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THE INCORPORATED
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DEVOTED TO THE SCIENCE AND ADVANCEMENT OF AMATEUR RADIO

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CONTENTS

JULY, 1939

	Page
Sunspots, Magnetic Storms and Radio Conditions	7
The Franklin Master Oscillator in Amateur Transmission	13
A 56 Mc. Crystal Controlled Portable Transmitter	19
The Sunshine Won	23
Ragchewing—1949	26
Experimental Technique	27
The Ninth Annual B.E.R.U. Contests, 1939	30
Experimental Section	34
An Ultra-High Frequency Wavemeter	36
Letters to the Editor	37
Valve Review—The Osram KT8	38
Book Reviews	39
The Month on the Air	41
The 28 Mc. Band. The 56 Mc. Band	44
Headquarters Calling	46
56 Mc. Activity	49
Around the British Isles	50
British Empire Notes and News	63
Contemporary Literature for July, 1939	64
QRA Section	67

FIVE METRES MAKES NEWS AGAIN

FIVE metres is always news but those who forecast that European contacts would again take place last month, must have experienced a sense of pleasure when they found their predictions had materialised.

One feature of the present intensive 56 Mc. drive is the enthusiasm which greets the news of contacts over distances, which on most of the lower frequencies, would be accepted as small fry. Herein lies one of the chief attractions of ultra-high frequency work—the results obtained are of an entirely different character to those we have been accustomed to expect, since an earlier generation of amateurs unfolded the secrets of International short-wave communication.

No man or woman can assert with authority that world-wide contacts are impossible on frequencies above 50 Mc. for during the recent spell of good conditions certain of the Italian signals were received at great strength for quite long periods. Is it not possible that under such conditions trans-atlantic work could take place?

The present summer has brought more British stations on to five metres than ever before as the list in this issue will show. The secret, if there is one, of this increase in interest, is unquestionably due to the fact that more and more amateurs are tiring of the stereotype conversations which frequently result from contacts on other bands.

The tremendous technical advances which have been made since last year have contributed to the improved results now being recorded, but even more important has been the publication in this Journal of theoretical assumptions which have induced many newcomers to the band to lend a hand in their solution.

Our Second Annual 56 Mc. Field Day staged on July 9 saw a marked change in the *modus operandi*. Gone are the days when portable stations were erected to contact others across the valley. In their place have arisen frequency stabilised transmitters working into ambitious aerial systems—often rotatable—and manned by members who have made a study of cosmic data, meterological and other effects governing U.H.F. propagation. The reports which we shall receive from those who took part in the field day will, when published, represent a valuable contribution to existing knowledge, but in addition we know that many important studies based on long-period observations are in the course of preparation.

Such evidence will focus attention on the Society, besides acting as an antidote to those who continue to fill the lower frequency bands with their inane chatter.

We frequently learn of great strides being made in official circles to solve the mysteries of ultra-high frequency communication, but in our opinion the present-day amateur stands as good a chance as anyone else of extending existing knowledge. The amateur, because radio for him is a hobby, will concentrate on his pet problem unto the bitter end, further he will offer his knowledge and the results of his labours to his colleagues ; virtues which mean a great deal.

Come what may, the Society can take pleasure in the thought that so long as there is work of a scientific nature to be done, its members will undertake it in the same spirit which pervaded the activities of the Pioneers of the Amateur Radio Movement.

* * * * * *

CONVENTION

The news published elsewhere in this issue that the Council is arranging an exhibition during our Fourteenth Annual Convention will evoke interest throughout the Society.

It is early days yet to say with certainty that every concern supplying apparatus to the amateur fraternity will be represented, but present indications show that many of the prominent firms supporting this Journal welcome the unique opportunity of presenting a display of their products.

The fact that Convention, and with it the Exhibition, will, for the first time take place under one roof, should prove an added attraction, for in past years much time has been lost in moving the scene of activity from one place to another.

In arranging for all functions (except of course the visits) to be held in a London hotel, ample opportunities will be afforded for informal conversations, one of the most important features of any Convention.

The necessity of making reservations will be apparent to all members, for an event of this magnitude can only succeed when system prevails. When the official Convention questionnaire is issued next month it is hoped that every member in a position to attend will study it carefully and notify Headquarters of his or her wishes.

* * * * * *

HOLIDAY MONTH

From now until the end of August the world and his wife will be holiday-making. The radio amateur frequently has the opportunity when away from his home of meeting personally friends of the ether. These informal meetings do much to bind together our members but let us remember that our friends who we visit at the seaside or abroad invariably have jobs of work to attend to during the day, and have domestic commitments in the evenings.

To avoid embarrassment to your future host, and in courtesy to him and to his family, send a postcard before calling.

J. C.

Forthcoming Events

July 17 District 12 (Watford Section), 7.30 p.m. at Carlton Tea Rooms, 77a Queen's Road, Watford.

,, 19 District 14 (East Essex Section), 8 p.m. at G2SO, " Pen Cuckoo," Linksway, Belfairs, Leigh-on-Sea.

,, 20 District 13 (Central Areas), 8 p.m., at Brotherhood Hall, West Norwood.

,, 23* District 4, 3.30 p.m., at Trent Bridge Hotel, Nottingham.

July 24 District 13 (Woolwich Area), 8 p.m., at Memorial Hospital Hall, Woolwich.

,, 26* District 15, 7.30 p.m., at G6VP, " Holmlea," 12 Ferrers Avenue, West Drayton, Middlesex.

Aug. 2* District 1 (Manchester Section), 7.30 p.m., at Brooks Cafe, 1 Hilton Street, Manchester. Informal chat.

,, 2 S.L.D.R.T.S., 8 p.m., at Brotherhood Hall, West Norwood.

* *Sale of disused apparatus will be held at these meetings.*

Sunspots, Magnetic Storms and Radio Conditions

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

Some observations on Solar and Magnetic activity during the period May, 1938, to April, 1939, together with a review of conditions on the band of frequencies 28 to 30 Mc. for the same period. The Character Figure Scheme for these frequencies is explained and variations in conditions shown by them is correlated with magnetic activity. The "Hissing" phenomenon encountered on this and other frequency bands is compared with solar activity.

DURING the past twelve months members of the Propagation Group of the Experimental Section have been receiving Cosmic data regularly, thus making it possible to study propagation phenomena in a way that they had not been able to do previously. A summary of the main solar and magnetic activities has been published in THE T. & R. BULLETIN each month since August, 1938. At the same time a cosmic data sheet has been issued monthly giving more exact details (*see* THE T. & R. BULLETIN, December, 1938, page 344). The data available includes magnetic conditions, sunspot information (numbers from Tokio and Zurich, observations of dates of central meridian passage), solar prominence activity, times of observed chromospheric eruptions on the sun, measurements of the ionosphere, times of ionosphere storms and short period fade-outs in radio communication observed at Washington and Tokio.

Sunspots and Magnetic Disturbances

From the *International Astronomical Union's* "Bulletin of Character Figures for Solar Phenomena" the dates of central meridian passage of fifteen large groups of spots between May and December were obtained and the magnetic character figures for the succeeding eight half days were extracted from the Science Service Research Aid Announcements. This showed that in eight out of the fifteen cases a magnetic disturbance occurred within the following eight half days. The mean character figures for the half days following the C.M.P. of the spots were as follows:—0·23, 0·45, 0·54, 0·42, 0·33, 0·28, 0·23, 0·39, showing that the probability of a disturbance of the magnetic elements is greatest during the third half day following the central meridian passage of a large spot. This confirms previous observations.

Recurrence of Magnetic Storms

The tendency for periods of magnetic disturbance to recur at 27 day intervals was noted, and quiet periods were found to be recurrent at the same interval. An example of the latter is the following series:—May 4 to 10, May 31 to June 6, etc., finishing January 3 to 9. During these periods only one major disturbance occurred and the mean magnetic character figure was 0·22. During the succeeding periods of seven days, *i.e.*, May 11 to 19, etc., the average magnetic character was 0·54 and seven large disturbances were recorded. The series of quiet periods mentioned above seems to have come to an end with the January period. This tendency to 27 day recurrence affords some measure of success in forecasting magnetic storms but it is obvious that such forecasts will not be completely infallible.

This and the conclusions reached in the previous paragraph support the suggestion, made by Professor Chapman in his monograph "The Earth's Magnetism," that terrestrial magnetic disturbance is due to some emission from limited areas on the sun, often but not always associated with sunspots; and that this emission is corpuscular, being confined to a limited "beam."

An example of a storm not readily associated with sunspot activity occurred on March 28 and 29 this year. On those dates no spots at all were visible with the writer's apparatus, Meudon observatory reported sunspot activity "nil," and Tokio observatory counted only 19 individual spots (an extremely low number). Twenty-seven days later, further magnetic storms occurred but this time the writer observed no less than eight groups of spots and Tokio counted the same number of groups with a total of 127 individual spots. It would therefore appear that the same area of the sun's face was instrumental in causing both storms even although on the earlier occasion there was little visible sunspot activity.

Radio Conditions

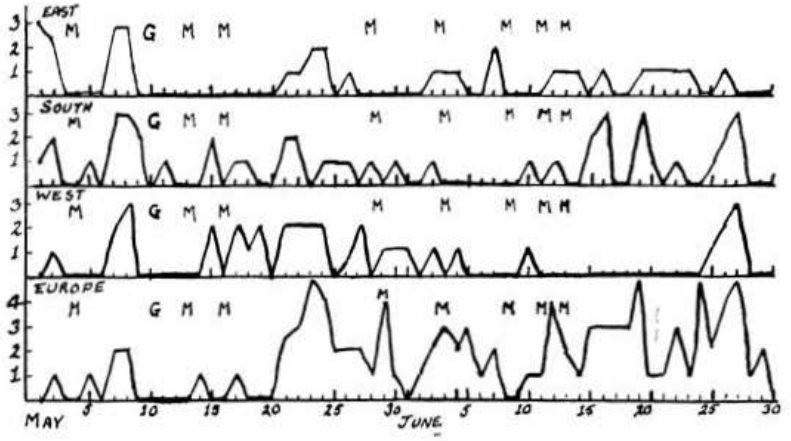
The radio conditions considered in this article are chiefly those existing on the band of frequencies 28 to 30 Mc. Realising that lists of stations heard gave no real measure of the actual propagation conditions existing on various dates the writer suggested to the 28 Mc. Propagation sub-groups that character figures should be allotted to each day to indicate the conditions prevailing, in a way similar to that of the solar and magnetic observatories. As few members of these sub-groups are able to listen all day and every day it was considered that by averaging the figures allocated by the members individually a truer description of conditions would be obtained than any one member could supply from his personal observations. This was particularly true in the case of observers, who like the writer, are unable to listen as regularly as they would wish.

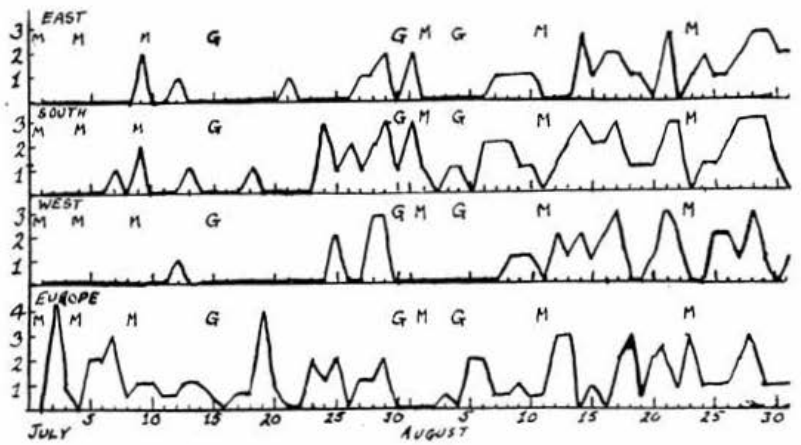
It was decided, after discussion among the group members, to divide the world into four sections or areas and to allocate a separate character to each. Members listening at times unsuitable for any particular direction would not allocate a figure, *e.g.*, if listening was confined to the evening no character figure would be assessed for stations to the east, as they are normally inaudible at that time of day.

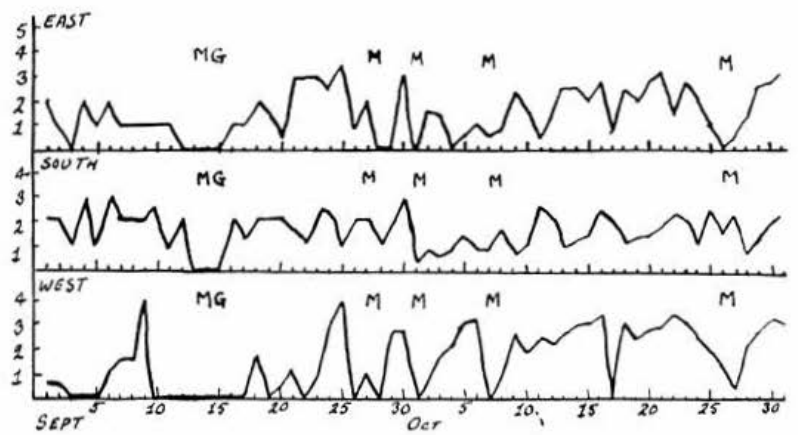
The four sections were as follows:—

(1) *East section.* Distances exceeding 1,000 miles

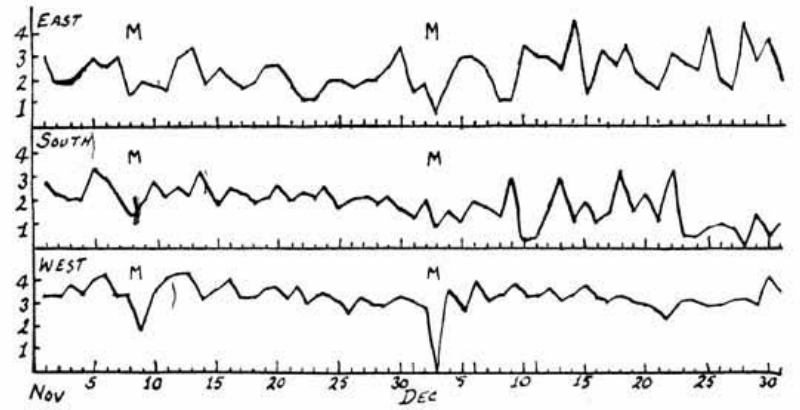
* *Member of Experimental Section.*

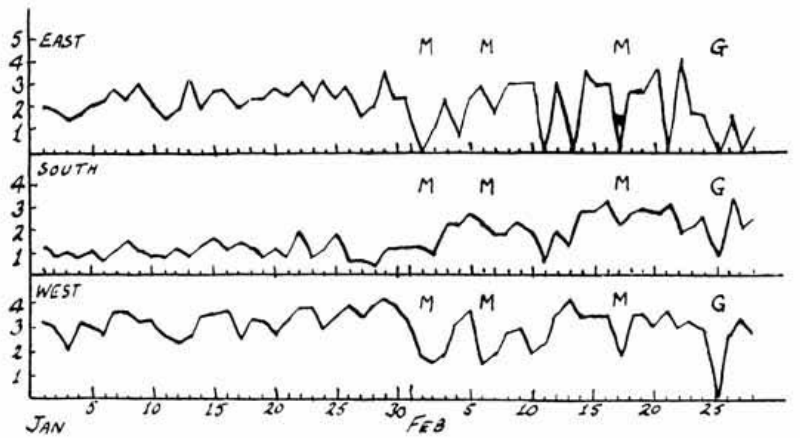


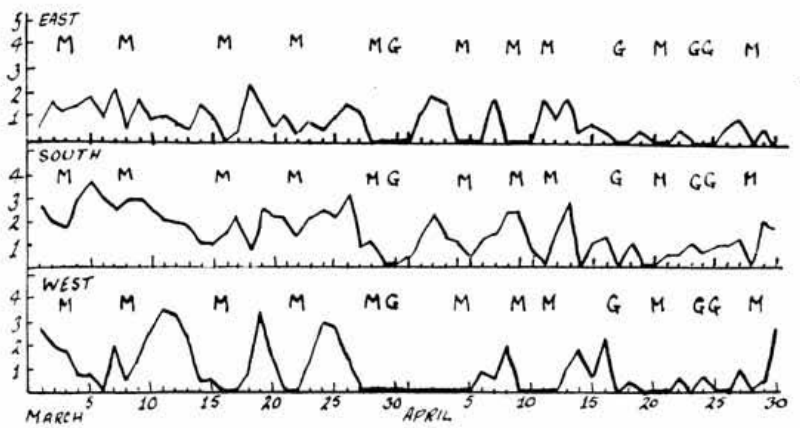




Daily variation of propagation conditions on 28 to 30 Mc. for distances exceeding 1,000 miles to east, south, and west from May 1938 to October 1938, and for short-skip signals for summer months only. For explanation of character figures see text.







Daily variation of propagation conditions on 28 to 30 Mc. for distances exceeding 1,000 miles to east, south, and west, from November 1938 to April 1939. For explanation of character figures see text.

to the east, *i.e.*, north of a line running slightly south of east from Great Britain on a Great Circle Map. This includes India but not Egypt.

(2) *South section.* Distances exceeding 1,000 miles to the south, *i.e.*, Africa and South America.

(3) *West section.* Distances exceeding 1,000 miles to the west, *i.e.*, north of a line joining England and Panama.

(4) *European section.* Distances in any direction less than 1,000 miles, but not including extended ground wave signals (*see* THE T. & R. BULLETIN, September, 1938, page 136). Regular observers on 28 Mc., experience very little difficulty in identifying extended ground waves. Reception of signals in this section is normally confined to the summer months and is believed to be due to sporadic E layer ionisation.

Each member was asked to assess a figure from 0 to 5 to each section on each day on which observations were made at suitable times. As a guide the following meanings were given to the figures :—

0 No signals at all ;
1 Poor, very weak and spasmodic signals only ;
2 Fair, weak but steady signals ;
3 Fairly good, signals of average strength ;
4 Good, strong signals but fading, etc. ;
5 Exceptionally good (to be reserved for the best conditions only).

It must be realised that this was a guide only and several other points had to be considered in making the final assessment, *e.g.*, whether or not signals were being received from all the area concerned or only a small part, and the number of hours during which signals were audible.

The scheme was begun in the autumn of 1938 and was continued throughout the winter months. The following stations have co-operated with the writer during either part or the whole of this period :—G2YL, 6DH, 6QZ, 6XL, 8CO, 8MH, 8SA, BRS25, 3003, and 3179. Some difficulties have been experienced, the lack of activity in certain directions being a real trouble. Similarly, the number of observers during the mornings is usually small. Care had to be taken to see that the figures were not a record of activity but of conditions and a watch was kept on the week-end figures to see that they did not show any marked increase over the mid-week figures. No signs of this were detected. It is pleasing to note that from September 1, 1938, to April 30, 1939, a character figure has been obtained for each of the first three areas on every day.

There was some doubt, at first, concerning which signals to include in the European section. Signals from more than 1,000 miles distance, even if European in origin, should be included in the first three sections. The greater the number of observers the greater is likely to be the accuracy of the final character figures. For this reason the figures for conditions to the west are probably the most accurate. Generally speaking an average character of less than 2·0 represents rather poor conditions, less than 1·0 extremely poor conditions, while a figure exceeding 3·0 shows conditions above the normal.

Previous to September, 1938, no character figures for 28 Mc. conditions are available, but Miss N. Corry (G2YL) has kindly lent the writer her " 28 Mc. Diary " in which she keeps details of all stations heard by members of the 28 Mc. Propagation Groups A and B, and by certain other stations, together with other relative data. From this and personal observations it has been possible to assess approximate character figures for every day between May 1 and August 31, 1938, but it must be stressed that these figures are probably not so accurate as those in the winter months assessed by means of the scheme already outlined.

Magnetic and Radio Conditions

The character figures for the twelve months are shown in graphical form. It is interesting to study these in conjunction with the magnetic data available from the U.S. Coast and Geodetic Survey at Cheltenham, U.S.A. An attempt was made to compare an inverted graph of the magnetic character figures with the 28 Mc. graphs. At some periods the relation between these graphs was very evident but at other periods unexpected differences were found. The reason for this was soon discovered. The magnetic figures which are alloted on a scale 0·0 to 2·0 cover a period of twelve hours each. A magnetic storm beginning at, say, 2000 G.M.T. might raise the character to 1·0 or higher, yet most of the half-day under consideration has been quiet and it is therefore incorrect to compare the 28 Mc. figures for that day with the rather high magnetic character. On investigation this was found to be the cause of most of the discrepancies existing between the two graphs. As an alternative method of comparison a list of periods during which the magnetic elements were reported by Cheltenham as moderately or greatly disturbed has been compiled. The most important of these periods is given in the accompanying table and all are marked on the graphs by letters M and G, M indicating moderate and G great disturbance.

The effect of these disturbances is very marked in the graph showing western conditions. In every case a severe drop is recorded during the winter months, while during the summer months when conditions are generally poor, none of the periods of good conditions coincided with disturbed magnetic conditions. The graph for conditions to the east shows more irregularities. This is probably due to inconsistent activity in that direction, but in almost every case a marked deterioration follows each magnetic disturbance. It is not unknown, however, for signals from India and other southern and eastern parts of Asia to be received in this country on 28 Mc. during magnetic storm periods and this is the cause of the east character figure not dropping to zero on several of the disturbed days. The magnetic north pole is located to the north of Canada and it seems probable that the path taken by signals from southern Asia is far enough from this pole to be unaffected by the magnetic disturbance unless it is extremely severe.

Lack of regular activity in Africa and South America is, undoubtedly, the cause of some of the irregularities in the graph for signals from those areas, but it is noticed that the conditions on magnetically disturbed days are usually shown as poor and never as good. The effect is much less marked than for either east or west signals but it seems that on 28 Mc., at least, magnetic storms do not improve conditions from the south.

September and April are transition months and the effects of magnetic storms and seasonal changes are not easily differentiated, so it is, perhaps, inadvis-

THE HISSING PHENOMENON AND BRIGHT CHROMOSPHERIC ERUPTIONS ON THE SUN RECORDED DURING 1938.

Hissing Phenomenon				Eruptions
Date	G.M.T.	Remarks	Observer	G.M.T.
Jan. 3	2034		G2YL	
Jan. 16	—	Loud	G6DH	Several this day
Jan. 17	1320	Loud	G6DH	Several during morning
Mar. 21	Morn. 1205	Loud	G6DH BRS 3179	
April 7	1403	Loud	G6DH	1314 to 1322 and 1425 to 1620
April 15	0840	Very loud for 5 minutes	G2XC & G6DH	0830 to 0950
April 24	0950 1351	On 14 Mc. On 28 Mc.	G8MH G2XC	0803 to 0815
April 25	0858	Loud on 14 Mc.	G6YL	0840 to 0902
July 10	0823 0905 1038 1047 1050 1222 1810	 On 9 Mc. Loud 7 to 28 Mc. Loud 7 to 28 Mc. Loud 7 to 28 Mc. Loud	BRS 25 GM6JJ G2XC G2XC G2XC GM6JJ BRS 1173	Several eruptions this morning and in late afternoon
July 12	1722	On 14 Mc.	G2YL	
July 26	0810	Loud	G6DH	
July 29	0600	Intermittent	G6DH	0438
July 30	0800	Intermittent to 0930	G8MH	0750 and 0910
July 31	0655 0815 1305 1307 1759	Very loud Very loud On 56 Mc. On 28 Mc. Slight	G6DH G6DH 2BIL & G6YL VU2AN G2YL	0615 to 0633 and 0700 to 0710 0814 to 0815
Aug. 1	0810		G6DH	
Sept. 19	1217		G6DH	1310 to 1358
Sept. 21	1303 1701		G6YL BRS 3003	
Oct. 14	1235 1335		BRS 3179 G6DH	1238 to 1320 and 1538 to 1605
Oct. 17	1239		BRS 3003	1238 to 1302
Nov. 6	1000		VU2AN	
Nov. 11	0939		G6DH	0940 to 1011
Nov. 12	1005	Several	G6DH	1132 to 1142
Dec. 7	1040		BRS 3003	

able to give over-much attention to any slight discrepancies between magnetic and radio conditions during these months. October 17, however, presents a puzzle. Magnetic conditions were reported as quiet on that day except for a slight disturbance ending at 0200 G.M.T., yet both eastern and western graphs show an amazing deterioration in conditions on that day, so much so that the five stations contributing character figures all gave 0 for western conditions. On February 11, 13 and 21, the east graph sinks to zero, probably due to lack of activity in that direction, a reason which is not likely for western conditions on any date. It may be worth mentioning that on October 17, eight separate chromospheric eruptions on the sun were observed, some of them being intensity 2 to 3 on a scale of 0 to 3, according to the *I.A.U. Bulletin*. Such eruptions are often co-incident with sudden fade-outs in radio communication but the fade-out of October 17 did not show the characteristics of that type of fade.

a fade-out of radio communication. The fade-outs have also been correlated with chromospheric solar eruptions and it was therefore decided to check the times of such eruptions with the times at which the hiss had been heard on 28 Mc. or other frequencies. The accompanying table shows the result of this investigation. On several occasions there is very close agreement of times, *e.g.*, April 15 and 25, July 30 and 31, October 14 and 17, and November 11, while several others show fairly close agreement. In making these comparisons it must be remembered that the sun is not under continuous observation. It is understood that the observing of solar phenomena is performed in rotation by a number of observatories but even then cloudy weather conditions can cause considerable periods of no observations. Thus because there is no eruption reported at any given time it is by no means proof that one did not occur. Further there are often considerable discrepancies in the reported times of commencement and termination of eruptions, *e.g.*, on April 13

PRINCIPAL MAGNETIC DISTURBANCES—MAY, 1938 to APRIL, 1939.

Began Date	G.M.T.	Ended Date	G.M.T.	Magnetic Character
1938		1938		
May 11	1555	May 13	0200	1·9 to 1·0
June 12	1756	June 14	0220	1·3 to 0·8
July 15	0315	July 17	0700	1·6 to 1·1
July 30	0436	July 30	1300	1·6
Aug. 3	2136	Aug. 4	1100	1·3 to 1·6
Sept. 14	1532	Sept. 16	0400	1·2 to 1·7
Sept. 27	2202	Sept. 28	0930	1·5
Sept. 30	1022	Oct. 2	0500	1·3 to 0·6
Oct. 7	0615	Oct. 8	1300	1·4 to 1·6
Oct. 24	2300	Oct. 28	2100	1·0 to 0·6
Dec. 2	2100	Dec. 3	1700	1·0
1939		1939		
Feb. 6	0536	Feb. 6	1700	1·2 to 1·4
Feb. 24	1708	Feb. 25	1800	1·9
Mar. 27	1735	Mar. 31	1610	1·7 to 0·6
April 16	2132	April 22	0300	2·0 to 0·6
April 23	0545	April 23	2400	1·8 to 1·7
April 24	1740	April 26	0300	1·9 to 1·0

The magnetic character figures given are the greatest and least during the period of the disturbance.

The graph for section 4 (European signals) is not shown for the winter months, as during the first month or so it was unreliable as a result of certain misunderstandings mentioned above, and since then has consisted chiefly of noughts. A graph, compiled from G2YL's 28 Mc. Diary, is shown for the summer months. The effect of magnetic disturbances on these signals is not so marked as on the more distant signals. There is, perhaps, a tendency for poor conditions on disturbed days but there are a number of notable exceptions to be encountered.

The "Hissing" Phenomenon

It is now several years since Mr. D. W. Heightman, G6DH, first drew attention to a peculiar hissing noise occasionally heard on the 28 Mc. band. The hiss was recorded a number of times during 1938, and Miss N. Corry has compiled a list of the occasions which have been reported to her. On several occasions the hiss has been closely associated with six observatories observed the same eruption, but the times of commencement are given as 0933, 0934, 0948, 0949, 1025 and 1052 G.M.T., similarly the times at which this eruption ended disagree. A few minutes difference between the time at which the hiss was heard and the time the eruption was observed is therefore permissible. It must not be overlooked that confusion between man-made static and the hissing is not impossible, although very improbable in the case of any observer who has actually heard the hiss. It cannot be stressed too strongly that the hiss really does occur and the close agreement in the times of different observers on April 15 and July 31 is something of a proof of this. The writer must confess that he was at one time sceptical but having heard it on April 15 and July 10, 1938, he is now very certain that it really does occur. It seems, therefore, that the hiss is

(*Continued on Page* 68)

The Franklin Master Oscillator in Amateur Transmission

By E. L. GARDINER, B.Sc. (G6GR)

A FEW years ago the writer became regularly active on the air after a long period in which the lack of a permanent address, and general business activities, had prevented more than occasional visits to the key. He was at once struck by the changed conditions brought about through the wide adoption of crystal control, in place of the usual self-excited oscillators of the early nineteen-twenties, which, although not giving as pure a note as might be desired, could at least be adjusted in a moment to any desired frequency in order to dodge interference. A few months listening on 7 and 14 Mc. showed that most amateur stations were forced to work through intense interference because they were tied down to one or two crystal frequencies. Although a small number were using some form of master oscillator control, in many cases, their

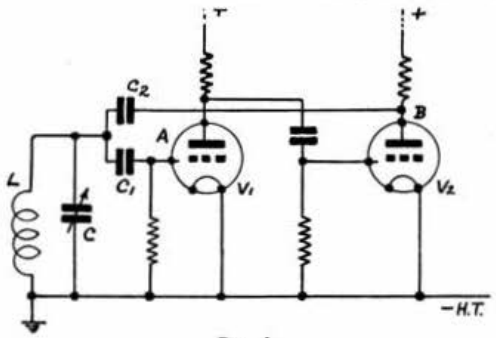


Fig. 1.
Fundamental circuit of Franklin Oscillator.

transmissions were characterised by having drifted to another part of the band each time the receiver was switched on during a QSO !

Whilst the foregoing remark is not intended to be taken too seriously, there is undoubtedly a good deal to be said for the master oscillator controlled transmitter, provided (1) it can be designed to compare in stability with the crystal, and (2) it has the ability of quartz control to work at an accurately known frequency without continual resort to frequency measuring gear. It is not the wish of the writer to add to the crystal-E.C.O. controversy which still rages in amateur circles, although it must be admitted that only the most carefully designed and constructed E.C.O. can be used with complete confidence. We can sum up this thought by stating that there seems room for some more reliable form of master oscillator in the average amateur station. In this connection a leaf can be taken from the commercial engineer's note-book. It will be found that commercial transmitters most frequently employ crystal control when they work on a reserved frequency channel (probably having several kilocycles clearance on either side). But under conditions more nearly parallel to the crowded amateur bands, such transmitters are either self-excited, or employ a master oscillator, of which one of the most satisfactory is that designed by Franklin for the *Marconi Company*. This oscillator has been widely used in marine installations, where a single transmitter may have to work on a number of short-wave channels when handling various types of service. It is inherently a simple arrangement, and seems very suited to amateur needs and to home construction.

A simplified Franklin Master Oscillator was installed at G6GR early in 1937, and has proved so uniformly satisfactory since then, that a few notes on its construction may be of interest to other amateurs who feel inclined to try a departure from stereotyped methods.

The Franklin Oscillator

The principle of the Franklin Oscillator is illustrated in Fig. 1. The circuit employs two valves, generally triodes, in a conventional Resistance-Capacity Coupled Amplifying arrangement. Potentials of any frequency (provided it is not too high), applied at "A" will result in amplified potentials at the output " B." But there are two special points to notice in which this amplification differs from that of a single valve. First, unless the losses in the couplings are very high (as might occur at ultra-high frequencies), the gain of the two stages will be a good deal greater than that of either valve alone ; second, owing to the reversal of phase which normally occurs in any simple amplifying stage, the potentials at " B " (having been reversed twice) will be in the same phase as those at " A." Thus the conditions are ideal for reactive feedback, since we have a considerably amplified output in the same phase as the input voltage.

Suppose a feedback coupling be provided from " B " back to " A," such as through two small condensers C1 and C2 in series, then provided the coupling is sufficient, the whole amplifier will go into oscillation just as would a single valve when provided with a reaction coil arrangement. In fact, apart from its additional amplification, which naturally assists oscillation, the second valve V2 can be regarded as an alternative method of reversing the phase of the feedback, just as is done in more usual circuits by arranging the reaction coil to be wound in the opposite direction to the grid coil to which it is coupled.

There is, however, nothing in the circuit so far described, which will fix this oscillation at any definite frequency. Practically therefore the arrangement would probably oscillate at that frequency which happened to correspond with the greatest effective amplification, or at that frequency at which the feedback was most effective. It would probably be a low frequency, not unconnected with the time constant of the R.C. coupling, and would not be very definite.

In order to convert the arrangement into a

constant frequency oscillator, we must provide some means whereby the feedback, or the amplification, is a maximum at the desired frequency, and much less at all others. This is easily done by inserting a parallel resonant circuit, L and C, between the junction of the two condensers C1 and C2 and the earth line. Such a circuit has a low impedance to all frequencies removed from resonance, and it thus virtually short-circuits the reaction path. Also at other frequencies the circuit behaves either as a condenser or an inductance, introducing a phase change which spoils the condition necessary for oscillation. At resonance, however, the circuit behaves as a pure high resistance, and the maximum feedback will occur in the correct phase across it. If C1 and C2 are reduced until their capacities are only just sufficient to produce oscillation, the latter will occur exactly at the frequency at which feedback is a maximum, namely the frequency to which the circuit LC is tuned.

tightly coupled to a valve, and as a result considerably loaded thereby. Whatever may have been its "Q" when measured alone, its "working Q" will be a good deal lower. It is in this respect that the Franklin circuit scores, for the small condensers C1 and C2 effectively reduce valve loading to an almost negligible value. In the commercial case it is found possible to work with each of these condensers less than one micro-micro-farad capacity; and in the oscillator to be described they should not exceed about 2μμF. As a result the isolation of the circuit LC, from valve effects, is very complete. Suppose for example C1 is 1μμF and the tuning capacity C about 500μμF, then since the inter-electrode capacities of V1, can only act across the circuit in series with C1, no changes of any kind in the valve circuits can possibly alter C by more than 1μμF or 0·2 per cent. Thus we could change the valve for another of a different type, alter the H.T. or L.T. voltages widely, or allow any wide amount of heating

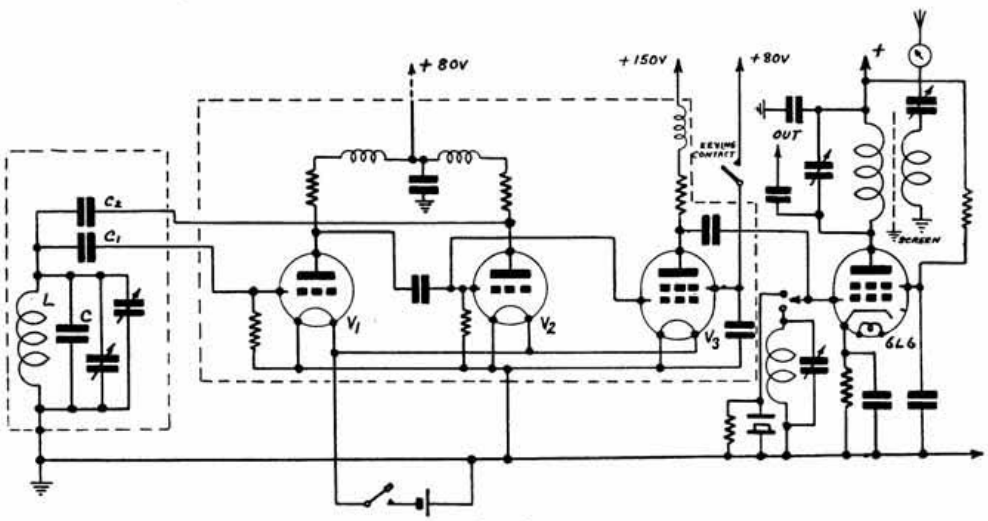


Fig. 2.

A 1·7 Mc. Franklin Oscillator designed for amateur operation.

The stability of the Franklin oscillator depends upon two main factors; first the quality of the circuit LC, and second the degree of loose coupling between this circuit and the valves, caused by the choice of very small values for the two condensers C1 and C2. We will examine these two points individually.

First the oscillator must obviously be of the "High Q" controlled type, therefore the circuit LC should be a good one, possessing low losses and rigid construction. In commercial practice* an elaborate construction is employed, in which a tubular condenser C surrounds the coil L, the whole being cleverly compensated against changes of temperature. As will be described later, however, it is not essential to go to this length in amateur equipment, provided the coil L is rigidly constructed and is of a low-loss type, and that the condenser C is well designed.

In most forms of oscillator the resonant circuit is

* "*Short-wave Wireless Communication*" *by Ladner and Stoner.*

up to occur, yet the resonant circuit cannot possibly be changed in effective capacity by more than 0·2 per cent. In practice, since such drastic changes are not contemplated, the effect upon frequency would be much less than this percentage. It is this singular immunity from valve and voltage variations, and from the effects of valve heating and consequent drift, that makes the Franklin such a useful arrangement.

It will also be noted that no reaction tappings, or similar complications occur, in fact all we have is a simple tuned circuit with one end earthed. Practical construction is thus made very convenient, since the variable condenser can be earthed to the screening compartment, whilst to change the frequency range it is only necessary to provide several coils, all joined to earth at one end, and to switch them in turn to the condenser by a simple single-pole selector switch. No other alteration to the circuit is necessary in order to make up a handy laboratory oscillator having a tuning range of from 20 kc. up to 3,000 kc. or higher.

Practical Application to Amateur Transmitters

Turning now to the application of the Franklin oscillator in the control of an amateur transmitter, several modifications are clearly possible, and the particular arrangement chosen at G6GR will be described.

It may at first seem surprising that battery triodes have been used by the writer, but there are several good reasons why these are desirable. Such valves take a comparatively short time to heat up, further they do not develop so much heat in use as the indirectly heated types. It is thus easier to prevent heat from reaching the circuit LC, which could cause frequency drift by the gradual expansion of components. The whole oscillator comes into operation instantly upon switching on, and settles down to its working frequency, for all practical purposes, in a few seconds. The current consumption of the oscillator is very small, being approximately 6 to 8 mA. at from 80 to 100 volts H.T., and about 0·35 amps. at 2 volts L.T. The former can, with advantage, be drawn from an H.T. battery, thus guarding completely against possible slight frequency changes due to mains variations, and without the need for any elaborate stabilising circuits. It is found that a cheap H.T. battery lasts about a year. An L.T. accumulator lasts for two or three weeks of normal operation, and since several charged cells are always available for experimental purposes, it is no great trouble to change the cell should it show signs of failing during a contact. The anode current meter shows a warning drop somewhile before the oscillator actually ceases to function.

For those who on principle do not like battery operation, it may be noted that a 6N7 double triode has been found quite effective in the circuit, and this may be run from A.C.

If the oscillator is not to be switched, we must select the frequency at which it is to work. Experiments have shown that there is little to choose between 1·7 and 3·5 Mc. as regards ease of construction or stability. At higher frequencies such as 7 or 14 Mc. it is necessary (when using battery valves) to increase C1 and C2 in order to obtain oscillation ; stability is therefore a good deal poorer. A very fruitful field of experiment seems to exist, however, in the use of highly efficient valves, such as the high mutual conductance Television pentodes now on the market, or perhaps even Acorn valves, which by their improved amplification at the higher frequencies should enable the circuit to perform satisfactorily. The writer has not yet found time to explore this field, and suggests that it might appeal to the experimentally minded amateur.

Since it was desired to use the oscillator to drive a 1·7 Mc. transmitter, it was decided to design it for that band, and to double up to the higher frequencies when necessary. Whilst agreeing that the reduction of stages in a transmitter is a valuable field for development in the case of portable or compact gear, the writer can see little justification for it in the case of a home transmitter working from A.C. mains, particularly in view of the present low price of valves and the excellent stability and convenience of a multi-stage design. The transmitter therefore employs a straight frequency doubler for each band, 6L6's having proved admirable throughout. When working at 56 Mc. five exactly similar stages are in use.

A Practical Design

Fig. 2 illustrates the practical circuit used by the writer. The main resonant circuit LC is placed by itself in a 6 in. × 6 in. × 6 in. copper box, the only other components allowed in this compartment being the small condensers C1 and C2. This box is spaced an inch or two away from a second similar box which contains the oscillator valves and coupling components, and is well removed from all other parts of the transmitter which " run hot " during operation. This simple expedient seems sufficient to keep heat from the tuned circuit, and whilst there may be a slight change in frequency from day to day (owing to changes in room temperature), these small effects are unimportant in amateur work compared to the possibility of drift during a QSO through the effects of valve heating. The coil L is made from an old broadcast receiver coil which was selected simply because it was wound upon a grooved moulded former, and was therefore very rigid and easily mounted. About half the turns were removed, until the inductance was such as to tune to 1·7 Mc. with a parallel capacity of about ·0006μF. In order to obtain a fairly low LC ratio, a ·0003μF mica condenser is joined across the coil, together with a ·0005μF max. variable band-setting condenser adjusted from inside the screening box, and the usual 50 μμF variable band-spread condenser controlled by a good slow-motion dial from the front panel. It has not been found necessary to compensate these condensers for temperature, but no doubt the introduction of ceramic condensers in the right proportion would be a useful refinement. The batteries for feeding the oscillator are placed on a near-by shelf, beneath the equipment, and are not included in it.

In order to couple from the oscillator to the next stage, a third battery valve V3 is added, which is an S.G. type mounted through the side of the valve compartment, horizontally, with its anode outside. V1 and V2 are type HL210 valves, whilst V3 is an SG 215. The grid of this buffer valve is fed from an intermediate point between V1 and V2, and is thus isolated by these valves from the live end of the main resonant circuit, thus reducing the risk of pulling by the later stages of the transmitter. This buffer stage which is not worked at all " hard," delivers about a half watt of R.F. power, which is quite sufficient to excite the grid of the following 6L6 stage. It derives its anode current from the power-pack used to supply the following doubler stages, and the output from the oscillator is keyed by interrupting the screen-grid lead to this stage, except on those occasions when a later stage in the transmitter is keyed, such as the final.

In the ordinary way the 6L6 shown at the right of Fig. 2, is used as a 1·7 to 3·5 Mc. doubler, its anode circuit being tuned to the latter frequency with a rather high LC ratio. A universal exciter unit employing two further 6L6 stages follows, feeding two separate final amplifiers through link couplings. When working at 1·7 Mc., however, the first doubler, just referred to is converted into a neutralised final amplifier by the simple expedient of tuning its anode circuit to the required frequency in that band by means of the rather large variable condenser provided.

The H.T. can be switched over to a modulated

supply, whilst a permanent aerial coupling circuit is inductively coupled to the anode coil through a Faraday shield, which is very effective in preventing harmonic radiation, particularly at frequencies around 3·5 Mc. It is then only necessary to attach an aerial to the former circuit in order to operate on the 1·7 Mc. band, the whole process taking only a few seconds. It has been found quite unnecessary to remove the aerial coupling coil when using the stage as a doubler, provided of course the aerial is disconnected from it.

The component values within the oscillator compartment of Fig. 2 are not very critical. Each valve employs a 1 megohm grid-leak, whilst a ·0001μF coupling condenser is used between the stages. The anode resistances used for all three stages are 25,000 ohms, and in series with each is inserted a small *Eddystone* R.F. choke to improve the amplification at high frequencies. The two small condensers C1 and C2 can be *Dubilier* 0 to 6μμF ceramic variables, of the tubular sliding-plunger pattern, or any good low-loss type of neutralising condenser. A second ·0001μF condenser couples the anode of V3 (which is actually outside the screening box) to the 6L6 doubler, the circuit values for which are exactly as usual for a 1·7 to 3·5 Mc. doubler stage. The tuned-anode form of coupling is also very suitable for V3, and may result in rather better output.

The only adjustment necessary to put the circuit into operation (apart of course from usual routine tests to detect faulty connections, etc., and to tune the various circuits to resonance) is to reduce C1 and C2 until gentle stable oscillation takes place whilst any further reduction prevents this occurring. The two condensers should be about equal in capacity, but this equality need not be exact. It is most important not to employ too much capacity here, for not only will stability become poor, but it is quite possible to make the oscillator howl. A bad note in early tests was traced to the use of a little too much capacity, which curiously enough also reduced the R.F. output, and led to several unpleasant effects.

Conclusions

In conclusion, a few facts concerning the performance of the Franklin drive may be of interest. The frequency drift was measured by setting the oscillator to zero beat with the second harmonic of the London Regional Transmitter, and observing the beat frequency at intervals. It was found that the drift was in the order of 300 cycles per hour, most of this occurring within the first 10 minutes after switching on. It is interesting to note that this figure is materially better than that usually obtained from an X or Y cut crystal, running with a crystal current of some 100 mA. An optional crystal is in fact provided to supplement the Franklin, this being switched across the grid circuit of the first doubler as shown in Fig. 2, so that the stage can function as a C.O. when desired. Not only is the drift of the crystal found to exceed that of the Franklin oscillator, but it also provides rather an inferior note when a later stage in the transmitter is keyed. This effect may, however, be explained by the fact that an additional buffer stage is in use when the oscillator replaces the crystal. As a result of these facts, the crystal has now quite passed out of use, except as a handy means of checking frequency. It seems fair to say that only a low-temperature cut crystal can improve upon the oscillator for stability, and then only when used under carefully chosen conditions.

With regard to the other important factor of frequency stability, that of calibration, the Franklin oscillator has not been exactly checked, because the band-setting condenser has occasionally been readjusted. It can, however, be stated that another exactly similar oscillator which is used for testing in the neighbourhood of 465 kc. has been checked, and its calibration has varied by less than 1 kilocycle over a period of one year, which seems quite satisfactory.

The transmitting oscillator is generally set against the receiver, the process being facilitated by the fact that the screening has been so chosen that when the screen-grid circuit of the buffer stage is open, the oscillator just provides an S2 beat in the receiver. It can thus be switched on at the beginning of an operating period, and left running until the station closes down. Being within easy reach of the receiving position, the oscillator can be brought into tune with any free frequency channel in the band (when such exists) and the transmitter will be on that frequency when the key is pressed.

The arrangement of frequency doublers ensures that each stage receives considerably more than minimum drive, and it is therefore possible to change frequency over about one-third of any band without retuning the doublers; only the tank circuit of the final amplifier being touched if the absolute maximum output seems essential. These facts are only mentioned to point out the convenience of an ample number of stages in the equipment, combined with a stable variable drive system.

The performance of the oscillator is well illustrated by the reports received on 56 Mc., on which band more than half the total operating time is spent. Since installing the system about eighteen months ago, not a single report has been received which suggests that the transmitter is not crystal controlled, the majority being T9x, with a few more truthful reports of T8x owing to traces of A.C. ripple on the final amplifier H.T. supply.

1·7 Mc. Co-operation Wanted

Mr. N. F. O'Brien (G3LP), 31 Brunswick Street, Cheltenham, asks us to mention that he will be active on 1,865 kc. every day except Sundays between 0700 and 0800 B.S.T., and in the evenings after 1900 B.S.T. Mr. O'Brien hopes that other British Isles stations will follow his example by working regularly on this band during the earlier hours of the day.

Listener reports will be welcomed.

Reports Wanted

G3WP (Colchester) on his 1,730 kc. c.w. transmissions. All reports will be acknowledged if sent direct.

* *

A. B. Raye (XZ2AB), 78 Fraser Street, Rangoon, who operates on 14,316 kc. between 1800 and 2000, and between 2200 and 2400 GMT daily is anxious to work British Isles stations.

A 56 Mc. Crystal-Controlled Portable Transmitter

By D. N. CORFIELD, D.L.C. (HONS.) (G5CD).

Introduction

RATHER more than a year ago it was considered desirable to have available a portable 56 Mc. crystal-controlled transmitter capable of being operated from a power supply such as a small convertor or vibrator, or as a last resort from H.T. batteries, additionally it was felt that the design should avoid the use of special crystals, regeneration or the like.

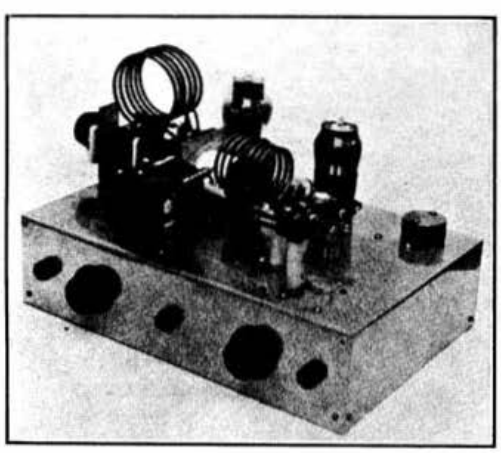
Development of Projected Design

As a first consideration it was decided that the H.T. supply (for an input to the last stage of 10 watts) must be limited to a maximum of 250 volts at 80 mA. At the same time the final had to be efficient and the drive adequate for telephony and for possible inputs up to 20 watts when the transmitter was used at a home station.

The obvious choice of input crystal frequency was 7 Mc., which could be frequency-doubled twice to 28 Mc., making the final valve a power doubler. From the above considerations, 40 mA. would be allotted to the final valve and 40 mA. to the C.O. and two F.D.'s.

Work commenced at the output end because it was felt that the most difficult task was the provision of an efficient power doubler requiring little drive and having high efficiency. A number of arrangements and various types of valves were tested but they all suffered either from the disadvantage that too much drive was required or that too few H.T. volts were available for a reasonable output or efficiency.

These experiments led to the conclusion that a push-push doubler seemed the most likely arrangement, consequently tests proceeded with a *Standard* 4074A, which is a near equivalent to the RK34. Using conventional methods the output appeared to be good until an aerial load was applied after which it tended to vanish in the tank, appearing as a voltage drop across the return lead from the tank to the cathode. This lead was relatively long, due to the physical length of the valve and if the tank position was changed, the lead merely appeared at the anode end, thus producing the same result.



Side elevation of 56 Mc. Crystal Controlled Portable Transmitter.

Very little fresh progress was made until a series-turned circuit was tested. A method which proved to be highly satisfactory. With this arrangement a phenomenal plate current dip was obtained off load, and the valve loaded up similarly to a normal P.A. and unlike a doubler. This circuit which has been incorporated in the transmitter described possesses the chief advantage that the leads are part of the tuned circuit and the coil possesses about four times the inductance it would have otherwise. In practice a plate current dip off load from 100 mA. down to 10 mA. is obtained with a measured efficiency of 50 per cent.

The next problem was to transform 7 Mc. to 28 Mc. with an output of at least one watt. This amount of power was necessary to obtain high efficiency from the final and also to take care of modulation peaks or higher inputs. Several attempts were made to obtain a 28 Mc. output from a 7 Mc. Tritet, but this method was abandoned due to poor efficiency, only about half a watt being available, unless some form of regeneration was used. It was found that regeneration produced high crystal current and also gave a wide variation between different valves even of the same make, hence its use was considered undesirable.

The above results led to the assumption that two small pentodes could be used, one working as a C.O. and the other as a quadrupler. The only suitable small valve seemed to be the 6G6G, which is a pentode of heater rating, 6·3 volts, ·15 amps., and 15 mA. anode current, but tests showed this to be a poor quadrupler, the output being very small.

Two 6G6G valves were next tried as a tritet and F.D. and results were quite promising, the output on 28 Mc. being about 0·75 watts for a total H.T. consumption of 30 mA. It was then found that 6G6G's are not made in England, the nearest being a *Tungsram* double pentode, type ELL1. In this valve each pentode is similar to the 6G6G, but with a common cathode, a fact which prevented its use as a tritet unless all following circuits, *i.e.*, 14 Mc. and 28 Mc. returns, were connected to the cathode instead of to the chassis. As it was desired to feed the push-pull grid circuit of the final direct from the 28 Mc. output without using link coupling and an extra tuned circuit (which would have entailed more space and components) this method was considered to be out of the question.

It was felt that if the ELL1 could be used as a straight CO, FD and the input kept small, enough drive might be obtained for a separate valve, working as a 14–28 Mc. F.D., to give a good output on 28 Mc. At the same time this would avoid the use of a tritet (from the point of view of frequency drift due to crystal heating), and would enable any 7 Mc. crystal to be employed without difficulty. Tests with the ELL1 confirmed the above anticipation with the result that an output of over 1 watt on 14 Mc. was obtained with a total input of 10 mA.

to both halves of the valve, one operating as a straight CO and the other as an FD; the crystal current being microscopic.

As a 14–28 Mc. doubler (in the absence of a 6G6G) a 6V6G valve was used in a rather over-biassed condition. This gave an output of 1·5 watts driving power, with an H.T. consumption of 25 mA., a figure which was satisfactory.

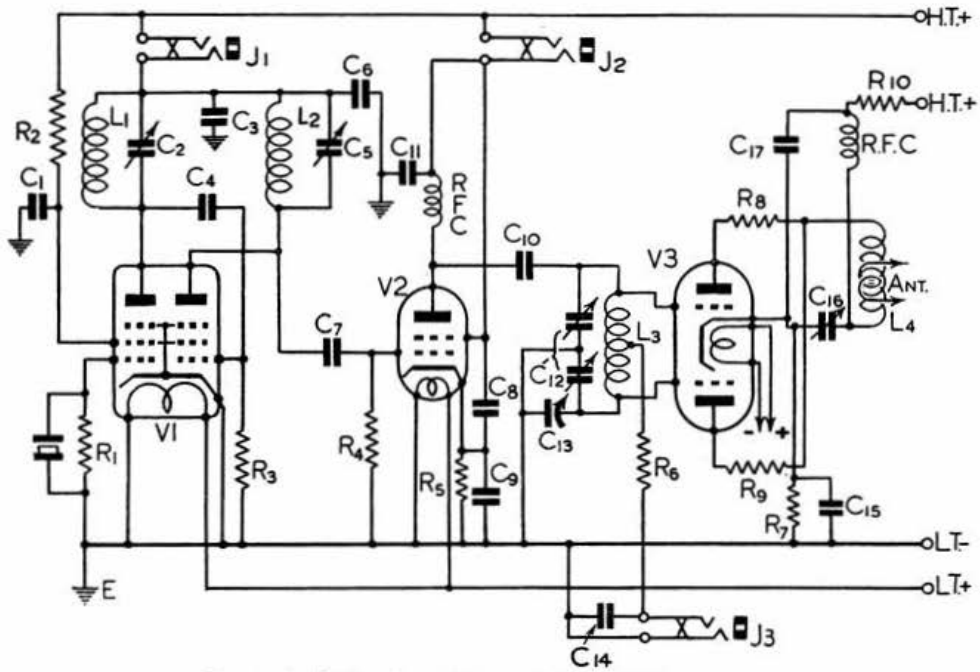
The final design incorporates the results of the above experiments and, as will be noted, the original specification has been met. The L.T. consumption is about 12 watts at 6 volts and the H.T. consumption about 20 watts at 250 volts, with an output of 5 watts R.F.

Layout and Construction

The transmitter was constructed on an 18 S.W.G. aluminium chassis, 12 in. long, 8 in. wide and 3 in. deep, the bottom edges being turned inwards for ⅜-in. in order to provide extra rigidity.

Photographs showing the layout are reproduced together with a list of components. The layout is arranged so that short leads are used throughout, whilst the circuit which follows round the chassis above and below in sequence should be quite clear from the photographs.

The tuned circuits L1 C2 and L2 C5 underneath



Circuit of a 56 Mc. Crystal Controlled Portable Transmitter.

Keyed Components

C1, C9, C14.	01 μF Mica Dubilier, 975W.
C2.	50 μμF variable Apex, Webb's Radio.
C3, C4, C6, C7, C17.	100 μμF Mica Dubilier, 675.
C5.	15 μμF variable Apex, Webb's Radio.
C8.	500 μμF Mica Dubilier, 675.
C10.	100 μμF Ceramic Dubilier, CC.
C11.	1,000 μμF Mica Dubilier, 975W.
C12.	40 μμF Split Stator Eddystone, 1068.
C13.	3-15 μμF Single Trimmer Dubilier, 340115.
C15.	200 μμF Mica Dubilier, 675.
C16.	18 μμF, high voltage microdenser Eddystone, 1094.
R1.	50,000 ohms. 1 watt, Erie.
R2, R3, R4.	100,000 ohms, 1 watt, Erie.
R5.	400 ohms 1 watt, Erie.
R6.	20,000 ohms, 2 watt, Erie.
R7.	150 ohms 1 watt, Erie.
R8, R9.	5 ohms ½ watt, Erie.
R10.	250 ohms 3 watt, Erie.
L1, L2, L3, L4.	See text.

Other Components

1 chassis, 12 in. x 8 in. x 3 in.
4 insulated brackets, Eddystone, 1116.
2 extension outfits, Eddystone, 1008.
2 pillars, Eddystone, 1029.
2 ultra S/W R.F. chokes, Eddystone, 1021.
3 Igranic midget jacks (closed circuit), Webb's Radio.
1 8-pin octal ceramic valve socket, Webb's Radio.
1 7-pin U.X. ceramic valve socket, Webb's Radio; or
1 5-pin English ceramic valve socket, Webb's Radio.
1 8-pin side contact valve socket, Bulgin.

Valves

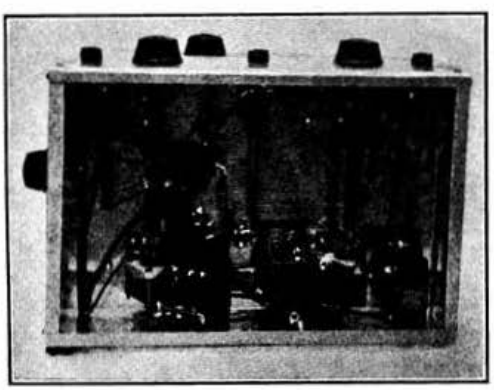
V1 Tungsram, ELL1.
V2 { Tungsram / Mullard } 6V6G.
V3 Standard 4074A, or Mullard TV03/10.

Sundries

2 3 in. lengths 1 in. diameter Paxolin tube.
10 ft. ⅛ in. copper tube.
1 5-way connector or valve base and socket.
1 terminal saddle, Eddystone, 1046.

the chassis, each comprise a *Webbs* "Apex" condenser supported on an *Eddystone* 1116 bracket, driven by an *Eddystone* 1008 extension outfit from the front. Dials were not fitted to these or any other controls, as no adjustment is necessary unless the crystal frequency is altered. Both L1 and L2 are wound on 1-in. Paxolin tubes, having a disc of ebonite or hard wood fixed in one end in order to mount them under the chassis. No advantage was found in using ceramic formers for L1 and L2. L1 is wound with 20 turns of 22 S.W.G. D.S.C. copper wire with turns touching and L2 is wound with 14 turns of 22 S.W.G. D.S.C. copper wire spaced to occupy 1 in.

The crystal base which should be of a suitable type is mounted in the back right-hand corner, next to a side contact socket for the *Tungsram* ELL1 valve. As these sockets (although numbered) are not in very general use, it has been decided to give the connections; these are: *Pin* 1, grid (B); *pin* 2, heater; *pin* 3, heater, *pin* 4, cathode; *pin* 5, anode (A); *pin* 6, grid (A); *pin* 7, screen; *pin* 8, anode (B). The socket should be mounted so that pin 4 is nearest the back of the chassis, so that the connections are made as direct as possible. The tuning circuit L1 C2 is adjacent to the ELL1 socket. The decoupling condensers C1, C3 should be wired with short leads and earthed beside the valve socket. The 6V6G valve is mounted towards the back left-hand corner. The tuned circuit L2 C5 is adjacent to the octal valve socket, which should have pin 8 towards the back of the chassis. The decoupling condensers C6, C8, C9 and C11 associated with this valve should also have short direct leads. The R.F. choke in the anode of V2 is an *Eddystone* 1021 and the lead from this anode passes through the chassis direct to the tuning condenser C12, which is an *Eddystone* 1068. The ceramic cup type condenser C10 is used to prevent an H.T. short-circuit. *Igranic* midget (closed circuit) jacks are mounted in the front of the chassis. The first is common to both sections of V1 and the second reads the anode and screen currents to V2. This may also be used for the insertion of a key for CW, the key contacts being shunted with a suitable click filter; alternatively the final valve V3 may be keyed. The third jack reads the grid current of V3. It was considered desirable to provide a permanent meter for the anode current to V3 in preference to a jack. In any case the provision of jacks and the method of keying is a matter of individual taste.



Underneath view of 56 Mc. Crystal Controlled Portable Transmitter showing layout and wiring.

The position of C12 is at the left-hand side next to the pins of V3, which is shown lying on its side. The coil L3 comprises 6 turns of $\frac{1}{4}$-in. copper tube, 2 in. diameter, centre tapped with the turns spread out in order to mount directly on to C12. The leads from either end of C12 to the grids of V3 must not be more than $1\frac{1}{2}$ in. long, and must be of equal length, whilst R6 should be wired directly to the centre tap of L3. These facts explain the apparently awkward position of C12 with its knob overhanging the side of the chassis. In practice no difficulty has been found and unless the chassis is laid out so as to be deeper than its length (rather an awkward shape for congested bench space when used portable), no simpler method of overcoming this difficulty appears evident.

The valve V3 is mounted on a 7-pin UX ceramic socket fixed to an L-shaped metal bracket, the heater pins being downward. If a *Mullard* TV03/10 valve is used instead of the 4074A, a 5-pin English socket should be fitted with pins 1 and 2 lying horizontal.

The purpose of the trimmer C13 is to balance the capacity of the anode to all other electrodes of V2, which is loaded on the opposite end of L3. The method of adjusting this condenser in the absence of a capacity bridge is described later.

The final series tuned tank L4 C16 is placed along the side of V3. The condenser is mounted on another *Eddystone* 1116 bracket and is an *Eddystone* high voltage microdenser type 1094. The moving vanes are connected to the cathode of V3 *via* a short piece of $\frac{1}{4}$-in. copper tube. The coil L4 comprises 8 turns, $1\frac{1}{2}$ in. diameter of $\frac{1}{8}$-in. copper tube, one end being supported by C16 and the other on an *Eddystone* 1029 pillar. The anode end of L4 is left long enough to be bent to reach within about $\frac{1}{2}$-in. of the anodes of V3. This end is connected to the anodes by short flexible leads or by two resistances R8 and R9, which must be non-inductive. The latter are optional, but may be required if due to slight changes in layout, parasitic oscillation is experienced; they were not found essential in the transmitter described, but were fitted as a precaution. The R.F. choke from the junction of L4 C16 is another *Eddystone* 1021. Condenser C17 is wired direct from the end of the R.F.C. to the cathode; this component and R10 are employed to prevent another possible form of parasitic.

The aerial is closely coupled to L4 by a single turn link wound around the centre, which is correct for a 70–100 ohm line. The link is supported by a connector or an *Eddystone* terminal saddle 1046 mounted on another 1029 pillar. For joining up power supplies a connector or plug and socket is mounted to the rear of the chassis.

The bias resistances R5 and R7 restrict the current to normal in the event of the drive failing, whilst R2 protects V1 in case the crystal fails to oscillate.

Adjustment and Operation

In order to adjust C13 the anode caps of V3 should be removed and drive applied to the grids of V3. A condenser of about ·001 μF should be connected between either anode of V3 and chassis and an H.T. voltage of 100 volts connected through a meter to the same point. The current to either

anode will be found to be different therefore, C13 should be adjusted and C12 retuned for maximum drive until the current is equal, indicating equal drive to each grid, assuming each half of V3 is similar, which should be the case within small limits.

The anode and grid currents, etc., obtained on the model described are given below :—

Operating Conditions at H.T. volts 250

Valve	Anode Current	Grid Current
V1	10 mA. (J1)	0·6 mA (R1), 1 mA. (R3)
V2	30 mA. (J2)	1 mA. (R4)
V3	Off resonance, 60 mA.	8 mA. (R6)
	On resonance, no load, 10 mA.	—
	Loaded, 40 mA.	7 mA. (R6)
Feeder current, 0·22 amp. in 100 ohm line.		

Telephony Operation

For telephony work V3 may be anode modulated with entire success, a modulating power of about 5 watts at about 6,000 ohm impedance being required.

For telephony tests a 50 watt universal modulation transformer made by *General Radio & Television Ltd.*, was used with success. A review of this useful component appeared on page 335 of the December, 1938, issue of this journal.

If it is desired to reduce still further the current consumption, a screen dropping resistance to V2 of about 25,000 ohms may be employed, but if this is used the drive will not be sufficient for telephony if the input exceeds about 5 watts. If low power work is desired, the transmitter will operate quite satisfactorily on 100 volts H.T., the total input being 30 mA. (final 17 mA. or 1·7 watts) and an output of just over half a watt. The drive to the final is then 2·5 mA. Both *Standard* 4074A and *Mullard* TV03/10 valves have been tested in the transmitter with similar results except that for the purpose of easy interchangeability the TV03/10 was rebased with a 7-pin UX ceramic base.

The transmitter has been tested under portable conditions in the field when an output of 5 watts was obtained and signals (both CW and telephony), were reported excellent. In the latter case the modulation capabilities were found to be in every way satisfactory.

Readers who construct this transmitter are invited to communicate with the writer in the event of any difficulty arising.

GM3AK

Mr. Gibson (GM3AK) informs us he has been inactive since July 30, 1938, and that he will not renew operations until the latter half of September. He believes that a station signing G3AK has been operating within the last few months.

An R.M.A. Statement

The Radio Manufacturers' Association has asked us to give publicity to the following statement concerning the recent pronouncement by the Postmaster-General in the House of Commons on the subject of the projected radio relay service to telephone subscribers.

"The Radio Manufacturers' Association can only reiterate the view expressed some time ago that relay and wired wireless systems are in no way a substitute for the radio receiving set, which gives listeners a wide choice of programmes from all over the world.

"In emphasising the case for wired communication in case of emergency, the Postmaster-General seems to have overlooked the lessons of the last war. It was shown repeatedly that in bombed and shelled areas wired communication was subject to continued interruption and if, as has been frequently stated, large areas are vulnerable from the air, then wired communication may be subject to interruption and the radio link is vital to the maintenance of communication.

"The Postmaster-General appears to have overlooked or ignored the importance of radio services as a means of maintaining communication in case of emergency, although it appears to be fully recognised by the Services."

Uruguay QSL Bureau

We understand that the Radio Club of Uruguay has taken over the QSL service for Uruguay hitherto carried out by the U.S.W.C.G.

The new address for CX cards is Radio Club Uruguayo, QSL Section, Box 37, Montevideo.

N.F.D.

By INKER

The stretching skip makes known the dying day
The cows are bravely wrestling with the guys.
The operator sends a quick "OK"
And hopes that soon the QRK's will rise.

He sends a QRZ then QLM
And searching, hears an HB1 reply
Who just gives "339 wid QRM"
But they can read us, or at least will try.

The hours roll on, the first watch is in bed
The batts. go dead and quickly are replaced.
The sky assumes a rosy, glowing, red,
The Yanks perk up, but all our calls are waste.

The points mount up, but not so fast
As we had planned, but still we smile
For did we not get six of those HB's?
Who by themselves are worth a biggish pile.

At last the end is come, and taken down
Are masts that cost us hours of work to raise.
The gear is loaded into waiting cars
The crew break up to go their divers ways.

So once again we have exposed ourselves
To dangers which might cost us really dear,
But we've enjoyed each moment of the fray
AND WE SHALL ALL BE THERE AGAIN NEXT YEAR.

THE SUNSHINE WON

By THE NAVIGATOR.

A brief account of N.F.D. in the North London and Essex Districts.

FLAMING June gave of her best during that long awaited weekend which ranks high in our calendar under the somewhat ambiguous title—National Field Day.

Blue skies, extraordinary visibility and brilliant sunshine all contributed to the success of an event, which gains in popularity each year.

This year, with no filming cares on our shoulders, the headquarters party were able to take things a little easier than in the past, although nearly 250 miles were covered during the weekend.

To The Rodings

Leaving North London at 2.30 p.m. on the Saturday a course was set for that famous Essex "home for hams" which, for the uninitiated, means Abbess Roding. For how many years G6UT and his merry men have been privileged to use the grounds of Rookwood Hall for N.F.D., we cannot say, but way back in 1930 we remember this delectable spot figuring in R.S.G.B. field day news. Especially pleased were we to meet again the Misses Rowe who have done so much for our Eastern District members. Living in a 400 years' old cottage, surrounded by a garden which is the envy of all who see it, these kindly souls spare no pains to make everyone welcome. What tales their cottage could tell! Even as we sat in the shade of the oak-beamed dining-room awaiting tea we could smell those 200 "dogs" which G6LL fried up during a memorable field day not so long ago.

G6UT gets down to it at Abbess Roding, Essex.

But we digress, for surely it was to G6UTP that our journey had been made! Nestling among trees, the white bell tent could be spied from the road with the chief op. and his staff taking a breather, prior to putting to the test their new 1·7 Mc. transmitter. Nothing elaborate here but an efficient crystal controlled job, housed if our eyes and memory serve us correctly, in the self same cabinet as was used when N.F.D. was in its infancy. An excellent aerial system suspended between trees looked fit for any amateur, and as results proved, over 100 points were collected before Field Day ended.

Those who think of Essex, as a flat uninteresting county should follow the route we took that afternoon through leafy lanes, past the famous Matching Green with its flannelled cricketers and its handy pub, on to the site of G8ABP the District 14, 3·5 Mc. station at Tye Green. Unfortunately the chief of staff was missing when we arrived but an old friend in "Bill" Matthews, G2CD, accompanied by G2XP showed us "the works." The way our boys pick the sites for N.F.D. stations speaks volumes for their initiative! We can think of many worse ways of spending a weekend than taking refuge in that field behind Tye Cottage with its brilliant red painted door.

Hoddesdon Riviera

Leaving G2CD and his colleagues at 5.30 p.m. we moved off for a first view of our own District 12, 7 Mc. station, which we had been led to believe was near Fieldsweir, Hoddesdon. Our chief guide who for years had "week-ended" at Dobbsweir led us a pretty dance before figures we recognised were espied on the *other* bank of the River Lea. By the aid of flags and whistles we made it known that a visit was contemplated. Out came the fleet, manned by the sturdy lads of North London. How they rued the fact that no ciné camera was at hand as one member of the party took his seat in the stern, or was it the bow? By dint of real hard rowing the river journey was ultimately completed, and the party disembarked, amid a chorus of protests that the Lea liners are not designed for people weighing several hundredweights.

The remarks which we have made earlier about our members finding good sites for N.F.D. apply

Hostesses.
The Misses Rowe, of Abbess Roding, pose with G3SI and G6UT outside their 400 years' old cottage.

even more forcibly in describing this "seaside station." Thanks to the generosity of Mr. Deverell, senior, G5FAP was operated from a sumptuous tent on ground adjoining his property. The gear itself was just about the neatest it has been our lot to see during many N.F.D. excursions.

Our admiring glances at their "sticks" elicited

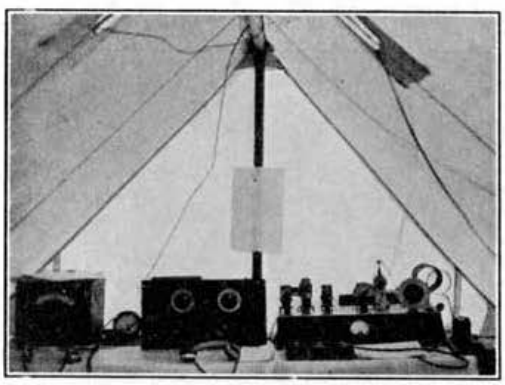
G8ABP, Tye Green, Essex.
Family party with G2CD and 2XP making up the number.

the information that in true backwoods style they had been floated downstream that morning from a point some half a mile distant.

Comfort being a primary consideration of all good amateurs Mr. Deverell had completely spoilt his little party by allowing them to sleep in a five bunk bungalow. How they managed to knock up nearly 200 points under such trying conditions mystifies us!

Bidding *au revoir* half an hour before kick-off the visitors were successfully piloted across stream to the cheers of those fortunate lads who had not been called upon to act as oarsmen!

With tongues hanging out, due to the salt air from the Lea Riviera, our party dallied for a while in Ye Olde Tudor Café, Hoddesdon, before commencing a longish cross country journey to Welwyn Heath, the home of G5UMP, District 12's 1·7 Mc. station.. Last year it took us 30 minutes to locate



G5FAP, Fieldsweir, Hoddesdon, Herts.
The very efficient gear used at the District 12, 7 Mc. Station.

this station and it is a fairly safe bet that a similar period would have elapsed on this occasion, had it not been for the happy incidence that we nearly bowled over the chief operator *en route* to the common.

Buried away from most human eyes, Jack Hum's station was going strong by the time we arrived. Unfortunately we missed many old friends due, we understand, to the fact that "they had opened" in the village. This, as it may be, we certainly hope that when next we call at Welwyn we shall be greeted from the ceremonial armchair by that well-known voice of Cecil Cleland.

The Canteen Station

Time was slipping fast as we turned back into the Great North Road and speeded on to Barnet Gate, where "Wicked Walter" was hitting the high spots on 3·5 Mc. Year after year Paul Carment has operated G5WWP, and year after year we have noted the efficient manner in which his station piles up the points. There is much to be said for the North London policy of assigning the chief responsibility at each station to a man who knows his band inside out. That principle has been followed with outstanding success, and even if No. 12 *has* finished down the list, they will have had the satisfaction of knowing that the best men were in charge.

It was at G5WWP that we encountered the first

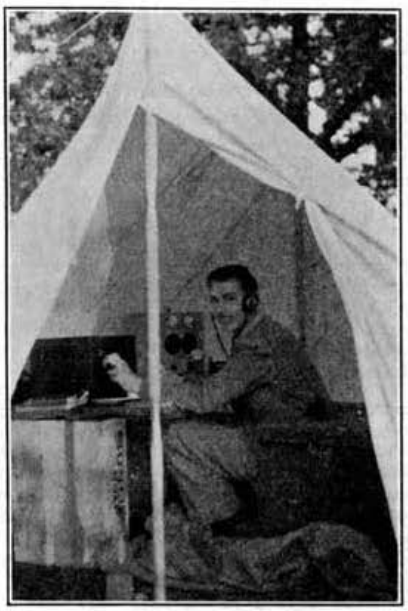
By the River Lea.
Percy Solder, G5FA, Alec Watson, G2YD, and L. R. Crawley, G3DT, entertain the ladies, Mrs. 6CL, Miss Gadsden and Mrs. 6LL.

portable N.F.D. canteen. Not content with a tent for a cookhouse, our worthy Bert Matthews, G6QM, backed by many willing helpers, was operating a super snack bar from a 2-ton lorry! How we appreciated a noggin of tea and some new buns at 10.20 p.m. Next year they must really see that serviettes and the District plate are available for the use of visitors—distinguished and otherwise.

With old man Moon staring us full in the face we began our homeward journey, safe in the knowledge that everyone we had visited would sleep on dry ground that night at any rate. And then to bed ourselves, but not until we had given a few single point contacts to deserving cases on 7 Mc.

Towards Southend

Breaking new ground, our first Sunday call was to Thundersley Glen near Southend, the 7 Mc. station operated by G5XI on behalf of District 14. The view from the site was reminiscent of the old Frant site used by District 16, except that here was shipping in the distance to add additional interest to the view. Once again we missed the chief op. who was out on safari, but Jimmy Watson, G6CT, was there to show us round. It was here that we met for the first time a team whose primary and avowed object in life was to score points. " This is a contest, not a social event " was the official order of the day. Neatly typed instructions posted at the entrance to the tent spelt " Keep out except on Business."



The Armchair Station G5UMP on Welwyn Common.

Just before our departure the distant horizon suddenly became obscured. Investigation brought to light that a young fellow named Nickless—(we believe his call is 2 Kay Tock) had arrived to find out why he could not work anyone that morning on 1·7 (or was it 3·5 Mc. ?). We can't be sure but we believe we heard him say that he considered the Council had made this N.F.D. too easy by barring phone. We have an idea too that he had been using phone on 1·7 Mc. just to make the boys work a bit harder for their points. Nice thought Nick and one which we *know* everyone really appreciated !

Climbing down to earth we set course for Danbury Church, the highest point in Essex, so we have been told. What we should perhaps have said was, we set course for the most obvious public house in Danbury, but knowing the sensitiveness of such worthies as Louis Varney, G5RV, and Laurie Fuller, G6LB, we prefer to indicate that our search was for a more prominent landmark. Curiously enough, however, G5RVP had grown up within two dart lengths of " The Griffin," Danbury, but we were more than relieved to find that only on rare occasions had it become necessary to bother Mine Host more than once an hour and then only to ask the time.

We should never have believed that an N.F.D. station could have been operated under such dry

G5RVP, Danbury Common, Essex.
A nice quiet well behaved lot of lads who like experimenting with aerials and with the jaw bones of cows.

conditions, but facts are facts, even if the camera sometimes lies !

Those of our readers who are acquainted with the dark doings of DX Century Clubbers need no telling that G5RV is among the present leaders, but few there are who have had an opportunity of seeing the gear that does the job. We had that pleasure after inspecting the super fine transmitter our Louis had constructed for N.F.D. During our stay at Danbury we witnessed the unusual sight of the second ops. showing " Rasputin Valadivostock " that his " posh " Marconi-loaned aerial worked far better when one end was a few inches above ground level.

With Chelmsford left behind we set off for a second visit to Abbess Roding, but what a difference 24 hours had made to the bright young lads of yesterday !

Under the warm sky recumbent forms suddenly

G5XIP, Thundersley Glen, Essex.
Some of the staff and a couple of visitors enjoy the fresh air, leaving the station to look after itself—but only for a few seconds.

came to life to give us first-hand news of 1·7 Mc. conditions during the wee small hours when scoring was fast and furious, but we learned that a lull had set in and points were becoming harder and harder to collect.

Before pressing on we enjoyed once again the hospitality of the Sisters Rowe who at short notice put on a tea fit for kings—complete with lemon pie.

G6ZOP, Mill Hill, Middlesex.
Old Timer H. W. Pope, G3HT, puts his transmitter to bed at the end of the day, whilst the chief operator tells us who he is.

Striking across country for 16 miles, Hoddesdon was reached at 5.55 p.m. An excellent score had been put up and everyone was reported well. With less than an hour of N.F.D. left we hurried off on another 20 miles journey to look up the District 12, 14 Mc. station, G6ZOP, located at Mill Hill, within 300 yards of the District 15 boundary, and hereby hangs a tale which we will leave for another occasion. Seven o'clock had passed as we reached the gate leading up Mote Mountain, but fortunately we were just in time to see Jim Kirk and his able lieutenants (not forgetting Miss Kirk and her fellow cooks) begin the task of dismantling the station which had knocked up 148 points.

We were introduced to the little transmitter made by old timer G3HT which had borne the brunt of the weekend activities, and a really nice looking job it was to be sure.

Although our visit was brief the impression we gathered was that team spirit had been in evidence throughout the weekend. The support given by the Edgware Club and by the newly formed Watford Club was, we know, appreciated by G6ZO and his other colleagues.

* * * *

And so we bring to an end yet another account of our N.F.D. travels. As each year passes, fresh evidence is forthcoming that members are fast becoming adept at the task of putting into operation efficient portable gear which is capable of standing up to 24 hours of gruelling service. We noted with particular pleasure that every transmitter seen this year was truly portable, the only heavy " props " being the storage batteries for filament and generator supplies.

We conclude by echoing the view of many we met during the weekend " may N.F.D. continue to grow in popularity."

Ragchewing—1949

Inspired by the June Editorial and the Present Style Amateur Radio.

By G6LB.

1*st Ham* (meeting 2nd Ham in street) : What-ho, how's DX ?

2*nd Ham* : Fine, dear old chappie. I worked two new streets last night. That makes 99,000 streets and 78 Postal districts. I only want 55,000 more for " worked all streets." By the way, old man, look out for XYZ77 on the HF end. His name's Heckmondwike, and he QSL's. He's the only one on the air with that name.

1*st Ham* : Thanks a lot, lovely, old pal. I'll certainly keep an eye open for him. A Heckmondwike card will look fine on my wall.

Old Timer (arriving on scene, and butting in) : Hullo, you fellows, what's the news ?

1*st Ham* : Blinky, here, says there's a new guy on the air air called Heckmondwike, and he QSL's——

2*nd Ham* : Yes, and he must know a deuce of a lot about radio. I've heard he can tune his own TX.

1*st Ham* : What a fearful sweat. I always have mine adjusted by Blanks, under their new All-in Scheme. They do the whole show for a fiver a week, and they write up your log and write your cards as well. Are you going after this new fellow ?

Old Timer : I don't think I'll have time. I'm trying out a new So-and-so aerial. Ever tried one ?

1*st Ham* : No, I can't spare the time off the air. If I closed down, old Blinky would grab all my DX, and I should drop about ten places in " worked all streets." Besides——

3*rd Ham* (dashing up excitedly) : I say, you chaps, there's a new station just started up in Thingummybob Street. His name's Blathersnoop and——

Exit 1st and 2nd Hams in a cloud of dust, and collapse of Old Timer.

G2FIP, Purley, Surrey.
The staff at District 7, 1·7 Mc. Station.

EXPERIMENTAL TECHNIQUE

By J. V. WARNER, B.A. (G2WR)

Part I.—PRACTICAL WORK

Introduction

DURING the recent reorganisation of the Experimental Section it was suggested that a series of articles on the technique of experimental work and the interpretation of results might be of value and assistance to members generally. The writer was invited to undertake their preparation, and the article which follows and those to appear later are the result.

The articles are in no way intended to indicate the exact course of procedure in any one specific investigation, but rather to outline the practices and precautions common to all scientific investigations. If the general procedure is indicated there should be no difficulty in applying it to specific cases.

The treatment of the subject falls conveniently into two sections, therefore, the first article will deal with actual experimental work, whilst the second will be concerned with the interpretation and use of the results obtained.

On reading the articles through for the first time the average amateur about to undertake some experimental work may feel that there is little in them of use to him, and further that they savour more of the physics laboratory than the radio shack. This impression may be due chiefly to their general nature, but a little thought will show that the principles can be applied to his case. It should not be forgotten that the radio shack must really be a miniature laboratory if results of any value are to be obtained. This does not imply that it is necessary to possess quantities of glittering and expensive apparatus before anything can be achieved, for much is possible with the simplest of gear, but it *is* necessary to proceed in certain ways which are found in all laboratories. It may also be suggested that a fetish has been made of accurate measurement, and that the importance of this has been over-stressed. Although it is often unnecessary to go to the ends indicated here to obtain a quantitative result, there is a certain real satisfaction in obtaining data which is as accurate as possible. Anyone who has built and calibrated a good frequency meter, for example, will appreciate this point.

Qualitative and Quantitative Results

The result of any physical experiment can take either of two forms—the qualitative, in which the effect studied is simply compared with some other effect, or the quantitative, in which the actual magnitude of the effect is obtained in some system of units. Where possible, the quantitative method is to be preferred. For instance, it is interesting to know that close-spaced reflectors give good directional aerials, but the information is of infinitely more value if the actual size of the spacing can be given. Obtaining a quantitive result involves accurate observation and measurement, and it has been said that physics is the science of accurate measurement. Radio is a branch of physics, hence the need for accurate observation is no less in it than in any science.

Probably the greatest reward to an amateur experimenter is to see his results used not only by his fellow amateurs but also by those to whom radio is a commercial proposition, and he can only achieve this if his work is known to be accurate and dependable within the limits imposed by the conditions under which he works.

Whilst remembering what was said in the introduction about the satisfaction of being as accurate as possible, it must always be borne in mind that there are two other factors which affect a result. The first of these is that the accuracy attained can be no greater than that of any and all of the measurements which go to make up the result. It is of no use, and may even be misleading, to calculate to three places of decimals when one of the measurements is only correct to two places. In addition, it is always advisable to pause a moment and see whether one is justified in going to great lengths. Such thought may also show some means of increasing the accuracy of observation, which is always desirable.

The second factor to be considered is the desired accuracy of the result. There is no point in calculating to several places of decimals when a result to the nearest whole number is all that is required. For example, in calculating the inductance and capacity values of a tank circuit to give a certain value of Q, the capacity need not be correct to more than two or three micromicrofarads. So long as the value of Q is near to 12 (or whatever is the desired value), all is well.

Use of Apparatus

The taking of observations or measurements involves the use of apparatus, although it need not necessarily be radio apparatus, e.g., the barometer in propagation observations. The first rule when using any apparatus is to understand its operation thoroughly. This seems almost obvious, but it is surprisingly easy to delude oneself that something is understood thoroughly, when actually the knowledge is only superficial. Most amateurs know that the rectified grid current of a power amplifier stage is a measure of the amount of drive being applied to that stage, but few could explain why this is so, and what are the limitations of the method as an indication. It is when things go wrong, or the unexpected happens, that the deeper knowledge proves of value, and it will be found almost impossible to make any deductions from one's observations without it. Therefore, always know what you are doing, and why you are doing it. Half an hour with pencil and paper beforehand may save hours spent in making unwanted observations or not taking the shortest route to the desired goal.

After it has been decided what is to be done, and what apparatus is to be used, it may be set up. But in doing this it is always wise to remember that ease of position and convenience of placing are two

very important factors making for speedier and more accurate work. The bench on which the work is taking place should be high enough to allow readings to be made without having to bend down to an uncomfortable position, and if a series of adjustments have to be carried out, and the corresponding readings taken, a position which requires a minimum of bodily movement will prevent physical fatigue, which can become surprisingly great if such measures are not taken. For this reason also, it will help if all apparatus, on which readings are being taken simultaneously, can be grouped together, so that it is not necessary to move about from one piece to the other. Those who are in the habit of building their transmitters with the meters grouped together on one panel will agree that this is so.

Convenience of placing is rendered much easier to achieve if it is remembered that experimental work and " haywire " construction are not synonymous. Many people are under the mistaken impression that no experiment can give any result unless it has been carried out with a heap of junk looking like the result of an explosion at a spaghetti factory, and from which, by some mysterious and unspecified means, accurate results are obtained. Nothing can be farther from the truth. An experimental piece of apparatus admittedly will not take on the appearance of a commercial station, since it is useless to " dress up " a job which in all probability will be altered out of all recognition before the end of the work, but on the other hand there is no excuse for a complete lack of fixing screws, terminals, soldered joints, or proper connecting wire, as is so often the case. Appearance is of minor importance, but efficiency is the most necessary requirement of all, and it can never be achieved by " haywire " methods. Avoid stray lengths of assorted double cotton covered wire with their ends casually twisted around terminals ; instead use wire you would not be ashamed to put in the permanent transmitter, and make sure that every joint is what it is meant to be, and not an unwanted resistance of several ohms. The soldering iron is as useful in experimental work as it is for ordinary construction. In addition, experimental work is no excuse for neglecting all the safety precautions taken where high voltage is concerned. The precautions taken in commercial high voltage experimental laboratories are as strict as those found anywhere else.

Whilst " haywire " methods are inexcusable it is quite easy to practise economy in the use of apparatus, and it is surprising what a little ingenuity can do to make the most unlikely things serve in the place of others which are either unobtainable or too costly. By the use of a common ice pail, Faraday was able to demonstrate one of the fundamental laws of electrostatics.

When measurements are being made all readings should be checked immediately and then recorded in a special book kept for the purpose, about which more will be said later. To effect this checking it is advisable to take all readings over again, as it is often possible to " cheat " unknowingly when a certain result is expected. For instance, should the first three readings be 10, 20, and 30, one feels subconsciously that the next one will be 40, and after a glance at the meter puts this down, although the meter reading may actually be 39. Needless to say, it is 39 which must be recorded, even although it may seem to be wrong from what theory leads one to expect. The reason for the difference can be sought afterwards, when the results are being considered. An inexplicable difference may lead to the discovery of an error in the apparatus, or some hitherto concealed effect which is causing a change from the theoretical expectation. All readings and observations must be made with complete impartiality, and it is fatal to yield to any desire to add a little on to get a straight line graph.

This question of impartiality of the observer is of the greatest importance in such things as experimental work on aerials, where the performance is assessed in terms of signal strength reports from other stations. Accurate reporting, in cases such as these, is one of the major problems of amateur radio, and a really satisfactory system has yet to be found. In the meantime we must use the best that we have available, and attempt to reduce the possibilities of error. The comparison of the reports given by two different stations as a means of estimating the performance of an aerial is useless, as one may have been given by a man using an S meter on a good superhet, and the other by ear from an O–V–1 receiver. The former is obviously by far the more reliable, but one single reading can tell very little in any case. To assess the performance of any aerial accurately a large number of reports are needed, and they must be spread over a considerable length of time—six months is none too short a period. In this way the errors due both to inaccuracy on the part of the observer and to changing conditions are minimised, for the probable error of a series of observations diminishes as the number of observations increases. A good meter or instrument has no personal factor, hence it is always preferable to base conclusions upon observations made merely by reading a meter rather than on those which depend on personal assessment.

Another important point connected with the use of apparatus is that the accuracy and stability of all auxiliary apparatus must be constant. If this is not the case errors will be introduced which may well mask the effects being studied. If, for instance, an experiment involves the use of a frequency meter this must be above question, as the accuracy of the experiment can be no greater than that of the meter.

Recording Results

The human memory is notoriously unreliable, and it cannot therefore be called upon to play any part in the recording of an experiment. Pencil and paper are two of the things which cannot be dispensed with in any experimental work, but there are right and wrong ways of using them. The first golden rule is that everything that is done must be recorded immediately, and the second is that loose sheets of paper should never be used. This therefore calls for the use of a notebook, and in actual fact it is best to have two. The first is usually known as the " rough " book, although the name is not a very happy one. It is the book which is found on the experimental bench and into which is written an outline of the theory of the experiment, details of the apparatus used, method of procedure, and *all* measurements or observations made. Its purpose is to enable one to sit down at the end of the experiment to study the results, and to have available everything relevant to it, collected in one

place. It is indispensable, especially if some time has elapsed between doing the experiment and studying the results. If a ban is placed on all loose sheets of paper its contents can be guaranteed to be complete, and therefore it should not even be a loose-leaf book, but should preferably be bound. This will also help to resist the temptation to use pages for lighting pipes, scribbling notes, or other purposes for which it is not intended !

Although we have called it a " rough " book the title should not be taken too literally. " Haywire " in the notebook is nearly as annoying and hindering as " haywire " on the work bench. It may be rather satisfying to have pages full of cryptic notes and odd diagrams which can only be interpreted by the compiler, but when needing the notes again in six months time it is highly probable that he will be equally baffled. The rough book obviously will not read like an essay or novel, but on perusing the notes of an experiment it should be possible to gather immediately what was done, and what observations were made. If the experimenter should make a name for himself at some later date and it is decided to publish his notebooks the task of the editor will be made infinitely easier if his notebooks can be understood without a great deal of study ! Sensible abbreviations are quite in order, and the use of tabular forms when taking down results often enables an easier grasp to be obtained of the results. However, abbreviation should not be carried to extreme lengths, or its purpose will be defeated—Pepys' Diaries were lost to the world for 200 years because he used a form of shorthand known only to himself.

The second of the two notebooks required is the one in which all the calculations and deductions from the experiment appear, together with the details of it arranged in their most convenient order. The use of this book will be dealt with in the second article.

Accuracy of Observation—Null and Deflection Methods

The observation of an effect can be achieved by two methods—the null or the deflection. The null method involves the balancing of two effects to neutralise one another, as shown by a zero reading on some instrument, whilst the deflection method requires the observation of the magnitude of an effect shown by a positive reading on a meter. Of the two types, the null method is the one allowing the greatest accuracy, as the sensitivity of the instrument can be increased as the null is approached. If it were necessary, a power amplifier stage could be very accurately neutralised by using a multi-range milliammeter to measure the rectified grid current. As the point of neutralisation is approached the more sensitive ranges of the meter could be used, and if desired the final reading could be carried out with the aid of a microammeter, which would enable the last point to be determined very closely. A further illustration is furnished by a chemical balance and a spring balance. The former, which is a null instrument, is much more accurate than the spring balance, which gives its reading by deflection methods. It is interesting to note that the measurement of mass on a chemical balance is one of the most accurate measurements possible in physics, and its accuracy is only approached by the determination of resistance by the Wheatstone Bridge method—itself a null method.

Most measurements by bridge methods are null experiments, and it is therefore advantageous to use them whenever possible, although this is not likely to be very often in amateur radio. However, most measurements on valves can be made by bridge experiments.

Fundamental Units

The three fundamental units of physics are mass, length, and time, and all other units can be obtained in terms of these three. As has been already pointed out the measurement of mass is the one that can be carried out with the greatest accuracy, but such a measurement is not often needed in experimental radio, and we shall not be concerned with it here. The other two units are more often needed, so their measurement will be dealt with in greater detail.

Measurement of Length

Before discussing this subject it is interesting to consider on what system of measurement it is to be based. There are two available—the Metric (or centimetre-gram system) and the English (or foot-pound system). The centimetre-gram system has the great advantage that it is a decimal one, and hence all calculations are considerably easier than on the foot-pound system. It is therefore used in all scientific work, and it is only consistent that it should be used in radio. Since mass has little concern with us, our chief requirement will be to measure lengths in centimetres and metres rather than in inches and feet, although for some strange reason the average amateur does not adopt this method. It is surely rather illogical to measure wavelengths in metres, yet at the same time think of a half-wave aerial for the 20 metre band as being 33 feet in length. The reason for this anomoly is partly due to the fact that metric system rules are seldom used in every day life. As most of the rules and tape-measures are not particularly accurate it is a good thing to invest two or three shillings in a good quality wooden metre stick, which can be obtained from any instrument supplier. For measuring aerials in particular it will be found of great value.

In making measurements of length for radio purposes a degree of accuracy greater than can be obtained with a metre stick is seldom required. However, when using such a stick the precaution should be taken of illiminating errors due to parallax. This is the error caused by different readings being obtained when the position of the eye is varied, and arises when the graduations on the rule are some distance away from the marks which are being measured. The remedy is to have the graduations in contact with the marks to be measured. The same difficulty is met with when the pointer of an instrument is some distance from the scale. This is obviated in accurate instruments by fastening a mirror to the scale behind the pointer. If the eye is adjusted when taking readings so that the pointer coincides with its image in the mirror, then parallax will be eliminated.

The accuracy of measurements of length is increased by the use of the vernier scale—a simple device which enables readings of a tenth of a scale division to be made. Its most important application

(*Continued on page* 68.)

The Ninth Annual B.E.R.U. Contests, 1939.

By W. H. ALLEN (G2UJ).*

FOR the first time in the history of the B.E.R.U. contests the events ran over a period of a week from the commencement of the Senior event on Saturday, February 4, to the conclusion of the Junior at 24.00 G.M.T. on the following Sunday with only the omission of Wednesday as a short respite for the many who entered, and in some cases did extremely well in, both contests.

A maximum of thirty hours operating time was allowed out of the four days allocated for each event, a system which was greeted with approval in some quarters, if not in others. The new arrangement was an experiment designed to satisfy the majority of competitors, but whether it will be retained in future years can only be decided when the results of the questionnaire published in the May issue of THE T. & R. BULLETIN together with the opinions expressed by competitors generally have been considered in all their aspects by the Tests Committee.

Those who were only able to operate at weekends were of course at a disadvantage, but so were those who, in previous years, found themselves in the reverse position.

The introduction of serial numbers which was also an innovation this year, led to some difficulty with certain Empire stations not conversant with the rules. They, in many cases, either refused to give a number at all or allotted to themselves a group of figures bearing no relation to the number of the contact, which they adhered to throughout and gave to every contest station worked.

There was again the old trouble—the answering by non-Empire stations of the supposedly well known call "Test BERU"—but it is hoped in future years to provide even more advance publicity to foreign amateur organisations so that they may acquaint their members of the futility of answering such calls.

Incomplete Entries

In accordance with Rule 11 several entries were disqualified because the forms had not been completely filled in. This is not the first time the attention of competitors has been drawn to this point, and those who invalidated their entry by lack of attention to this rule have only themselves to blame.

The Individual Contests

We now come to review the three sections of the contest in brief, and it is hoped that the technical notes given of the gear used by the leading stations will be appreciated. It is always of interest to know what that fellow was using who worked those coveted zones just before they faded out, leaving you with a blank log and a dead band!

The Senior Contest

Here our congratulations go to Mr. R. G. Henwick, ZS2AL, of Port Elizabeth, South Africa, who appears as the winner of this section with a score of 1,410; a splendid effort, and over 200 points ahead of the runner-up, Captain Eric Cole, ZC6EC, who, however, receives the Trophy, as ZS2AL is not a member of the Society.

The equipment at the Port Elizabeth station consisted of a three-stage transmitter ending up in a T40 with an input of 80 watts, a commercial S.S. superhet, and a bent back doublet aerial with a parasitic reflector. His operating time was 27¾ hours, and using 14 Mc. exclusively, he worked 145 stations in 27 zones.

Eric Cole, with 100 watts to an RK47, a superhet, and a 66-foot Windom, worked no less than 185 stations on 14 Mc. and 8 on 7 Mc. in 20 zones in a total operating time of 29 hours 25 minutes. Among his contacts were 94 stations in the British Isles.

Mr. W. E. Russell, G5WP, with 50 watts to a T55 used 3·5, 14 and 28 Mc. for his 95 contacts in 25 zones, but all but two were obtained on 14 Mc.

High Spots

Senior Winner ...	R. G. Henwick...	ZS2AL
Runner-up and Trophy Holder	E. S. Cole ...	ZC6EC
Colonel Thomas Trophy Holder	W. E. Russell ...	G5WP
Junior Winner ...	J. Drudge-Coates	VU2FO
Runner-up ...	R. J. Beatson ...	VK4BB
Receiving Winner	E. Trebilcock ...	BERS195
Runner-up ...	M. Bourke ...	2AOU

He had three aerials available, a rotatable vertical W8JK, a 138-foot Windom and a fixed horizontal W8JK, and his 1,079 points show that his somewhat lavish aerial system produced the desired results. G5WP as leading British Isles station wins the Colonel Thomas Trophy.

Last year's winner, XZ2DY, occupies 4th place this year, his 983 points being, like the majority of competitors, obtained on 14 Mc. He worked 119 stations in 16 zones, with a three-stage transmitter employing a pair of RK20's in the final, a home constructed 9 valve super, and two "Y" type matched impedance aerials.

Now we come to the somewhat surprising fact that 5th and 6th places were occupied by stations using powers in the vicinity of 10 watts. In each case, however, we find the rightly popular W8JK rotary beam in use, and once again it is demonstrated that provided you have a good operator and a good receiver, "the aerial's the thing." Mr. B. M. Tanna, VU2LK, scored 959 points in 29½ hours using 14 Mc. only with 107 stations in 19 zones, while the well-known Jack Drudge-Coates, VU2FO, using a single valve transmitter, a 6L6 ECO, rather overshadowed by two multi-valve S.S. supers, ran up 892 points by contacts with 90 stations in 17 zones.

The positions of the first 20 stations is set out in Table I, while the following list gives the remainder of the 134 entrants together with their scores in the order they finished :—

* *Hon. Secretary Tests Committee.*

TABLE 1.—SENIOR TRANSMITTING CONTEST.

Position	Name	Call	Input Power in Watts	Points
1	R. G. Henwick*	ZS2AL	80	1,410
2	E. S. Cole	ZC6EC	100	1,193
3	W. E. Russell	G5WP	50	1,079
4	F. J. Mustill	XZ2DY	100	983
5	B. M. Tanna	VU2LK	10	959
6	J. M. Drudge-Coates	VU2FO	9–12	892
7	N. Shrimpton*	ZL4AO	100	832
8	S. G. Taylor*	ZL2GW	100	811
9	A. D. Boyle*	ZL2VM	100	795
10	A. D. Gay	G6NF	200	785
11	G. B. Butler*	ZL2FA	100	779
12	K. Rudkin*	VK2DG	47	771
13	W. B. Stirling	GM6RV	50	765
14	H. A. M. Whyte	G6WY	200	764
15	H. F. J. Powell	VQ3HJP	40	758
16	A. F. Frame*	ZL4BQ	90	756
17	R. J. Beatson	VK4BB	75	728
18	H. Mee	G5MY	25	727
19	R. L. Gream*	VK2AFP	48	722
20	F. Charman	G6CJ	50	720

* Non-Member, R.S.G.B.

TABLE 2.—JUNIOR TRANSMITTING CONTEST.

Position	Name	Call	Input Power in Watts	Points
1	J. M. Drudge-Coates	VU2FO	9–12	891
2	R. J. Beatson	VK4BB	25	872
3	B. M. Tanna	VU2LK	10	797
4	Chas. Miller*	VK2ADE	22	781
5	A. S. Smith*	VK4SA	25	746
6	R. Holmes	G6RH	10–25	721
7	K. Rudkin*	VK2DG	23·5	710
8	G. B. Butler*	ZL2FA	25	629
9	A. F. Frame*	ZL4GA	24	620
10	R. E. Barnes*	ZL1MR	25	613
11	G. McB. Salt*	ZL1CK	23	558
12	T. J. Brown	VU7BR	25	551
	T. Arnold	VU2AN	10	551
14	H. Mee	G5MY	25	544
15	D. H. Duff*	VK2EO	25	532
16	V. De Robillard	VQ8AF	24	496
17	E. R. Cook	ZS6BT	25	493
18	F. W. Garnett	G6XL	25	457
19	T. F. Hall	ZD4AB	20	454
20	F. H. Cooper	G2QT	25	432

* Non-Member, R.S.G.B.

TABLE 3.—RECEIVING CONTEST.

Position	Name	Call	Points
1	Eric W. Trebilcock	BERS195	1,515
2	Martin G. Bourke	2AOU	1,445
3	G. A. Hook	2CIL	1,320
4	R. J. Lee	BRS1173	1,281
5	E. Wake	2CZQ	1,220

21, L. M. Mellars, ZL1AR, 706; *22*, F. W. Garnett, G6XL, 697; *22*, P. Pennell, G2PL, 697; *24*, K. S. J. Rancombe, ST6KR, 693; *25*, C. L. Herbert*, ZL1MB, 689; *26*, R. A. Bartlett, G6RB, 665; *27*, R. H. Hammans, G2IG, 659; *28*, G. Merriman, VS6AH, 640; *29*, M. S. W. Bisdee, VS7MB, 639; *30*, D. Hunter, VP1AA, 611; *31*, A. Foxcroft*, VK6AF, 609; *32*, W. G. Ryan, VK2TI, 604; *33*, V. Williams*, VE3KE, 579; *34*, R. A. Priddle, VK2RA, 547; *35*, S. W. Van der Merwe*, ZS2Y, 542; *36*, A. S. Smith*, VK4SA, 536; *37*, R. E. Barnes*, ZL1MR, 534; *38*, T. J. Brown, VU7BR, 532; *39*, T. Arnold, VU2AN, 531; *40*, L. Dods, ZB1V, 520; *41*, D. H. B. Duff*, VK2EO, 516; *42*, J. Wyllie, GM5YG, 507; *43*, T. F. Hall, ZD4AB, 500; *44*, V. de Robillard, VQ8AF, 495; *45*, R. E. M. de la Pole*, VS7RP, 465; *46*, E. J. Fowler, VE5VO, 464; *47*, E. R. Cook, ZS6BT, 451; *48*, W. D. Wadsworth, VE5ZM, 435; *49*, T. M. Yule, ZS6DM, 421; *50*, F. H. Cooper, G2QT, 420; *51*, G. McB. Salt*, ZL1CK, 417; *52*, C. B. Dowden, VE1HK, 405; *53*, J. Marlow, G2FT, 399; *54*, J. L. Weir*, VE3A1B, 395; *55*, A. C. Simons, G5BD, 390; *56*, P. L. Lowth, VQ2PL, 375; *57*, J. B. Corbin*, VK2YC, 353; *58*, C. E. Roach, VE1EA, 349; *59*, R. G. Knightley, VE3ES, 342; *60*, R. F. Galea, ZB1E, 338; *61*, F. Hawthorn*, ZL1GX, 334; *61*, R. H. Rowe*, ZL3GR, 334; *63* K. Holloway, G8MS, 333; *63*, W. H. Tittley, ZS5BF, 333; *65*, K. Wellington*, ZL1LM, 327; *66*, L. W. Parry, G6PY, 323; *67*, R. T. Stanton, ZL3AZ, 321; *68*, R. H. Lawrenz, VQ4RHL, 320; *69*, D. G. Bagg, VP4TO, 313; *70*, E. J. Williams, G2XC, 310; *71*, A. G. Brewer*, VE3DA, 306; *72*, L. O. Rogers, G2HX, 286; *73*, H. O. Sills, G8QZ, 285; *74*, T. P. Allen, GI6YW, 283; *75*, R. H. Atkinson, VK6WZ, 277; *76*, G. Henderson, G8JV, 276; *77*, J. P. Vesper*, VK2PV, 270; *78*, S. Riesen, G5SR, 268; *79*, E. G. Ingram, GM6IZ, 267; *80*, J. Millie, GM8MQ, 263; *81*, W. R. Savage*, VE4EO, 258; *82*, F. McAinsh, GM8MN, 257; *83*, E. R. Radford, G2IM, 248; *84*, E. Jones*, VE3VN, 240; *85*, F. T. Hine*, VK2QL, 237; *85*, W. L. Harston, VK4RY, 237; *87*, J. Mead, VK6LJ, 233; *88*, L. E. H. Scholefield, G5SO, 229; *89*, A. G. Fowler, GM8SV, 228; *90*, J. H. Fraser*, VK2AFJ, 209; *91*, T. A. E. Tibbits, VP2AT, 203; *92*, H. R. Hough*, VE5HR, 200; *93*, R. W. Munroe*, VO1D, 188; *94*, R. Campbell*, VK4RC, 185; *94*, S. C. Pleass, ZS6CF, 185; *94*, J. Ravenscroft*, VE3AKG, 185; *97*, A. E. Walz*, VK4AW, 180; *98*, F. J. Wadman, G2GK, 177; *99*, A. O. Milne, G2MI, 175; *99*, J. Clarricoats, G6CL, 175; *101*, J. R. Letts, G8IL, 169; *102*, J. Romanchuck*, VE4ABC, 168; *103*, R. W. Martin*, VK2AHI, 164; *104*, R. H. Guest*, VE1CU, 156; *105*, S. A. Pegrum, VQ4CRE, 151; *106*, H. J. Chater, G2LU, 150; *107*, J. Flategan*, ZS4U, 147; *108*, S. B. Trainer*, VE3GT, 142; *109*, E. C. Ilott, G2JK, 140; *109*, J. Paine, G6PR, 140; *111*, H. J. Hunt, G5HH, 133; *112*, J. Kuhny*, VE4OB, 114; *113*, J. Lunt, ZS1BY, 110; *114*, H. V. Wilkins, G6WN, 104; *115*, G. H. Scarfe, ZS5BW, 89; *115*, M. Brooke*, VE5QP, 89; *115*, D. S. Hutchinson*, VE3DU, 89; *118*, E. H. Pawson, G8AP, 75; *118*, T. A. Appleby, G3RZ, 75; *120*, R. P. Walker-Alexander, VS7RA, 74; *121*, R. Price*, ZS5DC, 73; *121*, W. H. Windle, G8VG, 73; *123*, S. Moir*, VE3AQB, 69; *124*, H. Wells*, VO1Y, 54; *124*, R. C. Potter*, VE3TO, 54; *126*, C. E. Jefferies, G5JF, 45; *126*, L. Hill, G5WI, 45; *126*, G. M. King, G3MY, 45; *126*, T. W. McIntosh*, ZS5CY, 45; *130*, J. B. Duncan, GM6JD, 30; *130*, L. F. Woodhams, G8RL, 30; *130*, C. C. Newman, ZB1J, 30; *130*, L. G. Parclan, GM3UA, 30; *134*, J. Cilia, ZB1W, 29.

Disqualified; VK3ZC (no serial numbers), G5IV and XZ2LZ (no reports given).

* Denotes non-member, R.S.G.B.

Senior Contest Zone Winners

Zone	Winner	Call
Australia, VK2, 3, 4, 7, 8, 9	K. Rudkin ...	VK2DG
Australia, VK5, 6	A. Foxcroft ...	VK6AF
British Isles ...	W. E. Russell...	G5WP
Canada, VE1, 2 ...	C. B. Dowden...	VE1HK
,, VE3 ...	V. Williams ...	VE3KE
,, VE4 ...	W. R. Savage...	VE4EO
,, VE5 ...	E. J. Fowler ...	VE5VO
Ceylon	M. S. W. Bisdee	VS7MB
India	B. M. Tanna ...	VU2LK
Malta	L. Dods ...	ZB1V
New Zealand, 1, 2	S. G. Taylor ...	ZL2GW
,, ,, 3, 4	N. Shrimpton...	ZL4AO
South Africa, ZS1, 2	R. G. Henwick	ZS2AL
South Africa, ZS4, 5, 6 ...	E. R. Cook ...	ZS6BT
SECOND PLACE ZONE AWARDS		
Australia, VK2, 3, 4, 7, 8, 9 ...	R. J. Beatson...	VK4BB
British Isles ...	A. D. Gay ...	G6NF
Canada, VE3 ...	J. L. Weir ...	VE3A1B

The Junior Contest

In this event Mr. J. Drudge-Coates, VU2FO, scored a well merited victory by the narrow margin of 19 points over Mr. R. J. Beatson, VK4BB, who finished 4th last year. The winner's score of 891 was made up of 99 contacts in 17 zones in 29¾ hours. The same gear was in use as in the Senior contest, and it is worthy of note that almost all tone reports were T9, which speaks well for the stability of the single valve ECO transmitter.

VK4BB worked 75 stations in 20 zones in 29 hours,

Junior Contest Zone Winners

Zone	Winner	Call
Australia, VK2, 3, 4, 7, 8, 9	R. J. Beatson...	VK4BB
British Isles ...	R. Holmes ...	G6RH
India	J. M. Drudge-Coates ...	VU2FO
Malta	R. F. Galea ...	ZB1E
New Zealand, ZL1, 2	G. B. Butler ...	ZL2FA
South Africa, ZS4, 5, 6 ...	E. R. Cook ...	ZS6BT
SECOND PLACE ZONE AWARD		
British Isles ...	H. Mee ...	G5MY

and becomes the VK Zone winner. He also used a superhet and, like VU2FO, employed the 14 Mc. band exclusively.

Seventy points behind came Mr. B. M. Tanna, VU2LK, with the same input and gear as used in the Senior, and with the same number of zones—19—to his credit. He was closely followed by Charles Miller, VK2ADE, of New South Wales who with 22 watts worked 22 zones and made 95 contacts in the short space of 18¾ hours. He employed a "Vee" beam for Europe and QSO'ed 48 stations in the British Isles, while his rotary beam directed on Africa gained him eight contacts with that continent. The 2½ wavelength aerial intended for the West Indies put him through only to VP1AI, but it is noticed that 13 contacts representing 175 points were made with VE.

Mr. A. S. Smith, VK4SA, of Brisbane scored 746 with 83 stations in 17 zones, and was notable in his being one of the few with high scores who did not use a superhet receiver.

Up to this point the Junior contest has been all with " British Empire," but in the 6th place there appears Mr. R. Holmes, G6RH, the British Isles Zone Award winner with a score of 721 represented by 55 stations worked in 21 zones, certainly an example of well spread scoring. He used 14 Mc. for all but one contact—VP4TO—whom he contacted on 7 Mc.

As with the Senior contest, the first 20 stations will be found set out in Table 2, while the following are the remainder of the entrants together with their scores :—

21, R. S. Cross, G2FZ, 429 ; *22*, R. F. Galea, ZB1E, 427 ; *23*, R. P. Walker-Alexander*, VS7RA, 424 ; *24*, R. W. Rogers, G6YR, 410 ; *25*, V. Williams*, VE3KE, 393 ; *26*, R. E. M. de la Pole*, VS7RP, 389 ; *27*, C. B. Dowden, VE1HK, 366 ; *28*, L. Dods, ZB1V, 352 ; *29*, S. A. Pegrume, VQ4CRE, 336 ; *30*, E. G. Ingram, GM6IZ, 330 ; *31*, J. F. Stanley, G6SY, 315 ; *32*, S. Riesen, G5SR, 314 ; *33*, H. J. M. Box, G6BQ, 312 ; *34*, R. H. Rowe*, ZL3GR, 311 ; *35*, J. B. Corbin*, VK2YC, 309 ; *36*, G. H. Scarfe, ZS5BW, 296 ; *37*, R. A. Bartlett, G6RB, 272 ; *38*, W. L. Harston, VK4RY, 268 ; *39*, E. C. Ilott, G2JK, 246 ; *40*, C. E. Roach, VE1EA, 238 ; *41*, G. P. Anderson, G2QY, 235 ; *42*, L. R. Crawley, G3DT, 233 ; *43*, W. H. Tittley, ZS5BF, 232 ; *43*, D. G. Bagg, VP4TO, 232 ; *45*, C. Watson, G3CW, 230 ; *46*, J. M. Kirk, G6ZO, 228 ; *47*, K. Holloway, G8MS, 219 ; *48*, T. O. Cadell, VU2EB, 212 ; *49*, R. Campbell*, VK4RC, 206 ; *49*, C. A. Heathcote, G3JR, 206 ; *51*, J. Richardson, G8GQ, 196 ; *52*, D. W. Flavell, G3PG, 190 ; *53*, E. F. Fowler, GM8SV, 188 ; *54*, J. Hall, GM3QH, 187 ; *54*, R. G. Knightley*, VE3ES, 187 ; *56*, L. G. Pairman, GM3UA, 186 ; *57*, R. W. Munro*, VO1D, 184 ; *58*, B. E. P. Sadler, G2RC, 177 ; *58*, T. A. E. Tibbits, VP2AT, 177 ; *60*, A. R. Stansfield, VO4Y, 174 ; *61*, E. Pawson, G8AP, 173 ; *62*, A. E. Walz*, VK4AW, 172 ; *63*, H. J. Chater, G2LU, 165 ; *64*, M. Brooke*, VE5QP, 155 ; *65*, J. Schefer, G3JX, 145 ; *66*, M. H. Parsons, G8TC, 143 ; *66*, J. P. Vesper*, VK2PV, 143 ; *68*, L. F. Woodhams, G8RL, 133 ; *68*, R. Frew, GM8FR, 133 ; *68*, L. Hill, G5WI, 133 ; *71*, J. Paine, G6PR, 129 ; *72*, J. Lunt, ZS1BY, 120 ; *73*, T. A. Appleby, G3RZ, 118 ; *73*, C. E. Jefferies, G5JF, 118 ; *75*, J. F. Lategan, ZS4U, 117 ; *76*, W. T. Pickard, G8KP, 103 ; *77*, J. B. Kershaw, G2WV, 101 ; *78*, S. A. C. Howell, G5FN, 90 ; *79*, J. B. Duncan, GM6JD, 89 ; *79*, E. R. Radford, G2IM, 89 ; *79*, G. Edwards, G2UX, 89 ; *82*, A. E. Seymour, ZB1Q, 84 ; *83*, E. Vella, ZB1S, 80 ; *84*, H. J. Hunt, G5HH, 75 ; *85*, B. H. Lagden, G3GX, 74 ; *85*, C. F. Barnard, G8AC, 74 ; *85*, D. R. Aston, G8DR, 74 ; *85*, J. R. Letts, G8IL, 74 ; *89*, J. H. Payton, G2JB, 73 ; *90*, E. W. Price, G8UE, 60 ; *90*, J. F. Davis, G3CI, 60 ; *90*, H. S. Chadwick, G8ON, 60 ; *93*, G. M. King, G3MY, 59 ; *93*, J. S. Owen, GW3QN, 59 ; *95*, W. V. Champion, G8CY, 45 ; *96*, G. Proctor, GM8SQ, 44 ; *96*, A. C. Dowdeswell, G4AR, 44 ; *98*, W. H. Windle, G8VG, 42 ; *99*, D. G. Farquharson, G3MF, 30 ; *100*, T. T. Parker, G8FL, 15 ; *100*, L. M. Mellars, ZL1AR, 15 ; *100*, R. M. Hall, XZ2EM, 15.

Disqualified : G5IV and XZ2LZ (no reports given), G8IW (analysis not completed).

* Denotes non-member, R.S.G.B.

The Receiving Contest

This event, as has been the case for some years, resolved itself into a struggle between Mr. Eric Trebilcock, BERS195, of Northern Australia, and Mr. Martin Bourke, 2AOU, of the Channel Isles. This year it was Trebilcock's turn, for he led 2AOU by 1,515 points to 1,445, thus reversing last year's positions and repeating those of 1937. Curiously enough almost the same number of points separated them. Their scores were made up, respectively, of 115 stations in 28 zones, and 95 stations in 27 zones.

In 3rd place came Mr. G. A. Hook, 2CIL, who with 1,320 points obtained by receiving 70 stations in 25 zones, was 39 points ahead of that very active receiving station BRS1173, Mr. R. J. Lee, of Heathfield, Sussex.

The first three used T.R.F. receivers, while BRS1173 relied upon the well-tried O-V-1.

In common with the transmitting contests the leaders are shown in Table 3, while the names, calls and scores of the remainder of the entrants follow :—

6, L. F. Coursey, 2FHA, 1,179 ; *7*, W. F. Miller, 2AAH, 1,160 ; *8*, P. Seymour, 2AZX, 1,114 ; *9*, L. J. Goupland, 2BQC, 1,081 ; *10*, H. N. Holbrook, BRS3511, 888 ; *11*, K. M. Fraser, 2DIT, 882 ; *12*, W. R. Chaffe, 2DLJ, 877 ; *13*, D. E. White, BERS112, 727 ; *14*, L. W. Wilson, BRS3323, 725 ; *15*, D. J. B. Upton, BRS3106, 564 ; *16*, I. D. McDermid, BRS2689, 561 ; *17*, F. J. Harris, 2BOF, 515.

Check Logs

Check logs were received from the following stations, and the Tests Committee wishes to express its thanks for their co-operation :—

E14J, 5F, 6F, 9N, G2FT, 2IO, 2QY, 2WD, GW3QN, 3UP, 5BD, 5OJ, GM5YX, 6AH, 6CJ, 6KM, 6OQ, 6PY, 6YR, GI6YW, 8AC, 8NO, 8PC, 8UD, VE1EK, 1IR, 2FC, 3AJX, 3AMK, 4HM, 4LQ, 5VO, VK3HT, 3PG, 4UR, 4YL, 5FM, 5GR, 5LD, 6LJ, VS7MB, VU2EB, XZ2JB, ZC6EC, ZL1FT, 1GX, 2AI, 2GW, 2OU, ZS1BA, 1BG, 1CJ, 1Z, 5BU, 6BJ.

Correspondence

The Tests Committee also desires to thank those who took the trouble to send letters to the Society

(*Continued on page* 68).

EXPERIMENTAL SECTION

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A. M. HOUSTON FERGUS (G2ZC),
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Aerial Group Manager:
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Receiver Group Manager:
H. R. HEAP (G5HF),
404 Victoria Avenue East, New Moston,
Manchester, 10.

Propagation Group Manager:
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10 Selkirk Street,
Cheltenham, Glos.

Transmitter Group Manager:
J. N. WALKER (G5JU),
4 Frenchay Road, Downend,
Bristol, Glos.

IT is too early yet to forecast the demand for an E.S. meeting during Convention, but if this takes place we hope that many non-members of the Section will also attend to give us their views.

The Section membership has recently been well pruned and we believe we now have listed only those who are really active. This fact may induce some of the "real brains" of the Society to come in with us and lend a hand. We feel that there are far too many first class technical members of the Society outside the ranks of E.S. It is to be our job to enlist their support.

One reason which has kept out a number of such members is the thought that they will be asked to act in the capacity of technical advisors. We would reiterate that the E.S. does not exist to answer technical questions—its purpose is to place members interested in various experimental aspects of our hobby into touch with one another.

Members are only accepted and—let it also be said—*retained* unless they are prepared to carry out genuine experimental work, reporting results regularly to their group manager or group centre.

The "take all and give nothing" type of person does not exist in the E.S. as at present constituted, so perhaps those who were such towers of strength in the old Contact Bureau days will rejoin us and give us the benefit of their wide experience.

Contemporary Literature

For some years Mr. L. Fryer has been furnishing the Society with brief details of technical articles published in contemporary journals. We are anxious to discover whether members of E.S. use this carefully prepared information, therefore, when writing to G.M.'s we shall be glad if they will indicate whether or not they find the feature of value.

Suggestions for its improvement will also be welcomed.

Aerial Group

It is regretted that no notes appear in this issue from the Aerial Group, but the manager informs us that he has been unable to obtain replies to the various letters he has circulated to G.C.'s and others. Summertime apathy seems to have started earlier than usual!

Vacation

The E.S.M. will be out of England from the last week in July until the end of August. Will members please restrict correspondence to the minimum. Monthly reports should reach him before July 18th.
G2ZC.

Propagation Group

GM3TR of the Aurora sub-group finds that conditions on 7 and 14 Mc. change about three hours before an auroral display. The higher frequencies are affected first with flutter fading, shortening of skip and slight falling off in signal strengths. This slowly spreads to the lower frequencies and when the aurora becomes visible, signal strengths drop rapidly, with severe flutter fading and telephony signals have a hollow sound. If the display is very vivid, 14 Mc. signals may disappear, while 7 Mc. signals will be only weakly audible. Several days usually elapse before conditions return to normal, the higher frequencies taking longer to recover than the lower ones.

The Barometric sub-group note that 7 Mc. waves show a pronounced tendency to follow isobars, and received signals seem to come mainly from areas where the pressure is equal to that at the receiver. These facts are being verified and data relative to variations in propagation conditions with temperature changes is being collected.

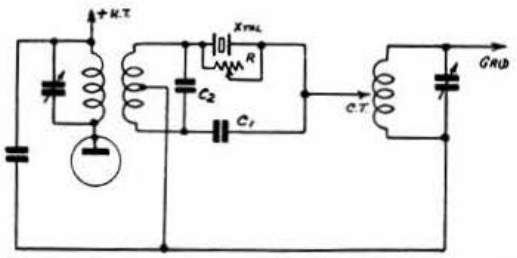
The comment is made on the deflection theory being studied by the Magnetism and Conditions sub-group that an electromagnetic wave is not deflected by any magnetic field, although particle radiation from the sun will be so deflected. Some confirmation of the deflection theory would be forthcoming if it is found very difficult to contact PY from either G or W during magnetic storms. A calculation of the amount of deflection of a signal from PY agreed approximately with that actually obtained in practice during a magnetic disturbance.

The presence of the sporadic E layer was evident during June and on several days DX signals or harmonics were audible up to 60 Mc. It is pointed out that when signals from Scotland and the North of England are good in the South on 14 Mc., the 28 Mc. band may be expected to be open and likewise, when near European stations are heard on 28 Mc., the 56 Mc. band should be open for DX. The query is raised whether the E sporadic layer varies with sunspot activity as does the F layer and the answer to this will become evident during the next few years when sunspot activity will be on the decline.
G8DA.

Receiver Group

Much controversy exists as to the use of regeneration in the R.F. amplifying stages of superhets. Some experimenters find that the improvement in gain and selectivity warrant the inclusion of regeneration, whereas others claim that the increase in noise is so great as to offset the advantages. One point which is frequently overlooked is that using regeneration in a stage coupled to the aerial requires a regeneration control covering a wide range, in order to compensate for the aerial absorption. Variable aerial coupling helps, but is another complication. Summing up the pros and cons of regeneration it can be said to be useful, but for low set noise the stage should first have good non-regenerative gain.

For crystal filter circuits, thorough recommendation can be given for the circuit in the accompanying diagram. Here the selectivity is



Crystal filter circuit, the virtues of which are described in the text.

controlled without sacrificing amplification. The selectivity control may be a series of small resistors mounted round a multi-contact switch, and the values should be from 5,000 ohms. to 2 megohms. On the subject of crystal filters, a recent case has come to light in which a dirty crystal caused a receiver to have "ultra-selectivity," so that it was impossible to tune in any signal for more than about a second. This intense peaking of the crystal characteristic was overcome by washing the crystal in carbon tetrachloride.

A problem which has confronted many experimenters in R.F. stages is that the replacement of old unscreened valves by the modern metal types results in disappointment, as the older valves appeared to give greater gain. It has been shown that in most receivers, especially on the higher frequencies, a certain amount of accidental regeneration is introduced due to stray capacities or faulty wiring. The inclusion of metal or metal-glass valves of course stabilises the stage and so they give all appearances of being inferior to their ancient counterparts.

G5HF.

Transmitter Group

All members of the Transmitter Group are asked to take particular note of the remarks made in last month's issue, both in the Editorial and under the E.S. notes. The problem of optimum L/C tank ratios is of outstanding importance and it is hoped that everyone will concentrate immediately on this particular subject and provide their G.C. with some practical information concerning it at the earliest possible moment. It is further hoped that such information will cover the operation of triodes and pentodes, neutralised and un-neutralised circuits, and single-ended and push-pull arrangements. In the first place, experiments should be conducted on power amplifier tank circuits but, later, information on results obtained in the case of frequency multipliers would also prove useful. Undoubtedly, this particular point, bound up as it is with the degree of drive available for later stages (assuming a given input), is one well worth investigating.

Apologies are made to the members of Group "C" —G5NG, GM6ZV, G3RZ and G6TG—that, owing to causes entirely beyond his control, the group centre, GW2NG, has been unable to acquaint them of recent developments in the formation of the group, lines of experiment, etc. G5NG has been asked to take over as G.C. and it is hoped that a Letter Budget will be circulating very shortly.

H. H. Phillips, GW4KZ, has been appointed as assistant to the G.M. and all communications relative to group membership, alterations to records, etc., should be addressed to him. Technical matters will continue to receive the attention of the G.M.

G5JU.

Cosmic Notes

The ionosphere storm which began at 03.00 G.M.T. on May 24, continued until midnight on that day and the critical frequency for the F2 layer extraordinary ray at 17.00 G.M.T. at Washington, U.S.A., was 6,600 kc., the layer height being 660 kms.

Small groups of spots crossed the sun's central meridian on May 28 and 29 and magnetic conditions were moderately disturbed from the evening of May 27 to May 29. June 1, which produced good U.H.F. conditions, was slightly disturbed and the following day a large spot crossed the central meridian. From June 2 to 5 magnetic and ionosphere disturbances occurred. (This covered National Field Day.) On June 7 the F2 critical frequency was 9,600 kc. and layer height 320 kms.

An average group of spots was observed with C.M.P., June 14 and magnetic and ionosphere storms occurred on that day. The critical frequency for the F2 layer could not be accurately measured as a result of the storm but no echo could be obtained with frequencies greater than 5,600 kc. This ionosphere storm lasted until the early hours of June 17.

Another group of spots crossed the meridian on June 19 and were probably the cause of an ionosphere storm which began on June 20 and was still in progress at 17.00 G.M.T. on the following day, when the F2 critical frequency was 6,500 kc. and the height 490 kms.

A number of spots were observed on the eastern half of the sun's disc towards the end of the month and were calculated to cross the central meridian on June 29 and following days.

Sporadic E layer ionisation appears to have existed on many days during June to judge by conditions on the ultra-high frequency bands. It must have been very intense on the following dates when signals from southern Europe were audible on frequencies as high as 60 Mc. :—June 1, 13, 19, 24 and 25. These dates are given as a result of the writer's personal observations.

G2XC.

An Ultra-High Frequency Wavemeter

By H. R. HEAP* (G5HF).

MANY amateurs consider that a wavemeter of the absorption type is necessarily inefficient and insufficiently accurate for reliable results. In the case of a simple tuned circuit with a microammeter or flash lamp bulb connected in series, this is usually true, for the reasons that :—

(*a*) Selectivity is poor, making accurate tuning difficult,

(*b*) Sensitivity is poor and close coupling is necessary between the coil of the wavemeter and the circuit to be measured. This produces two errors, one due to frequency locking and the other to the added inductance and capacity, which has the effect of detuning the resonant circuit.

Therefore to obtain a wavemeter which will be reliable, it must be both sensitive and selective. A resonant circuit consisting of a coil and condenser has inherently a high selectivity but when an indicating device, such as a meter or bulb, is connected

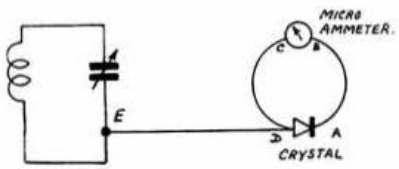


Fig. 1.
Arrangement of apparatus to produce a sensitive-selective U.H.F. wavemeter. The distances A-B, C-D are not critical but 4 in. is a recommended length.

to it, the effective resistance increases and selectivity suffers accordingly. In the meter to be described a special indicating system is employed, whereby a very simple piece of apparatus may be used, yet the required characteristics are not sacrificed.

In the theoretical resonant circuit the voltage distribution is such that the voltage node is the mid-point of the coil and the voltage antinode appears across the condenser terminals. If now a microammeter and detector (such as a crystal) are connected as shown in Fig. 1, to the point of maximum voltage, the meter reading will be maximum when the circuit is tuned to resonance.

Construction

A 56 Mc. wavemeter was constructed on the above lines using a 0–500 microammeter in series with a crystal detector of the semi-fixed type. The lengths of wires finally chosen were :—

DC = AB = 4 inches.

It was found that these lengths were not critical although in general the longer the wires the more sensitive the instrument. Above 4 in. in length, however, the improvement was too small to warrant the extra space taken up by the wire. The wire ED was found to influence sensitivity to a much greater degree and the shorter this was kept the more sensitive the wavemeter. Fig. 2 shows the curve of sensitivity expressed against length ED. It will be noticed that maximum sensitivity is to be found where ED = zero.

* *Receiver Group Manager, E.S.*

Results

The results obtained with this wavemeter were nothing short of amazing. Sensitivity was so high that accurate readings were possible 3 ft. away from a wire carrying 0·1 amps of R.F. at 58 Mc., a reading of 50 microamps being obtained on the meter at resonance.

Selectivity was so good that a very smooth action slow-motion dial had to be fitted to the tuning capacitance in order to make full use of the properties of the instrument.

Precautions

An extension handle is necessary on the tuning spindle, and some experimenting is necessary before the point E (Fig. 1) can be found. This point of maximum voltage is critical to $\frac{1}{8}$-in. for maximum sensitivity, but varies with the mechanical construction of the condenser and with frequency; thus if a wide frequency coverage is desired the tapping point may have to be altered. However, over 3 or 4 Mc. the point is reasonably constant so that when adjusted for 58 Mc. the wavemeter will cover the 56 to 60 Mc. band with fair uniformity.

The crystal detector influences the results to a large extent, and it is best to " tickle " it until the point of maximum sensitivity has been ascertained. The crystal should then be locked in position and not touched again. If the meter reading is found to waver when measuring a constant R.F. current it may be found that the crystal is not making adequate contact. A fairly high pressure should then be applied to the crystal contact and this may be arranged by substituting a spring loaded screw for the normal plunger.

Conclusion

This wavemeter has been found to supply a long-wanted requirement for a simple and efficient portable instrument, which can be conveniently

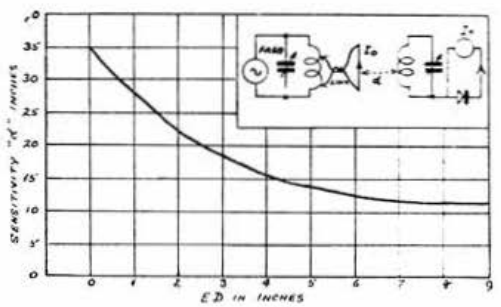


Fig. 2.
Curve showing sensitivity " d " expressed against the length ED of Fig. 1. Ir = 100μA. I_0 = 1A. Freq. = 58 Mc.

constructed at the end of a pole to prevent body capacity errors. Its high sensitivity renders it invaluable for testing transmitters and oscillating

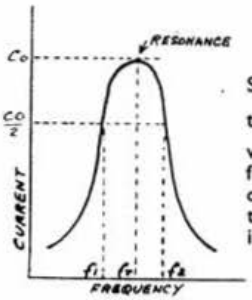


Fig. 3.
Selectivity curve based on the formula $\delta = \pi \frac{f_2 - f_1}{f_R}$ where f2 and f1 are the frequencies on either side of the resonance, and where the current is half that flowing at resonance.

circuits. For selectivity it was found to be every bit as good as an E.C.O. meter, when the relative decrement was tested from the formula :—

$$\delta = \pi \frac{f_2 - f_1}{f_R}$$

For a good wavemeter this should not exceed a few 100ths.

Letters to the Editor

The Editor does not hold himself responsible for opinions expressed by correspondents

FREQUENCY MEASURING

To the Editor, THE T. & R. BULLETIN

DEAR SIR,—In view of the prevalence of off-frequency operation, it appears to be an appropriate time for the publication in this Journal of an authoritative article on frequency measurement.

The band-edge tolerances in this country appear to be based on an accuracy of ·03 per cent. (i.e. 5 kc. at 14 Mc.); it is evident, however, that if we are to take full advantage of the bands available, ability to check our frequencies to a greater degree of accuracy than this is required.

It is noted that the more reputable crystal manufacturers now supply to a tolerance of ·025 per cent., a figure which is satisfactory provided that temperature coefficients are taken into account when working close to band limits. The fact that for these reasons crystals having nominal frequencies right up to the band limits cannot be safely used, appears to be generally overlooked. There is ample evidence to support this contention as a result of operations during the recent N.F.D. event! It is well to bear in mind also that cheap crystals cannot have the same accuracy as more expensive units, and should be used with even greater caution for band-edge working.

Where crystal control is employed and the foregoing limitations are taken into consideration, we can safely proceed without the benefit of a frequency-meter. But if the transmitter is to be self-controlled such an instrument is a necessity, and the construction of one having the necessary accuracy and inherent stability is no easy task.

Since the use of "signal-shifters" is becoming increasingly popular, the majority of them having reference to no standard whatsoever, it is felt that many of the operators would welcome information on the building of a suitable meter which they could readily duplicate. Surely the experience and practices of the Society's Monitoring Stations could be made available to members?

A simple 100 kc. crystal oscillator non-temperature controlled will provide an accuracy of not less than ·025 per cent. (making no allowance for change due to temperature), which at 14 Mc. is equivalent to plus or minus 3·5 kc. The temperature coefficient of these crystals being usually less than 6 parts per million negative, under considerable temperature increases the accuracy may well be within ·01 per cent., but since the working temperature is constantly changing it is not possible to rely on better than ·025 per cent. Such an oscillator constitutes a useful device for checking band limits and as such is infinitely preferable to no standard at all, but it is my opinion that an instrument having an absolute accuracy of not less than ·01 per cent. should be in use at every station working as close to the band limits as is current practice.

Having recently received a "pink ticket" I do not propose to tempt providence again! Can any member provide details of a simple crystal oven which can be constructed with average amateur workshop facilities?—Yours faithfully,

H. E. JAMES (G5JM).

(Editorial Note.—We shall welcome authoritative articles dealing with frequency measurements).

AN INTERESTING THEORY

To the Editor, THE T. & R. BULLETIN

DEAR SIR,—I was interested in reading a letter from Mr. W. H. Walker, 2DXS, in your June issue.

Some time ago I suggested that the moon may possibly reflect wireless waves, but of course I did not enter into the subject in such detail as your correspondent has done. Your correspondent's reference to light waves is noted. It is now an established part of the new theory, which the writer had the privilege of publishing some years ago, that the nearer the frequency of wireless waves to the frequency of light waves, the more the wireless waves acquire the characteristics of light waves, and the more the wireless waves behave in accordance with the characteristics of light waves. Even the detection of wireless waves has been proved to be analogous to refraction of light.

Yours faithfully,

D'ARCY FORD (B.R.S. 1879).

Stray

G3CU and 3VK will be operating with 56 Mc. portable gear on Sundays. Reports from listeners will be much appreciated.

VALVE REVIEW—THE OSRAM KT8

THE Osram KT8 supplied by *The General Electric Co. Ltd.*, is a screened radio frequency transmitting tetrode of 25 watt anode dissipation having characteristics somewhat similar to that of the R.C.A. 807.

The valve has an indirectly heated cathode, aligned grids and beam confining plates, the anode is brought out to a top cap and is fitted with a 5-pin English bakelite base. The price is fixed at 22s. 6d.

A very complete Application Report covering characteristics and operating instructions is furnished on application to the makers.

Characteristics	Makers Rating	Measured Sample
Heater volts	6·3	6·3
,, current	1·27	1·27
Anode voltage (max.) ...	600	—
,, current (,,) mA. ...	95	—
,, input (,,) watts ...	57	—
Screen voltage (,,) ...	300	—
,, dissipation watts ..	3·5	—
Grid volts	—200	—
Mutual conductance, mA./V ...	6·0*	5·8*
Anode impedance, ohms. ...	—	12,000*
Interelectrode Capacities		
Anode—grid μμF.	0·12	0·165
,, all other electrodes μμF.	5·5	5·9
Grid—all other electrodes μμF.	15·3	14·4

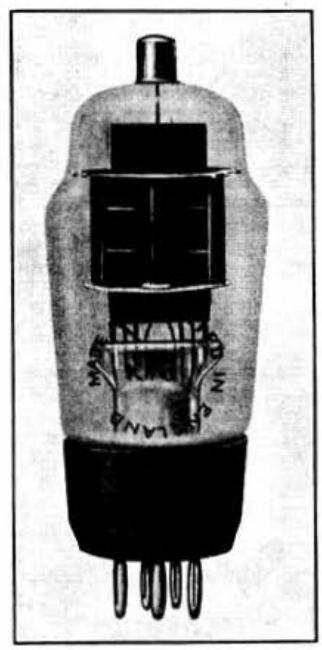
* *Measured at anode volts 250, screen volts 250, anode current 72 mA.*

Characteristic Curves

The sample valve showed a lower anode current generally than the published curves but was within normal manufacturing tolerance. The ratio of anode to screen current was high indicating good alignment and there was negligible grid current.

General

The valve was tested in comparison with an R.C.A. 807 as a power frequency doubler, doubling from 28 to 56 Mc., and for the purpose of this test a 5-pin UX base was substituted for the English base in order that direct comparison could be made. It was found that the grid input capacity was somewhat higher than that of the 807 and the output capacity slightly lower. This was to be expected but the differences in practice were quite small. The first tests were made at anode volts 425, screen volts 290 and grid bias —120, the output being used to drive 2—4304B triodes in push-pull having 10,000 ohms leak bias. The 807 anode current was 80 mA. and the output drive measured as D.C. grid drive watts was 6·2, the KT8 anode current was 60 mA. and the D.C. output watts 4·8, the lower watts being proportional to the lower anode current or input watts. In order to obtain a more true comparison the bias was increased to —200 volts and the drive correspondingly increased with the result that the anode current and output of the KT8 and 807 were now equal. Tests were also made at an anode voltage of 600 volts where the output was of the order of 9 watts of D.C., the output and input still tending to be a trifle lower than the 807. No attempt was made to measure the true R.F. output in either test.



The New Osram KT8 Valve

It must be pointed out here that the KT8 is not intended to be an exact equivalent of the 807 and its operating conditions are not identical but the above tests indicate that it is a satisfactory replacement for the 807.

The grid to anode capacity is lower than that of an 807 and considerably lower than that of an RK39, consequently when used as a straight amplifier, the stability is likely to be improved.

The dimensions are such that the height is about ½ inch less than an 807 but the diameter is similar.

The KT8 can be recommended for all purposes where an R.F. amplifier, oscillator, or frequency multiplier of its rating is required and its price of 22s. 6d. is an additional recommendation.

D. N. C.

Danish QSL Bureau

We have been informed that all QSL cards for Danish amateurs should from now on be sent to Box 79, Copenhagen K, the official address of the Experimenterende Danske Radioamatorer.

BOOK REVIEWS

BUILDING TELEVISION RECEIVERS AT HOME. Edited by H. Corbishley (Editor *Television and Short-wave World*). 105 pages and 97 illustrations. Published by Bernard Jones Publications Limited, London. Price 2s. 6d. net.

This book is called the " Television and Short-wave World Practical Handbook No. 1 " and gives detailed information of the construction of three different designs of television receiver. It deals with only the vision side, the audio section being covered in a companion handbook.

How a television receiver works is explained in a simple way, and about one half of the rest of the book is given to details of a receiver for pictures up to 12 inches. Three R.F. stages are used, and it is said that it will receive satisfactorily up to a distance of 65 miles. A smaller number of R.F. stages may be used for shorter ranges, and such a modification (which will reduce the cost) is explained.

The next receiver is for 4 in. pictures. It employs two R.F. stages in a straight circuit, thus simplifying adjustments but reducing range as well as cost. It has been found effective to distances of about 30 miles.

The third receiver is briefly described and uses an RCA913 tube with a 1 in. screen. It is suggested that a lens be used in front of the small screen.

The descriptions are detailed and well-illustrated with both conventional circuit diagrams and " pictorial " connection diagrams. Anyone who can build a radio receiver of more than the most elementary type should be able to follow the instructions and duplicate the apparatus described.

The subject matter is reprinted, with revisions, from contributions to *Television and Short-wave World* by S. West and D. E. Osman.

T. P. A.

THE PRINCIPLES AND PRACTICE OF RADIO SERVICING. By H. J. Hicks, M.S. 305 pages and 220 illustrations. Published by McGraw-Hill Publishing Co., Ltd., London. Price 18s.

The author of this book, as radio instructor at Hadley Vocational School, St. Louis, has had long experience in teaching men in the radio service and allied fields. As would be expected, then, the book is a highly organised training manual with practical detail creeping into every theoretical treatment, a richness in quantitative information, and the subject well limited to suit the purpose of the book. There are many intricacies in theory and practice which, though the business of the designer and experimenter, would only befuddle the service man. The author has made a sound choice of the material to be presented, and in only one section has the writer a criticism to make.

The opening chapters on fundamentals are too brief to give the reader more than a superficial knowledge of the groundwork. This is felt particularly in the case of A.C. and the A.C. circuit, though this is all-important to the reader. Without some further information the reader may be puzzled that resistances and reactances cannot be added arithmetically because they are not acting in " the same direction," and the vector diagram can mean little except, perhaps, a convenient way of remembering a formula. One feels that the fundamental work should be expanded considerably.

A brief description of valve action and various types is followed by an extremely useful section on test equipment, ranging from shunts and multipliers to C.R. Oscilloscopes, and showing the values of components in most circuits.

The chapters on the operational theory of radio and audio frequency amplifiers, detection, power supplies, volume, tone and frequency control, loudspeakers, aerials, interference suppressors, and superheterodynes, are intensely practical and interspersed with examples of circuit values and hints. These chapters explain how and why circuits operate: the following section on servicing explains how one goes about tracing and rectifying abnormal operation, and includes much highly valuable advice as to method and even such details as proper soldering. This section covers faulty adjustments in addition to faulty valves and components.

There is a chapter on public-address systems; this covers a fairly wide field and much useful instruction is given on mixing circuits, impedance matching, care, operation and installation, to mention only a few items.

The final chapter is a short one on the business side of the job. This deals very briefly with business methods and economics, but gives much advice on the proper behaviour and attitude of the service man, especially when he is in the client's home. The writer, candidly, started this chapter with little enthusiasm, but concluded it feeling that it could hardly be praised too much. It is shrewdly reasoned and immensely valuable advice, and sets high standards of integrity and professional dignity as very necessary qualifications.

There is an appendix with data which are often required by service men.

Though this book is in the rather highly priced class, the purchaser is getting a first-grade production, and one feels that service men, particularly those in business on their own account, will agree that the book is very good value indeed and a pleasure to read.

T. P. A.

British Calls Heard

A. Tomlinson (ZD2H-G2QN), Posts and Telegraphs, Buea, Cameroons. 14 Mc. The figure in brackets denotes QRK.

March 24–April 15 on 14 Mc.:—G2FT (5); 2KG (6); 2KM (5); 2LB (6); 2SY (5); 2VF (5); 2XS (5); 2ZP (6); 3BS (5); 3GQ (5); 3IQ (6); 3VQ (4); 5CM (5); 5DV (5); 5LC (6); 5RV (7); 6IP (7); 6XA (5); GM6HZ (7); 8DV (4); 8GB (7); 8IM (6); 8IP (5); 8JM (6); 8LT (6); 8LU (5); 8OA (7); 8OM (6).

May 14–June 1 on 14 Mc.:—2DF (7); 2IM (7); 2RO (6); 2SY (6); 2YL (5); 2ZQ (8); 3DG (4); 3JR (6); 3MY (5); 4FR (6); 5BJ (6); 5DQ (5); 5PJ (4); 5YV (6); 6VX (6); 8BX (6); 8IT (6); 8KP (5); 8PL (5).

THE MONTH ON THE AIR

A COMMENTARY OF AMATEUR RADIO CONDITIONS FOR THE MONTH OF . . . . . JUNE, 1939

by ARTHUR.O. MILNE (G2MI)

TAKING over this feature from the capable hands of H.A.M. Whyte is a considerable responsibility. In doing so, may I take this opportunity of asking for a continuation of the support which he has been given in the past so that I may prove a worthy successor in a difficult task.

As for myself, well I have been on the air for some 15 years and naturally during that time I have managed to work a bit of DX. Being a near neighbour and co-DX-hunter with G6WY, I suppose I looked " easy " and so here I am, to do my best, with your assistance. Remember, no dope, no story !

* * *

DX conditions during June have been just about normal for this time of year, with a sudden opening up of 56 Mc. thrown in, but more of that anon. The early part of the month was notable for excellent early morning conditions for West Coast Americans, especially during the warm spell. The rainy days, however, seemed to spoil this but made up in some degree by improving things in the evenings. On many days there was very pronounced short-skip, with 14 Mc. full of S9 Scandinavians mixed up with the DX.

Talking of Scandinavians, we should like to know the real call of the SM4 lady who appears to use a different one each evening ; does she travel around the SM shacks as a sort of DX bait or is she unlicensed ?

There is a growing tendency for European 'phones to work in the American 'phone band whilst the W's are coming through, a practice which should be discouraged.

The sudden burst of good conditions on the 56 Mc. band culminated on June 13 with two G-Italy contacts, between G6CW and I1FA and G8JV and I1SS. The time was 20.00–20.30 G.M.T. and coincided with a sudden opening up of 28 Mc. and exceptionally short skip on 14. All QSO's were on 'phone at S8.

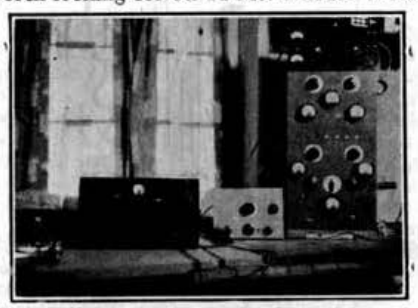
An interesting point has been noticed regarding the 5 metre band, in that if the medium wave Broadcast Stations, situated about 500 miles away, show a sudden increase in QRK (Scottish Regional in London for example) then 56 Mc. is almost certain to be open. By the way, most of the European signals are on 57 Mc.

G8GI claims first 'phone contact with Gibraltar. As ZB2B himself says this is a fact and as ZB2A never used 'phone, there seems no doubt about it. Congratulations to G8IG who is the first G8 to claim W.A.S. and has actually done it on 'phone into the bargain. He has 87 countries confirmed and reports a new one in FF3Q 14360, who gives his QRA as 13 Av. Foch. Dakar French West Africa and promises to QSL. If 8IG's new three element rotary is as good as it looks, he should make the hat trick by being the first G8 in the Century Club as well.

SU5KW puts a damper on a few of us with the news that FQ8QS was a Frenchman in Cairo, hard luck, chaps ! Has anyone details of CR5CD heard on 14 Mc. ? How many of you heard GM6RG do his stuff over W2XAD on the night of June 6 ? Introduced as one of the interesting personalities visiting the World's Fair, Brian was on the air for 15 minutes, all about Ham Radio in G.

VQ4JRW is a new one on 14,180 c.w. LX1EP is good for a card ; his QRA is Emile Franz, Rue Luxembourg 15 Esch. ZC6JW is O.K. Cards to P.O. Box 309, Haifa. G6WY reports working KC5C who claims to be on a ship in the northern Black Sea and asks for QSL via W8LCN. LZ1HL is another from Ham's case book, alleged to be in Varna. WY and 2ZQ have worked YA2UR who says he is in Kabul ; however, G8PT tells us that the operator of this station gave his name as Peter Henin and that he recently worked TA1XR who gave the same name and asked for cards to Box 525, Istanbul. 8PT thinks it may be our old friend TA1AA (who is still on, under that call), doing a bit of complicated leg-pulling. The suggestion is to hand the whole thing over to Inspector Hornleigh, to find a pirate named Peter, with a passion for " Buls " ! G8PT also mentions EA9BW on the 7 Mc. band who QSL's direct. QRA, La Estacion Experimental EA9BJ, Alcazarquivir, Spanish Morocco. ZC6HS is genuine.

KB4FCS, Virgin Is., VP1BA, PJ5EE and EA7XX are worth looking for on 14 Mc. and for those who



VU2FO, Jubbulpore, India. The station which landed the Junior Trophy for Jack Drudge-Coates, ex G2DC—YDCR.

are chasing W.A.S., G6CJ sends the following :— W6QQL, Nevada 14360. W6CW Nevada 'phone 14350, W6PEO 14270 (who tunes QMH) and W6RCQ 14300 both in Arizona. CR6AF is a juicy one with a T7 note in the middle of 14. G6CL recently worked W6USA, on Treasure Is. at the San Francisco Fair ; we believe this station issues something rather special in QSL cards. G3UP also reports a contact with YA2UR and awaits cards from U9BC and ZC6EC. Keep smiling O.M. 8IG has just had one from the U9. ZC6EC has always QSL'd most methodically but as he is a busy man, suggest you drop him a line via R.S.G.B., yours may have been overlooked.

VK6WZ says that following VK6 calls are phoney : AI, AO, BK, BP, CZ, FE, GZ, HM, HP, IA, IM, JF, MR, OH, OI, OP, OQ, QH, QM, QP, QT, RR, SE, SY and XX. He suggests VK6XX may be someone's mistake for PK6XX—Fancy landing that one and then QSL'ing to the wrong station ! What a horrible thought.

Look for J8CD, T7 on 14,350 around 20.00 B.S.T. He QSL's.

Several members have asked for a B.E.R.T.A. " roll of honour " similar to the Century Club list in Q.S.T. Whilst it is probably a good idea, the amount of office work involved would be quite considerable at present; therefore, it is impracticable. Talking of B.E.R.T.A., don't forget the power guarantee which has to be signed on all R.S.G.B. certificate claims.

DX PERSONALITIES—No. 1

The Aerial Wizard of Stoke Poges. " Dud" Charman, G6CJ.

This seems an appropriate point at which to make a few remarks about QSL cards and their usefulness when forwarding a claim. If you make a contact on 'phone, say so clearly on the card, and for goodness sake don't join the " No nuffink brigade " ; you know, the chaps who send a card which you could have printed yourself, just " This confirms QSO with G9AA " and not even a signature. We saw a card from Delaware the other day, a rare State mind you, and all it contained was the man's call and QRA ! Not a single word about radio or anything else . . . ! Yes, that's what we said ! but isn't it daft ? Why bother to send the thing at all. CX2AJ sends a list of G's he has worked and complains of not having received any cards. As the list names some of our best known DX workers, who regularly QSL, his trouble is hard to explain. Anyway, if you want a card, evidently you must QSL direct. QRA Enzo. Sommarugaz, Marco Bruto 1168, Montevideo.

G5XB who is using a pair of 46's in the final doesn't quite know what to think about HV1PP (14,370) who promises to QSL from Vatican City. We'll wait and see, but just for the moment we are wondering if his name is Peter, what with Papal Bulls and all, still he may be alright or it may be TA1AA turned Christian ; we shall see. HK3AC T4 14280, NY2AE 14008, VP7NT T9 14380, VS7LT 14300 and FB8AA 14310 are a further selection from 'XB who also raised YY7X " unlicensed in Eastern Europe." BRS2763, who has an excellent QRA, reports all W districts on 7 Mc., also K5, CM, ZL, HP, HK, PY and ZS5, not bad for the month of June. That old stager BRS 195 forwards his usual list of rarities from VK8. He is sending a list of calls heard on 7 Mc. which will appear next month. He offers reports gratis, no coupons or return postage required, to anyone wanting information from Northern Territory. He says Reply Coupons annoy him and considers it his daily good deed to help with reports to those who want them. A real Ham spirit in fact. He has received a card from KF6DSF (Baker Is.), but as this counts with Howland Is., his countries list remains at 172 heard and 140 confirmed. BRS 3555 also has a nice list of 'phones on 14 Mc. of which KA3KK, J3HT FB8AH and FT4AI are the pick ; KA1HS, VQ2CM, ZS2BJ, ZS2AZ, ZS5BZ, VU2FQ, ZS6Q and ZS6DW are some of the others which he has copied on his O-V-1. Good work !

G6QX also has an imposing list of contacts which proves that DX is available all the year round. He makes some very caustic remarks about the pests who tune up their E.C.O.'s on a rare DX station preparatory to a broadside when he has finished, or more often than not, *before* he has finished. Oh ! where is the Ham spirit of the good old days ? VQ8AF, VQ3HJP, CR6AI and W6QQL have been worked, leaving only New Mexico for WAS ; VP4TO, VQ2GW and ST6KR bring his country total to 93/85. ST6KR gives a vivid account of the electrical effect of a sandstorm and reckons it has all the neon signs in Piccadilly beaten for din. He says the first G4–ST QSO was between G4GN and himself. He wants VE for B.E.R.T.A. and as he leaves ST in October, perhaps Canadian stations will keep a look out for him, frequencies 14325, 14340 or 14350.

G4AU steals a march on 4FI with a card from VE5HR for a contact on February 3, 1939. CR4MM is very active on the H.F. end of 14 and has worked many G stations, but is prone to drift well outside the band, followed, we are sorry to relate, by a large number of G's. This out of band business is getting serious again, mostly among the newly licensed stations, and a few old lags. Come, come you fellows, we can't have this sort of thing, you know ; it is only asking for trouble and we don't want to see anyone having their permit suspended. Don't trust the other fellow to be inside, be sure yourself. After all you wouldn't think much of a milliammeter with no scale, yet the average Ham appears to have only the haziest idea of his frequency.

The VS6 stations have been coming in well, with VS6AG on the H.F. edge as the best. This particular call has given a new country or new B.E.R.T.A. zone to many Europeans in the late evenings during the month. G4FS had a 'phone QSO with VS2AK so thought he would have a shot at W.A.C. An all-night sitting produced the following highly satisfactory result ; W2ESO, YV1AP, CT2BP and VK3HG all on 'phone ; other contacts are SU1AF, SU5BO, YY4AE, VE1HI, VE1BB and all W districts except 6 and 7. 4FS does not state his input but the rig is a 6A6 C.O. 6L6 PA and two half waves in phase running North and South. U6SE and U6ST are very active on the H.F. end of 14, the latter gives his position as Batum, Bleksi, which is evidently a new phonetic way of spelling Black Sea ! He is proof against all appeals for his full QRA.

An interesting but rather sad letter comes from 111R. It seems that despite what has been said here and elsewhere, there are still a number of thoughtless amateurs, mostly British he is sorry to say, who are responsible for landing these under-cover boys into trouble. 11T, 1KS and 1ZZ have all been visited by the police and punished for working their rigs all because someone put their call-signs on the outside of the envelope in which he sent his card. We all know that the bulk of the Italians do not QSL, because it is too risky, but a few of them do take the risk and this is the nice kind way they have been served in return. 111R himself always QSL's, yet he tells us that he still receives letters and sometimes open QSL cards from G amateurs with his call-sign printed in block capitals for all to see. It may be just carelessness but it borders on downright stupidity. Play the game, fellows, and don't put these sporting lads in jail. Please note, therefore. Make no mention of radio or call-sign on any postal packet sent to I, YU, SV, EL, HR, YS, PJ, HP, PZ or LZ and don't send your card in a semi-transparent envelope. You have only to read the DX notes in June QST concerning the fate of YS2LR to see how necessary all this is. 111R also mentions having worked KC5C but this time it was " pse QSL via W1DMA." So what ?

2BGN reports YY5XZ calling CQ and wonders if PK4KS ever works any other country but PA. BRS3319 sends a long list of DX heard between June 4 and 19 which all goes to show that it is there even at midsummer ; OA4AW, VP6MY and CT3AN are worth going after for Century Club. 3319 says that VK has the poorest showing of the month and we are inclined to agree. Peak conditions for VK certainly appear to be spring and autumn. VU2JG, writing via G2YL, joins the ranks of those overseas amateurs who no longer feel able to cope with the shoals of listeners' reports. He will, however, answer reports on his 'phone if accompanied by return postage. He points out that sending cards even in bulk works out very expensive by air mail. He would like to get into touch with anyone interested in radio control of model boats.

G3JR sends the usual list of QSO's which makes we high powered old-timers feel like giving up radio in despair ! K5AF 14370, ZC6RP 14305, ZS4L 14330, CR7BC 14340, CR7AK 14325, KB6ILT 14355, PK1MF 14360, VQ4CRI 14290, VP2AD 14415, CX1NE 14325, VQ4RHL 14110, XE1PE 14405 (don't clamber out after this one !) VP5AM 14415 (an Empire station should know better). VQ4CRE 14365, PK1RI 14340, VP9L 14290, W6PFL (Arizona) 14290, CR4MM 14410 (in fact anywhere up to 14460), NY2AE 14025, W7GBG (Wyo.) 14365 and OA4D 14410.

A perusal of the above will show how easy it is to be led out of the band if you are ECO and not too sure of your calibration ; five of them well out of the band. LZ1AP who speaks excellent English is another interesting one and he asks 3JR to await his card before sending a QSL. Frequency 14200 c.w. EA9RA gave his QRA as George Jossique Ifni, Spanish Morocco. 3JR forwards three more separate names and addresses provided by YA2UR, we give it up !

A letter from VO3X explains his recent inactivity due to removal. He hopes to be on soon again and incidentally has sent a nice wad of QSL's to the Bureau, an unexpected new country for some of you who had ceased to hope. He was with VO3R recently and contacted G2QO who was originally NE8AE and later VO8AE in the old days. He asks those who still await a card to be patient as he is having some more printed.

Finally comes a letter from G2AT with some useful items namely : PJ3CO, CE2AG, K4ESH, CR7AF, CR7BC, PY2AL, PY2EC and VK7CW. He wonders what is wrong with OQ5AE's receiver. 2AT raises a point which is rather important, but we don't know what can be done about it, namely the spread of 'phone over the 14 Mc. band. There was a time, he says, when by some tacit mutual arrangement the extreme L.F. and the H.F. end were left for C.W. but now the L.F. end has been completely swallowed up and the H.F. end is rapidly following suit.

Epilogue

Here, then, is my first effort. Please write to me and criticise, offer suggestions and give your news. I can't have too many letters, so please don't let me down. Cheerio, till next month.—G2MI.

D.J.D.C. Contest 1939.

The Fourth Annual German DX Contest has been arranged to take place during the four weekends in August, commencing at 12.00 G.M.T. each Saturday and finishing at 24.00 G.M.T. each Sunday.

Headquarters has a limited supply of official entry forms which are available on receipt of a stamped addressed envelope.

Additional forms can be obtained from the Contest Manager, D.A.S.D., e.V, Berlin-Dahlem, Cecilienalle 4.

The 28 Mc. Band

By NELLY CORRY (G2YL)

CONDITIONS during June were normal for the season in that a few DX signals were heard spasmodically, and short skip signals, due to sporadic E layer reflections, were audible at some time or other nearly every day.

There is no report of any oceanic station being heard during the month, but this may be partly due to the fact that PA0FB is cycling in Norway as a change from maintaining his regular schedule with PK2WL! In Asia, the only signal reported was VU7BR, worked by G6YL on June 12 and 13, and heard on June 18 and 25. VU2FO was active on Sundays, 09.00–13.00 G.M.T., and found conditions very poor. He worked ZE1JR and heard VS6AF, VS6AO on May 28, heard D3XGB at S9 the only signal on June 11, and VU7BR on June 18.

From Africa, G2XC heard ZE1JR on June 6, 12, and 13, and VQ3HJP on the 10th; BRS3179 logged ZS1AX on the 11th and FB8AA on the 25th. Signals from Algeria and Egypt were audible on about 10 days in the month and included FA3JY, FA8CC (harmonic), SU1GP, SU1MW, SU1RD, SU1WM and SU5BO (harmonic ?). The only South American stations reported were LU7AZ, PY1HP, PY3EN and YV1AQ, heard respectively by BRS3003 on June 24, by BRS3179 on June 27, by G6DH on June 25 and BRS3179 on June 13.

From reports to hand it appears that signals from North and Central America and the West Indies did not reach England on any day in the month. On June 12, SM7MU told G2TK on 14 Mc. that he had heard one W on 28 Mc. that evening but did not get the whole call. He also reported G2TK's harmonic audible from 21.00–23.30 G.M.T., and that the band was full of European signals, mostly harmonics.

It is a pity that activity in Europe is at such a low level this year, as conditions during the past month were more favourable for inter-European communication than for a long time previously, especially during the early evenings. On many days only European commercial harmonics showed that the band was open, but these were audible above 28 Mc. almost daily, and G6DH logged signals up to 50 Mc. on June, 1, 2, 12, 13, 16, 17, 24 and 25. Skip distance was particularly short on June 16 and 17, when several EI, GI and GM stations were worked from the South of England. Europeans heard active included CT1ZZ, D3CSC, D3DBN, D3DSR, D3FDC, D4GXF, D4ORT, D4OYT, D4TKP, D4XJF, F3LE, F8CT, F8PA, F8QD, F8SI, F8VP, F8XT, HA3H, HB9CZ, x11ER, LA1F, LA1V, LA2B, LY1AD, LY1AX, OH7ND, SP1BR and UR1A (the latter told G2XC he was "under cover"!).

The Hissing Phenomenon was heard by BRS3003 at 17.49 G.M.T. on June 9, and by G2YL on 28 Mc., and G6DH on 56 Mc. simultaneously at 11.27 G.M.T. on June 25.

Reports from G2TK, 2XC, 5MP, 6DH, 6YL, BRS25, 3003, 3179 and VU2FO (via G6GL) are acknowledged with many thanks.

The 56 Mc. Band

By CONSTANCE HALL (G8LY)

THE 56 Mc. band has produced great activity recently, and all who have kept a constant watch must feel slightly rewarded, and will make an even greater effort to listen at every possible moment.

May 28 appears to have started the excitement, when 2DDD, portable on Kithurst Hill, Sussex Downs, heard, besides 56 Mc. signals, many 14 Mc. G harmonics.

May 29 found 2ZV hearing short skip on 28 Mc. around 12.00. Later, on 56 Mc. he heard 5TX, QSO 2MV, and 3YY and 2XC QSO 3YY, all believed to be first contacts. 2ZV himself was QSO 2MV on 'phone, which usually signifies good conditions. 6DH heard 5TX (130) and 6PG, QSO 5TX (90).

May 30 produced a good QSO between 6DH and 2ZV (110), this being their first solid contact, although nightly schedules had been in operation for nearly two months. 6CW also worked 2ZV for first contact, 6CW being audible at ZV from 21.10 to 23.00. 2ZV heard 3FA's carrier and when eventually keyed, produced a Q3 R2 signal. 2NH worked 2ZV, also for the first time. 2ADZ heard 2MV contact 6CW (122), 8JV (122) and 3FA (160). BRS1173 (Sussex) heard 6DH and 6CW as best DX.

On May 31 conditions again allowed 2MV to work 6CW, the latter also being audible at 2ZV. 8LY raised 2XC for the first time since last July, worked 5RD as a first contact, and heard 5TX suddenly at 22.50, after he had been in QSO with 5RD for some time. 2DDD portable, Bury Hill, Sussex, heard sixteen G's during the evening!

June 1 started a thrilling month, with numerous commercial harmonics (Italian) and an Italian Broadcast on 59 Mc., S9 at 2XC, commercial harmonics at 5AX, including EAK, and some scrambled 'phone; and on 58 Mc. a German-speaking station at 17.50, for about half-an-hour. 6YL heard, between 17.05 and 19.13, thirteen signals, five not known (not keyed!), the others including Rome broadcast station, 59·07 Mc., IBE 56·15 Mc. approximately. IRX 60 Mc. approximately and on 2nd, 3rd, 6th commercial harmonics, 7th, 9th telephony carriers, 12th several harmonics (1200) between 17.00 and 19.30. 2ADZ heard up to 160 miles on 'phone, and BRS1173 heard 6DH as best DX. 6DH reported conditions good for Italy and Southern Europe, commencing about 17.00. Strong consistent signals were being heard, *i.e.*, commercial harmonics up to 62 Mc. Although DH called test for two hours he heard no amateur signals, but was rewarded by a reception report from I1IRA, reporting him 599, and also 5MQ and 5MP. The Italian was testing a new receiver and was, unfortunately, unable to transmit at the time.

On June 6 2XC heard IBX on 48 Mc. at 18.55.

June 7 found 6QZ, QSO 2MV (112) his best DX, but a schedule for the following night proved unsuccessful. 6QZ was heard by 5MA, 2ADZ and 2CMF (Essex); in fact more reports for one evening than previously. 2ADZ also heard GIH or S, and harmonic of RTV.

On June 12 5MQ and GW6AA heard Italian and other signals up to 60 Mc.

June 13 skip opened up again, 6CW worked

11FA, and 8JV (also Notts.) worked 11SS, both between 20.00 and 20.30; 28 Mc. opened for Europe just before the Italians came through. 6DH heard a French 'phone S6/3 at 0700. 2XC heard 1BX again, and 1BT, 21.15 to 21.50.

On June 14 6QZ after working D4GXF on 28 Mc., promptly QSY'd to five and heard HFD (Poland) calling LQC at HF end 448, QSB S2. No amateur signals audible, and no sign of anything above 34 Mc

June 16 2XC heard 1BT, 49 Mc. 16.20; BRS1173 heard F3AA.

June 17 2XC heard 1BC, 48 Mc., 10.48; 1BT 20.10.

June 19 2XC heard 1BX, 19.25, and 6LK heard Italians.

June 24 skip opened for Italy again, 2NH hearing 1BE, using tape sending " 56 de 1BE," S9 QSB2 and 11FA calling 8KD at 19.08.

When 11FA had faded out at 2NH and 2MV, 19.18, he was still audible at 6XM (Farnborough), until 19.45, XM working him at 19.30.

2XC received 11FA 19.15, and harmonic of Rome B/C 19.35; 5OJ also heard 11FA.

On this day 6YL heard an identified 5-metre amateur signal (besides 5QY local), for the first time in 17 months in F8VC S6 'phone (500), 56576 kc., and 11RA S8 (1060) between 19.08 and 19.15, with Bar. 29·6 in., a cold N.E. wind, temperature 50°, cloud, heavy rain and midsummer day! 2ZV heard 11FA and Italian B/C harmonics S9 + QSB. 8KD and 2MV were QSO 11FA between 19.15 and 20.20.

On June 25 conditions still held up. 11TKM was heard by G2MR calling CQ England and he had a short QSO with him at 14.45; after which the Italian worked 5AA (Ashstead). BRS3179 also heard 11TKM at 14.40 and BRS3003 heard 11SS on 'phone, 2CIL heard 11TKM from 14.45 to 15.18, as did BRS1151 (Yorkshire) at 15.15 with rapid QSB and flutter, this being his second signal received since April 29.

It is interesting to note, says 2NH, that these were afternoon contacts.

2XC received the harmonic of 1BD at 13.20, and a French-speaking station at 13.30, and 1BT at 16.20.

Of special interest is the fact that the band opened for Italian commercials 1BE and 1RX, at G6YL ten days earlier than in June, 1938, both times coinciding with the June full moon, *viz.*:—

1938. Full moon, June 12: at 23.47. 1BE, 1RX heard 17.08 to 17.54.

1939. Full moon, June 2: at 03.11. 1BE, 1RX heard 17.29 to 18.30 on June 1, and 11.32 on June 2.

The following are thanked for their reports: G2NH, 2XC, 2YL, 2ZV, 3YY, 5AX, 5MP, 6DH, 6QZ, 6YL, 8AA, 2ADZ, 2CIL, 2DDD, BRS1173 and 1151.

Future reports please to North Waltham, Near Winchester, by the 25th of each month.

All times G.M.T. ( ) indicate distance.

Trade Review

The high standard of workmanship associated with the name of " Varley " is well maintained in recent additions to their range of components. These comprise B.F.O. coils fitted with a semi-variable tuning condenser, designed for use in electron-coupled circuits employing mains operated S.G. or R.F. pentodes. Under test the coils have proved entirely satisfactory and they can be recommended with confidence.

The coil is mounted on a low-loss base, which also contains the trimmer used for course tuning, provision being made at the top for finer adjustment which is by means of a screw, giving a variation of approximately 10 kc. each side of zero beat.

The whole assembly is of very compact form, enclosed in a metal screening can which helps considerably towards the simplification of communication receiver construction.

Two types are being manufactured, one suitable for 1,600 kc. (price 5s. 6d.) and the other for 465 kc. (price 6s. 6d.).

Messrs. Oliver Pell Control also supply a Shaft Adaptor and Mounting Bracket (price 6d.) which enables these coils to be mounted horizontally so that adjustments can conveniently be performed from the front panel.

G8TC.

Rotary Beam Aerials

The Secretary Editor will be pleased to receive articles dealing with the construction of simple rotating beams for transmission and reception purposes. Details of construction, shown in a series of photographs, will prove particularly valuable.

Convention Programme

We shall include in our next issue a comprehensive Questionnaire giving full details of the Convention programme which is being arranged, but in order to allow members to formulate their own plans well in advance we give below a brief outline of the major events.

Thursday, September 21.

11 a.m. Society's Radio Exhibition opens at The Royal Hotel, Woburn Place, Russell Square, London, W.C.2.
1.15 p.m. Visit to Broadcasting House.
2.30 p.m. Visit to G.P.O. Station at Dollis Hill.
2.45 p.m. Visit to Alexandra Palace Television Station.
6.30 p.m. Informal Meeting at The Royal Hotel.

Friday, September 22.

11 a.m. Radio Exhibition opens.
2.30 p.m. Visit to Radio Research Board Station at Slough.
2.45 p.m. Visit to Alexandra Palace Television Station.
3 p.m. Visit to B.B.C Station at Tatsfield.
6.30–7.30 Running Buffet at The Royal Hotel (Tickets 2s.).
7.30–8.30 Technical Lecture.
8.30 p.m. Informal Discussion.

Saturday, September 23.

10 a.m. Meeting.
10.30 a.m. Exhibition opens.
1 p.m. Informal Luncheon.
2.15 p.m. Photograph.
2.30 p.m. Presentation of trophies.
2.45 p.m. Lecture or Meeting.
4.30 p.m. Informal Tea and Discussion.
6.30 p.m. Convention Dinner (Tickets 6s. 6d.).

In view of the fact that for the first time Convention will take place under one roof, it will be necessary for all who wish to attend to notify Headquarters prior to September 15. Arrangements are being made to provide a special Convention badge which must be worn during the time members are attending official functions.

After the issue of the Questionnaire members will be required to reserve accommodation which, in the case of the Conversazione and the Dinner, must be paid for in advance. Headquarters will issue the badges, dinner tickets and official programmes, prior to September 21, after which date no bookings can be accepted for either the Conversazione or the Dinner.

For the benefit of provincial visitors arrangements will be made for members of Headquarters' staff to be in attendance at The Royal Hotel throughout the Convention and Exhibition period.

The whole success of both ventures depends upon the co-operation of members.

Our New Printers

Members will be interested to learn that *Sir Joseph Causton & Sons, Ltd.*, of Eastleigh, Hants, have secured the contract for printing the current volume of this journal.

It will be remembered that this firm were responsible for the printing of the five editions of *A Guide to Amateur Radio* and also the first edition of *The Amateur Radio Handbook*.

We feel confident that readers will appreciate the many small changes in layout which have been introduced with this issue.

Secretary's Vacation

The Secretary-Editor expects to be on vacation from about August 11–27. During this time it will be appreciated if correspondence requiring his personal attention can be kept down to a minimum.

Normal routine matters will, of course, be dealt with as usual.

August Issue of "The T. & R. Bulletin"

It is requested that all copy, including District Notes, be forwarded to Headquarters not later than Friday, July 28.

Unlicensed Operation

The G.P.O. has informed us that the holder of an artificial aerial licence living in Devonshire, in consequence of an infringement of licence conditions by the radiation of signals under a misappropriated call sign, has had his permit cancelled.

It is hoped that the publication of this information will act as a deterrent to other potential offenders.

South African Air Force Civilian Wireless Reserve

We have received from the Department of Defence, Pretoria, a memorandum setting out the conditions of entry and service in the C.W.R., which has recently been inaugurated in South Africa. We are glad to note that our colleagues in that Dominion are being given the opportunity of taking part in a similar reserve to that which is operating so successfully in Great Britain.

New B.E.R.U. Representative

Mr. T. Arnold, VU2AN, Zhob Signal Section, Fort Sandeman, Baluchistan, India, has been appointed to serve as B.E.R.U. Representative for Northern India, in succession to Mr. J. G. McIntosh, VU2LJ, who has resigned owing to pressure of private business.

In welcoming Mr. Arnold, Council also records its thanks to Mr. McIntosh for his past services.

District 10 Representation

The Council has accepted with regret Mr. Forsyth's resignation from his post as District 10 Representative. During his tenure of office, Mr. Forsyth has done a great deal to weld together the town groups in his district, and in addition he has made many personal visits to local meetings. His resignation has been due to pressure of private business.

Council records its thanks to G6FO for his many past services to the society.

A new representative will, it is hoped, be appointed next month.

"The 56 Mc. Band"

We are pleased to announce that Miss Constance Hall (G8LY), North Waltham Rectory, Winchester, Hants, has kindly agreed to take over the preparation of our monthly feature "The 56 Mc. Band."

Miss Hall needs no introduction to the majority of 56 Mc. workers who have had the pleasure of either corresponding with her or contacting her station on that band. All contributions for the monthly commentary should be sent to reach Miss Hall by the 25th day of each month.

We take this opportunity of recording our thanks to Mr. J. M. R. Sutton (GW2NG), who for the past nine months has been responsible for the preparation of 56 Mc. notes.

VK-ZL Contest

Mr. R. Stanton, ZL3AZ, advises us by letter telegram that the New Zealand Government will support the forthcoming VK-ZL contest, and will present trophies. Rules will appear in a later issue.

R.S.G.B. Slow Morse Practices

Details appear below of the slow Morse practices organised by the Society for those members wishing to learn or improve their code. As usual, test matter will be taken from recent issues of THE T. & R. BULLETIN. The page number and month of issue will be given at the end of each test, by telephony. A telephony announcement will also be given at the commencement of each test to assist those interested in tuning-in the sending station. It is emphasised that reports will be appreciated and are desired in order to ascertain useful range and numbers utilising the service. If, however, a reply is desired, a stamp should be sent. Will stations in areas not at present served offer their services to Mr. T. A. St. Johnston (G6UT), "Normandale," Little Hallingbury, Essex. (Telephone: Bishop's Stortford 785.) G8AB has been left out of the Schedule but he hopes to continue again in the autumn. A new station G3RQ of Bristol takes his place.

	G.M.T.	k.c.	Call	Location
Sundays ...	09.00	1755	G8NF	Manchester
	09.00	1865	G3LP	Cheltenham
	10.00	1800	G8PR	Staffordshire
	10.15	1920	G6VC	Northfleet
	10.15	1765	GW3LG	Conway
	10.30	1761	G3RQ	Bristol
	12.30	1758	G6VD	Leicester
Tuesdays ...	22.00	1934	G3GH	N. Devon
Wednesdays	22.15	1865	G3LP	Cheltenham
	22.30	1813	G4AU	Charlton
Thursdays ...	21.30	1765	GW3GL	Conway
	22.00	1934	G3GH	N. Devon

New Members

HOME CORPORATES

N. F. POWELL (G2FB), St. Margaret's School, Welwyn, Herts.
S. TAYLOR (G3CD), 30 Longden Avenue, Beaumont Park, Huddersfield.
R. W. BELL (GM3MX), "Laurel Bank," Pitlochry, Perth.
R. E. LEWIS (G3PC), 167 Park Road, Sittingbourne, Kent.
J. V. WILD (G3WG), Spring Bank, Lily Hill Street, Whitefield, Lancs.
J. W. HEFFERNAN (G4BX), 342 Sutton Road, Walsall, Staffs.
J. McK. ARCHER (GM4GR), 21 Trinity Crescent, Edinburgh 5, Scotland.
E. SPENCER (G4HV), 16 Keswick Gardens, Ruislip, Middx.
R. A. CLARKE (G4IC), 10 St. Vincent's Road, Dartford, Kent.
T. J. NORTON (G4KZ), "Breydon," Belton Lane, Grantham, Lincs.
P. WHITTLE (2AOW), 32 Burleigh Gardens, Southgate, London, N.14.
A. G. BECKETT (2AUM), 13 Central Road, Arrowthwaite, Whitehaven, Cumbs.
E. V. JACOBS (2AVJ), 1 Rugby Avenue, Wembley, Middx.
J. G. TURNER (2AXY), 12 Third Avenue, Blackpool, S.S. Lancs,
W. F. BADCOCK (2BAP), "Kenilworth," Somerby Road, Thurnby, Leicester.
F. J. FORBES (2BFC), 78 West Hill, East Grinstead, Sussex.
K. S. J. GASSON (2BGU), The Steam Bakery, Hurst Green, Sussex.
J. FRANCOMBE (2BRF), 22 Deane Croft Road, Eastcote, Pinner, Middx.
R. G. FRISBY (2CFC), 5 Ventnor Road, Leicester.
J. HOLDEN (2CJO), 13 Shaw Street, Drypool, Hull, E. Yorks.
H. J. MILLER (2CVX), "Friarsbrae," Linlithgow, Scotland.
H. B. SANDERS (2FRH), 55 Dundale Road, Tring, Herts.
C. F. SCOTT (2FWI), "Cross Scythes," Totley, Sheffield, Yorks.
W. TITTERINGTON (2FYC), "Cherryvalley," Moira, Co. Down N. Ireland.
D. R. PENFOLD (BRS3648), 9 Devizes Road, Swindon, Wilts.
C. THORNTON (BRS3649), 57 Welholme Avenue, Grimsby, Lincs.
C. F. SCALES (BRS3650), 25 Galleywood Road, Chelmsford, Essex.
T. BLAKE (BRS3651), Bay Horse Hotel, Snaygill, Bradley, Keighley, Yorks.
T. FORREST (BRS3652), 123 Windermere Road, Kendal, Westmorland.
J. H. VARLEY (BRS3653), "Chowl House," Haulbowline Island, Co. Cork, Eire.
S. D. ISON (BRS3654), "Hawkhurst," Cambridge Road, Sawbridgeworth, Herts.
S. C. FRYER (BRS3655), 168 Ashgate Road, Chesterfield, Derby.
T. BINGHAM (BRS3656), 191 Wykeham Road, Reading, Berks.
P. V. C. DAVIES (BRS3657), 17 King Street, Shrewsbury, Salop.
E. BRANNON (BRS3658), 3 Rhodes Terrace, Gold Street, Barnsley, Yorks.
W. SUMNER (BRS3659), 403 Bolton Road, Ewood, Blackburn, Lancs.
H. J. BINET (BRS3660), "La Fontaine," St. Mary's, Jersey, C.I.
C. J. R. FRANCIS (BRS3661), 33 Kemball Street, Ipswich, Suffolk.
I. G. PATON (BRS3662), 100 Southbrae Drive, Jordanhill, Glasgow.

REV. G. S. ROBINSON (BRS3663), 47 Balfour Road, Southport, Lancs.
G. F. GRENFELL (BRS3664), 1b Chestnut Drive, Wanstead, London, E.11.
D. GARRARD (BRS3665), 135 Hervey Street, Ipswich, Suffolk.
E. D. JENNINGS (BRS3666), "Highfield," Woolton Road, Liverpool 16, Lancs.
D. LAING (BRS3667), "Nairn," Kettlewell Hill, Woking, Surrey.
H. MAGKATH (BRS3668), "Portawhile," Mill Hill, St. Margaret's Bay, Kent.
E. A. STUART (BRS3669), 10 Fosse Road South, Leicester.
T. R. MOORE (BRS3670), "Brackenhill," St. John's, I.O.M.
J. H. R. RUSSELL (BRS3671), "Shalfleet," Binfield Road, Byfleet, Surrey.
J. R. COLLIER (BRS3672), 77 Drummond Road, Skegness, Lincs.
H. A. LINAY (BRS3673), 35 Broad Street, Jersey, C.I.
J. S. N. DENNIS (BRS3674), 3 Gibbs Road, Newport, Mon.

DOMINION AND FOREIGN

WM. MCILWAINE (EI9F), 4 Templeogue Park, Templeogue, Co. Dublin, Eire.
T. W. GOFORD (VK4MI), Radio Hut, Mount Isa, Queensland Australia.
J. R. WILKINSON (VQ4JRW), Naivasha, Kenya Colony.
V. G. DAMERON (W8HGA), 602 Temple Street, Hinton, West Virginia, U.S.A.
Z. WILLISON (W8JAH), 10019 Broadstreet Bvd., Detroit, Mich., U.S.A.
S/Cdtr. A. E. HEWITT (BERS472), Ordnance Depot, Deolali, India.
L. G. GRAHAM (BERS473), Australian Radio College Pty. Ltd., 206 Broadway, Sydney, N.S.W., Australia.
F. W. KAULEN (FRS45), at "Ellerslie," Upper Park Road, Victoria Park, Manchester, Lancs.
A. S. CONTOPOULOS (FRS46), Barakat, Sudan.
K. GOLDBERGER (FRS47), at "Yew Cottage," Gardener Street, Herstmonceux, Sussex.

W.B.E., H.B.E. and B.E.R.T.A. Certificates

The following certificates have been issued since the last list appeared :—

W.B.E. (Telegraphy)

Name	*Call Sign*	1939
H. Benson	G8NF	May 1
J. G. Treece	G3QD	,, 1
C. Guilbert*	F3LG	,, 8
C. D. Underwood	G5UD	,, 9
G. A. Patrick	G8CL	,, 10
L. A. Kippin	G8PL	,, 15
R. Morris*	W2GSA	,, 16
N. O. Merz	W9YNB	,, 16
L. G. Pairman	GM3UA	,, 22
A. V. David*	CT1JU	,, 22
R. P. Walker-Alexandra	VS7RA	,, 26
R. A. Priddle	VK2RA	,, 26
D. G. Farquharson	G3MF	June 1
R. Tunney	G8DD	,, 1
R. Jones	GW3JI	,, 1
H. G. Burnett*	W1LZ	,, 2
B. E. P. Sadler	G2RC	,, 2
F. C. Miller*	W9RQS	,, 2
H. Andersson*	SM5LL	,, 9
R. W. Collins*	W8EUY	,, 13
W. F. Clark*	W6DHS	,, 13
G. Katzenberger*	W7DVY	,, 13
W. T. Caswell*	W5BB	,, 13
R. R. Rosenberg*	W8NCJ	,, 13
A. J. Paquet*	ON4GU	,, 14
Z. Willison	W8JAH	,, 17
J. Orr	G8JO	,, 17
H. L. A. Obreen*	PA0ON	,, 19
H. Veenstra*	PA0FO	,, 19
P. F. v. Cleemputte*	PA0XM	,, 19
F. J. Verzyl*	PA0QZ	,, 19
Ph. J. Huis*	PA0AD	,, 19
H. B. Gortz*	PA0GN	,, 19
C. W. Thayne	G2UT	,, 20
V. C. Besancon*	W6OLU	,, 20
D. G. Bardin*	W6PH	,, 20
R. Christiansson	SM7YA	,, 21
Prof. R. J. Izykowski*	SP1LP	,, 22
J. F. Egan*	W2FLG	,, 27
D. R. Aston	G8DR	,, 27
R. C. Farwell*	W2BJ	,, 28
H. W. McNeill	VO3X	,, 28
P. H. Rock	G3LN	,, 30

W.B.E. (Telephony)

A. O. Milne	G2MI	May 22
J. L. Care*	F8SC	,, 26
C. W. Thayne	G2UT	,, 26
J. E. Holding	G4AS	June 1
F. Frey*	HB9DO	,, 1
W. H. Dyson	G8TD	,, 6
F. E. Stallworthy	G8WS	,, 20
R. Christiansson	SM7YA	,, 21
L. Knight	G3LK	,, 30
H. S. Simmons*	ON4HS	,, 30

W.B.E., 28 Mc. (Telegraphy)

A. O. Milne	G2MI	May 22
I. Thomas	VK5IT	,, 22
Z. Willison	W8JAH	June 17
C. A. Heathcote	G3JR	,, 20
H. Hodgens*	EI5F	,, 28
G. Werkema*	PA0APX	,, 30

W.B.E., 28 Mc. (Telephony)

S. E. Martingell	G2MV	May 26

H.B.E.

F. H. Pettitt	SU1SG	May 10
L. C. Blanchard	BRS.3003	,, 24
H. Mee	G5MY	June 6
L. le Kashman*	W2IOP	,, 13
R. Watson	BRS.1845 / 2CRS / G3ZZ	,, 27
R. Jardine	G6QX	,, 27
J. Cymerman	BRS.3101	,, 28

B.E.R.T.A.

No. 43	F. H. Pettitt	SU1SG	May 10
,, 44	H. Eliaeson	SM6WL	,, 10
,, 45	H. H. Brokate	W8AAJ	,, 26
,, 46	R. A. Priddle	VK2RA	,, 26
,, 47	C. A. Heathcote	G3JR	,, 31
,, 48	H. G. Burnett*	W1LZ	June 2
,, 49	H. Mee	G5MY	,, 6
,, 50	R. W. Collins*	W8EUY	,, 13
,, 51	W. T. Caswell*	W5BB	,, 13
,, 52	L. le Kashman*	W2IOP	,, 13
,, 53	H. B. Gortz*	PA0GN	,, 19
,, 54	D. Brown	ZL1HY	,, 19
,, 55	H. A. Hodgens*	EI5F	,, 28
,, 56	J. L. Bates	VK4UR	,, 28
,, 57	F. A. Robb	GI6TK	,, 28

* *Denotes Non-member.*

CX2AJ

In a quaintly worded letter CX2AJ (whose address is Marco Bruto, 1168, Montevideo, Uruguay) tells us that he will not send cards until he receives them first from stations he has worked. As there are 31 prominent G's in his "black list" some of whom *may* require a CX card, we can only suggest they QSL direct. It occurs to us however that CX2AJ may find the majority of his missing cards in his own QSL Bureau !

56 Mc. Activity

IN order to provide members with brief details of stations which are believed to be active on 56 Mc., we have decided to publish each month, a list showing call signs, locations, and normal working frequencies. Additions or changes should be sent to the compiler of the list: Mr. E. C. Cosh (2DDD), "Anslyn," Mill Road, Angmering, Sussex, not later than the 25th of each month.

Stations whose frequencies are not given, or are inaccurately quoted, should forward details to 2DDD. Particulars of location (height above sea level, etc.), aerials and apparatus will be welcome, as it is proposed to compile a card index system of all stations working on this band.

It is possible that certain inaccuracies have crept into this first list, members will therefore help by forwarding correct details.

112 and 224 Mc.

It is also proposed to extend this list to amateurs working on these bands. Any member who is equipped for reception and transmission should forward particulars to 2DDD.

Call Sign	*Location*	*Normal Frequency*
2AO	Eastbourne	
2AU	Wolverhampton	
2AW	Orpington, Kent	
2BI	Calne	
2DP	Thornton Heath	
2GG	Newbury	
2LW	Norwood, S.E.	
2MC	Pinner	
2MR	Surbiton, Surrey	
2MV	Coulsdon, Surrey	
2NH	New Malden	
2NV	Stourton, Staffs	56250
2OA	Wallasey, Cheshire	
2OI	Manchester	
2RD	Thornton Heath	
2UJ	Tunbridge Wells	
2VG	Newcastle, Stoke-on-Trent	
2WD	Water Orton	
2XC	Cosham, Nr. Portsmouth	56060
2ZV	Littlehampton	56320
3BY	Manchester	
3IQ	Enderby, Nr. Leicester	
3OO	Wolverhampton	
3SU	Petworth, Sussex	
3YY	Brighton	58760
5BY	Croydon	
5CD	Hendon	57860
5HF	Middleton, Lancs	57000 / 56020
5IB	London, S.W.3	
5JU	Downend, Bristol	
5MH	Ewhurst	
5MP	Hythe	
5MQ	Liverpool	
5NF	Farnham	56960
5NG	Egham	57400
5OJ	Ewhurst	56232
5OX	West Wickham, Kent	
5RD	Abbots Langley	
5TN	Weston-super-Mare	56272
5TX	Newport, I.O.W.	
5UK	Westcliff-on-Sea	57000
5WH	Wolverhampton	
5WU	Newport, Mon.	
5XY	Havant	56120
5ZT	Preston, Lancs	56020
6AA	Colwyn Bay, Wales	
6CW	Nottingham	
6DH	Clacton	
6FO	Newport, Mon.	
6GR	Northwood, Middlesex	
6GS	Guildford	
6IH	Malvern	56344
6LC	Liverpool	
6OH	Ashtead, Surrey	
6OM	Manchester	
6OT	London, N.14	
6PG	Gravesend	
6QZ	Norwich	56340
6TG	Scarborough	56120
6TL	Manchester	56316
6VF	Bristol	56400
6VX	Sidcup	
6WL	London, N.17	
6YL	Felton	
8BI	Manchester	56280
8CV	Farnham	56035
8JB	Portsmouth	56260
8JV	Nottingham	
8KD	Sheffield	
8KZ	London, W.10	56312
8LY	Winchester	58828
8ML	Cheltenham	56800
8NM	Barnsley	
8OS	Billingshurst	57452
8SK	Enfield, Middlesex	

Television Interference

We have recently heard of a case where a well-known American amateur-bands receiver causes severe interference to Television programmes when tuned across the 14 Mc. band. This trouble may, we suggest, be due to the output from the very efficient electron-coupled oscillator getting through to the aerial, thereby radiating a signal which would naturally be very rich in harmonics.

We shall be glad to hear from any member who has succeeded in curing this particular trouble. Our own suggestion is to fit a filter in the receiver aerial with a cut-off at about 32 Mc. A. O. M.

56 Mc. Calls Heard

June 1 to July 2, 1939, by G2WS, Beckenham Grove, Shortlands, Kent. G2MC, 2MR, 2MV, 2NH, 2UJ, 3NR, 3OO, 5CD, 5IB, 5KH, 5MA, 5UK, 6CW, 6OH, 6OT, 6PG, 6VX, 6WL, 8SK.

Calls Heard on 56 Mc.

We shall be pleased to publish lists of Calls heard on 56 Mc. Such lists should be sent direct to Miss C. Hall, G8LY, by the 25th of each month. The lists should show distance and R.S.T. of stations heard.

Around the British Isles

NOTES AND NEWS FROM THE DISTRICTS

DISTRICT REPRESENTATIVES.

DISTRICT 1 (North-Western). (*Cheshire, Cumberland, Lancashire, Westmorland.*) MR. J. NODEN (G6TW), "Fern Villa," Coppice Road, Willaston, near Nantwich, Cheshire.

DISTRICT 2 (North-Eastern). *Yorkshire (West Riding, and part of North Riding).* MR. L. W. PARRY (G6PY), 13 Huddersfield Road, Barnsley, Yorks.

DISTRICT 3 (West Midlands). (*Shropshire, Staffordshire, Warwick, Worcester.*) MR. V. M. DESMOND (G5VM), 199 Russell Road, Moseley, Birmingham.

DISTRICT 4 (East Midlands). (*Derby, Leicester, Northants, Notts.*) MR. L. RIDGWAY (G2RI), 90 Romway Road, Leicester.

DISTRICT 5 (Western). (*Wiltshire, Gloucester, Hereford.*) MR. J. N. WALKER (G5JU), 4 Frenchay Road, Downend, Bristol.

DISTRICT 6 (South-Western). (*Cornwall, Devon, Dorset, Somerset.*) MR. W. B. SYDENHAM (G5SY), "Sherrington," Cleveland Road, Torquay.

DISTRICT 7 (Southern). (*Berkshire, Hampshire, Oxfordshire, Surrey.*) MR. W. E. RUSSELL (G5WP), "Milestones," Westfield Road, Mayford, Woking, Surrey.

DISTRICT 8 (Home Counties). (*Beds., Cambs., Hunts. and the towns of Peterborough and Newmarket.*) MR. S. J. GRANFIELD (G5BQ), 47 Warren Road, Milton Road, Cambridge.

DISTRICT 9 (East Anglia). (*Norfolk and Suffolk.*) MR. H. W. SADLER (G2XS), "The Warren Farm," South Wootton, King's Lynn, Norfolk.

DISTRICT 10 (South Wales and Monmouth). (To be appointed.)

DISTRICT 11 (North Wales). (*Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth, Montgomery, Radnorshire.*) MR. D. S. MITCHELL (GW6AA), "The Flagstaff," Colwyn Bay, Denbighshire.

DISTRICT 12 (London North and Hertford). (*North London Postal Districts and Hertford, together with the area known as North Middlesex.*) MR. S. BUCKINGHAM (G5QF), 41 Brunswick Park Road, New Southgate, N.11.

DISTRICT 13 (London South). MR. J. B. KERSHAW (G2WV), 13 Montpelier Row, Blackheath, S.E.3.

DISTRICT 14 (Eastern). (*East London and Essex.*) MR. T. A. ST. JOHNSTON (G6UT), "Normandale," New Barn Lane, Little Hallingbury, Bishops Stortford.

DISTRICT 15 (London West). (*West London Postal Districts, Bucks, and that part of Middlesex not included in District 12.*) MR. H. V. WILKINS (G6WN), 539 Oldfield Lane, Sudbury Hill, Greenford, Middlesex.

DISTRICT 16 (South-Eastern). (*Kent and Sussex.*) MR. W. H. ALLEN (G2UJ), 32 Earls Road, Tunbridge Wells.

DISTRICT 17 (Mid-East). (*Lincolnshire and Rutland.*) MR. W. GRIEVE (G5GS), "Summerford," New Waltham, Lincs.

DISTRICT 18 (East Yorkshire). (*East Riding and part of North Riding.*) MR. E. MITCHELL (G5MV), 40 North Marine Road, Scarborough.

DISTRICT 19 (Northern). (*Northumberland, Durham, and North Yorks.*) MR. R. J. BRADLEY (G2FO), "High Crest," Yarm Road, Eaglescliffe, Co. Durham.

SCOTLAND. MR. JAMES HUNTER (GM6ZV), Records Office, 51 Camphill Avenue, Langside, Glasgow.

NORTHERN IRELAND. MR. J. A. SANG (GI6TB), 22 Stranmillis Gardens, Belfast.

New Members are cordially invited to write to their local District Representative.

DISTRICT 1 (North Western)

District Representative : J. Noden (G6TW), "Fern Villa," Coppice Road, Willaston, Nantwich, Cheshire.

District Scribe : H. W. Stacey (G6CX), "Sandleas," Eddisbury Road, West Kirby, Cheshire.

Town Representatives :

Birkenhead.—G. Russel Lee (G6GL), 25 Boundary Road, West Kirby, Cheshire.

Blackburn.—Jim Bolton (2CRM), 6 Ash Street.

Blackpool.—H. Fenton (G8GG), 25 Abbey Road, Blackpool, S.S.

Burnley.—P. Nicoll (G5ZN), 35 Reedley Road.

Bury.—T. G. Platt (G2GA), 64 Holcombe Avenue.

Crewe.—L. H. Webber (2CPW), 18 Jesmond Crescent.

Liverpool.—H. Caunce (G6KS), 24 Vanbrugh Road, Anfield, Liverpool, 4.

Manchester.—W. Lucas (G2OI), 25 Boothfields, Winton, near Manchester.

talk by "Clarry." The T.R. takes this opportunity of thanking both G6TW and 6CX for the able manner in which they carry out their respective jobs.

We welcome Mr. F. Davy, BRS3626 to membership.

On Sunday, June 18, members of the Bury Group visited the Rochdale stations and thanks are accorded to G6QA, 6AX, 3BN (and particularly Mrs. 3BN) for their hospitality. The visit was voted a great success.

G2GA has been busy with T.R.'s duties. 3ZN who has just returned from a short holiday in North Wales wishes to thank GW6AA for his hospitality, 8NF is experimenting with E.C.O. on all bands and operated a portable transmitter during N.F.D., 8NL has received a visit from 5KT of Bristol and is now W.A.C. on 14 Mc. telephony. 3CJ, 8QS, 2BDA and BRS3626 are also active.

Manchester.—An attendance of 18 was recorded at the last Manchester meeting when G2OI gave an account of activities at N.F.D. All those who attended agree that it was the best Field Day to date, with perfect weather for a change. Unfortunately 2DF, an old timer at N.F.D., was unable to attend on account of illness and all members wish him a speedy recovery.

Thanks to subscriptions and junk sales this section

The first "Hamfest" held in the East Lancashire Area was attended by 43 members of the R.S.G.B. The venue was The Old Boars Head, Bury.

Oldham.—F. Sutton (2DJV), 194 Shaw Road, Royton.

Southport.—R. W. Rogers (G6YR), 21 Chester Avenue.

Warrington.—F. A. Vost (G2IF), 26 Pinewood Avenue.

* * *

Blackburn.—Congratulations to G2TM and 4JK on their new calls. All who attended N.F.D. were well satisfied and enjoyed a glorious week-end under canvas. The T.R. wishes to thank members for their close co-operation in this event and thanks are also accorded to the D.R. for his arrangements in connection with the North-western P.D.M. at Chester.

Burnley.—We are pleased to welcome G3ZM as a new member. 8TD, 3KT and 3VO are competing with each other for early morning DX. 5ZN helped 18 of the 3·5 Mc. N.F.D. stations to gain an extra point and still finds the W3EDP aerial very good for this band. 3WU is active with 7 Mc. phone and a W3EDP aerial. 2RB, 3HK, 3XK and 3IY have been heard.

Bury.—The usual monthly meeting was held at the Elsinore Café, Town Centre, Bury, on June 20 and eleven members attended. Herr Kaulen, D4TPV, was a welcome visitor.

Seven local members attended the P.D.M. at Chester and all enjoyed the annual heart-to-heart

G6KSP, Woolton, Lancashire.
Some of the operators at the District 1, 14 Mc. Station. On the left G2JT, 8DI and 6KS.

was able to equip itself with a permanent N.F.D. transmitter with all necessary aerial equipment and there is still a balance in hand. This transmitter can be borrowed by any member of the section for test purposes; application to be made at any of the Manchester meetings.

Some interesting tests were made during N.F.D. with a portable petrol-driven generator set of very small size and some useful data obtained.

Thanks are extended to Mr. Brannigan of the Manchester Wireless College, who has very kindly agreed to give an address at the July meeting. This arrangement was made too late for mention in last month's issue.

Sales will be held at all future meetings and ten per cent. of the proceeds will be appropriated towards the Section Fund.

56 Mc. news.—G8BI has now completed an Acorn receiver which seems to be working very well; 6TL, 6LC, 5HF and 2OI are still operating on this band and it is whispered that quite a number of stations in the area constructed new super receivers for this frequency in preparation for the 56 Mc. field day. 2OI and 6TL still make regular contact with 5MQ of Liverpool and would welcome more distant schedules. 2OI heard 5MQ calling 6TW on June 16 and would like to know if this call was successful.

Southport.—N.F.D. was a great success, the station being operated by G2IN, 2XU, 4CF, 4DF, 5KX, 6YR, 8DQ and 8QG. 137 points were obtained. VO4, ZB1 and W8 were heard but not worked.

At the June meeting of S.A.T.A., G3JR gave an interesting account of his station equipment and how he managed to work over 100 countries with 10 watts input during one year on the air.

It is proposed to hold a hamfest in Southport during the autumn to which all transmitting members are cordially invited. Suggestions from district members are invited regarding date, etc.

G2IN is erecting a rotary beam aerial, 4DF, 5KX and 8QG have erected Zepp aerials. 4DF worked KA and PK3 with less than 10 watts input from a receiver power pack. 4CF is now W.A.C and awaiting cards. 2XU and 6YR are building superhet receivers and 8DQ is working DX with QRP.

DISTRICT 2 (North Eastern)

District Representative: L. W. Parry (G6PY), 13, Huddersfield Road, Barnsley.

District Scribe; C. A. Sharp (G6KU), 316 Poplar Grove, Great Horton, Bradford.

Town Representatives:

Barnsley.—T. Malkin (G5IV), 5 White Hill Terrace, Dodsworth Road.

Bradford.—As Scribe above.

Doncaster.—A. Dickinson (G4DP), 111 Sprotboro Road.

Halifax.—R. P. Pohlmann (G3ZK), 138 Skircoat Moor Road.

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

Huddersfield.—J. Dale (G5VD), 12 Langley Terrace, Crosland Road, Oakes.

Keighley.—H. Beadle (G8UO), 13 Chandos Street.

Leeds.—J. P. Edwards (G3WH), 3 Autumn Crescent, Horsforth.

Wakefield.—W. L. V. Parker (G6WJ), "Chalfonte," Thornes Road.

Sheffield.—A. H. B. Cross (G3FN), 19 Stradbroke Road.

* * *

Barnsley.—Mr. J. Ward (G4JJ), is welcomed to the local club as a new member. G2BH, 2WX and 8NM are active on 56 Mc., and the following on various bands: G2BH, 2WX, 3PG, 3YA, 4JJ, 5KM, 5IV, 5DW, 5UA, 6PY, 6LZ, 6XG, 8NM, 8WF, 8IJ, 8PK, 2AYX, 2DQL, 2BFJ and BRS3068.

Doncaster.—Morse classes are now held three times each week, for the benefit of holders of AA licences, those on Monday and Friday evenings being at Electric House, and the other at the usual club meeting.

On two Thursdays each month, meetings are held in the science laboratory at Wheatley, where various types of experiments are carried out.

An AA licence has been applied for, on behalf of the local club who are looking forward to the time when a full call will be granted. During the next few weeks, visits are to be made to the Doncaster Airport and the R.A.F. station at Finningley. The following are active: G3NJ, 4DP, 5GJ, 2AMT, 2BCQ, 2BOJ, 2CLK, 2CKR, 2FTO, BRS193 and 3494.

Huddersfield.—The major event last month was N.F.D.; those taking part were: G2PC, 5VD, 6RO, 8CD, 8CW, 8GU, 8TM, 8VF, 3GT and 3UR.

Keighley.—We are sorry to lose G4DU, who is leaving for Ilkeston, where he hopes to meet local members. The local club are active on 1·7 and 7 Mc., under the call G3NN. G8UO who asks for more CW activity on 1·7 has a sked every Friday evening with 3HA at 2100 BST, and is willing to stand by for any other station.

Bradford.—The 1·7 Mc band has been in great demand lately by most of the local stations, especially on Sunday mornings. An old Ilkley member, G8UQ, now of Harrogate, has made a welcome appearance on this band in order to contact the local group. A station was run by G6SN during the Annual 56 Mc. Field Day, and his signals may be heard during other weekends under the portable call G5QR. 6BX has changed QRA and is again on the air. 2DM who has been inactive for several years, has started up again on 1·7 Mc., and is looking for his old associates. A new station at Hipperholme, G4JB, is commencing work on most bands, and asks for reports; others active include: G2DM, 2QM, 2SU, 3HA, 3KF, 3MQ, 3NN, 4GJ, 5HB, 6BX, 6KU, 6NP, 6PL, 6SN, and 8TF, all of whom have been heard on the air but no reports are to hand.

DISTRICT 4 (East Midlands)

An attendance of 24 members at Leicester on June 25, had an opportunity of re-living the milestone of the year . . . N.F.D. Each year this event sees the birth of problems that must be overcome at very short notice and lessons can be learnt by B.R.S. or Old-timer that will stand in good stead for subsequent use. All stations put up very good average scores and we can look forward to Convention with confidence and pride in a job well done.

Mansfield.—At the local meeting on June 18, N.F.D. items of expenditure were passed and settled. The T.R. (G8SA) wishes to thank all members for their loyal co-operation and assistance which went to make a very notable week-end.

Leicester.—The T.R. would like to thank those members who helped to make a success of G6VDP, and particularly two newer members BRS3588 and 2BAP who did more than their share. The catering arrangements were better than ever this year, thanks to 2BLR.

Activity is still high on 1·7 Mc., a race to work the most stations continues, with G2RI the leader. Our hearty congratulations to 6IM and YF on their recent marriage. After a long period of inactivity it is said that 6IM is back on the air for good. Our best wishes for long life and happiness to the brand new junior op. at G3KH.

Nottingham.—N.F.D. at G2IOP was an epic of marvellous effort in the face of dire adversity. An accident in transit deprived them of the intended power supplies, leaving them a matter of a few hours only to re-design for an emergency supply to both transmitter and receiver. G5JX and 8JV earned for themselves some very large medals, not forgetting the movie-camera man. The 3·5 Mc. station at G5VUP which went absolutely to order was ready for the air by 4 p.m. The operators were G2WS, 5KG, 5VU, 6MN, 8MW, 8QZ, a team which no doubt accounts for the very fine result achieved.

We hear with regret that G5TT is leaving the air owing to poor health. His complete station is for sale and a list may be obtained from the D.R. or direct.

Both G8JV and G6CW have added two Italian contacts to their list of 56 Mc. DX. Very fine work.

Northampton.—The D.R. spent two very happy half-days in this town to see all members and to re-establish general contact. In a town with so few full licences it is very heartening to find so much enthusiasm and well-run stations. G2SY has been appointed T.R. and under the guidance of a man with a home-made station, fairly bristling with ideas and good workmanship, Northampton's future seems assured. Owing to holidays there is an alteration in next month's district meeting which will now be held at Trent Bridge Hotel, Nottingham, 3.30 p.m. Junk sale will be held.

DISTRICT 5 (Western)

The exceptionally fine weather experienced during the week-end of N.F.D. made that event thoroughly enjoyable in all respects. All four District 5 stations put up good scores, although the 14 Mc. station found conditions poor. The claimed total score was 607 points, which probably puts the District somewhere near the top of the list. All those who helped in any way towards the success achieved are thanked for their services.

The June meeting in *Bristol* was well attended, 40 members being present. The main business of the evening was naturally the arranging of final N.F.D. details.

Several local members have asked for slow Morse practice and the T.R. has pleasure in announcing that this has been arranged. Transmissions are taking place every Sunday morning at 10.30 B.S.T. from G3RQ, Bristol, on a frequency of 1761 kc. Those taking advantage of this service are asked to notify G3RQ. G2HX and G5LR are welcomed into the ranks of Bristol amateurs. Both will shortly be recommencing activities. The following are active: G2IK, 2YT, 3RQ, 3YH, 3YT, 4CM, 5JU, 5WI, 5KT, 6GN, 6RB, 6VF and 8TC.

A. Le Cheminant, ex-G6AC, is to be heard each evening on 14292 kc, with the call VO2O. He is anxious to make contacts with his old friends in the District.

Recent visitors to *Cheltenham* have included ON4SW and ON4AD. G5BM and G3YZ have been taking advantage of the short skip on 28 Mc. to work European stations as a change from 14 Mc. DX. Interest otherwise is mainly centred on 56 Mc. It is hoped that G3LZ will soon be fully recovered from his recent illness.

G8JQ of *Bath* is shortly paying a visit to the U.S.A. Whilst there, he hopes to make many personal contacts and also hopes to keep in touch by radio with G2IW at his home town. G2IW has recently installed a very complete set of testing gear, with which many experiments will be carried out. G8DX is active on 14 and 1·7 Mc.

DISTRICT 6 (South Western)

We offer sincere thanks to all those in District 6 who helped to make N.F.D. such a success. We hear that all who took part had a thoroughly enjoyable time. The final scores were: Taunton on 1·7 Mc., 94 points; N. Devon on 3·5 Mc., 109; Torquay and Exeter on 7 Mc., 148; Plymouth on 14 Mc., 64; total 415. Those who operated on 1·7 Mc. are especially to be congratulated, as a score of 94 on that band is considered excellent work. It is interesting to note that the 7 Mc. station had a total of 71 contacts, a remarkable achievement. The score would have been higher had it not been for the fact that many of the contacts, although often right across the country, carried only one point each. Once again, therefore, we repeat that we consider the method of scoring operates distinctly to our disadvantage.

A local 56 Mc. Field Day is being held in the District on Sunday, July 23, from 12.00 to 18.00 B.S.T. A number of portable transmitters will be on the air, and there will also be a number of direction-finding receivers at work. It is hoped that as many as possible will take part. Will all those interested please write to the D.R. at once for information.

Torquay.—There are no formal meetings at present and interest seems chiefly confined to 56 Mc. Contacts are being made between G2CI, 3HW, 5QI and 5SY. The last named has managed to get a half-wave vertical raised above the top of the mast, and is feeding it by means of stub matched 500 ohm feeders. Results have been extremely gratifying. G3HW reports that on Sunday morning, June 25, he heard a station, G6G, calling "Test 56 Mc." He would like to communicate with the station concerned.

Exeter.—There was an attendance of 16 at the monthly meeting—a very good turn-up for the summer. The chief topic was N.F.D. followed by a Morse practice for an hour. The meeting then split up into three groups, one discussing the various aerial problems of the local stations, another dealing with L.F. amplifier work, and a third with the methods of coupling to the final stage of any Transmitter. The proceedings proved very interesting.

G5QA is producing some good DX with his portable transmitter at Sandy Bay using a half-wave VS1AA aerial.

N. Devon.—Her many friends will be sorry to hear that G3GH is suffering from eye trouble, probably aggravated by doing much radio at night. She has been advised to do no night operating for a year but hopes soon to be able to resume day work. We all sincerely hope that the trouble will be short lived, and that she will soon be fully recovered.

The bi-monthly meeting was held at G6GM, five members being present. Further to the above G3GH reports that she will have to give up R.E.S. for the present, and also her regular schedules on 1·7 and 3·5 Mc.

Plymouth.—Seven members attended the June meeting at G8PN, when discussion ranged from modulation and the new P.O. relay scheme to frequency measurement and learning the code.

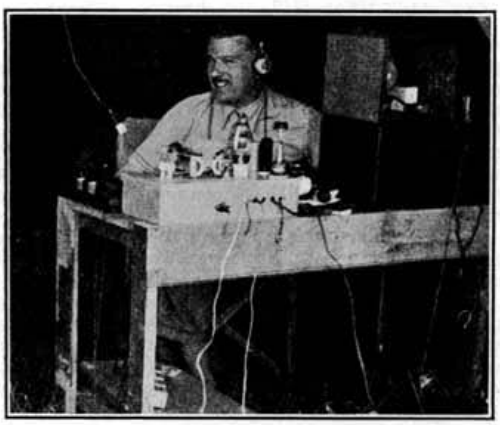
G8HF is now operating from his new QRA, and he, G3TX and G8PN are all active on 14 Mc. 2FKO, BRS2997 and 3464 are learning Morse. The next meeting will be at 2DLJ, 21 Rosslyn Park Road, Peverall, on Monday, July 24.

DISTRICT 7 (Southern)

Those who made up the rather meagre attendance at the Southsea P.D.M., were well rewarded by having the opportunity of hearing " Clarry " at his best during an exceedingly interesting 80-minute chat. The thanks of the District are due to G2NH and Mr. Dimmer for the arrangement of this well organised function.

Guildford.—Considerable 56 Mc. activity is now apparent, engendered no doubt by the appearance of DX European signals. G6XM has managed to contact I1TKM, whilst G6GS, 6LK, and 8IX are also working on this band. The following are active: G4AP, 5WP, 5YA, 6NA, 6YZ, 8CV, 8LT, 8NT, and 8UG. Notice of the next meeting for this area will be given in due course, but none will be held in August.

Kingston.—G4CI who is testing a new aerial array contacted five continents in a week. Some fine 56 Mc. work is being done in the area, G2NH, 5MA, and others are on this band regularly. 8TX has an effective 14 Mc. rotary beam working. The following are also active: G2GK, 3OR, 3VK, 4CI, 5LC, 6NK, 8SM, 2DLX.



" Rusty " does his bit. G5WP, D.R. for Southern England, operating G6GSP on 3·5 Mc. at Farley Green, Surrey.

Portsmouth.—N.F.D. was rather disappointing, for in spite of the numerous precautions taken, battery and generator trouble was experienced and G6YKP was off the air for several hours or running on low power for long periods. G6YK is active again and 4FA will probably be going by the time these notes appear. 5UI a newcomer to 56 Mc. contacted the TR for his first QSO on this band. Congratulations to 8WC on the arrival of a junior operator. 3CN anticipates going abroad shortly.

Croydon.—The Surrey Radio Contact Club played a great part in the successful running of the N.F.D. station, G2FIP. G3IG is interested in frequency measurement. 5GQ is similarly interested and also with E.C.O.'s. 2KU has constructed a fine television receiver. 6UB leaves the district for Eastbourne and we offer him our best wishes in his new venture. 2FI and 5XH are active, and the latter by doing more listening than transmitting has been getting out well on low power. The T.R. requests information on local activities.

Purley.—The T.R. G5AN, 16 Manor Gardens, Purley, requests local members to keep him informed of their activities. He is proposing to hold informal meetings.

DISTRICT 8 (Home Counties)

District Representative; S. J. Granfield (G5BQ), 47 Warren Road, Cambridge (Phone: 54644).

Town Representatives;

Bedford.—H. R. Jeakings (G5FO), c/o Jeakings and Son, Ltd., Mill Street.

Cambridge.—L. W. Jones (G5JO), " Mella Loona," 16 Leys Road (Phone: 3406.)

Luton.—A. G. Tearle (G3KG), 32 Waller Avenue.

Peterborough.—W. Carter (G2NJ), 52 Park Road. (Phone: 3587.)

St. Ives.—C. D. Whaley (G6WA), " Danum," Ramsey Road.

* * *

Owing to N.F.D. no regular District meeting was held during June, although an informal meeting of Field Day participants was held at G5JO (Cambridge), on the Wednesday immediately before the event. Final details were discussed, after which the Television programme was viewed. We record our appreciation of 5JO's hospitality.

The only hold-up during N.F.D. was at the 3·5 Mc. station at Swavesey, where serious trouble delayed the start for six hours. All other stations reported a clean run throughout.

Cambridge.—G2XV is on the air after an extensive rebuild. 5BQ, 5DQ, and 5JO are active, while 2PL is busy with the C.W.R. Congratulations to Mr. and Mrs. 8SY upon the arrival of a daughter. 5DR is nearly ready for a start from his new QRA. 8FF is back in the town, but has not been heard on the air.

XZ2DY is building gear ready for his return to Burma. With the help of 6FL and 5OV, he has practically completed a most workmanlike receiver, and is commencing a transmitter with a pair of Eimac 35T's. (Another BERU winner ?) 5OV has been somewhat less active recently, as his wife has been in hospital for some time.

March. G3WW and 3BK planned a tour of Scottish stations, but upon their arrival in Scotland they received an urgent call home and had to curtail the holiday. 3WW is trying all the more expensive communication receivers in turn, and will soon be an authority on their merits and demerits. 3DY is active on 14 Mc.

Peterborough.—G2NJ reports a QSO with 6HB of Bedford who was paying a flying visit to his home after returning from Japan and China. He was about to leave for an unknown destination, but sends his regards to District members.

Luton.—G3KG, who recently changed QRA, sustained a severe leg injury while erecting his new aerial. 5CS has moved to Watford. A welcome is extended to Mr. J. Ellett, BRS3585, Mr. H. E. Walkden, BRS3617, and Mr. Frost, who are thanked for their letters.

Bedford.—G5FO and 5PA put in a good deal of work on the N.F.D. gear, for the 1·7 Mc. station, and were justifiably pleased with its performance. ON4SW, who has been paying a return visit to 5BQ, visited several stations in the district. G5BQ hopes to contact District 8 members from ON4SW (Antwerp) on 7 Mc. during August.

DISTRICT 9 (East Anglia)

District Representative : H. W. Sadler (G2XS), Warren Farm, South Wootton, King's Lynn, Norfolk.

District Scribe : H. A. Spashett (G3RK), Smallgate, Beccles, Suffolk.

Town Representatives :

Gt. Yarmouth.—D. Davy (G3RW), 59 East Road, Maygrove.

Ipswich.—S. G. Keeble (G2AN), 139 Sidegate Lane.

Lowestoft.—F. L. C. Firmin (G5QO), 2 Hall Park Villas, Oulton Road.

Norwich.—C. White (G8VW), Heathfield House, Ipswich Road.

* * *

National Field Day took place without a hitch at the four district stations. Being blessed with ideal weather conditions, everyone thoroughly enjoyed themselves, and the total number of points collected was 365. All apparatus worked well and we thank those who contributed gear and thereby helped to make the event such an enjoyable occasion.

At Gt. Yarmouth, where a station was run for the first time for some years, several non-operating members were sufficiently enthusiastic to bring their own tents and spend the night in the open air.

Ipswich.—The Ipswich 14 Mc. station started N.F.D. well, and some smart operating and good luck enabled them to work PY's and VQ4, but conditions deteriorated after midnight and points became more difficult to collect. The total of 57 was compiled. The other Ipswich station G8MUP on 1·7 Mc. scored 77.

There is a dearth of reports this month, probably owing to the holiday season ; but stations known to be active include G2AN, 2JD, 3OJ, 6TI, 8AN and 8MU.

Gt. Yarmouth.—There was no shortage of operators at the N.F.D. station, a spirit of keenness ensuring the success of the District 3·5 Mc. post. 105 points were secured, and the well thought out power plant proved very reliable in operation.

G3RW has taken delivery of his new *Eddystone* E.C.R. receiver and is very pleased with results, he is trying out various types of 14 Mc. aerial systems ; 2FAO is constructing a P.A. stage and experimenting with a OQ15/600 ; 2BXJ soon hopes to obtain his H.B.E. certificate ; BRS3468 is constructing a C and R bridge, using a buzzer as the audio source ; other active stations include 2BIC and BRS2999.

Norwich.—The 7 Mc. N.F.D. station collected 126 points. G5IX is now complete with power supply at his new QRA and operates on 3·5 and 7 Mc., phone and C.W. ; 2MN is planning a 56 Mc. transmitter ; and 6QZ is also active on the Ultra High Frequency bands.

Lowestoft Area.— G5QO is looking for a sufficiently sensitive microphone to use with his single valve 56 Mc. transceiver. 8WI (Orford) has rebuilt for 14 Mc. but is still not satisfied with results and contemplates yet another re-construction of his transmitter. 3XT (Stratford), the QRP battery exponent, is still making a large number of QSO's using an input of one watt. During the last seven months he has worked 217 stations in 18 different countries, including one S5-6 telephony contact with LX.

Congratulations to Mr. Fish of Northwold, on obtaining his full call G4LO.

Other stations active are, G3IN, 3RK, 3UT, 2AFC, 2APD, and 2FFT.

DISTRICT 10 (South Wales and Monmouthshire)

The news of chief interest this month is the report on our N.F.D. participation. The four stations were located in the Blackwood, Cardiff and Newport areas, in the latter case with two transmitters (1·7 and 3·5 Mc.) set up in the same field and sharing one of three poles. It is of interest to remark here that in spite of the fact that no particular precautions were taken, mutual interference was practically negligible, being confined to sharply tuned beats on each receiver which were not much louder than some of the best signals heard. Taking the stations in ascending order of frequency, individual results were :—

GW3AJP, 1·7 Mc.; 40 contacts for 83 points with 20 portables worked. All battery-operated equipment, 240-volt triple capacity blocks running a CO–BA–PA transmitter (7–9 watts input) and 1–V–1 receiver, with the aerial a ¼-wave Marconi, separately tuned and link-coupled. Operators were GW3AJ (in charge), assisted by 2NG, 2UL and 6FO.

G2JLP, 3·5 Mc.; 53 QSO's gave 135 points, with 31 portables worked including the HB's. The transmitter was CO–PA with 25 watts from a rotary converter driven off heavy accumulators, the receiver a batter 1–V–1, and the aerial ½-wave VF. G2JL was in charge, with 2UL and 2NG to assist.

The non-operating members—2DBO, 2DHM, BRS3491 and ex-BERS44, with others—gave both these stations most unselfish and enthusiastic help throughout the period, without which it would have been very heavy going, while the journey from Swansea undertaken by GW2UL to make up the deficiency in operators was also greatly appreciated.

GW8NPP, 7 Mc. ; the Cardiff group did brilliantly by putting on 193 points for 97 QSOs, which included four W's but only twelve Europeans, the rest being G's. The transmitter was CO–PA, run at under 25 watts input from a machine, and the receiver 1–V–0. Two aerials were available, a doublet set up to cover NW–SE directions, and a 66-ft. end-on at right angles to it. GW8NP had charge, assisted by practically the whole of the local group and (apparently) most of the population of Cardiff, for the site was as last year—near a well-known weekend resort ; anyway, the cavalcade of cars and lorries round the station was most impressive.

G8PUP, the redoubtable " Blackwood Group," took 14 Mc. this year, making 35 contacts for 113

points; DX included twelve W's (1–4, 8, 9), two VK's, a ZL2, SU and VP4, with 16 Europeans to make up the total. The transmitter was CO–BA–PA, with HT from a rotary converter, and the receiver a Sky Champion.

The claimed District total thus works out at 524 points, compared with 547 for 1938; quite a creditable effort, though an honourable place in the final list will be largely due to the efforts of Cardiff. Next year, we hope to have the co-operation of both Swansea and the Rhondda Valley membership, as Newport will probably like to look on for a change, having sustained an N.F.D. station since the event was first instituted.

* * *

Finally, a word in person. I write these notes for the last time, as with the appearance of this issue, my resignation from office as your D.R. takes effect. New responsibilities and heavy pressure of work demand that I make room for someone with more time to devote to a job which requires all the attention one can give it. I am sure that my successor will have both the co-operation of the T.R.'s and the courtesy which was always shown me by every member of the District with whom I came in contact, for all of which I should like to record my thanks.

73, and GL to No. 10.

A.F.

DISTRICT 11 (North Wales)

In view of the fact that this year was the first time the district had entered for N.F.D. as competitors, with four stations, the results achieved can be considered satisfactory.

In comparison with the crowds at many N.F.D. stations in other districts, it is interesting to note the small number of assistants at each of our stations. GW6AAP had a personnel of three, 6OKP three, 5FUP three, and 6USP four. This meant really hard work for everyone concerned. All stations were located in mountainous districts far from maddening magnetos and ignition coils!

G6USP (14 Mc.) claimed 130 points and had contacts with W, VE, VK, KA, K5, VU, SU, and other distant countries. G3YL played a prominent part in the station erection and organisation. She provided the tent, and instructed the party in the art of putting it up in double-quick time. Not only did she erect a mast with the help of only one other member, and climb trees to put up a receiving aerial, but also did all the cooking and a good share of the operating. She was also responsible for some splendid DX contacts, and earned many points for the station. District 11 is indeed proud of its energetic lady amateur.

G5FUP (7 Mc.) claimed 113 points, with Newfoundland as best DX. G6OKP (3·5 Mc.) claimed 126 points, Bucharest, with an S8 report, being best DX. G6AAP (1·7 Mc.) claimed 160 points. Two Swiss portable stations provided the most distant contacts. This station used a small portable 12-volt petrol generating set to light camp, and keep the batteries charged.

Cloudless weather was enjoyed throughout the period, and N.F.D. was voted the best event of the year. Everyone is looking forward to the next.

DISTRICT 12 (London North and Hertford)

North London. There was not such a large attendance as usual at the last meeting of the season held at the Orpheum Cinema. We had, however, representative operators from three of the District N.F.D. stations who related their experiences during the event.

G6ZOP, Mill Hill, North London. Operators at the District 12, 14 Mc. Station. G6ZO third from right at back.

Due to the holiday season meetings are being discontinued until September when they will be resumed on the third Friday in each month.

The D.R. takes this opportunity of thanking all those who loaned cars or gear, and gave up their time to help the District during N.F.D.

Central Herts. As on past occasions the N.F.D. station G5UMP on Welwyn Heath proved the meeting place for many local amateurs. Assisting G5UM on 1·7 Mc. were G2CN, 3JX, 2YN, 8PM and 8DR who has just moved into the District.

Members were very sorry to hear of the serious illness of David Price Jones G5SA who in order to recuperate has moved from Hatfield to Welwyn.

Norman Powell has now received the call G2FB for his station on top of Lockley's School where he has been doing some good work on 14 Mc. 'phone with the aid of a selection of beam aerials. G2CN is rebuilding and hopes to be on the air again after nearly three years.

DISTRICT 13 (London South)

Activities in South London have been somewhat curtailed this month owing to the commencement of the holiday season, but in reviewing the month of June we should like to comment on N.F.D. The D.R. was very pleased to be able to spend some time at each of the sites this year and it was noticeable that at all stations operating was being carried on very competently. Certain difficulties arose, as they always do at this annual event, and the two Westerham stations were more unlucky than the others in that they had considerable trouble with generators. The difficulty was eventually overcome and the two stations went ahead in fine style, but of course with a severe handicap. Considering the time lost in the early part of the contest the scores showed hard work on the part of those responsible. The 7 Mc. station, at Dulwich, was undoubtedly a triumph for those in charge. The whole layout and arrangement, including two half wave aerials erected at right angles, revealed efficiency and thoroughness. The final score at this station only shows what can be done with a N.F.D.

station in the heart of the district. The 3·5 Mc. station at Botley Hill, put up a splendid show in spite of various difficulties with the landlord! The score here was also excellent and reflected the hard work and enthusiasm of all concerned.

G2RC is active and busy chasing new countries. It is a pleasure to see Mr. Hall, G2TH-ZD4AB, home again and we hope to hear him on the air before very long. 4AU and 3ZJ have now returned from their holiday at Hayling Island where they carried out some interesting and instructive experiments with an aerial 15 feet high. 8SC and 2CHR report active. 8DI. has now arrived in Woolwich from Birmingham and finds conditions much more difficult in London than in the provinces. 4KY who has recently joined the district is active and looking forward to meeting other local members. 4GD reports that his activities are on low power, owing to D.C. mains and that most of his experiments are on the 14 Mc. band. The Woolwich meeting took place on June 26, whilst that at Norwood was held on June 22; both meetings were highly successful.

DISTRICT 14 (Eastern)

East London.—There was an average attendance at the June meeting held at G8AB, Loughton, when SM5JQ was also present. The District's 3·5 Mc. N.F.D. station G8ABP was located at Tye Green, near Potter Street, by the courtesy of G4LV who also assisted in other directions; operators were G8AB, 2CD and 2XP. Transport arrangements were ably carried out by 2ANB and a good score was registered. Visitors included a party from Headquarters, also G5FN, 4HG and 2AFT. Both of these parties also visited Rookwood Hall, Abess Roding, where station G6UTP on 1·7 Mc. was again situated. The Misses Rowe were once more responsible for the catering. A moderate score was put up, the operators being G3SI, 3LP, 3JW, 3KZ, 6AH and 6UT. The next meeting will be held in August at G6UT.

G2JBP, Dulwich, South London. G2JB in foreground with G6HM operating on 7 Mc.

East Essex.—G5X1P on 7 Mc. managed to raise a fairly good score during N.F.D. and except for one or two minor setbacks everything worked perfectly. Conditions seemed fairly good although continentals were rather lacking in numbers, and during the night the band decreased in activity.

There were 13 members present at G5VQ for the monthly meeting, amongst whom we were pleased to welcome BRS3044 from Ilford.

2BQN has taken his code test, and is eagerly awaiting the result. 2SO at a new QRA is getting his station on the air again. 2CYC is building a superhet receiver. 5UK reports lack of co-operation on 56 Mc. although he is on regularly with a beam aerial.

Chelmsford.—A very interesting and thoroughly enjoyable time was had by all during N.F.D. 14 Mc. conditions were on the whole poor and the score was low, but this was not for want of trying.

G5RV has been measuring up lengths of copper tubing in the garden, a sure sign of "Rotary Beam-itis" which recurs each summer! 2KG and 4AC have been on 1·7 Mc. with good results, while 6LB threatens to forsake 14 Mc. and join them there. 3OX is now on 14 Mc. as well as on 56 Mc.; he has worked G5BY and G6DH on the latter frequency using both horizontal and vertical dipole aerials. 2FTW is welcomed to the town, and we hope he will soon have a full call. 8PB, 8PL and BRS3650 gave great help during N.F.D. but have not been heard of since! 4AC reports that his call has been pirated.

Monthly meetings at Chelmsford have now ceased until the holiday season closes. The next meeting will be held at G5RV on the first Monday in October.

DISTRICT 15 (London West, Middlesex and Buckinghamshire)

District Representative: H. V. Wilkins (G6WN), 539, Oldfield Lane, Sudbury Hill, Greenford, Middlesex.

Town Representatives:

Edgware.—H. W. Pope (G3HT), 4 Gainsborough Gardens.

High Wycombe.—J. Redrup (G8VZ), "Lyndale," Longwick Road, Princes Risboro, Bucks.

Slough.—J. Paine (G6PR), 38 Alpha Street.

Wembley.—S. Riesen (G5SR), 44 Wood End Road, Sudbury Hill, Middlesex.

West London.—H. B. Crowe (G6CO), 22 Chipstead Gardens, Cricklewood, N.W.2.

* * *

Only two local members attended the meeting held at Slough, although the total present was 18.

N.F.D. again proved a success, everyone remarking on the very fine organisation worked out by the chief operators. To G6CJ, 6PR, 6RW, 5VB and 6GB we should like to record our particular thanks for the splendid work they put in at the stations, and to G2TJ who assisted the D.R. in his task of "going the rounds."

The writer has despaired of receiving any reports other than those written from hearsay by the T.R.'s. At the time of writing (June 27), only four sheets have arrived from the T.R.'s.

Edgware.—G3HT attempted to run local meetings, but owing to poor attendances they have been postponed until September.

High Wycombe.—A welcome is extended to G3BP who now resides in this area. We are sorry to hear that G8JK has been ordered a complete rest. Congratulations to 2AKL who is entering wedlock this month. Active: G2RK, 3BP, 3MI, 6JK, 8VZ, 2BAO and BRS3292 who has been granted his full permit.

Slough.—G6PR is chasing new DX with little success.

Wembley.—G5SR has contacted NX2A at Godhaven, Disco Island, and 6WN has raised CE, PY and CX the first South Americans from his new QRA. Encouraged by others, the W3EDP aerial was erected and this resulted in the contacts mentioned, but no other DX has been worked with it.

West London.—G3UQ raised FB8 twice on 7 Mc. and 4FS contacted W5 and 6 on 14 Mc. G4AR, 5FG, 6CO, 8KZ and 2DRF are active, G5CV has moved to Harrow, and 3GY to Chorley Wood.

DISTRICT 16 (South Eastern)

We wish to take this opportunity of thanking all those who helped in any way during National Field Day. The District results, although not outstanding, were good, and so far as can be ascertained everybody thoroughly enjoyed themselves. Certainly the excellent weather experienced helped a lot in this respect.

Brighton and District.—A talk on the uses of the Cathode Ray Oscilloscope was given at the monthly meeting by Mr. Bannister, assisted by 2CIA; a transmitter being used to show the patterns obtained by modulation. The lecture proved very interesting, and was well attended. Meetings will be held throughout the summer on the first Thursday of the month, at the Imperial Hotel, Queen's Road, and visitors are always welcome.

Eastbourne.—The following stations are active :—G2AO (on 56 Mc. every night from 22.00 B.S.T.), 3CX (on 7 and 14 Mc. with new remote controlled transmitter), and 4FV.

Gravesend.—A certain amount of trouble was experienced by G2IZP, the 3·5 Mc. N.F.D. station, but despite this a fair score was put up. The 22nd Gravesend Scouts camped at the station, and rendered invaluable service with transport and catering. They showed a keen interest in the working of the station, and several budding "Hams" are expected from this quarter ere long. On June 7, Mr. Jack Box (G6BQ) was married to the daughter of Mr. Ingleton (G5IL) and we join with the Gravesend Group in wishing them all prosperity in the future.

Heathfield.—G5JZP has put up such an outstanding score in the last two Field Days that this year the group are somewhat disappointed at the smaller number of points obtained. No blame attaches, however, to either the gear or operators for this, as it was the experience of nearly every 14 Mc. station in the country that DX was much more elusive this year. The members wish to express their thanks to *Messrs. Exide* for the loan of 350 volts of H.T. accumulators. Thirty-two different stations were heard on 56 Mc. during May by BRS1173. G6CW, of Nottingham, was received several times, and on June 5 at 22.50 his phone was peaking S9. On Sunday, June 25, 1173 heard several Italian stations on phone on this band, but at the moment details are not to hand.

Tunbridge Wells.—The 1·7 Mc. N.F.D. station was this year at a new site on the outskirts of Tunbridge Wells. The position proved to be a good one, and the score obtained should place the station well up in the final results. The transmitter was an ECO run from a *Bulgin* vibrator supply, driving an 809 powered by a *Mortley-Sprague* rotary converter, while the aerial consisted of a ¾-wave Marconi and counterpoise. G2UJ has been taking advantage of the recent good conditions on 56 Mc., and has added a number of new stations to his log. He has been heard by G5TX in the Isle of Wight.

West Sussex.—We offer our hearty congratulations to G2ZV and 6CW who by virtue of their QSO on 56 Mc. on May 29 now hold the inter-G long distance record for this band (145 miles). Phone signals from 6CW were S6/7, QSA5.

Hythe.—G5MP reports hearing an Italian phone station on 56 Mc. on May 24 and 25, while on June 1 he was heard S9 in Italy. He would welcome co-operation from stations on the Kent and Sussex coasts.

Whitstable.—A successful weekend was had during N.F.D., and most of the G-portable stations were contacted on 7 Mc. by G5CIP. G3NQ is welcomed to the town. G4BY, 4FI and 5CI are active.

G5JBP, Boston, Lincs.
Operators (and others!) at District 17, 7 Mc. Station.

DISTRICT 18 (North and East Yorkshire)

District Representative; E. Mitchell (G5MV), 40 North Marine Road, Scarborough.

Town Representatives;

Bridlington.—T. Woodcock (G6OO), 24 Roundhay Road.

Hull.—J. W. Gill (G6OS), 95 Parkfield Drive.

Scarborough.—L. Tranmer (G6TG), "Wandsworth," Burniston.

* * *

Although the District has not come out amongst the leaders in the N.F.D. event it is by no means disgraced. All four stations functioned throughout without any trouble except of a minor nature. Hull, owing to the number of local members, had an ample supply of operators. The Driffield group who had expected to be shorthanded were helped by the inclusion of G5CJ, a newcomer to the District. At Scarborough, however, things were not so rosy; for the first time two stations were run from here yet the total number of operators available was below that for the one station in 1938. In particular, G2CP had a five-hour stretch by himself with no-one within half a mile. If two stations are to be operated next year, things will have to improve considerably. The D.R. wishes to thank all who lent their aid, including A.A., B.R.S., and non-members.

The equipment in use was as follows :—

1·7 *Mc. G3KSP, Scarborough.*—Transmitter 6C5 Pierce Oscillator driving an RK39 Power Amplifier, built by G6TG. Marconi 138 ft. aerial and a "Radio" 8-valve Superhet built by G5GI. Operators G5GI, G5MV and G6TG.

3·5 *Mc. G2KOP, Garton-on-the-Wolds.* LS5B Crystal Oscillator, and T61D Power Amplifier. Half-wave Doublet, Trophy Three Receiver. Operators G2KO, G5CJ and G6UJ.

7 *Mc. G8K-UP, Scarborough.* 6L6G (C.O.), RCA809 (P.A.), the transmitter of the Scarborough Short-wave Society (G4BP). Two 66 ft. Hertz aerials and a 1-V-1 receiver. Operators G2CP and G8KU.

14 *Mc. G6OSP, Hull.* 6L6 (C.O.), 6L6 (F.D.), T20 (P.A.). Half-wave Doublet and 1-V-1 receiver.

Bridlington.—No report has been received from here for several months, but it is reported that two members visited G2KOP for a few minutes during N.F.D. Presumably there is no activity at present in this town.

Hull. Taking into consideration the time of the year, activity in this part of the district is satisfactory. The June meeting was well attended, and an interesting and informative talk given by G6OY on Rectifiers and the Design of Filter Circuits was much appreciated.

Will members please note that it has been decided not to hold a meeting during August. The next meeting will therefore be held on Wednesday, September 13, at the Broadway Hotel.

The T.R. thanks all who kindly assisted at N.F.D. G6OS has purchased a very fine pre-selector, 8IM a super-pro receiver, and 8UL an *Eddystone* ECR receiver.

Scarborough.—G2CP, who has commenced three months naval training as a wireless operator, is now on H.M.S. " Selkirk." 6TG is trying various types of 56 Mc. converters with his ECR. receiver.

General.—It is felt by several members in the District that dates when once fixed should not be changed. Examples this year are the Convention and York P.D.M. No doubt there are excellent reasons, but sometimes arrangements to attend on the specified date are made well in advance and cannot be altered. Many even arrange their annual holidays to coincide with the Convention, and it is felt that provincial members should at least be consulted before a different date is decided upon.

[When it was decided against exhibiting at Radiolympia, Council agreed to hold Convention later in September and the membership was advised immediately. The dates once fixed have not been changed.—ED.]

DISTRICT 19 (North Eastern)

South Shields.—Successful meetings continue to be held at 5WZ who is at present trying out a Collin's coupler in his receiving aerial. The N.F.D. Station G8JOP, operated on 14 Mc. did fairly well but trouble was experienced through the generator overheating. Conditions were rather poor but several good DX contacts were made. A score of 80 points was obtained.

Newcastle-on-Tyne.—No reports from members are to hand. The two N.F.D. stations G5RIP operating on 1·7 Mc. and G5WZP on 3·5 Mc. put up scores of 110 and 113 points respectively but were handicapped by lack of operators.

Stockton-on-Tees and Middlesbrough.—G5QU is preparing for operation on 56 Mc. and would be pleased to hear from any local stations willing to co-operate with him. 5XT, 3YK and 8CL are active on 14 Mc. 'phone, 2FO is adding a preselector to the existing receiver.

N.F.D. proved a great success at G2FOP operating on 7 Mc. Everybody had a good time although some grumbles were heard about the temperature! The gear gave no trouble at all but poor conditions limited the score to 101 points. 2DMY deserves special thanks for his help in obtaining the use of the site and the loan of the poles. The " high light " of the weekend however came when 2DMY, operating his televisor from a nearby shack, was able to receive excellent pictures from Alexandra Palace 220 miles away, thus affording several members their first opportunity of " looking-in." We believe District 19 to be pioneers of the idea of television at N.F.D.!

GM8MN, Crieff, Scotland.

Scotland

The weather during N.F.D. was easily the best yet experienced, if anything too warm! Conditions on 7, 3·5 and 1·7 Mc. were fair, but 14 Mc. was in the doldrums and all stations experienced a blank period from approximately midnight on Saturday until around 8 o'clock the following morning. Despite the bad conditions some good DX was worked, but this year a change was noticeable in conditions, in that the South of England portable stations were virtually inaudible. It would appear that " A " will lead the GM stations with " C " as runner-up, and " B " filling third place, although unfortunately no District's score is high enough to be placed as national winners.

GM6XWP, Stirlingshire.
GM6XW in background and 8MP at the key.

" D " District. In spite of a run of bad luck during N.F.D. as regards scores, the weekend was a decided social success. Most members are active. GM6LS has been working with low power and has built a most efficient 'phone transmitter using a 6A6, measuring 6 in. × 6 in. × 5 in. He has obtained a portable licence and would welcome reports on his transmissions. GM6SR is rebuilding his 14 Mc. rig, and 5GK is rebuilding both transmitter and receiver.

" G " District. N.F.D. was voted a great success, everyone having a grand time. We must hope our score does not damp our spirits ! Most stations are active.

" H " District. From a practical point of view N.F.D. arrangements were a complete success, thanks to all who assisted ; but the D.O. would like to stress the fact that more operators would have been a decided advantage. Arrangements for next N.F.D. are being made during the summer months, therefore those who wish to take part are asked to notify the D.O. Any suggestions that may be put forward will be discussed with pleasure.

Members are reminded that the paucity of news here is due to the lack of reports, and that a note of their activities each month would be appreciated. The following are active : GM2NQ, 3LO, 3ND, 3LG, 3SW, 3XO, 3UU, 4FK, 4GK, 6JJ, 8MQ, 8KQ, 8KR, 8FB and 8SQ. A.A. members are active and several full licences are expected in the near future. GM3UU will welcome reports on telephony transmissions from a new battery operated QRP 1·7 Mc. transmitter.

Northern Ireland

A District meeting was held in Belfast at the end of last month when there was a good attendance for the time of year. Reference was made to a Silent Key in the District, and those present stood in silence as a mark of respect to the memory of GI2KN who had passed away since the previous meeting. His rather

G8FCP, Cranwell, Lincs. Operating tent of District 17, 3·5 Mc. station.

retiring disposition made Mr. McCann less well known than some of the G1's but his friends will miss his kindly smile. Intimation was also given of the serious illness of a comparatively new key, GI3JP, and the meeting sent him sincere wishes for an early recovery.

Reports of the various N.F.D. stations were given and the event discussed as a whole. GI5UR was unfortunately unable to attend but the others were unanimous in their opinion of the success of the outing. The weather, which was very kind, must have relented after battering us and half-drowning us in previous years. It was felt that the scores claimed would not disgrace us, but conditions particularly on the 14 Mc. band were not good. Appreciation was expressed of the good performance of GI5SJP on 3·5 Mc. band, which went all-out for portability of gear and never exceeded 7·5 watts input during the tests. On 7 Mc. the assistant ops. were unavoidably prevented from coming, and the meeting passed a unanimous resolution of congratulation to GI5UR on his plucky performance. Although he had been on night duty all the previous Friday night, he spent the Saturday in arranging emergency transport and setting up the station, and then carried on for the whole 24 hours, operating himself, and making 65 QSO's.

All stations showed good operating, the average " R " given to them being little short of 5, the mean " S " just over 6, and the " T " much nearer 9 than 8. Receiving RST was much the same but with a higher " S " and lower average " T."

At the meeting an attempt was made to stage the sale or exchange of " junk " but with the disappointing results always experienced here. There is a saying : " Keep a thing for seven years and you'll find a use for it." It must be firmly fixed in the Ulster mind ! Do other districts find the same ?

GI5MZ has left permanently for England, and the Auxiliary Air Service has claimed 2CKO. 2DWF is awaiting the issue of his full call-sign. GI6TK has qualified for B.E.R.T.A., the third in Ulster, and for W.A.S. which he thinks is the first in Ireland.

Good holidays to all.

In Search of B.E.R.T.A.

Call.	Dominion Districts.	Colonies.	Total.
G8IL	25	14	39
G3BS	25	14	39
G6ZO	25	14	39
G5OJ	25	13	38
G2HX ...	25	13	38
W1WV ...	23	15	38
GM8HA ...	25	11	36
G2UX ...	22	14	36
G8KP ...	23	13	36
ZS6DM ...	21	14	35
G5ND ...	24	10	34
G3BI	24	10	34
VU2AN ...	20	14	34
VU2FO ...	23	11	34
W9YNB ...	25	9	34
ZS6BT ...	18	15	33
VS7RP ...	18	15	33
G2GK ...	25	8	33
G2LC	24	8	32
GM8MQ ...	21	10	31
W1IKT ...	21	9	30
G3DQ ...	20	10	30

Members who have received confirmation from 30 or more British Dominions and Colonies are asked to forward to G2MI their call for listing in the above table, which is revised monthly.

BRITISH EMPIRE NOTES & NEWS

Australia (Queensland)

By VK4GK

National Field Day was a failure in VK4, for although several G portables were heard, no contacts were effected.

G6OSP, for instance, was RST569 for over an hour and was answered accordingly. It is suggested by a few members that the portable G receivers are not up to the standard of the transmitters.

A further suggestion is made that log sheets (with a column for listing stations called but who do not answer), be supplied. The issue of these to all active stations overseas, should help to popularise N.F.D.

A few desultory contacts on 28 Mc. have been made with U.S.A. stations, but generally this band is considered off until September or October. Judged by the number of G and other European stations heard on 7 Mc. at present, this band is again coming into its own, which strengthens the belief that 28 Mc. will not be so good next season.

VK4HR who has again changed his QRA, seems determined to find the ideal location. 4KH has farewelled the love of his youth, a DET1, and has now installed an 809 to drive his 800s. 4AP and BERS463 are getting some pleasure and profit from their experiments with a pair of PX25s.

There are a few members in this State awaiting cards from British Africans for W.B.E. and B.E.R.T.A. A QSL is of little value to some of us perhaps, but when the want of one, prevents a fellow amateur obtaining a much prized award, ignoring his appeal is not quite playing the game. Cards do sometimes go astray in the various bureaux, in fact we have always wondered why so few are lost, but any card required for a certificate, could or should be sent direct.

Australia (Western)

By VK6WZ

Main events here recently were the annual general meeting of the W.A. division of the Wireless Institute and the annual dinner. At the Annual Meeting councillors and office bearers for the new term were elected and last year's Council (6KS, 6CB, 6WH, 6GM, 6BB, 6LW, 6CX, 6MW and 6BW) were all returned. Such offices as QSL, Technical Director, Station Manager, publicity, etc., remain as before while an office allowed to lapse in recent years, that of Traffic Manager, has been revived and 6AF elected.

An attendance of about seventy sat down to the dinner and a good time resulted. Western Australia's large area was responsible for the absence of several country members who had expressed the desire to attend but found distances and expenses too much for them. Trophies for the year's work were won by and presented to: 6MW ("West Australian" cup), 6KW (Senior R.I.'s trophy), 6GM (C. Cohen cup, President's cup, DF field day cup and Hayman trophy—shared with 6MW), 6AF (7 Mc. field day cup and 7 Mc. home QSO day trophy), 6IG (56 Mc. field day cup) and 6WZ (7 Mc. home QSO day). The company greeted with applause announcements that *W.A. Newspapers Ltd.* had donated a new cup to replace that won outright by 6MW, that *Nicholson's Ltd.* had donated an RCA microphone and that Mr. C. H. Park had presented a globe for competition in the new year.

Activity is fairly brisk at present with most operation on 7, 14 and 56 Mc. A new 56 Mc. record of 60 miles has been set up according to a report but details are meagre except that one station used a kite to support its aerial several hundred feet in the air.

British West Africa

By ZD2H

Sierra Leone. Cards continue to come to hand for unlicensed ZD1 stations. So far as is known ZD1GT (now inactive) is the only officially licensed station in this colony.

Nigeria. ZD2H is still off the air but manages to maintain interest by listening. He is contemplating methods of overcoming power supply difficulties on the occasion of future tours. ZD2KM is now on leave in G. BERS440 announces that a petrol driven electric light plant has solved his power problems.

Gold Coast. ZD4AB has gone on leave to G, as a consequence ZD4 will not be represented until his return in November.

Operators at EI3LP, Killiney, Co. Dublin.
Left to right, EI4N, 2P, 9N, 5P, 9D.

Channel Islands

By 2AOU

Alderney.—G3XN who is active, was recently visited by G3GS, Jersey, and G8OK, Guernsey.

Jersey.—G3GS is still testing aerials, principally for 14 Mc, being unable to work DX on that band. Congratulations to 2FDJ, now G4LI, who is on 7080 kc. with telephony. 2AOU reports very erratic conditions on all bands.

Eire

By EI9D

N.F.D. is behind us once more and although we did not put up the scores expected everybody who took part had an enjoyable time.

Our thanks are due to Mr. Field, of Corbawn Lane, and to EI2P who placed at our disposal a couple of large fields on the Killiney coast. Here we had no difficulty in erecting the four stations but when all the aerials were in position the place looked like a miniature Rugby ! Difficulty was experienced, however, due to general interference between our own stations and for that reason mainly the results on 14 and 7 Mc. were below expectations.

Special credit is due to EI3L, hon. secretary, I.R.T.S., for the very capable organisation, notwithstanding transport and other difficulties. EI6F and 7F did fine work rendering technical assistance where required and EI4N is entitled to special mention for the manner in which, unaided, he kept the 1·7 Mc. station operating on the Saturday night, whilst EI5P who made valiant efforts to keep the 7 Mc. station going was operating continuously for long periods. To EI9M, 9F, 5G, 2L, 8L, 8J, 9N and 6J and all others who helped in various ways we say thanks OM's and here's to the next time.

Malta

By ZB1E

It is regretted that owing to the exigencies of duties the ZB1 group this year could not take part with a portable on NFD, but ZB1E managed to work 7 G-portables in the hour he had available whilst ZB1X worked 13 in his seven hours between duties. Owing to short skip the G-portables were swamped in continental QRM, and it was only because of their very good signals that contacts were possible.

Since the beginning of June conditions have been deteriorating steadily and the static which commenced to increase on all bands in the second week of the month, has now rendered contacts impossible at times. It may be remarked that the weather during the whole of the month was very erratic and exceptional for the time of year.

As single-letter calls have been exhausted, two-letter calls are now being issued, the call ZB1LS having just been granted to Mr. Ellis, ex-G6LS, who is expected to be on the air shortly.

BERS446, Mr. Hanford of Cyprus, reports that the authorities there are very reluctant to issue transmitting licences and his application has been under consideration for the past year. He also reports that a regular comparison of conditions as reported under these notes with those obtaining at Cyprus showed them to be identical for the two islands.

Public Schools Exploring Society

The organisers of the Public Schools Exploring Society due to visit Little Grand Lake, Newfoundland next month, will appreciate contacts with their stations G8XY and G8XZ. Transmissions will take place daily on 3·5, 7 and 14 Mc. between about 19.30–03.30 B.S.T. and the stations will be in operation between August 8 and September 5. All reports should be sent to: Major C. A. Carkeet-James, R.A., Littleshaw, Woldingham, Surrey.

CONTEMPORARY LITERATURE

By L. FRYER (GM2FR)

A BAND-EDGE FREQUENCY SPOTTER. Ray L. Dawley (W6DHC.) *Radio*, May, 1939.

A description of a 50 kilocycle frequency standard whose amplified harmonics give calibration points every 50 kc. from the broadcast band through 30 megacycles. A 6K8 valve is used as a combined 50 kc. oscillator and electron-coupled doubler to 100 kc., the harmonic amplifier being a 6V6, operating as a tetrode amplifier with grid leak bias and a tapped coil tuned output circuit. The power supply uses a type 80 rectifier and a VR-150-30 voltage regulator.

* * *

CONQUERING THE "Q." H. Burgess (W9TGU). *Radio*, May, 1939.

A very interesting discussion on the "Q" factor and its influence on the working of receivers and transmitters.

* * *

FIVE-BAND COIL SWITCHING EXCITER. Frank C. Jones (W6AIF). *Radio*, May, 1939.

The author describes a very simple band-switching exciter which is inexpensive and easy to construct The crystal oscillator, a type 6V6g is followed by a type 807 buffer-doubler. Only two tuned circuits are used and the crystal is mounted on the front panel for quick crystal changing. With a built-in 550 volt power supply the output is 24 watts on 10 metres, 35 watts on 20 metres, 36 watts on 40 metres, 27 watts on 80 metres and 26 watts on 160 metres.

* * *

THE 4 ELEMENT ROTARY. Rex Bassett. *Radio*, May, 1939.

The purpose of this article is to assist the amateur who is trying to decide what type of rotary beam to install by attempting to clarify certain phases of the essential adjusting procedure and by pointing out what forward gain and front-to-back ratios can be obtained from the various types of arrays when they are correctly adjusted.

* * *

A NEW COMMUNICATION RECEIVER KIT. McMurdo Silver. *Radio*, May, 1939.

A description of a communication receiver having a range of 5 to 625 metres. R.f. and I.f. regeneration give high performance with low cost and ease of alignment. The receiver is available in kit form.

* * *

HIGH VOLTAGE POWER SUPPLIES. Louis J. Gamache (W9RGL). *Radio News*, June, 1939.

In this article the writer discusses the design of a power pack and gives examples of the calculations necessary for the design of a ripple-free high voltage power supply.

INDEX TO DISPLAYED ADVERTISEMENTS

	Page
A.C.S. Radio	3
Automatic Coil Winder & Electrical Equipment Co., Ltd.	Cover ii
British Mechanical Productions, Ltd. (Clix)	2
Brookes Measuring Tools	65
Brown, S. G., Ltd.	16
Candler System Co.	3
Day & Elliott	65
Electradix Radios	54
G2CR Radio Construction Service	54
G5NI (Birmingham) Ltd. (Radiomart)	1
GW8WU Wholesale Radio Supplies	54
International Majestic Radio Corp., Ltd.	54
Mullard Wireless Service Co., Ltd.	Cover ii
Oliver Pell Control Ltd. (Varley)	65
Peto-Scott Co., Ltd.	2
Premier Radio	53
Quartz Crystal Co., Ltd. (Q.C.C.)	2, 45
Standard Telephones & Cables, Ltd.	16
Stratton & Co., Ltd. (Eddystone)	15
Television and Short-Wave World	Back Cover
Webb's Radio	Front Cover

HEADQUARTERS STANDING NOTICES

Licence Facilities

Considerable time will be saved if Home members approach their D.R. or T.R. for advice regarding the extension of licence facilities. Such enquiries should in all cases be *accompanied with a stamp for reply*.

Members are asked to note that the Council can only recommend the following facilities.

(*a*) *An increase in power from* 10 *to* 25 *watts.*—Members must apply to Headquarters for a special form which must be returned in accordance with the instructions given thereon. Applications for this facility can only be considered after a member has been licenced for six months.

(*b*) *An increase in power to* 50 *watts.*—Members must submit a detailed technical application, *in duplicate*, to their District Representative and must give an assurance that crystal control or some other method of frequency stabilisation will be used. Applications can only be considered after a member has been licenced for twelve months.

(*c*) *Permission to use the* 3·5 *Mc. Band.*—Members must submit a technical application *via* their District Representative, and must give an assurance that crystal control or some other method of frequency stabilisation will be used. Applications can only be considered after a member has been licenced for twelve months.

The Society cannot obtain special facilities such as Field Day or Portable permits except as from time to time announced in this Journal.

Permission to use the 60 Mc. band and all other similar facilities must be applied for by direct application to The Engineer-in-Chief, Radio Section, G.P.O., " Armour House," London, E.C.1.

The Society cannot assist members to obtain either an Artificial Aerial or Radiating Licence, but D.R.'s and T.R.'s will at all times be glad to give private advice.

* * *

Unlicenced Operation

From time to time we are asked by members to insert a notice in this Journal to the effect that their call sign has been pirated. We would point out that no useful purpose whatever is served by giving publicity to this information. The correct procedure is to inform the G.P.O. of the facts, submitting such evidence as may be available.

Before hastening into writing members are urged, to satisfy themselves fully that it is *their* call which has been pirated. Misread telegraphy calls, and, more frequently, incorrectly logged telephony calls, are responsible for much of the supposed illegal operation.

W.B.E. and B.E.R.T.A. Claims

Unavoidable delays in dealing with these claims will occur unless members adhere to the rule which states that a guarantee must be given that licenced power has not been exceeded in making the contacts upon which the claim is based.

Cards confirming contacts made with N.F.D. stations cannot be allowed to count for B.E.R.T.A. and W.B.E. claims.

* * *

W.A.C. Claims

W.A.C. certificates can only be issued to Home members after approval by R.S.G.B. Headquarters. Cards should be sent by registered post, and stamps enclosed for their return. After approval, I.A.R.U. Headquarters are notified, and the certificate is issued direct from their offices at Hartford, U.S.A. A period of six to seven weeks usually elapses between the date of approval and receipt of the certificate.

* * *

B.E.R.U. Contest Contacts

Members who have been unable to obtain confirmation (in the form of QSL cards) of contacts made with British Empire stations during recent B.E.R.U. Contests may apply to Headquarters for proof of contact.

The following conditions govern this arrangement :—

1. Members may only apply for confirmation from stations in Dominion Districts and Colonies from which they have had no previous QSL.

2. Members must themselves ascertain, by examining the contest report, that an entry was accepted by the Society from the overseas station concerned.

3. Members must prepare a card worded in the following manner :—

" This is to confirm that your station was in contact with (name of station) at ..... G.M.T. ..... 193..... when your signals were recorded on his B.E.R.U. Contest log as RST....."

This postcard must be self-addressed and stamped and forwarded under cover to the Secretary-Editor, who will, if the contact is confirmed, sign the card.

The postcard will additionally carry an impression of the Society's seal.

4. Contacts can only be checked back for a period of two years, e.g., during 1939 a member may ask for contacts made in the 1938 and 1939 Contests to be checked.

G2GM.—G. O. MARSH, 26 Dulwich Wood Avenue, London, S.E.19
G2OK—E. A. C. JONES, 6 Gatcombe Road, Tufnell Park, London, N.19.
G2QH.—C. HEWINS, 53 Park View Crescent, New Southgate, London, N.11.
G2RF.—H. D. BRAMWELL, 31 Stand Park Road, Childwall, Liverpool.
G2TM.—W. P. MITCHELL, 111 Roe Lee Park, Blackburn, Lancs.
G2TP.—C. W. ANDREWS, 19 North Rocks Road, Paignton, South Devon.
G2TT.—A. BLOW, 36 Carterhatch Road, Enfield Highway, Middlesex.
G2XU.—D. CARR, 23 Highfield Road, Churchtown, Southport, Lancs.
GM3DW.—R. M. BANGAY, No/5 F.T.S., R.A.F. Lossiemouth, Moray, Scotland.
G3GY.—J. V. NEWSON, 19 Brushwood Drive, Chorleywood, Herts.
GM3ND.—MAJOR A. THALLON WOOD, 181 Dunnikier Road, Kirkcaldy, Scotland.
G3NQ.—W. J. BARKER, "Hillrise," Courtlees, near Whitstable, Kent.
G3PY.—S. TORKINGTON, 113 Station Road, Hadfield, near Manchester.
G3WU.—H. SMITH, 13 Oslo Road, Burnley, Lancs.
G3ZM.—F. C. MOORE, 27 Midland Street, Nelson, Lancs.
G4BI.—L. J. PHILPOTT, 30 Bradgate Hill, Markfield Road, Groby, Leicester.
G4BP.—SCARBOROUGH SHORT-WAVE SOCIETY, 16c Gladstone Lane, Scarborough.
G4DI.—J. E. LE B. TERRY, Luccombe Hill, Shanklin, I.O.W.
G4HC.—H. WATLING, 15 Lucas Road, Colchester, Essex.
G4HJ.—H. A. W. JONES, "St. Louis," North Street, Nazeing, Essex.
G4IC.—R. A. CLARKE, 10 St. Vincent's Road, Dartford, Kent.
GM4II.—J. C. ROBERTSON, 67 West Nile Street, Glasgow.
G4IK (VS7RF).—R. A. F. FARQUHARSON, Kingsdon Manor, Kingsdon, Taunton, Somerset.
G4IT.—E. H. PAULTON, "Inglewood," The Plantation, Worthing, Sussex.
G4JK.—G. WHITESIDE, Buncer Lane, Blackburn, Lancs.
GM4JR.—J. ATCHESON, 15 Merrick Gardens, Glasgow, S.W.1.
G4JW.—J. R. PETTY, 79 Glebe Road, Sheffield, 10.
G4JX.—A. MILLER, 215 Victoria Avenue, Princes Avenue, Hull, Yorks.
G4KB.—A. Baker, 31 Moorsyde Avenue, Sheffield, 10.
GW4KQ.—H. J. PHILLIPS, 132 Clare Road, Grange, Cardiff, South Wales.
G4KS.—N. A. OWEN, 1 Acol Crescent, South Ruislip, Middlesex.
G4KT.—J. BOLTON, 6 Ash Street, Blackburn, Lancs.
G4KW.—G. JONES, 46 Hobart Street, Sheffield, 11.
G4KY.—S. C. HARVEY, 141 Elm Park, Brixton Hill, S.W.2.
G4LI.—H. E. LEDAIN, "Burcott," La Mare, Samares, Jersey, C.I.
G4LO.—G. W. FISH, Lancaster Cottages, Northwold, Thetford, Norfolk.
GW4LK.—R. FOSTER, 15 Park Drive, Cardiff Road, Newport, Monmouthshire.
G4LQ.—H. J. BARLOW, 8 Harton Avenue, Gorton, Manchester, 18.
G4LX.—L. GORDON SPENCER, 43 Rokeby Drive, Newcastle-upon-Tyne, 3.
G4MB.—J. L. BOWES, 20 Broomfield Road, Bexleyheath, Kent.
G5CV.—DOUGLAS WALTERS, "Lymebury," 4 Manor Road, Harrow-on-the-Hill, Middlesex.
GW5KJ.—K. MORTON EVANS, Llangennech Park, Carmarthenshire.
G5LT.—J. W. GOODLAD, "The Doreys," Medstead, near Alton, Hants.
G5RP.—E. WAKE, "Old Gaol House," Abingdon, Berks.
G5XL.—H. P. TOWNHILL, 62 Moorland Avenue, Lincoln.
G5ZI.—J. R. FENNESSY, 65 Balmoral Drive, Southport, Lancs.
G6BM.—D. W. MILNE, 27 Queen's Road, Little Sutton, Wirral, Cheshire.
G6TZ.—R. BOTTOMLEY, 108 Erithway Road, Green Lane, Coventry, Warwickshire.
G6UB.—S. W. J. BUTTERS, 5 St. Aubyn's Road, Eastbourne, Sussex.
G8BI.—R. A. BUTTERWORTH, 896 Middleton Road, Chadderton, Oldham, Lancs.
G8HA.—J. H. EMMERSON, "Green Gates," Burwood Park, Walton-on-Thames, Surrey.
G8HF.—A. G. LAWS, 1 Furzehatt Villas, Plymstock, Plymouth, Devon.
G8IJ.—R. H. FARR, c/o Mrs. Richardson, "Helvellyn," Hookfield Lane, Bridgnorth, Salop.
G8QX.—K. HOPKINSON, B.Eng., "Thornton House," 17 Beatrice Avenue, Felixstowe, Suffolk, and at "Daisy Bank," Killamarsh, near Sheffield.
G8SD.—R. A. SIMPSON, "Esses Don," Harworth Road, Blyth, near Worksop, Notts.
G8ST.—P. D. G. FRAZER, "Meadow Cottage," Hemingford Grey, Hunts.
G8UJ.—T. C. WHIMSTER, "The Green," North Featherstone, near Pontefract, Yorks.
G8VD.—C. PLUMMER, 77 Petherton Road, London, N.5.
2ABC.—R. A. LEDGERTON, 64 High Road, Woodford Bridge, Essex.
2AMJ.—GEORGE RAAHAUGE, "Wavertree," Wolfreton Lane, Willerby, East Yorks.
2APT.—W. LEIVERS, 9 Beardall Street, Mansfield, Notts.
2ATW.—D. C. AMBLER, 1 Friendly Street, Friendly Fold Road, Halifax, Yorks.
2AVW.—R. W. BRITTON, 6 Bothall Terrace, Stakeford, Choppington, Northumberland.
2BAJ.—H. ODLE, 41 Perham Road, London, W.14.
2BIC.—N. H. MEANWELL, 31 West Road, Caister-on-Sea, Norfolk.
2BLT.—T. DWYER, Halifax Road, Greenoside, Sheffield.
2BXJ.—ARTHUR F. THOMPSON, 5 Audley Street, Great Yarmouth, Norfolk. (Reported incorrectly in June BULLETIN.)
2CBB.—H. R. HATCH, 1 Delcombe Avenue, Worcester Park, Surrey.
2CBG.—C. GUEST, 440 Glossop Road, Sheffield, 10.
2CCK.—P. KING, 348 Blackfen Road, Sidcup, Kent.
2CNC.—E. BANKS, 14 Byron Road, St. Helier, Jersey, C.I.
2DGW.—H. HOLLOWAY, 141 Eleanor Cross Road, Waltham Cross, Herts.
2DXN.—D. WELCHMAN, 75 Frome Road, Trowbridge, Wilts.
2FOV.—J. D. CAIRNS, "Rose Bank," Well Road, Bridge of Allan, Scotland.
2FTG.—R. JOHNSON, 11 Perry Mansions, Catford Hill, London, S.E.6.
2HCB.—H. S. MARSHALL, 15 Quarry Rise, Tonbridge, Kent.
2HCS.—D. TAYLOR, 37 Acacia Avenue, Hale, Cheshire.
2HDI.—G. M. WITKINS, "Stoneacre," Cote Park, Westbury-on-Trym, Bristol.
2HDN.—B. H. SMITH, "Southdown Cottage," Medstead, near Alton, Hants.
2HDZ.—A. E. BREESE, "Blue Haze," Highfield Avenue, Pinner Middlesex.
2HFQ.—H. W. EAGLAND, 2 Lord Street, Slaithwaite, near Huddersfield, Yorks.
Cancelled.—2AAA, 2AFO, 2AOI, 2BCX, 2BQB, 2CGZ, 2CRM, 2CZO, 2DJD, 2DJH, 2DMM, 2DNV, 2DOG, 2DPJ, 2DTC, 2DUT, 2FCY, 2FDJ.

When sending in a new, or changed address to Headquarters, members are requested to print their names and addresses in block letters. Frequently signatures and names of streets are illegible, which necessitates reprinting the corrected address in the next issue.

Cambridge Conventionette

HELD on Sunday, July 2, the Cambridge Conventionette drew an attendance of 54 members and wives—a rather considerable drop on that of last year. Whether this was due to the international situation, the holiday season, or some other cause it is difficult to say, but certain it is that those who attended had a really enjoyable day.

G5BQ and 5JO (D.R. and T.R. respectively), who were first to arrive at the place of assembly were quite surprised to find the Market Place (usually quiet on a Sunday morning) really crowded. It transpired, however, there was a broadcast service

from Great St. Mary's nearby, and they soon realised that no records had been broken after all! By the time G6CL, G8KZ and his merry men from London had arrived, we were ready for a move off on a tour of the Colleges.

The District owes a debt of gratitude to Mr. David Holt, M.A., Mr. Hutt, and Miss Stubblefield, who so kindly acted as guides. By their enthusiasm, and painstaking manner, they made their respective parties wish that there had been time for more—much more.

Following the luncheon held at the University Arms Hotel, with the D.R. in the chair, Mr. Jones (G5JO) proposed the toast of the R.S.G.B. and in his reply "Clarry" gave a review of arrangements for the London Convention in September, and recommended that Chelmsford be the venue for the next Eastern Counties meeting. He then presented the District DX Trophy, with replica, to Mr. L. W. Jones (G5JO), and that for the 14 Mc. section to Mr. Gerald Jeapes, (G2XV). Mr. St. Johnston (G6UT) proposed the toast of District 8, to which the D.R. responded. The party afterwards adjourned to Parker's Piece for a group photograph.

The afternoon was occupied with a river trip to Clayhithe and in spite of a rather cold wind this proved to be most enjoyable. It seemed a pity however that the "Duchess" had no radio gear with so many capable operators on board! By the time the hotel was reached again we were ready for tea.

There only remained the round of station visits, and those who had made the journey from distant places such as Loughborough, Nottingham, and Beccles, had perforce to leave early.

Altogether a most enjoyable meeting, but it is a great pity more people could not find it convenient to visit Cambridge this year. S. J. G.

SUNSPOTS, MAGNETIC STORMS—

(*Continued from page 12*)

associated with chromospheric eruptions on the sun.

In conclusion, the author would like to point out that the preparation of this article would not have been possible but for the enthusiastic way in which the 28 Mc. Propagation Sub-Groups took up the Character Figure Scheme and so supplied a reliable and continuous record of conditions on that frequency during the past winter. The writer's thanks are particularly due to Miss N. Corry and Mr. T. A. Iserbyt, the Group Centres.

EXPERIMENTAL TECHNIQUE—

(*Continued from page 29*)

to the amateur is its adaptation for angular measurement, particularly on frequency meter dials. To get the best out of any well-made frequency meter, a dial fitted with a vernier should be used, as the accuracy with which the meter can be calibrated is increased considerably.

Measurement of Time

Time is a unit which is not required to be measured very often in radio, but when it is needed a good electric clock will serve as a standard sufficient for most needs. It should be fitted with a seconds hand, but it cannot generally be used as a stop watch by breaking the current, because the movement does not stop abruptly, but gradually slows down.

Electrical Measurements

All instruments used for measuring electrical units are primarily current measuring instruments, hence the possession of a good milliammeter serves as the foundation on which several instruments can be built. No amateur doing serious experimental work can afford to be without a multi-range meter in addition to the instruments he may already use in his transmitter. It is usual to construct this around a 0–1 mA. meter, but there is a good deal to be said for using an even lower reading meter, say 0–250 microamps. In addition to having a lower current drain for voltage measurements a greater degree of accuracy can be obtained when the meter is used in null experiments.

For direct current measurements only instruments of the moving-coil type should be considered, as they are capable of more accuracy, are obtainable in low reading scales, and have a total resistance much lower than the moving-iron type. If they are to be used on alternating current, a rectifier is necessary, which decreases their accuracy, but even then the moving-iron types are no more accurate. It should be noted that it is more difficult to measure alternating current accurately than direct current, so whenever possible, measurements should be made of the latter quantity.

(*To be continued.*)

B.E.R.U. CONTESTS—

(*Continued from page 33*)

with reference to the various "grouses" or otherwise they had in regard to the conditions under which the contests were run. These views are always welcome, and have been read with interest, for it is only from such expressions of opinion from a number of members who have actually had experience of the contests that modifications of rules and conditions for future events can be made with the certainty that they will enjoy some measure of popularity.

EXCHANGE AND MART—

(*Contd. from Back Cover*)

EXCHANGE AND MART.

Advertisement Rates

MEMBERS' private advertisements 1d. per word, minimum 1s. 6d.
TRADE advertisements. One inch Semi-Display (max. 50 words), 10s., half inch (max. 25 words), 5s. TERMS: Cash with Order. All copy and payments to be sent direct to Advertisement Managers, Parrs Advertising Ltd., 121 Kingsway, London, W.C.2, by not later than the 30th of the month for the following month's issue.

BEST BRITISH MAKES.—Transformer 550 volts 250 mils., 15s. Double Filament 7·5 and 5 volts both at 4 amps., 5s. 6d. Filament 6·3 volts 6 amps., 6s. Swinging choke 250 mils. 25·5 Henries, 9s. Filter choke 30 Henries 150/200 mils., 5s. Condensers 6 mfd. 800 volts wkg., 3s. 6d. each. P.A. coils for 40, 20, and 10, 6s. 6d. the set. R.C.A.801 little used, perfect 12s. 6d. American Microphone Co. Carbon Mike on table stand, new 14s. Many other components for low and medium power. Send inquiries to G5BW, Willingdon, Eastbourne.

CRYSTALS, 1·7 and 3·5 Mc., 5s. each, all tested and guaranteed.—O.K. RADIO, G6MY, Morley, Leeds.

DETECTION. New theory, circuits, diagrams and experimental evidence. Book 2s., post free. —BRS1879, D'ARCY FORD, Gandy Street, Exeter.

FOR SALE.—Complete 10 and 20 metre C.W. transmitter. W.A.C. using 6L6G, T.20, T.20, T.40 Tubes 650 and 1,000 volt Power Packs, Hoyt Meters, all in large Eddystone Rack. Space for Speech Amplifier and Power Pack. Recently constructed, all new and finest grade components. Can be seen at any time. Bargain, £25.—W. W. HUNTER, Regent Street, Swindon, Wilts.

FOR SALE. Ferranti flush mounting meters 50 mA., 15s. Everrit flush 100 mA., 17s. 6d. Elliott surface 150 mA., 12s. 6d. G.E.C. surface 200 mA. with new dial and movement, £1. Morse tape recorder, £1. Ex-Navy Key very F.B., 30s. Ferranti 5·50–250 voltmeter 1,000 OPV, 21s. Philips Tubular converter 240 v., 12s. 6d. G.E.C. Rotary 240 VDC in 160 v. 2 phase 200 watts out, £5. Nearest offer secures.—2B2K, 81 London Road, Newbury, Berks.

FOR SALE. Philco II, Valve 5-band, 13–550 metres continuous. Speaker and S.G. Brown phones, type F, with external volume control "Matchall" Unit, £8 8s. or nearest.—BRS. 2797, Meadow House, Fakenham, Norfolk.

G5KT.—Outstanding QSL's. Trial order will convince you cannot do better. Samples. State AA, G, BRS, SWL.—33 Howard Road, Westbury Park, Bristol, 6.

G6DS.—Known the world over for quality. QSL Cards and Log Books. Send for samples. —QRA, 14 Lambley Avenue, Mapperley, Nottingham.

HALLICRAFTERS SX23, £33 10s. Guaranteed brand new. Unwanted present, unboxed £30 or nearest.—G5ZT, 69, Ribbleton Avenue, Preston.

NATIONAL 1–10 Receiver, less power pack. Hardly used. Speaker jack and plug-in power lead connection. All coils. £13 10s. Ex.—BERS41, 9 French Road, Catterick Camp, Yorks.

NATIONAL HRO SENIOR AS NEW, plus replacement set of ten RCA Tubes, in sealed cartons, and WB.PM. Speaker, £40 the lot. Universal Avominor, 50s. Two RK23, unused 19s. each. Two RK23, part used, 12s. 6d. each. Wearite Transformer 350 v. H.T. with L.T.'s, shrouded, 10s. Cyldon split-stator high-power 100 × 100, 11s. 6d. Turner MC 0–100 milliammeter, 12s. QCC plug-in dustproof crystals 7056, 7166, 7270, 11s. 6d. each. Lissen Hi-Q switched coil unit, unused, 7s. 6d. Cardwell Neutralising NA-5-NS (for T50 etc.) 6s. 6d. Send for List to E. H. PAWSON (G8AP), Scawby Brook, Brigg, Lincs.

OLDTIMER-G6MN for 1st Grade Clear Type QSL's and Log Books. Send for Samples. G, AA, BRS.—G6MN, Worksop.

QSL's.—250, 4s. 6d. 1,000, 9s. Post free. Samples gratis. State whether BRS, AA.— G. ATKINSON BROS., Printers, Elland.

RF 60 Watt TX. Built by Raymart. Double smoothing pack, coils for 3 bands, valves etc., cost £15 10s., 4 months old, cash wanted, no reasonable offer refused.—57 Briarlands Avenue, Sale, Cheshire.

SALE.—10–50W.C.W.Tx.6L6–809 Oak Rack, Screened, Super D.X. Rig, worked 82 countries, R8WAC. Bargain, need dough, £9 10s.—G8IW, Woodhouse, Sheffield.

"THE FINISHING TOUCH." Confirm QSO. with a "Ham-Aid" QSL. Samples from G6XT.—TILLOTSON BROTHERS, Commercial Street, Morley, Yorks.

TOBE DEUTCHMAN Communication Receiver in standard steel cabinet. B.F.O. headphone, jack, etc. Loudspeaker in separate cabinet. Excellent condition. First offer £9.—G6VQ, 22 Mythop Road, Lytham, Lancs.

UNUSED SURPLUS EQUIPMENT, valves, etc. For sale. Stamp for details.—2AVJ, 1 Rugby Avenue, Wembley.

WANTED.—Superheterodyne Communications Receiver with Radio-frequency Amplification and covering 10 to 550 metres. Please write giving full details and lowest price, to G8VU, 349 Wilbraham Road, Manchester, 16.

(*Continued on previous page*)

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