his section is P./O. J. N. Walker, G5JU.

* * *

Cpl. A. M. Boyce, 2CMR, of Prestwich, who is now listed as an instructor at one of the R.A.F. schools, tells us that numbered amongst his present colleagues are several full, and many A.A. licence holders including Cpl. G. Keen, G3RR. He recalls the 1939 P.D.M. at Chester and sends greetings to all who were present on that occasion.

It's a far cry from Southend to Ceylon but that's the DX journey Vic Sims, G5VB, made as a Telegraphist in the R.N.V.(W.)R.

Congratulations to G. R. Scott-Farnie, GW5FI, and S. G. Morgan, G6SM, on their promotion to Squadron Leader rank.

W. James, G6XM, is serving in the R.A.O.C. as Wireless Instrument Mechanic.

L.A.C. J. W. Russell, who is serving at an R.A.F. Coastal Command station in Hampshire, is one of many service members who have written in support of last month's editorial.

Like all other 7 Mc. enthusiasts, he often wonders what has happened to old friends in F, SP, ON, PA, OZ and PA. We wish we could give him some news. He advises us that R. H. Newland, G3VW, who was with him until recently, is now "out east."

Miss L. Nicholson, who signs herself as G4AI's YL, tell us that Mr. Blake is now serving as an A.C.2 with the R.A.F. He will be glad to meet other hams in Hut W44, No. 2 E. & W. S.

Charlie Miller, VK2ADE, visits R.S.G.B. Headquarters during short leave from duty with the R.A.A.F.

Tel. J. H. Brazzill, G3WP, sends 73 to G3GW and, in answer to the latter's query, asks us to say that he has very happy memories of 1·7 Mc. contacts with his portable station last summer. G3WP can be written to c/o. Y.M.C.A., near Guildhall, Portsmouth.

THE R.A.F. OUT THERE

Six members of the original R.A.F. draft which went to France on September 4 last year. The photograph was taken close to the Maginot Line. *From left to right:* Les. Coupland, 2BQC, Archie Davies, G4SY, Cpl. Stafford, Dick Marris, 2BZQ, Cpl. Davis, George Hammond, G4NL.

Numerous service members have asked our advice regarding methods of identifying themselves as amateurs when in uniform. As far as we are aware no official objection is likely to be raised if a call sign is imprinted on the strap of a gas respirator, but please don't blame us if you get 7 days' C.B. for your pains!

* * *

News has come to hand that several of the original B.E.F. draft of Civilian Wireless Reservists have been granted commissions in the R.A.F.

These include M. A. Brookes, G5OI; J. Starkey, GW6KY; G. F. Mason, G5BR and Sgt. Ballingale. We wish them luck in their new spheres of activity.

* * *

Writing from Berkshire our pre-war Blackpool T.R., A.C.1 H. M. Fenton, G8GG, reports fit after nine months in France. He has recently had the pleasure of meeting G3IY, 3NC, 4DS, 6QM and 8DI. He also sends news of other Blackpool members, including G3IC who is serving in South Wales, 3KD who is in the Merchant Service, 4PY who is on special work in Lincolnshire, and 8AK who is chasing around G after a spell of duty in France and Belgium.

* * *

Friends of Tony Chapman, G2IC, will be glad to hear that he has returned safely to the Old Country after a very hectic time in France. Tony, who is now an Acting F./Lt. at an A.M.E.S. in Northern Scotland, sends greetings to District 14 members and others who remember him. As his home QRA at Folkestone has been evacuated, letters should be sent *via* G6CL.

Lyn Jones, GW3XY, is a W/T Instructor in the Navy. A photo taken by GI6TK during a visit to Belfast.

After a spell of duty with the R.A.F. in France, Kenneth Jowers, now a Flight-Lieutenant, is back in England. Ken, in pre-war days, operated from Letchworth as G5ZJ. He was also short-wave editor of "Television & Short-Wave World."

Tel. R. Jones, GW3JI, who is attached to H.M.S. *Royal Arthur*, will be pleased to meet other amateurs who are serving in the same locality. He sends 73 to GW3CR and 3WY. Letters should be forwarded *via* his home address, 1 Victoria Street, Craig-y-Don, Llandudno.

Gordon Zedy, BRS 3732, serving as an A.C.1 in the R.A.F.

We are pleased to record that Max Buckwell, G5UK, F. Inchley, G3AG, and J. C. Alfred, G8UQ, are among several members of the original R.A.F. Fitting Parties who have been promoted to the rank of Pilot Officer. We wish them all good luck and happy landings.

* * *

Sgt. W. R. Eadie, (R.A.F.) GM4JO, who is attached to a station in Perthshire, wishes to be remembered to all old friends, especially those in Scotland "A" District. Ian McDermid, BRS.2689, is also with him. They send special greetings to A.C.1 Ken Peattie, 2FQG.

Greetings from "Chem"

A. N. Le Cheminant ("Chem"), G6AC, who has been at the Newfoundland Air Port since last year, sends greetings to all old friends. He is anticipating an appointment in Canada shortly.

An

R.A.F. MEETING

WILL BE HELD ON

Sunday, Sept. 29th, 1940

In N.A.A.F.I. CANTEEN No. 2 WING
No. 2 E. and W. SCHOOL

ASSEMBLE 2.30 P.M.

Technical Talks. Informal Discussions.
Tea. All service members in the above area are heartily welcomed.

GO TO IT ! ! !

ON ACTIVE SERVICE

ELEVENTH LIST

WE publish below our eleventh list of radio amateurs on active service. Additional details and corrections should be advised to Headquarters as early as possible. The present list contains information received up to August 2, 1940.

Rank and Name	Regiment or Branch	Pre-war Call or B.R.S.
L./Cpl. S. Archer ...	R.A.M.C. ...	2DWZ
A.C.2 N. Ashton ...	R.A.F. ...	3111
Pte. H. J. Binet ...	R.M.I.J. ...	3660
Gnr. W. T. Black ...	R.A. ...	2HGT
A.C.2 G. H. Blake ...	R.A.F. ...	G4AI
Sig. J. W. Booth ...	R.C. of S. ...	2AJB
Sig. C. A. Bradbury ...	,, ...	1066
A.C.2 H. B. Burton ...	R.A.F. ...	G2JR
A.C.2 J. J. Chittenden	,, ...	2CJT
L.A.C. J. Crawford ...	,, ...	G5CF
P./O. K. Dunsford ...	,, ...	G6KD
A.C.2 L. S. Eggleton ...	,, ...	2FUG
L./Cpl. C. Fisher ...	R.A.S.C. ...	3539
Pte. R. H. Forward* ...	R.A.O.C. ...	G4AV
P./O. J. Francombe ...	R.A.F. ...	2BRF
L.A.C. D. W. Greenwood	,, ...	2BFB
Sig. L. W. Hill ...	R.C. of S. ...	2HJZ
P./O. C. H. Hubbard	R.A.F. ...	G5OX
Gdsm. E. Huffington ...	Coldstream Guards	566
A.C.2 G. Jones ...	R.A.F. ...	G4KW
Ord./Tel. R. Jones ...	R.N. ...	GW3JI
P./O. J. W. Limmer ...	R.A.F. ...	G2GU
F./Lt. L. H. Mansell ...	,, ...	G6IH
— F. H. Martin ...	R.A.S.C. ...	2CDT
A.C.2 G. E. Morris ...	R.A.F. ...	2CAH
Spr. K. Moody ...	R.E. ...	G3VY
— P. Pender	R.A. ...	GM8HP
L.A.C. C. E. Rossiter ...	R.A.F. ...	2496
Cpl. R. A. Stelp ...	,, ...	3816
P./O. P. A. Thorogood	,, ...	G4KD
A.C.2 A. S. Tripp ...	,, ...	G8OT
Gnr. E. J. Truscott ...	R.H.A. ...	3013
P./O. L. C. Turner ...	R.A.F. ...	3823
Lt. E. S. G. K. Vance, M.B.	R.A.M.C. ...	G8SA
Sig. F. C. Ward ...	Northampton-shire Regt.	2CVV
Ldg./Airman R. A. R. Wilson	R.N.V.R.	2CNV
P./O. G. S. Woollatt ...	R.A.F. ...	G3ZI
A.C.2 A. J. Woolnough	,, ...	2CIB
L.A.C. W. B. Yates ...	,, ...	2HBK

* *Non-member.*

Sig. F. H. Spencer, R.C. of S. (G4AH), previously recorded as L./Bdr., Royal Artillery.

Silent Keys

WILLIAM GEORGE PLAYER BRIGSTOCKE, R.N. (G5ZQ)

It is with much regret we record the death, at the early age of 30, of Lieut. W. G. P. Brigstocke, G5ZQ, of Ryde, Isle of Wight, and Robert's Rest, Carmarthenshire.

Lieut. Brigstocke received a severe injury by enemy action while on the bridge of his ship off the West of England, and succumbed to his wounds on July 4.

Educated at Sherborne School and Manchester University, G5ZQ had since 1927 been an active member of the Society. Prior to the war he was engaged with the East Kent Car Company in the capacity of Thanet Area Manager. He was a member of the Royal Victoria Yacht and Army and Navy clubs.

The Society is the poorer by the loss of an amateur who possessed great personal charm, and who was imbued with the highest ideals of British citizenship.

We extend to his widow, parents and relatives our deepest sympathies.

J. C.

RONALD WALLACE HUNTER (G3FL)

The Civilian Wireless Reserve of the R.A.F. mourns the death, at the early age of 21, of L.A.C. Ronald Hunter, G3FL, who lost his life as a result of enemy action on June 17.

G3FL was a keen amateur of many years standing and, in addition to being a member of the C.W.R., he had seen service with the Merchant Navy. He was a very active member of the Swindon and District Transmitters' Club, whose headquarters were located at his home.

He will be sadly missed by his many amateur friends in the District, as well as by all who met him over the air. He was always ready to stand by for tests and was ever willing to extend a helping hand to the newcomer.

We extend to his parents, fiancée and relatives our deepest sympathies.

E. W. M.

D. T. B.

CANADIANS ON ACTIVE SERVICE

SECOND LIST.

WE are pleased to give publicity to a second list of Canadian amateurs on active service. Mr. Fred Saxon, VE3SG, the compiler, also forwarded a list of amateurs who have earned promotion since the first list was published in June, but as previously indicated we are unable, owing to pressure on space, to include promotions in any of our service lists.

Additional names and corrections should be sent to Mr. Saxon, 302 Lee Avenue, Toronto, Canada, and not to R.S.G.B. Headquarters.

Rank and Name	Regiment or Branch	Pre-war Call. VE
Tel. J. F. Baker	R.C.N.	4AIV
L./Cpl. E. L. Ball	R.C.C.S.	4AFA
Sig. F. J. Barkey,	,,	3JO
A.C.1 C. R. Barrett	R.C.A.F.	4AOJ
A.C.2 W. Benton	,,	4MD
S.S.M. W. F. Brennan	R.C.C.S.	3KA
Sig. A. E. Brookes	,,	3SC
A.C.2 R. Butler	R.C.A.F.	5ADJ
F/O. T. Carpenter	,,	3BD
Tel. F. G. Clements	R.C.N.	4AAR
Tel. A. J. Cook	,,	4KZ
Tel. L. E. Cuff	,,	4ADX
A.C.1 A. F. Dike	R.C.A.F.	3AFW
Lt. M. W. Doull	R.C.C.S.	1EE
F/O. N. C. Eaton	R.C.A.F.	3CJ
L.A.C. J. Forsyth	,,	4AAV
F./O. D. R. Gunn	,,	3EF
A.C.2 R. L. Hanneson	,,	4FN
A.C.2 C. E. Johnson	,,	4ABV
Sgt. H. T. Lewis	R.C.C.S.	3FN
A.C.2 H. B. J. Liddle	R.C.A.F.	3EG
A.C.2 E. H. Mann	,,	3AQN
Sig. J. Marachini	R.C.C.S.	3AUB
A.C.1 H. A. D. Marchant	R.C.A.F.	4LE
A.C.2 E. W. Miller	,,	2AF
Lt. H. V. Mills	R.C.C.S.	1EJ
Tel. A. E. Munro	R.C.N.	4ALY
A.C.2 A. J. Musselman	R.C.A.F.	4ANH
Tel. W. E. Neilson	R.C.N.	4BH
A.C.2 R. J. Newstead	R.C.A.F.	3AHU
A.C.1 T. A. Prest	,,	4MX
F./O. Geoffrey Priestley	,,	ex3HE
Tel. W. F. Purkis	R.C.N.	4ACM
Tel. R. L. Shideler	,,	4AIH
Sig. F. Solomon	R.C.C.S.	3AGX
A.C.1 J. F. Stacey	R.C.A.F.	3ALO
Tel. O. N. Tomlinson	R.C.N.	5AFG
A.C.2 P. E. Vivian	R.C.A.F.	4AIJ
S.D. R. R. White	R.C.N.	4RP
Tel. R. W. White	,,	4AX
A.C.2 F. R. Young	R.C.A.F.	4AMX

Corrections to List No. 1

Sig. E. K. Kelcey, R.C.C.S. (VE5EK) should read Lieut.; Sig. A. Kufluck, R.C.C.S. (VE3SS) should read A.C.1, R.C.A.F.; A.C.2 I. F. McArthur, R.C.A.F. (VE4MD) delete, see W. Benton in List 2; A.C.2 H. J. Simpson, R.C.A.F. (VE4AHE) delete.

Silent Key

It is with deep regret we have to report that A.C.2 Jack Kean, (VE3ADU) was killed in a flying accident at an Ontario air station on May 19.

F./Lt. R. C. Wilkinson, G4HW. Awarded the D.F.M. and Bar.

Triple congratulations are extended to Mr. R. C. Wilkinson, G4HW, first upon being awarded the Distinguished Flying Medal and bar, second, upon being promoted from Sergeant Pilot to Flight Lieutenant, and last, but by no means least, upon taking unto himself a wife.

In the words of the official announcement dealing with his award, "Sergeant Wilkinson has shot down five enemy aircraft and has displayed a very fine offensive spirit, coupled with a sense of resolute leadership." Later, when announcing the award of a bar to the D.F.M., it was stated that "This airman pilot has led his flight on several occasions, and once led the whole squadron on an offensive patrol during which they not only brought down a number of enemy aircraft, but returned without loss. He also led an attack on an enemy motor transport column, blowing up an ammunition lorry and setting two petrol tankers on fire in the face of heavy anti-aircraft fire. He has recently shot down four enemy aircraft, bringing his total to nine, and has at all times displayed courage and good leadership."

Service Promotions

In order to maintain accurate records, service members should notify Headquarters of promotions as early as possible.

Awards and Honours

Details of honours or awards made to radio amateurs should be communicated promptly to Headquarters, with a copy of the official announcement.

B.E.F. Members

Considerable anxiety is felt at Headquarters concerning the safety of several prominent members who were in France up to the time of the capitulation. At this stage we do not feel justified in publishing names but we would ask all who were concerned in the evacuation to advise us of their own safety, if this has not already been done.

Belfast Y.M.C.A. Radio Club

Mr. Frank Robb, GI6TK, requests us to mention that visitors to the Y.M.C.A. Radio Club in Belfast will find there a guide giving full instructions how to find the address, telephone number, etc., of all local amateurs. Photographs are also included to assist in identification.

An Appeal

L./Tel. Borton, ZB1Z, appeals for a microphone for use with a public address and radiogram equipment which has been given to his ship. Any member in a position to oblige should write to Mr. Borton, Mess 6, H.M.S. "Havelock," c/o. G.P.O., London.

73.

THIS new feature, suggested last month by Mr. Stan Granfield, G5BQ, has, as anticipated, met with considerable support. We take this opportunity of thanking all who have submitted calls for inclusion in the undermentioned list. Future lists should be set out in alphabetical order in exactly the style shown and should be sent on a *separate slip of paper*, to reach the Secretary-Editor not later than the 1st of each month.

G3JD (16A Linden Terrace, Newton Abbot, Devon), to G2FP, 3BI, 3HW, 3ID, 5QI, 6JL, ex VU2EB, VU2FO, 2CWR.

* * *

G8UO (13 Chandos Street, Keighley) to G2RB, 3HD, 3HK, 3OA, 3OU, 3RY, 3XT, 6ZN, 8KU, GM3BA, 3TD, 8RU.

* * *

G3WP (c/o Y.M.C.A., Near Guildhall, Portsmouth), to G4LV, 5XI, 5VS, 5SN, 6AB, 6DH, 6NU.

* * *

G3TL (87 High Street, Stevenage), to G2FB, 3OJ, 3SK, 5UM, 5ZJ, 6UT.

* * *

G2LT (11A Welwyn Close, Intake, Sheffield), to G2FX, 4JJ, 8CV, 8FI, 8IJ, 8RQ, GM2MP, G5IHU, GW3XW, ON4BG, ON4WD, W9DDX.

* * *

G3YK (32 Emerson Avenue, Middlesbrough), to GM3ZH, GW3KY, G4BO, 4DD, 5CP, 6QF, 8RN, 8IT, 8QX, SU1AF, VE1FG, 1NU.

* * *

G6BI to G2PS, 2UJ, 3BQ, 3ZZ, 5JW, 6OU, 6RS, 6VP, 8IP, 8IX, 8LY, 2CFW.

* * *

G2SO (c/o Public Assistance Dept., Southend-on-Sea), to G2GU, 2LC, 2OB, 2UK, 3WP, 5XI, 5UK, 5IV, 6CT, 8AX, W4CCH, ZL1II.

* * *

G3YY (1A Dover Road, Brighton 6), to G2LC, 2UJ, 2XC, 2ZV, GW2UH, G3KJ, GW3VL, G5TZ/X, 6OB, 2BIL, 2CIA, 2DDD.

* * *

G4CP (R.A.F.), to G2YV, 3HB, 3OZ, 3SI, 3WD, GW3WY, G4CD, 4CN, 6DV, GW8SO, 2CQU.

* * *

G2YS (Smeaton Manor, Northallerton), to G3IJ, 3OJ, 5LK, 5MO, 6DL, 8IS, 8TO and all Coventry and Ipswich amateurs.

* * *

G3WW (6 St. Peter's Road, March, Cambs), to G2LV, GM3KC, G3LP, 3PH, 3SH, GI3KV, GM3TR, G4AJ, 8AX, ON4SW, W1GR.

* * *

G4HW (R.A.F.), to G5YV, 8KP, SU1KG, 1SG.

* * *

G2XV (89 Perne Road, Cambridge), to G2JS, 2UT, 5TZ, W2IXY, 2IKV, 4BPG, 4CYU, 4ECF, 5EYZ, 7BVO, 8CNA, 9BEU.

* * *

G2JK (36 Montana Road, London, S.W.17), to G2RC, 2UJ, 2UX, 3CI, 3CU, 4HA, 5PY, 6AN, 2FQQ, and all who have at any time been operators of G5YC.

* * *

G8MR (10 Welbeck Street, Sutton-in-Ashfield), to G3XA, 4DS, 8MR, 8HX, 8NS, 8OT, 8SA, 2APT, 2DTQ, and all who worked the "Robin Hood Network."

GW6AA (The Flagstaff, Colwyn Bay), to GW3WY, 4MZ, 6KY, 8JY, 8JV and all old 56 Mc friends.

* * *

G4JS (c/o 16 Christian Road, Preston), to G4BM, 4BO, 4CJ, 4JJ, GM6RT, G8FI, 2AKK, 2ABF, VE1JS, W2LMC.

* * *

G4HW (R.A.F.), to G5YV, 8KP, SU1KG, SU1SG.

* * *

2BKO (R.A.F.), to G4HK, 2DRR and all members of Manchester Section (Group 1).

* * *

2HIK (30 North Street, Forfar, Angus), to G3IS, GM3KB, 3KC, 3OL, 4ON, 8CF, 2BFV, 2DRD, 2FVR.

* * *

G8CK (62 King George's Avenue, Watford), to G2VF, 3NR, 5BW, 5UA, 6KQ, 6ZO, 6ZY, 8FF, 8HA, 8IJ, 8QR, 8TK.

Ham Hospitality

We are pleased to give publicity to the following additional names of members who have kindly offered to extend "Ham Hospitality."

Belfast.—Jack Sang (GI6TB) (D.R. for Northern Ireland), 22 Stranmillis Gardens (Home 67158, Office 57373). Eric Sandys (2FHN) (Hon. Secretary, Y.M.C.A. Radio Club) (Home 46498). S. H. Pattison (GI5UW) (Manager Henley Cable Co., (Office 25176). A. T. Kennedy (GI3KN), 14 Taunton Avenue, Lansdowne Road (Office 22207). R. Holden (GI5HU), 260 Grosvenor Road. Jack Smith (GI5QX) (Home 63323) (recorded incorrectly last month).

Forfar, Angus.—J. A. Clark, jnr., 30 North Street.

Harrogate, Yorks.—J. G. Pullan (2BPI), 1 Roseville Avenue (Harrogate 2291).

Lydd, Kent.—A. E. Tillyard (G2IJ), Cambridge House.

Prestwich, Manchester.—P. Harrad (G8UN), 117 Heywood Road (Prestwich 2518).

Melton Mowbray, Leics.—S. Clark (G8CZ), 125 Thorpe Road.

Portsmouth, Hants.—J. S. K. Stephens (G8WC), 65 Ebery Grove, Copnor.

Ripon, Yorks.—A. R. Yates (G3LB), 25 Clotherholme Road.

Salisbury, Wilts.—J. R. Letts (G8IL), 16 Canadian Avenue.

St. Margaret's-on-Thames.—J. Roe (G2VV) (Popesgrove 4871) (recorded incorrectly previously).

Tonbridge, Kent.—F. Barnard (G4FB), 34 Springwell Road.

Absent Friends

The self-excited AC4 was walking up the band,
The G's were mortified to hear, such DX close at hand.
"If we but had transmitters now," they said, "it would be grand."
"With forty watts of ECO, into an 8JK
Do you suppose," the Ham Whyte said, "I'd keep the rest at bay?"
"I doubt it," said Jack Clarricoats, "there's always 6CJ!"

Dud.

THE MONTH "OFF" THE AIR—July, 1940

By ARTHUR O. MILNE (G2MI)

I MUST make an appeal to the membership to send along more reports for this feature if it is to continue. You will see how hard-up I am for copy by this month's cartoon! Seriously, though, I can't invent the stuff, and if you want me to keep it up I must have your co-operation.

Reports on rare or unusual signals heard, and extracts from your correspondence with amateurs abroad, in fact anything which is of general interest is grist to the mill, so come along. Walk up! Walk up!

G2MI.

* * *

Navy Comforts

Another three receivers have been despatched to this deserving cause and two have been presented to local A.A. Batteries by the indefatigable G6PR. Jack Paine has done a wonderful job of work for the lads in blue and has built nearly all the receivers which have been sent to the Navy Depots. He has had many appreciative letters from the recipients and made many new friends, both for himself and ham radio too.

Contributions to the fund are acknowledged from G2JB and G8UN. The total now stands at £2 3*s*. 0*d*

Will those members who have old sets or components to spare, please write to G6PR, 38, Alpha Street, Slough, Bucks.

Here and There

G2MI has been evacuated to Yorkshire but letters will be re-directed from his home address.

BRS2098 reports hearing XU8ZA, TG9BA, OA3B, TI3AV, HI2K, HI3N, and K5AP, besides many of the commoner South Americans on 14 Mc telephony. He also mentions that Melbourne VLQ2 (11.87 Mc) and Sydney VLQ6 (11.83 Mc) are coming in well just now between 1900 B.S.T. and 2150 B.S.T. Both stations show 20dB above S9 on the H.R.O. meter. Delhi is another station which is coming over very consistently. G4AB has heard 45 U.S. states on 7 Mc since the war began and his list of unusual calls heard includes K7HIE, K7BZG, W7EST/W7, W6SHC/W6, W4HDQ/K4, OA4U, HC1SD, HK5EE, XE3AF, YV1AD, LU9AX, KA1HQ and a number of K6's all on 7 Mc.

G2NJ has heard VX8AA in the 14 Mc band. This station, wherever he is, claims to be using 5-watts input.

G8VG reports XE1CH and HK3CE at 02·30 G.M.T. 11th July, on 7 Mc and is another to comment on the wonderful way this band has delivered the goods right through the summer.

2CLD sends a long list of DX heard and also reports a contact between a German station and "ZB2OL." It's marvellous how they think them all up, really it is! He also says YU7DX and YU7LX are still active.

3RB has overheard a contact between D4LKM and YR5BF and also another much more interesting S8, both ways, QSO, between W2CRB and KC4USA on 14200 kc 'phone.

Mostly about Folks

G6BQ tells us that he recently met VU2FV and VK2IK in his particular branch of the fighting forces. May we once again ask these overseas amateurs to drop a card to Headquarters telling us they are here so that arrangements can be made for them to meet some of the boys.

We had the pleasure of entertaining VK2ADE a few weeks ago during his spell of leave from his *very monotonous job*. He is an air gunner, and the italics are ours!

During the swapping of yarns at a local get-together, the talk turned to 28 Mc and its peculiarities in various parts of the world. We G's were considerably startled when 2ADE calmly stated that "you generally knew ten was opening up when AC4YN's 28 Mc harmonic and other Asiatic stuff started coming in!" AC4YN's . . . Ye gods and little fishes!

By the courtesy of Mr. Garner BRS3770, we have been able to peruse several numbers of a beautifully hand prepared magazine which he circulates to his friends. Mainly on radio topics, this little journal is a masterpiece of penmanship. He would be pleased to add to his circle of readers; his address is 8, Holding, Little Woodcote, Wallington, Surrey. As a matter of interest this budding journalist is only 16 years of age.

RADIO PERSONALITIES—No 2.

It's *Your* letter I want.

G2MI. The Society's general factotum appeals for news.

QSL Bureau

It is once again necessary to point out that cards can now be handled only for the American Continent, so that all others are now merely cluttering up the limited house room of the QSL manager, or rather his wife, who is running the Bureau during his absence from home. All cards which were awaiting despatch, prior to the new order, are being preserved and will be sent forward when the war is over, if the countries to which they are addressed still exist.

At the rate things are going at the moment it looks as though a DX Dozen Club might be a welcome institution for some of the new licensees !

VK2MH informs G2XS in a letter that he is still awaiting confirmation of 'phone QSO's from G2PU, 2TR, 8FT and GW5KJ. Cards have already been sent by VK2MH but duplicates will be forwarded if they have not been received.

Recent correspondence from America has been opened by Censor. We have enquired from the Ministry of Information whether the United States is a censorable country, to which they have replied that it is not. They point out, however, that all mail is *liable* to censorship, but that there are no restrictions on the type of matter posted to the Americans.

Postscript.—There, we fear, we must leave you, for the supply of news is very limited this month. It's up to you ! 73.

Correspondence

The Windom Aerial Again

To the Editor, THE T. & R. BULLETIN

DEAR SIR,—With reference to the article published in the July issue regarding the Windom aerial, I feel I must point out that under no circumstances may a radio frequency feeder be non-radiating unless it has close beside it or surrounding it a second wire or shield carrying energy in anti-phase to neutralize the electro-magnetic field set up by the feeder current. Whenever electrons are accelerated, or decelerated, inherently, electro-magnetic waves are radiated. Consider the case of the Beverage Aerial, the non-resonant Vee Aerial or the well-known Rhombic. In each case the aerial is really just a feeder terminated in its characteristic impedance—there are no standing waves—the impedance of the system is everywhere resistive.

The Windom aerial comes in the same category as regards its feeder. There is nothing to cancel the radiation from the feeder and taking the example of a 14 Mc. aerial with a 33′, top, and a feeder about 66′ long the radiation pattern of the feeder would be something similar to that obtained from a 66′ wire terminated in the characteristic impedance (600 to 800 ohms resistive.)

By virtue of the fact that the feeder *is* matched to the aerial " top " the maximum amount of energy is transferred to the " top " but this is only roughly half that supplied to the feeder at the transmitter end. Thus it is apparent that the feeder must contribute a good portion of the radiated energy of the whole system.

The writer is of the opinion that the great diversity of results obtained with the Windom are, perhaps, largely due to the widely varying orientations of the feeder wire employed by users in different locations.

Yours humbly,
J. M. KIRK (G6ZO),
2/Lieut., R. Signals, B.Sc., A.C.G.I., D.I.C.

Selected References

The titles of several very useful books, published by George Newnes, Ltd., were unfortunately omitted from the Selected References chapter published in the new edition of *The Amateur Radio Handbook*.

A list of these books appears below :

Wireless Constructor's Encyclopedia. By F. J. Camm. Newnes. Price 5s.

Practical Wireless Service Manual. By F. J. Camm. Newnes. Price 5s.

Wireless Transmission for Amateurs. By F. J. Camm. Newnes. Price 2s. 6d.

Short Wave Manual. By F. J. Camm. Newnes. Price 5s.

The Superhet Manual. By F. J. Camm. Newnes. Price 5s.

The Radio Engineer's Pocket Book. By F. J. Camm. Newnes. Price 3s. 6d.

Mathematics for the Radio Amateur

For some months we have felt that a useful service would be rendered by publishing a series of articles dealing with the application of mathematics to amateur radio requirements. Such a series should be written in as topical a strain as the subject will allow.

Any member in a position to consider undertaking this task should write to the Secretary-Editor, who will be pleased to outline his plans.

Fuel for All !

" Going to the coal house this morning for the first time since last Saturday, I was delighted to find on top of the ordinary fuel, some extra special ' fuel ' for the winter evenings—or for that matter ' fuel ' for all spare moments—in the shape of the new Handbook. Thanks to all who have made this war time luxury—yet necessity—possible."
2DBK.

* * *

" Hearty congratulations on a very fine production. How you can publish such a manual at such a price during these times—beats me." GI8TS.

* * *

" Many congratulations on the Handbook. It's a great piece of work and would have been outstanding in peace time—but as things are, it reflects the highest credit on the few who have evidently put in so much hard work and given their specialised knowledge freely to benefit amateurs in general." G6XL.

Ohm's Law

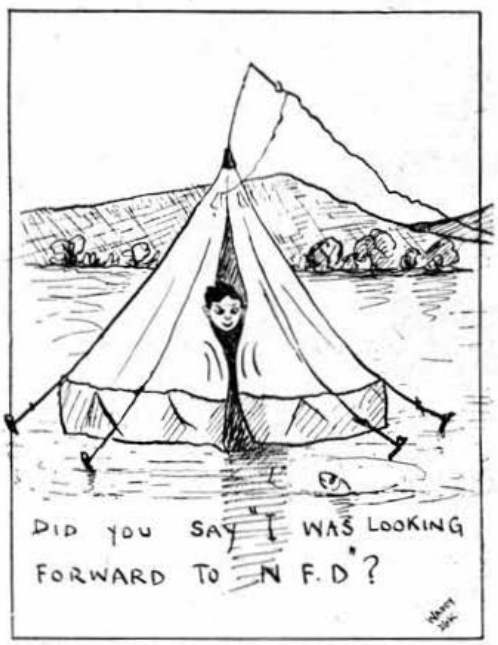
" If forty amps at forty volts produced but half a watt,
Would you suppose," the Walrus said, " that Ohm's
Law worked, or not ? "
" I doubt it," said the Carpenter, " but wouldn't it
get hot ! " Dud

The 28 Mc. Band

By NELLY CORRY (G2YL).

JULY is always rather a depressing month for the ham who thrives on 28 Mc.DX, but he usually has the consolation of being able to make European contacts on a good many days. This year the few European amateurs still active have quite naturally decided that the chances of effecting QSO's on 28 Mc. are negligible, so that the only short-skip signals reported were commercial harmonics.

Mrs. Hough, 2DYN, is to be congratulated on being the only member to report amateur signals this month. After much listening on a dead band she was eventually rewarded by exceptionally good conditions on the nights of July 18, 19 and 21.



Between the hours of 22.50 and 00.50 G.M.T. on the 18th W's in Districts 1, 2, 3, 4, 8 were coming in well, whilst W5BEK and W9CJW were also logged. HH4AS was S6/7 when calling CQ at 23.55, and W10XEA worked W2ATT (?) and W8CBC after 24.00 G.M.T. A station which 2DYN considered rather dubious (!) as it is not in the Call Book was none other than KC4USA, the West Base of the Third Byrd Antarctic Expedition, at "Little America." This station and W1FH were heard working each other at 24.00 G.M.T., at S4/5 and S9 respectively.

The following night 2DYN listened for an hour after 21.30 G.M.T. and logged W1, 2, 3, 9PAH and 10XEA. On July 21, 21.00—22.00 G.M.T., W's were again audible, including W4D SA, (an outstanding signal), W9FSZ and W9GEU.

Conditions for South America were well up to normal for the summer, judging by reception of LSA/LSA2 as reported by G4MR and BRS3003, but amateur activity was probably rather low. The harmonic on 31.5 Mc. was heard on 14 days, and the 27.5 Mc. harmonic on 21 days. The only other commercial harmonics reported, were DFI/DGC, EAK, EAX, HAS2 and IQA (all Europeans) who were audible on about ten days.

Reports from G4MR, 2DYN and BRS3003 are acknowledged with many thanks.

The Ultra-High Frequencies

By CONSTANCE HALL (G8LY)

ONCE again these notes appear, due mainly to the fact that six amateurs have had the enthusiasm, and the twopence halfpenny, to report their activities!

Conditions seem to have deteriorated in July, one enthusiast reporting it thus:—"*Eh, Lass, it's been a reight poor do this month, ah've nobbut 'eeard three signals, an' two on 'em we'ant reight 'uns neyther.*"

One report contains the following queries, and it is hoped that they may lead to some discussion in future notes:

1. When various harmonics, such as Italians, have been heard in the 56 Mc. band, has anyone located the fundamental signal on one receiver and the u.h.f. harmonic on another and measured the difference, if any, in the time taken by the two signals to reach the same listening point on both frequencies, thereby calculating a possible path the harmonic had taken, different from the fundamental, if any, at these "abnormal" periods of u.h.f. reception? [*Phew!*—ED.]

2. Does anyone think it possible for u.h.f. signals to be reflected by, say, the moon, in which case the difference in time between reception of fundamental and harmonic would be very different? [See Propagation Group report.—ED.]

The writer would appreciate remarks concerning the above, and also more questions, for it is obvious that this column cannot depend on stations heard reports during the winter, so what about it?

G3YY with less available listening time than in June, reports hearing two commercial harmonics, one on June 24 on 51 Mc. at 19.05, the other on July 10 on 52 Mc. at 19.30, whilst BRS1151, with more or less the same time spent on the band as in June, only heard one commercial harmonic, believed to be IRX on July 9 at 19.35; July 10, 11, 13, 15 and 19 static was troublesome, and on July 17, 18 and 19 there was a very low background level, becoming normal again on July 20; nothing being heard in the way of harmonics until July 27 when on 60 Mc. at 17.25, high-speed commercial morse was audible at S3/0 fading out at 18.05. All times G.M.T.

G3BN reports using an all-mains receiver which goes down comfortably to 112 Mc. He is on the look-out for American signals. He heard one commercial harmonic on July 8 at 18.00 on 56 Mc. He also says he has intended to send in a report for a long time and at last has done so, which shows that the monthly appeal for news is gradually taking effect; others please copy!

G3YL is known to be in possession of acorns

(*Continued on page* 60)

A NEW 32 RANGE UNIVERSAL TAYLOR·METER

Sensitivity 1000 ohms per volt A.C. and D.C.

Taylor instruments are designed and constructed by highly skilled technicians and experienced engineers. This Taylor Model 90 is acknowledged as a dependable, sensitive and accurate meter for Radio and General test requirements.

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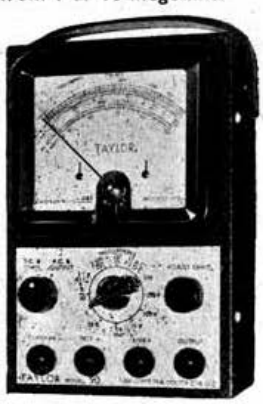
Note the following summary of the 32 RANGES :

(7 ranges) **D.C.** Volts 0-0·25 up to 1000.
(6 ranges) **A.C.** Volts 0-2·5 up to 1000.
(6 ranges) **OUTPUT** Volts 0-2·5 up to 1000.
(5 ranges) **D.C.** Current 0-1 mA. up to 2·5 amps.
(4 ranges) **A.C.** Current 0-1 mA. up to 2·5 amps.
(4 ranges) **OHMS** from 1 or 10 megohms.



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TRADE REVIEWS

Osram GU50

The *Osram GU50* is a half-wave Mercury Vapour-filled rectifier suitable for the supply of rectified current up to 250 milliamps. It is manufactured by the *M.O. Valve Company*, and retails at 25s.

The GU50 has been redesigned in order to replace the GU5 and incorporates modifications to improve the reliability under maximum conditions of operation, although the characteristics remain unchanged.

It has a somewhat larger bulb than the GU5 and the filament is in the form of a crinkled double V instead of a helix; the top anode connection has been retained. Readers will recollect that the GU5 replaced the GU1 although in this case the rating was increased and the base anode connection abandoned.

Characteristics

Filament volts	4·0
Filament current amps. ...	3·0
Anode volts (max.) R.M.S. ...	1,500
Rectified current (max.) mA....	250

A sample tested was found entirely satisfactory and agreed closely with the makers' published figures. D. N. C.

Masteradio Vibrators

A wide range of vibrators, and complete power packs incorporating them, are available from *Masteradio Ltd.*, Vibrant Works, Rickmansworth. There are two basis types—Interrupter and Synchronous. The former is available either in a 4-contact medium duty type, or as a 6-contact heavy duty type. The heavy duty model can handle considerable power and its normal use is in the conversion of direct into alternating current, usually termed "inverter service." To obtain high voltage D.C. from any of the Interrupter types, it is necessary to employ a rectifying valve—the OZ4 cold cathode type being most suitable.

The Synchronous or self rectifying type, as its name implies, delivers high voltage D.C. direct. It is only suitable for comparatively low power service.

Particular attention has been paid to such points as the materials employed, reed design, contact operation and magnetic circuits, the final result being a unit which is very satisfactory in operation and one which can be guaranteed to give long and useful service. Models are manufactured for use in 6, 12, 32 and 110 volt D.C. input, with outputs up to 150 watts.

Vibrapacks, the name by which the complete power packs are known, are for operation from 6 or 12 volt accumulators. The largest type delivers an output of 300 volts at 100 mA., which is sufficient for the operation of large receivers, public address equipment or small transmitters. Noise suppression filters are included in the specification but not smoothing chokes or condensers. These units are very satisfactory for V.H.F. operation, provided additional screening and screened leads are used. One Service user reports good results with a short-wave superhet, using a Vibrapack as source of power supply. Representative prices (subject to alteration) are £4 10s. for the VP551 (125/200 volts 100 mA. Synchronous) and £5 for the VP554 (300 volts 100 mA. Valve Rectified).

Full details and literature are available from the manufacturers. J.N.W.

Taylor-meter Model 90—Universal Test Meter

This is an inexpensive universal test meter manufactured by *Messrs. Taylor Electrical Instruments*, priced at £8 15s.

Housed in a metal case of overall dimensions 8 in. × 5 in. × 4 in. deep, it has a useful scale length of about 3½ in. and has a knife edged pointer and a well damped movement. Test prods are provided.

The ranges are selected by a twelve-position switch and an additional switch for A.C. or D.C. A zero adjuster is provided for the resistance ranges. The later ranges have an internal 9-volt battery but may be extended by an external supply of about 60 volts.

The instrument has the following ranges:—

(*a*) D.C. and A.C. volts 0—2.5, 10, 100, 250, 500 and 1,000 volts, each with a resistance of 1,000 ohms per volt.

(*b*) D.C. milliamps. 0–1, 2.5, 25, 250, 2,500 milliamps.

(*c*) A.C. milliamps. 0–1, 15, 250 and 2,500 milliamps.

(*d*) Resistance. 0–10,000, 0–100,000 ohms, 0–1 megohm using the internal battery and 0–10 megohm using an external 60 voltage supply.

There is also a position in the A.C. range, employing a series condenser, which enables the instrument to be used as an output meter.

The sample submitted was checked on its D.C. ranges by comparison with a sub-standard Weston Model 1; on the A.C. ranges against an A.C. Standard; and on the resistance ranges against a Cambridge resistance box. On the D.C. voltage ranges the maximum error at full scale was 2 per cent. high, and this only occurred on the lowest range, *viz.*, 0–10 volts. At readings lower than 10 volts (quarter full scale) errors up to 6 per cent. high were noted. On the D.C. current ranges the maximum error at full scale was 6 per cent. high on the lowest range, and 5 per cent. high at a quarter scale on the 0–250 milliamp range. On the A.C. voltage ranges the maximum error at full scale was 6 per cent. low on the 2½ volt range, and at quarter scale 7 per cent. low on the 0–10 volt range. On the current ranges, at full scale, the maximum error was 3 per cent. high on the 1 milliamp range and 3 per cent. low on the 2½ amp. range at quarter scale.

The resistance range 0–100,000 ohms showed an error of 10 per cent. low at 250 ohms and 2 per cent. low at 5,000 ohms. The 0–10,000 ohm range was 20 per cent. low at 25 ohms and 12 per cent. low at 500 ohms, whilst the 0–1 megohm range was

(*Continued on page* 60.)

RE-BROADCASTING IN SOUTH AFRICA

A FEW miles west of Johannesburg, from a small building which houses the "Panorama" broadcasting station, programmes of every kind from the pick of Europe are re-broadcast throughout the whole of South Africa. Reception from Daventry, Paris and other cities is of a consistently high order, and the apparatus installed, which is of British *G.E.C.* manufacture, bids fair to be ranked as near perfection as is possible to-day.

The Aerial System

The radiating system used consists of a rhomboid design of three aerials placed to give separations of between 1,250 ft. and 2,250 ft. At present they are directional on Central and Western Europe, but additional systems will be erected later to allow of reception from all parts of the world. The present arrangement mainly covers wave bands between 13 and 30 metres, but it also functions effectively on the 49-metre band.

The Receivers

Eight racks hold respectively the aerial coupling board, four receivers, diversity locking equipment, line and monitor amplifiers, and telephone apparatus. The aerial connectors are of the co-axial cable type, and any aerial may be linked with any of the receivers. Each receiver is an eight-valve superhet specially designed by *The General Electric Co., Ltd.*, for diversity reception. Both high and low tension supplies are taken from accumulators to reduce background noise. The two R.F. and the input signal frequency stages are independently tuned, whilst amplified A.V.C. holds signal strength exceptionally constant. When receivers are coupled in diversity through the locking equipment, *i.e.* when the outputs are coupled through a mixer unit and their A.V.C. lines bonded, the receiver which has injected into it the strongest signal will automatically take control, because the A.V.C. line of this particular receiver will bias back the other receivers, so making them inoperative. For example, as soon as a strong signal being received on one aerial fades, it will invariably increase on another aerial, and the receiver coupled to this second aerial will then take control.

In practice it has been proved that, if aerials are separated by 1,000 ft. or more, the signal they receive from a distant short-wave transmitter will fade only very seldom on all three aerials simultaneously. It is, therefore, not economically worth while to use four or more receivers in diversity. The fourth receiver is employed, therefore, for substitution in case of failure.

Selective fading, *i.e.* the type of fading which is accompanied by severe distortion, is not diminished by diversity working, which only aids in the elimination of straightforward fading.

Locking Equipment

It is possible to couple the output of two, three or four receivers as desired, or to extract the outputs from each receiver separately. Precautions are taken to ensure that the outputs are coupled in phase so that cancellation, noticeable in the bass frequencies, will not occur. The line amplifier incorporates tone control.

Power Equipment

The generator equipment, consisting of a petrol-electric 3½ kW. A.C. set, is housed in an outroom, and is electrostatically shielded to prevent interference. Mercury vapour rectifiers are employed to convert the current to D.C., which is then used to charge the large capacity accumulators feeding the receiving equipment.

Special arrangements have been made to provide a good earth, and care has also been taken to ensure that the wiring carrying A.C. (for power purposes) is well separated from that carrying D.C.

Romford Radio Society

The Romford and District Radio Society have resumed Tuesday evening meetings at the Red Triangle Club.

At the Annual General Meeting held on April 2 all retiring members were re-elected unanimously. On April 9 a Junk Sale was held to start the season while it is hoped to arrange a varied programme of lectures to suit all tastes.

New members are welcome. Inquiries should be addressed to Mr. H. G. Holt (2DXI), 5 Butts Green Road, Hornchurch, Essex, who, as Assistant Secretary for the duration, will give any help that may be required.

"Practical Wireless"

This well-known Newnes weekly publication will, as from September, appear as a monthly journal. (Price 6d.)

The first monthly issue, dated September, appeared on August 7th.

Channel Isles Members

The following Channel Isles members have not yet communicated their English addresses to Headquarters: Capt. C. A. Henn-Collins, G5ZC; H. E. Le Dain, G5LI; A. W. Gale, G3XN; A. A. Hordern, BRS.3709; S. N. Pain, BRS.3698; T. de Putron, G8MF; G. H. Smith, 2ASO.

Readers in a position to assist us in locating any of the above members are asked to write to Headquarters.

* * *

Thanks

Mr. A. G. Cole, G3GS, late of the Channel Isles and now resident at 27 Grange Road, Hook, Surbiton, Surrey, wishes to thank the many members who communicated with him after the publication in our last issue of his new address. Due to a printer's error his call was quoted as G3CG. Mr. Cole is now on war work in London.

BRITISH ISLES NOTES AND NEWS

DISTRICT 4 (East Midlands)

Leicester.—Members recently had a very pleasant surprise in the form of a visit whilst on leave, from G5UQ (the Vicar) who had many a good yarn to recount. G5MY is now quite happy, in charge of an R.A.F. station transmitter. 2HBG remains at No. 2 E. & W. S. and 2BAP was recently accepted as a radio mechanic. One or two other members have signed on the dotted line during the last week or two but have not yet been posted. G2RI and 3BU still walk a beat as special constables.

Mansfield.—So many members have been called for service that it has been decided to hold the next Town Meeting at 7 p.m., August 25th in order to save overhead expenses. We understand old timer G5KG is making good progress with his study of the violin whilst 2HPT is expecting to join the NAAFI as a canteen manager. Activity here is not great at the moment although some work is being put into audio gear.

Nottingham.—The T.R. G8DZ appeals to all members to get into touch with him and to send details of any activity. He points out that *everybody* must be doing *something* and co-operation can always be helpful. 8JV has been in hospital but is now out and O.K. again, with a promotion to Lieutenant (R.N.V.R.). 5VU (P./O., R.A.F.) has been on leave. 6CW is expecting to be called in the next week or so. 4NU of Liverpool (R.A.O.C.), visited 8DZ recently. 5BW and 2UT, of Norwich, are now working in the district and can be contacted *via* 8DZ, 17 Newstead Avenue, Mapperley, or by 'phone Nott. 45071 extension 7. One or two members have suggested a District Meeting while the weather is still good. If you would be able to support this venture, please write the D.R. at 90 Romway Road, Leicester by next post without fail. G2RI.

DISTRICT 6 (South Western)

The D.R. again appeals for news, especially chatty bits of gossip of interest to our pals on active service. Although most of the District has changed into Khaki or Blue there remains a sprinkling of civilians whom we would urge to pass on any items of interest.

During the latter part of July the D.R. was pleased to welcome G6JL (R. Signals), and BRS3171 (R.A.F.); also G2DP of Croydon. An interesting letter has recently come to hand from 2FNY (R.A.F.), who tells us that in the course of his wanderings he has met F8OT, G2IJ, 3HG, 5OI, 8HB and 8VH.

Letters from service members will be warmly welcomed, as will visits from those District members who get to Torquay on leave.

News from Exeter and North Devon is awaited with interest. G5SY.

DISTRICT 7 (Southern)

Aldershot and Farnborough.—Apologies are extended to anyone who turned up for the cancelled July Ham Gathering at North Camp. Every effort was made to warn all those who might have intended to be there. The cancellation was unavoidable owing to the decision of the authorities that the Hall must in future be reserved for members of H.M. Forces. Attempts were made to fix up another venue in the vicinity, but to no avail. However, it is with great pleasure, we are able to announce that a Ham Gathering is being arranged by Miss Corry, G2YL, to take place at her QRA, "Redholm," Walton-on-the-Hill, near Tadworth, Surrey, on Sunday, August 25th, at 2-30 p.m. All are welcome, but *please* if you are going, drop a post card to 2YL.

Bournemouth.—G2NS has moved and is busy reinstalling his gear. 2FSL is hoping to join the R.A.F. 4IJ, 2FHD and 2HMX had quite an experience when a certain "bottle" (to wit, a 6L6), was found by the authorities. BRS3789 has succeeded in clearing up RX troubles. 2HNO has joined the Signals Section of the L.D.V.

Woking.—A speedy recovery is wished to 5YA who is in the Victoria Hospital, Swindon, recovering from a car accident. 5WP received a visit from the local constabulary, who it seems had expected to find a branch of the Deutschekurtwellensender on the premises ! !

Forthcoming Events

Aug. 18 Scotland "A" District, 2.45 p.m. Y.M.C.A. Residential Club, 100 Bothwell Street, Glasgow.

" 24 District 15, 3 p.m. at The Excelsior Hotel, 1 Ladbroke Gardens, Ladbroke Grove, W.11

" 25 Ham Gathering at G2YL, "Redholm," Walton-on-the-Hill Tadworth, Surrey at 2.30 p.m. See separate announcement.

Channel Islands.—Although the C.I. are not in District 7 the following news is included as it was sent in by 3GS now evacuated to Surrey. 2AOU 2CNC, 3XN, and 3GS managed to get away from the Islands, but 4LI is apparently still there. There is no news of 5OU.

DISTRICT 8 (Home Counties)

It is very gratifying to be able to record that more members are now sending us items of news, and this month we have to acknowledge letters from G2NJ, 3KG, 3SK, 3WW and 5DQ. The former reports consistently. The D.R. has received personal visits from G3WW and 8SY, while others have made phone calls. If letters are not replied to individually they are none the less appreciated.

Cambridge.—G5DQ writes from the H.Q. of the Suffolk Regiment to say that he rises at 5.30, but "not to work DX." He has had a visit from 2PU. (Best wishes from all the boys, Peter.) 5JO is putting his workshop to good use, by doing war work. 5DR, was engaged on a very businesslike dug-out when we called recently. 2XV is fully occupied with business. 8SY listens when he can find time, but is busy on war work. 5BQ has heard from 3GS, who is well known to many Cambridge stations. He managed to get clear from Jersey just in time, but alas, had to leave everything behind.

Peterborough.—G2NJ was happy to run across GW2WO (Swansea) and 2AOU (Channel Islands) in London recently, all three being bent on the same errand. Over tea at a Corner House, ham experiences were recounted. 5NP has been appointed Deputy Group Warden in connection with A.R.P., and 3DY is putting in a lot of time with L.D.V. 3WW, who is fully occupied with A.R.P., has been investigating the possibility of sending impulses over the mains to warn A.R.P. services.

Hearty congrats. to 3BK, on his recent marriage to Miss Rose, of Wisbech. 3WW acted as best man.

Bedford.—Having had no news from this area since January, we were glad to hear from 3SK, who is employed at Leighton Buzzard. He lives at 127, Stanbridge Rd. (having moved from Letchworth), and would like to get in touch with local amateurs.

Luton.—G3KG reports that activity is at a low ebb in his area, as most members are away on active service.

Finally, please maintain contact and help to keep the district in the news.

G5BQ.

A Cordial Invitation is extended to all members, and in particular to those on Active Service—to attend a

HAM GATHERING

at

"REDHOLM," WALTON-ON-THE-HILL TADWORTH, SURREY

on

SUNDAY, AUGUST 25th,

Assemble 2.30 *p.m.*

Those hoping to attend are urgently requested to advise Miss N. Corry, G2YL, at the above address in advance. Telephone: Tadworth 3268.

A special feature of direct interest to all Canadian amateurs in this country will, it is hoped, be included in the programme.

DISTRICT 9 (East Anglia)

There has been nothing of interest to report since the meeting in Norwich during May, but the D.R. asks that T.R's and members generally will endeavour to supply the names of those who have recently joined H.M. Forces, in order that the official lists may be kept up to date

G2XS.

DISTRICT 12 (London North and Hertford)

BRS3747 in the only report received this month tells us he is undergoing a year's training in the R.A.F. as a Wireless Operator Mechanic, and is stationed in Lincs. with a number of other amateurs who comprise both instructors and learners. He sends 73 to all in the District. We have to welcome a well-known amateur to No. 12 in the person of D. W. Heightman, G6DH, and hope to see him at future meetings. Members will be pleased to know that our D.R. ("Buck") was home for a few days at the beginning of the month and visited G5FA. He continues to make good progress. It is proposed to recommence local meeting in September and details will be announced in the next issue.

G5FA.

DISTRICT 13 (London South)

We were pleased to welcome G6AN at a recent meeting. He had just returned from France and entertained us with vivid and instructing tales of life over there. We were also glad to see 2FQQ, home from a long spell at sea with the R.N.V.W.R. Two new members, whom we welcome are BRS3724 from Horsham and BRS3812 with the Royal Corps of Signals. G3CI is now in Scotland with the R.A.F., G5PY is in Devon, G3CU although in the R.A.M.C. manages to get time off to build a 9-valve super, G2UX has moved to Woking from Hove, whilst G6HM writes from Scotland, when we all thought he was in the Far East! G5OX and G2JB have left to take up duties in the R.A.F. News also comes from G5WG now in East Anglia after returning from France. G2GZ, 8TN, 3ST, 2DP, 6IO, 2LW, 2JK and 2VB are keeping the flag flying on the Home Front.

Don't forget the Norwood meetings, every fourth Saturday in the month, and if you can't come send news to the D.R. before the 25th so that we can keep in touch with each other.

G2WV.

DISTRICT 14 (Eastern)

East Essex.—Owing to evacuation, etc., G2SO appears to be the only remaining member in the area and even he is getting interested in the R.A.F.V.R. If there are any other members left in East Essex will they please write to G2SO at his temporary address 45 Bonchurch Avenue, Leigh on Sea? Monthly meetings are cancelled, but members are asked to keep in touch with the D.R., who will always be glad to hear from them. G2GU has obtained a commission in the R.A.F.V.R., and is now somewhere in England.

Ilford.—The June meeting held at G6HU was attended by six members. In future the host will be responsible for tabling an agenda of the subjects to be discussed. G8TL found himself unable to start up his car after the meeting until he discovered that the distributor head was in his pocket! A report of the July meeting held at G8TL will appear next month. G4LV, who is in hospital recovering from an operation, has been visited by G3MD. The former sends 73 to his friends.

East London.—Friends of G6SG will be interested to hear that he is now married and will join us in wishing him a happy future. 2BRR would like to hear from G8AB, 8JM, 2XG and 2XP.

DISTRICT 15 (London West, Middlesex and Buckinghamshire)

The July meeting saw thirteen members present including G3XI and 8VM, the latter on leave after having being torpedoed. We were pleased to see him safe and sound and extend our congratulations on his escape.

Letters were read from G3YM, 4PA, 4AR and 8VM while cigarettes were sent to G3YM, 8FA and 8WR. G8VM, who was present, received his in person.

FRS48 has passed his A.M.I.W.T. and the City and Guilds Radio Service Work examination. Congratulations O.M., good work.

We understand that G2LC, who recently joined the district after his marriage, has now been called up. We wish him good luck with the forces.

Unfortunately one letter sent us during May was lost by the person to whom it was passed for reply. We are very sorry about this and if the member who wrote does not receive the expected reply by the time this appears he is asked to drop a card to the D.R., who has the answer waiting to send him.

Apologies to all members for the omission of the date of the July meeting from THE BULLETIN. The Excelsior Hotel is now closed down but Mrs. Green has very kindly offered to continue with the holding of meetings there, in another room, an arrangement which we are sure will prove satisfactory. The date of the August meeting will be found under Forthcoming Events. G6WN.

A.C.I. R. G. Thornley, 2DAF, is a W.E.M. in the R.A.F.

DISTRICT 16 (South Eastern)

There is very little to report this month, but G3WR sends his usual monthly letter which is always welcome.

Brighton and Hove.—An unusual meeting was held in July when Mr. Baggaley (of *Wireless World* Amplifier fame) gave a most interesting talk on the human brain. The talk was greatly appreciated by those present, including G2RU, 2UX, 3HP, 3JF, 3WR, 3YY and 6CY. Members are maintaining their interest and are listening regularly, particularly on 56 Mc. G2WS.

Scotland

"A" District.—At the July meeting Mr. James Roy, GM3QM, gave a most interesting talk on his experiments with the Franklin Oscillator. He referred particularly to its value for use in frequency measurement work, a point which was appreciated by those present.

P/O J. Emmerson (GM8HA) wishes to be remembered to members and friends in the district, whilst Jim Troy (GM8RJ) leaves us to take up duties with the R.A.F.V.R. Good luck O.M. The next meeting will be held on August 18, at the usual time and place when a lecture on a subject still to be fixed will be given. GM6ZV.

Northern Ireland

As in other districts, amateur radio is quiet in N.I. and very few reports have been received of late.

GI5UW has been experimenting with cathode ray tubes whilst GI3KN is testing his new SX24. GI5QX, who has been trying out a Trophy 8 receiver for some weeks, has also been entertaining some of the visiting amateurs who are at present in N.I. with H.M. forces. The D.R. had a pleasant visit from G3RF and a friend, both of whom had temporarily found a quiet spell in an Ulster port after rough times in the North Sea. John C. Graham (GM3TR), who was in the district for some time, has now left for the Bristol area. Lyn Jones (GW3XY) was also in Belfast for a while and met many local amateurs.

The following members and other amateurs who are at present in Belfast or the surrounding district have contacted many GI's:

Harry Caunce (G6KS), George Petch (G4LZ), L. Huntley (G4LW), W. C. Barnes (G3JO and also operator of Swindon District S.W. Club), Sidney T. Hall (G3BR), R. H. G. Garside (G2YN), S. W. Clarke (2AMW) (late assistant Editor of the S.W. Magazine), R. S. Trevellyan (2CKQ), J. M. George (2DBO), and J. W. Booth (2AJV.)

Alan Mears, G8SM, now in Belfast, is T.R. for South Middlesex and also Treasurer of the T.V.A.R.T.S. Any of his friends who see this may like to write him c/o GI6TK.

Many local GI members serving with the Forces have been home on leave, including GI5HV, 5DX, 3ML, 8MI, 4QB, 5AJ, 2DYO, 2COF, and 2BNM. Several of these were in France and managed to get away safely. Would members with news of 2DZG or others who are serving please get in touch with the D.R. or with GI6TK. The latter has kindly undertaken to supply material for inclusion in THE BULLETIN each month.

Among those who are busy on work of National Service are GI5SJ (the Belfast T.R.), 6YW, 6TK, 5JN, 3IA, 5HU, 2DDI, and 2DTM.

GI6YM, the City of Belfast Y.M.C.A. Radio Club, has recently obtained a 1940 model Sky Champion receiver, and there is seldom an evening when members of the Forces do not avail themselves of its use. Any visiting amateur is welcomed at the club, where he will find ways and means of getting in touch with fellow amateurs.

Members in N.I. are asked to drop a line to the D.R. from time to time, with any news or information that comes their way. Every little helps.

Congratulations are sent to Jack Jensen, 2DGU, who was recently married.

All in this part of the world send best wishes and congratulations to HQ for so successfully keeping the flag flying in such adverse conditions.

GI6TB.

HEADQUARTERS CALLING

Have You Moved ?

Members who have changed their permanent home address since their gear was impounded by the G.P.O. would be advised in their own interest to send advice to the Engineer-in-Chief, Radio Branch, W2/2 Wellington Hotel, Harrogate.

Kilocycles-Metres Conversion Tables

Copies of this very useful 64-page publication, in vest pocket booklet format, are available from Headquarters, price 1s. 4d. each, post free.

C.O.D.

Due to the fact that Headquarters is being operated by a greatly reduced staff, it is regretted that Society publications and Sales Dept. items can no longer be sent C.O.D.

American Publications

Due to a fall in the sterling exchange rate on the American free market, it has become necessary to increase our charges for all American publications and subscriptions.

The following are the new rates :—

A.R.R.L.	s.	d.
Annual Subscription	17	6
A.R.R.L. Handbook	8	6
A.R.R.L. Antenna Handbook ...	4	0

Radio	s.	d.
Annual Subscription	21	0
Two Years' Subscription ..	35	0

Members are advised that these rates are subject to alteration without previous notice.

According to " Radio " their 1940 Handbook is now out of stock.

Returned Bulletins

Readers are asked to assist us in tracing the present whereabouts of the following members who have moved from the addresses given below without advising Headquarters :—

F. Adams (G2AP), 1 Ashley Avenue, Burnham-on-Sea, Somerset.

W. M. Aitken (BRS.3640), R.A.F.

W. Bell (GM3MX), " Laurel Bank," Pitlochry, Perth.

N. Booth (2DSF), 20 Gordon Avenue, Levenshulme, Manchester.

L. Hill (G3CN), 9 Bapaume Road, Hilsea, Portsmouth.

G. F. Keen (BRS3322), 38 St. Aubyns Road, Portslade, Sussex.

A. W. Lister (G5LG), Manor Farm, Winson, Cirencester, Glos.

A. M. R. Mallock (BRS3426) Royal Signals, Yorkshire.

C. H. Messenger (BRS3683), 35 Orchard Way, Bognor Regis

J. Pollard (G3IY), R.A.F.

H. Punch, 6 Falcon Cliff Terrace, Douglas, I.O.M.

W. G. Pyke (G6PK), Rose Cottage, Addington Village Road, Addington, Surrey.

C. D. Underwood (BRS1473), 17 Roseberry Avenue, Gaywood, King's Lynn.

E. Wake (G5RP), Rose Cottage, Addington Village Road, Addington.

R.A.O.C.

The Chief Ordnance Officer, Woolwich Arsenal, advises us that the scheme for the voluntary enlistment of clerks and storemen for the R.A.O.C. has been closed, due to the magnificent response to the appeal for recruits published in a recent issue of this Journal and contemporary publications.

The Society receives the grateful thanks of the Chief Ordnance Officer for the publicity given to the appeal. He also states that " from many thousands of applications we have been able to select a class of man who undoubtedly will prove of great value to the Corps."

Physical Problems in Industry

In order to assist professional men who, in the present emergency find themselves presented with technical problems in applied physics of which they do not happen to have had previous first-hand experience, it has been decided to extend the facilities of the Institute of Physics' panel of Consultants. Through this medium inquirers are put into touch with those physicists most likely to be able to offer immediate practical suggestions in any particular case.

Inquiries about this scheme should be addressed to The Secretary of the Institute of Physics, The University, Reading, Berks.

The F.C.C. and U.S. Amateurs

We are indebted to Dorothy Hall, W2IXY, for sending us a cutting from a New York newspaper giving an outline of the latest F.C.C. regulations.

A questionnaire, which present operators and future applicants must subscribe to under oath, demands proof of citizenship by birth or naturalisation, and requires information as to the nationality of immediate relatives, time spent by the applicant outside the United States, and service with the U.S. or any foreign government. In addition, present operators must submit finger prints and photographs prior to August 15.

From the same newspaper we read that Mr. K. B. Warner, Secretary of the A.R.R.L., expresses himself in favour of the new orders and supports the view that his Government should wipe out non-citizen operators.

New Members

S. R. POUNTNEY (G3NM), 68 Galton Road, Bearwood, Smethwick, Staffs.
L. LOTT (G6PT), " Gants Muir," Burnham on Sea, Som.
V. H. BLANC (2CGX), 19 Ardmillan Terrace, Edinburgh.
H. B. HARDING (2DGY), 11 Penrhyn Road, Kingston on Thames, Surrey.
S. ARCHER (2DWZ), 25 Wardle Grove, Arnold, Notts.
N. B. YATES (2HBK), " Grasbil," Waenfawr, Caernarvon.
W. T. BLACK (2HGT), 13 Sutherland Road, Park Lane, N.17.
L. W. HILL (2HJZ), 29 Swinburne Street, East Park, Hull, Yorks.
E. J. DANIELL (BRS.3818), 4 Barnsley Road, Thorpe Hesley, Rotherham.
J. F. HOTCHKIN (BRS.3819) 35 Blyth Street, Ransom Road, Mapperley, Nottingham.
R. A. LANE (BRS.3820) Woodgate, Rothley, Leics.
E. E. BUCK (BRS.3821) 24 Priory Street, Gorleston on Sea, Norfolk.
C. R. HEATH (BRS.3822) " Etheldene," Beaulyway, Romford, Essex.
L. F. C. TURNER (BRS.3823) Hartland, Chase Road, Southgate, N.14.
Correction to list in July issue. D. H. TOMLIN, 32 Moorsyde Avenue, Sheffield 10, given as BRS.3814 should read, 2HMN.

Book Reviews

AIRCRAFT RADIO AND ELECTRICAL EQUIPMENT. by H. K. Morgan. Published by Sir Isaac Pitman & Sons Ltd. 374 pages. Price 22s. 6d.

It needs little imagination to appreciate the close relationship which exists to-day between the designer of modern aircraft and the radio engineer. In this latest addition to the steadily increasing number of treatises dealing with the subject of Aircraft Radio and Electrical Equipment, the subject is reviewed in a manner which brings great credit to the author.

For British readers the chief interest, perhaps, lies in the earlier chapters which cover in a most comprehensive manner Hydraulic Analogies, Condensers, Coils, Accessories, Valves and Amplifiers. Chapters 6 and 8 might almost be a part of *The Amateur Radio Handbook*, for therein are given very complete descriptions of Transmitter and Receiver fundamentals, as applied to Aircraft Radio.

The chapter dealing with commercial Aircraft Receivers runs to nearly 100 pages but unfortunately American types only are described. The diagrams are exceptionally well executed and are of a type which will enable any practical man to diagnose trouble.

One of the most interesting of the later chapters is that dealing with U.H.F. equipment, but as is to be expected the treatment of the subject is not fully comprehensive. The chief applications considered are those dealing with beacons and above-ground altimeters. Later editions will undoubtedly give more details of point to point communication practice.

Direction finding is dealt with in a manner suited to the scope of the production—especial emphasis being paid to the fundamental principles of what is perhaps the most valuable of all radio applications to aircraft.

This publication can be strongly recommended for inclusion in reference libraries, particularly those attached to R.A.F. Signals Schools. It should also be read by all who desire to increase their existing knowledge of Aircraft Radio equipment.

J. C.

RADIO BOOKS

Radio Upkeep and Repairs for Amateurs

By ALFRED T. WITTS, A.M.I.E.E. How much *don't* you know about radio apparatus ? Just start reading this book and you'll be surprised ! It's an unfailing source of information, and really does help you tremendously to keep your set up to scratch, and to remedy any faults that arise. *World Radio* says : " A very useful and instructive book . . . should prove extremely useful to the average owner." Fourth Edition. 215 pages. **6s.** net.

Cathode Ray Oscillographs

By J. H. REYNER, B.Sc., A.C.G.I., D.I.C., A.M.I.E.E., M.Inst.R.E. The information given in this book will prove of value to all who have occasion to use the cathode ray oscillograph, as it enables the user to apply the apparatus to the solution of any problems which he may encounter. The book is strongly recommended as a textbook for students and teachers. 177 pages. 128 illustrations. **8s. 6d.** net (by post 9s. 1d.).

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EDITORIAL—(*Continued from page* 31)

Numerous other chapters have been subjected to most careful revision, and the resultant publication is now offered to our members and the general public alike as a major contribution by the Council, towards the war effort. That large quantities will be sold to men on active service goes without saying. To this class of reader in particular, we express the hope that they will realise that one of the chief precepts of the Society to-day is to afford to its service members every ounce of practical assistance possible.

The Handbook is but an outward and visible sign of that principle. J. C.

PORTABLE MOBILE ON 1·7 Mc—(*Continued from page* 39)

it having been established that we were heard and called by stations at considerable distances, but we were unable to receive them. A model of the proposed new receiver was used in the car during National Field Day 1939, and this proved very satisfactory. It was found to be quite easy to operate whilst driving solo, and several c.w. stations were worked mobile with the key on the writer's lap during the week-end. An extended permit had been obtained to cover tests in the Lowestoft area, but this had not been used up to the outbreak of war.

Conclusions

From the data collected in the course of these experiments, it would seem that reliable communication up to about 30 miles can be secured on 1·7 Mc., under the worst possible conditions, with a low power phone station. The transmitter, incidentally, was never modulated 100 per cent. (the average was about 70 per cent.) owing to power supply difficulties, and in any case it was not found necessary to do so.

The writer would like to thank Mr. L. Fitzgerald, 2CKJ, for his ungrudging assistance during many pleasant journeys, and he hopes that it will not be long before "G8TL Portable Mobile" is again heard on the air.

THE ULTRA-HIGH FREQUENCIES—(*Continued from page* 50)

and has curbed a refractory u.h.f. converter, whilst BRS2817 reports continued enthusiasm.

2BIL, the well-known u.h.f. receiving station, wishes to be remembered to all old friends; he hopes soon to meet some DX u.h.f. men in person and will fix up schedules for future contacts with "G"!

Everyone is thanked for writing—it may have been a fairy tale but surely there were some G2, 5, 6 and 8 calls "amid the Ultra Highs"—do write, telepathy is not enough, even if the frequency was known!

TRADE REVIEWS—(*continued from page* 53)

8 per cent. low at 2,500 ohms and 3 per cent. low at 10,000 ohms.

Taking into account the low price of this instrument and the fact that it is not intended to be in the precision class, these errors are not excessive. The Model 90 can safely be recommended for all general purpose tests within its scope. D. N. C.

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DENCO S.W. Components, Polystyrene insulating material. Pocket-Two receiver, etc. Send 2½d. stamp for Catalogue. Note: Emergency address for all enquiries, orders, etc.—DENCO, 59 Walmington Fold, London, N.12.

SALE 1937 model Super Skyrider. Crystal filter and built-in speaker. Offers.—65 Salisbury Road, Andover.

WANTED.—Communication Receiver NC—101X, HQ-120 or similar type for cash.—Write Box 153, "Parrs," 121 Kingsway, London, W.C.2.

WANTED.—National HRO, NC100, or Hammarlund HQ120X. First-class condition only.—Box 154, Parrs, T. R., 121 Kingsway, London, W.C.2.

WANTED.—Recent H.R.O. Receiver complete, or Home Cinema in exchange for 1937 14 h.p. 6-cylinder Morris Saloon. Excellent condition, low mileage, brand new engine, done only 400 miles, or sell £65.—Box 152, T.R., 121 Kingsway, London, W.C.2.

5-VALVE Battery Superhet, chassis with moving coil speaker and Collaro double spring motor with pick-up.—Offers to G3YH, 24 Hall Street, Bristol, 3.

PATENTS AND TRADE MARKS

KING'S Patent Agency Ltd. (B. T. King, G5TA, Mem. R.S.G.B., Reg. Pat. Agent), 146a, Queen Victoria Street, London, E.C.4. Handbook and Advice on Patents and Trade Marks free. Phone: City 6161. 50 years refs.

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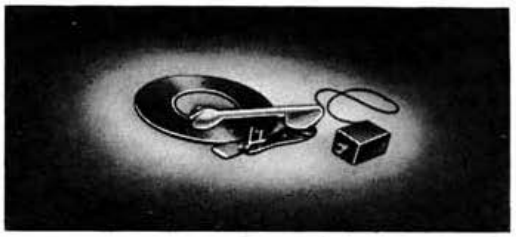

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