THE T. & R.

BULLETIN

THE INC. RADIO SOCIETY OF GREAT BRITAIN

AND THE BRITISH EMPIRE RADIO UNION

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THE INCORPORATED

Radio Society of Great Britain

AND THE

British Empire Radio Union

53, Victoria Street, London, S.W.1 (Phone: VICTORIA 4412)

Patron: H.R.H. THE PRINCE OF WALES, K.G.

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Honorary Secretary:
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Provincial District Representative on Council:
H. B. Old (G2VQ).

COUNCIL:
J. W. Mathews (G6LL).
H. C. Page (G6PA).
T. A. St. Johnston (G6UT)
J. C. Watts (BRS246).

R.S.G.B. CALENDAR

Unless otherwise announced all meetings are held at the Institution of Electrical Engineers, Savoy Place, W.C.2, commencing at 6.15 p.m. Tea is served at 5.30 p.m.

October 23.—Lecture on "Aerials" by F. Charman (G6CJ).

November 27.—Lecture by The Westinghouse Brake and Saxby Signal Co., Ltd., on "Rectifiers and Radio Work."

December 22.—Annual General Meeting.

January 22.—Lecture by The Cosmos Lamp Works, Ltd., on "The Development of the Pentode."

The T. & R. Bulletin.

(*Published on the 14th of the month.*)

Hon. Editor: G. W. Thomas (G5YK).

Editorial Committee: A. W. Alliston (G5LA), J. D. Chisholm (G2CX), A. D. Gay (G6NF), J. W. Mathews (G6LL), A. O. Milne (G2MI).

Advertising Manager: H. Freeman.

All correspondence should be addressed to The Secretary (or other officer concerned), The Radio Society of Great Britain, 53, Victoria Street, London, S.W.1. Insufficiently addressed letters may be considerably delayed.

T&R

Bulletin

The only Wireless Journal Published by Amateur Radio Experimenters in Great Britain

OCTOBER, 1931. Vol. 7. No. 4

THE CONVENTION AND THE RADIO EXHIBITION

CONVENTION, 1931, proved an even more successful event than its five predecessors, thanks to the excellent support shown by our ever-growing Provincial membership. As in former years, the dates chosen (September 25 and 26) coincided with the last two days of the R.M.A. Exhibition at Olympia, and, therefore, before proceeding with a detailed account of the Convention, it is desirable for the sake of posterity, and for the benefit of our short-lived memories, to mention something of the work which was done on Stand 246.

The Society Stand at Olympia

The Stand was located in the new Empire Hall Gallery, and was considerably larger than in former years, but even with more floor space available, those who were fortunate enough to be present on any evening during the week will agree that next year an even larger stand will be necessary if we are conveniently to welcome old and new adherents to the cause. Thursday evening, September 17, saw the Editorial and Social Committee members, to say nothing of the Secretarial and Financial departments, hard at work transforming a barren forest of highly coloured woodwork into the official rendezvous of the Society at Olympia. The transmitter, short-wave receiver, monitor box, and power supply unit, which were all fully described in the last issue of the BULLETIN, were given pride of place on the front counter, whilst an attractive map showing the location of the Overseas members of the B.E.R.U. made an excellent background. Especial thanks are due to Messrs. Brookes (G2CB) and Dowsett (BRS433) for their work in preparing the map, whilst this record would not be complete without a word of high praise being given to those who constructed the special Exhibition apparatus mentioned above. To Messrs. G. W. Thomas (G5YK), H. J. Powditch (G5VL), and H. C. Page (G6PA), we are thus indebted. Two further extremely interesting pieces of apparatus were shown ; first, a specially designed short-wave receiver suitable for the reception of the projected 7-metre Broadcasts, and second, a magnificent example of a medium power C.O-P.A. transmitter designed and constructed by Mr. S. Buckingham (G5QF).

One of the most unique exhibits at Olympia was also displayed on the stand. This was one of the oldest amateur receiving sets in the country, built by Mr. Old (G2VQ) during 1919. Christened " Pussy in the Well " by its owner, it gave abundant proof of the advances made during the twelve post-war years.

Throughout the duration of the Exhibition, Stand 246 provided one of the greatest " draws " for the public. At times it was impossible either to enter or leave, so great were the crowds. During the eight days it is estimated that 150,000 persons visited the stand, whilst nearly 10,000 copies of " What is Amateur Radio " were distributed free. As a further proof of the public interest shown in our work, about 3,000 extra copies of the September issue of the BULLETIN were sold at a reduced price.

Without the untiring help and assistance of a large number of London and Provincial members, who took over stand duties, this success could not have been achieved, and without attempting to record the names of all who assisted the following must be mentioned: Messrs. Page, Buckingham, Nepean, Old and Ostermeyer, all of whom gave up either their holidays or their business duties in order to help the Society.

Thanks are also due to our Treasurer, Mr. John Watts, Mr. St. Johnston, and Mr. A. Gay for carrying on at Olympia during the Convention meetings.

More than 300 London and Provincial members signed the Visitors' Book during the Exhibition, and many interesting personalities called at the stand. One such visitor was Mr. Rey Meyers, operator of the "Nautilus" during her recent Arctic expedition. In a message to the Convention, he thanked the Society membership for its past help, and expressed his regret that he could not be present at the meetings. Mr. Meyers was entertained on behalf of the Council by Messrs. Old and Desmond.

As in past years, many informal meetings were arranged on the stand, but for the first time a specially convened meeting of the new Empire Link Stations took place in the Addison Café, under the chairmanship of Mr. Arthur Watts (G6UN), Publicity Manager and Acting Vice-President. Many useful suggestions were made, and an outline of the methods to be adopted in handling E.L. traffic during the coming year were discussed.

The Society's Stand at the National Radio Exhibition at Olympia showing (at the counter), left to right: Mr. V. Desmond (G5VM); Mr. Rey Meyer, operator of the "Nautilus"; Mr. H. B. Old (G2VQ); Mr. S. Buckingham (G5QF); Mr. E. Y. Nepean (G5YN).

CONVENTION

The Convention Lecture.

The Institution of Electrical Engineers, the sacred shrine of the world's most famous engineers, was the venue of the opening meeting. Fortunately the International Illumination Congress Flood-lighting had still one night to run when Convention started, and our many Provincial members must have been pleasantly surprised at the sight of the somewhat drab I.E.E. building, brilliantly flood-lighted when they left.

It is fitting that we should pause for a moment to add our tribute to the memory and achievements

of that great genius, Michael Faraday, from whose experiments, a little more than a hundred years ago, wireless telegraphy traces its development. During the week preceding our Convention, his work was commemorated in speech by men of science from all parts of the world, and distinguished representatives of scientific institutions spoke of the services which Faraday has rendered to mankind. Can we not find inspiration in these " services rendered to mankind " while remembering that Faraday has often been called " the prince of experimenters " ?

Some 120 members were present when Mr. H. Bevan Swift (President) formally opened the Sixth Annual Convention. In a brief speech, he thanked the provincial members for their attendance, and expressed the hope that the progress which had been maintained in recent years would be continued in spite of the economic difficulties which exist to-day. The Honorary Secretary then formally announced the names of the new District and County Representatives.

In introducing Mr. R. A. Watson Watt—Superintendent of the Radio Research Board, Slough—the President mentioned that Mr. Watt had attained one of the highest posts in the radio world, and that he was unquestionably the leading authority on the subject he intended to lecture upon, " Atmospherics."

Mr. Watt, in opening, reminded members that he had on many past occasions had the pleasure of lecturing before the Society, and expressed the hope that as a result of his present lecture some means might be found whereby the members of the Society could assist the Research Board in their experimental work.

It is not possible in this account to mention details of Mr. Watt's absorbing lecture, but a full report will appear, if possible, in the November BULLETIN.

A very interesting discussion followed, which was contributed to by Messrs. Griffiths, Marcuse, Gay, Page, Clarke, Megan, Noden, Corsham, Phillips, Charman, Jackson, and Clarricoats. The latter, in thanking the lecturer, offered on behalf of Contact Bureau the full support of the Society in any direction which the Research Board might suggest.

The President moved a very sincere vote of thanks to Mr. Watt, which was given with acclamation.

CONVENTION, 1931
(At The Institution of Electrical Engineers, September 26).

The Charabanc Parties.

Following the meeting, charabanc parties were made up to visit the stations of Mr. J. W. Mathews (G6LL) at Clapton, and Mr. J. Clarricoats (G6CL) at Friern Barnet. Over seventy members took advantage of the arrangements made, with the result that many of our Provincial members were given the opportunity of discussing points of interest with the London members who had accompanied the parties. Especial praise is accorded to Mrs. Mathews and to Mrs. G6CL for their work as Official Society Hostesses.

THE DISTRICT REPRESENTATIVES' MEETING

This was opened at 10 a.m., Saturday, September 26, by the President, who was supported by practically all Council members. Every English district was represented by its new D.R. with the exception of No. 8, Mr. Runeckles being unable to attend. Mr. Bryan Groom (G6RG) acted for Mr. J. Wyllie as Scotland's representative.

In accordance with the procedure adopted last year, each D.R. was invited to give a brief report outlining the past year's work in his district and to make suggestions for the future.

District 1.—Mr. Higson (G2RV) reported that the Liverpool area particularly were extremely enthusiastic. He felt confident that his new C.R.'s would infuse fresh life into parts of the district which had become dormant. He pointed out that the Cheshire membership was spread out badly, making the holding of fully representative meetings difficult. The concentrated Cheshire membership proposed holding regular meetings, probably with the Manchester and Liverpool members combined. No letter budget would be run at present.

District 2.—Mr. Parry (G6PY) reported that some controversy had arisen, due to the difficulty of deciding upon suitable venues of conventionettes. He hoped to overcome these troubles with the assistance of Mr. Whiteley (G5IA) who he proposed as C.R. for Yorkshire. He hoped to revive the letter budget which had in the past been badly supported. He proposed appointing sub-managers for the three Yorkshire Ridings in order more efficiently to cater for the members' needs.

District 3.—Mr. Desmond (G5VM) stated that considerable progress had been made in his district since the inception of the Midland Amateur Radio Transmitters' Society.

District 4.—Mr. Old (G2VQ) reported progress in his district, particularly in the direction of an increase of B.R.S. He outlined plans he had adopted for increasing interest of such members, and emphasised the necessity for the inauguration of Morse practice.

District 5.—Capt. Price (G2OP) stated that a letter budget had been run with partial success. He anticipated that his C.R.'s would decide whether such should be continued. He proposed holding a Conventionette at Weston-super-Mare next year in collaboration with District 10. He commented on the fact that Wiltshire was somewhat "dead," due to lack of co-operation between the few members and their late D.R This latter difficulty he emphasised was due only to the distance between the D.R. and the county under discussion. He mentioned that two local societies interested in amateur radio were in existence, both of whom proposed seeking affiliation. He lamented the continuation of gramophone transmissions in his district, and pointed out that all serious work on the 80 metric band was spoilt, due to harmonics from these stations.

District 6.—Mr. Bartlett (G5QA) reported that C.R.'s had now been appointed for Devon and Cornwall, but some difficulty was being experienced in Somerset and Dorset owing to the sparse membership. He hoped, however, to have these county representatives appointed in a few weeks.

District 7.—Mr. Drudge-Coats (G2DC) stated that Surrey and Kent propose organising regular meetings and will continue with letter budgets. The Hampshire and Sussex membership, owing to its scattered nature, will probably organise letter budgets later. He mentioned that his C.R.'s had expressed some surprise at the methods employed in choosing the D.R.'s. They felt it was a duty of the membership to elect such officers. He was sure, however, that when the scheme was fully explained, he would receive the loyal support of his C.R.'s. He also asked whether a copy of the Council's minutes could be sent to each D.R. and C.R., but the President pointed out that the minutes of Council meetings were private and confidential and could not be distributed. The Hon. Secretary, however, agreed to make arrangements if possible to send a monthly circular to all D.R.'s.

District 9.—Mr. Stollery (G5QV) reported that the Essex membership seemed dissatisfied with past events. He intended to concentrate on restoring confidence, and would endeavour to obtain the support of some older members who have resigned. No letter budgets were at present running.

District 10.—Mr. Forsyth (G6FO) reported that the Monmouthshire Transmitters' Society membership were discontented owing to the fact that they had not been consulted in connection with his appointment as D.R. He felt that this was a personal grievance, mainly directed against him because of his decision to prevent the continuation of local amateur broadcasting. He reported that the M.T.S. at their last meeting had threatened to resign unless Council agreed to their wishes regarding the D.R. The President stated that Council refused to be intimidated by a small section which comprised a number of dealers interested in the broadcasting of music and transmissions. The resignations would be accepted by Council. Mr. Forsyth was assured by the President that he could expect the full support of Council. Mr. Forsyth also mentioned that the Glamorgan C.R. had objected to his county being placed under District 10. It was, however, pointed out that amateur interest had made practically no progress under the old scheme whereby Wales was considered a separate country. Council had therefore decided to place South Wales and Monmouth under the control of Mr. Forsyth who, in their opinion, was the most suitable person to represent the Society.

Mr. Forsyth stated that Mr. Harding had resigned his position as C.R. for Monmouth, and that Mr. Briggs had only agreed (as chairman of M.T.S.) to take office on condition that Council accepted the M.T.S. demands. The President stated that a new C.R. would be appointed by Council.

Mr. Forsyth stated that his future plans were indefinite, but he intended to encourage interest

in R.S.G.B. along the right lines by commencing a new letter budget and by giving Morse practice. He asked whether the BULLETIN could be sold on the news stands. The President stated that many difficulties presented themselves. He personally considered that the BULLETIN should be treated as a private record of proceedings, but agreed that Council would examine the possibilities. Previous attempts in this direction had been abortive.

District 12.—MR. S. BUCKINGHAM (G5QF) reported that a letter budget was being successfully run, that regular meetings were being organised and slow Morse practices transmitted for the benefit of B.R.S. members.

District 13.—MR. A. GAY (G6NF) mentioned that he had accepted office temporarily. He pointed out that South London was probably the most active district in England and therefore required the full attention of the D.R. He felt that some apathy exists at present, but hoped to overcome this by regular meetings and the continuance of a letter budget. He proposed to transmit a monthly bulletin on the 1.7 M.C. band. He supported the suggestions *re* Morse practices; further, he proposed to follow up all new members with a view to assisting them to obtain full benefits of membership.

District 14.—MR. T. A. ST. JOHNSTON (G6UT) said that he had made every endeavour to hold and obtain members. The monthly meetings have been an unqualified success. B.R.S. members are being assisted in every possible way. He recommended D.R.'s to follow a recent experiment tried in his district. A set listening period on a particular waveband is chosen, and stations in the district are asked to log all stations heard during the period and turn in a complete log to the D.R., which is then passed round to all reporting in the form of a budget. No letter budget is run as the monthly meetings serve the purpose. He wished to record that the members of No. 14 District showed full appreciation of the work done by the Honorary Editor and the Hon. Secretary.

District 15.—MR. H. WILKINS (G6WN) reported that monthly meetings and a letter budget have been run most successfully. His district is one of the most active in the country.

Scotland was represented by MR. BYRAN GROOM (G6RG) who read a lengthy report from Mr. Wyllie, in which he explained in detail the position of the Scottish membership.

The President requested Mr. Groom to convey his personal thanks and those of the Council to Mr. Wyllie for his report, and also for his continued support as honorary Scottish manager.

Discussion.

A general discussion on the D.R. reports followed, and the following concrete proposals were adopted :—

1. Regular Morse transmissions would be organised by the D.R.'s. The Hon. Secretary to collaborate with them in the preparation of a fixed schedule to be published monthly in the BULLETIN. Wavebands, times and speeds to be fixed mutually.

2. A monthly circular will be prepared, if possible, by Headquarters and sent to all D.R.'s.

3. Mr. Whiteley (G5IA) was appointed C.R. for Yorkshire.

4. D.R.'s would use their influence in obtaining new members. The following avenues were suggested :—

a. Men's and Boys' Clubs.
b. Public, Secondary, Technical, Elementary and Private Schools.
c. Boy Scout Clubs.
d. Press notices of meetings and invitations to the Press to visit stations and attend meetings.
e. Organise reception tests.
f. Follow up letters received from broadcast talks.

(In this connection the Hon. Secretary handed some 200 letters to the D.R.'s which had been received after his last broadcast from London.)

g. Follow up listeners' reports on transmissions.

Letter Budgets.

After general discussion the President suggested that in future the organisation of letter budgets be regarded as a local matter which should be left in the hands of the D.R. and his C.R.'s. The meeting agreed.

Conventionettes.

The Hon. Secretary asked that each Provincial D.R. should provisionally settle upon the date for his next Conventionette, as it had been found in the past that these events had been arranged without previous consideration of other districts' activities.

The following dates were *provisionally* agreed upon :—

District.	Date.	Venue.
1. ...	Oct. 31, 1931	Manchester.
2 ...	Nov. 28, 1931	—
3 ...	March —, 1932	Birmingham.
4 ...	June 19, 1932	Nottingham.
5 and 10	April —, 1932	Weston.
6 ...	May 15, 1932 (Whitsun)	Torquay.
7. ...	June 5, 1932	—
8 and 9	March 27, 1932 (Easter)	Clacton.

The Business Meeting.

About 150 members were present at 2 p.m. on Saturday afternoon when the business meeting was opened by the President. Messages of greeting were read from R.T.U. (Northern Ireland), DASD (Germany), OK2SI, G5YG, OZ7K, VS3AC, HAF1G, ST2D, and Mr. Reg Meyers, operator of the *Nautilus*.

A pleasing ceremony marked the opening of the meeting when the President presented a handsome silver salver to Mr. Marcuse in recognition of his work on behalf of the Society. Mr. Marcuse, in thanking the members, said that he would always serve the Society to the best of his ability.

The presentation of Society trophies followed. Mr. H. B. Old (G2VQ) and Mr. Bartlett (G6RB) receiving the Rotab and Wortley-Talbot Challenge Trophies respectively, whilst Mr. R. D. Scott accepted, on behalf of Station EI7C the 1.75 M.C. transmitting trophy. Miss Dunn (G6YL) was not able to be present to receive the 1.75 M.C. receiving trophy which she had won for the second year in succession.

The Blank trophy was presented to Contact Bureau Group 8A. Messrs. Varney (G5RV, Group Centre), Bott (G5VB), Hunter (G2ZQ), Buttress (G6MB), Walters (G2WP) and Goodliffe (G6LF).

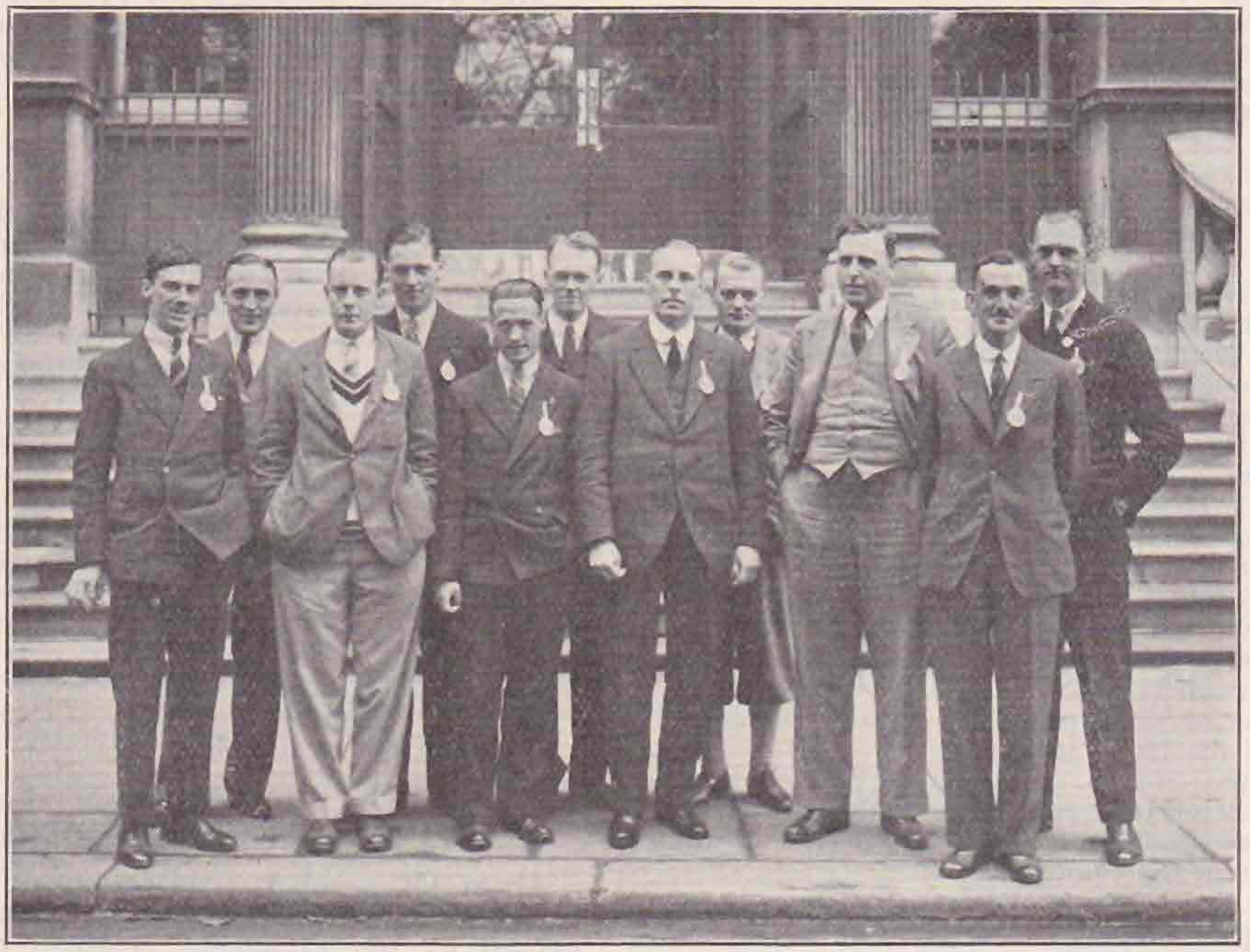
The Somerset 5-metre wavemeter was awarded to Mr. A. Forsyth (G6FO) for his article dealing with aerials.

Facsimiles of the Rotab Cup were handed to Messrs. Miles (G5ML ; winner 1930) and Old (G2VQ) whilst similar facsimiles are to be forwarded to Messrs. Runeckles (winner 1930) and Bartlett (G6RB).

The Powditch award of radio goods valued at £2 2s. was awarded to Mr. S. Cutler (G2OL) winner of the QRP tests.

The Hon. Secretary then outlined the results of the D.R.'s meeting, and assured the membership that the suggestions would be put into effect to the best of the Council's ability. He appealed to the assembly to extend interest in amateur radio and outlined various methods whereby new interests might be found. He asked members to give the Hon. Editor their support, and advised the meeting that Mr. Whiteley had been appointed C.R. for Yorkshire. The list of provisional conventionette dates was given, and suggestions made that more members be invited to county and district meetings. In reply to a question regarding membership, he stated that since January 1, 1931, the total membership had increased by 16 per cent., representing **315** new members elected in the first nine months, against 157 and 211 in the corresponding periods of 1929 and 1930. During the first six months of 1931, only 43 home and 27 overseas members had fallen out of membership, the majority of whom had lost interest in amateur radio for personal reasons. The Secretary estimated that the membership would reach the 2,000 mark during the early part of 1933.

Comments were made by Mr. Corsham (G2UV), Mr. Fuller (G6LB), Mr. Slough (G5SL), Mr. Drudge Coats (G2DC), and Mr. Milne (G2MI) on the following subjects: Delivery of QSL cards to non-members of foreign societies by the official I.A.R.U. bureau ; the Government's attitude towards Morse practice "over the air"; personal experience of Morse practices ; co-operation between H.Q.'s and the D.R.'s and Press publicity.



SOME OF THE BRITISH EMPIRE LINK STATIONS.
(CONVENTION 1931.)

Left to right :—H. V. WILKINS, G6WN; V. DESMOND, G5VN; H. A. M. WHYTE, G6WY; S. TOWNSEND, G2CJ; L. WILKINS, G6WN; R. A. BARTLETT, G6RB; ARTHUR WATTS, G6UN, (ACTING VICE-PRESIDENT AND E. L. S. ORGANISER); F. MILES, G5ML; H. B. OLD, G2VQ; CAPT. C. PRICE, G2OP; B. GROOM, G6RG.

Empire Link Stations.

Two pleasant surprises awaited the newly appointed Link Stations. Special certificates of appointment and newly designed tie-pin badges being presented to each E.L.S.

The following is a list of the E.L.S. for 1931-2 :—
Mr. Townsend (G2CJ).
Mr. Marshall (G2MA).
Capt. Price (G2OP).
Mr. Old (G2VQ).
Mr. Wilkinson (G2YU).
Mr. Brown (G5BJ).
Mr. Miles (G5ML).
Mr. Neill (G5NJ).
Mr. Desmond (G5VM).
Mr. Wyllie (G5YG).
Mr. Bartlett (G6RB).
Mr. Groom (G6RG).
Mr. Smith (G6VP).
Messrs. H. & L. Wilkins (G6WN).
Mr. Whyte (G6WY).
Mr. Owner (G6XQ).

Progress of B.E.R.U. and B.E.R.U. Contest, 1932.

Mr. Arthur Watts outlined recent progress, and reported that official representatives had been appointed for all parts of the Empire. The B.E.R.U. membership had been doubled during the past two years and shows signs of spreading rapidly. As a result of the 1931 B.E.R.U. contest he considered it advisable to recommend that the 1932 contest should extend over four week-end periods instead of during one complete week. The proposal was put to the meeting and unanimously carried.

International Policy.

Mr. Marcuse stated that during the past few days he had been advised that some attempt might be made at Madrid to wrest the whole or part of our lowest frequency band from us. He appealed to the members to use the band for genuine experimental work only, and thus show to the authorities that the band was of real scientific use to us as amateurs. He assured the members that their interests would be safeguarded to the best of the Council's ability.

Mr. Milne expressed the hope that the Society would be represented at Madrid.

Mr. Clarricoats then outlined the general policy that the Council intended to follow. He stated that the possibility of an R.S.G.B. delegate being permitted to attend the Conference was remote, but assured the members that every effort would be made to send a Society delegate to confer on the spot with the delegates from other I.A.R.U. Societies. He mentioned that he was in close personal touch with the A.R.R.R. and European societies, expressing the hope that the R.S.G.B. delegate would go to Madrid carrying the support of the B.E. radio societies. He did not propose outlining concrete proposals at this stage, but emphasised that every endeavour would be made to cultivate the official Government delegates in order to seek their support of the plans which Council were proposing to formulate.

New County and District Scheme.

The Hon. Secretary gave a brief outline of the new scheme, pointing out that the reason the D.R.'s had been appointed by Council was two-fold. First, it was essential with a growing membership to be certain that the right type of man should represent the Society in the provinces, and secondly from past experience it had been found that the country membership generally took little interest in appointments, with the result that the ultimate appointments were made by Council. He mentioned as an example the recent elections of C.R.'s. With over 40 elections to be made by the members, nominations were received from only eight counties, with the result that he personally found it necessary to approach upwards of 50 people to take over the duties. He assured the meeting that if the Council had been mistaken in the ability of the D.R.'s appointed steps would be taken to rectify matters, but he was sure that the steps which had been taken represented true progress and were necessary if the membership is to extend its activities. He mentioned with regret that a certain small group of amateurs resident in Monmouthshire had seen fit to challenge Council's right to make the appointment of D.R.'s on the lines adopted. He stated that these members intend to relinquish membership unless their demands were met. Council had reluctantly decided, therefore, that their resignations must be accepted.

Mr. Harding (G2HH) and Mr. Briggs (G2QI), both members of the Monmouth Transmitters' Society, voiced their objections, whilst Mr. Davies (G2OA) also expressed the views of some of his members that the appointments should have been made by the members. After some lengthy discussion the President closed the matter.

Telephony on the 7 Megacycle Band.

Mr. Marcuse recommended that in order to obtain permission from the P.O. to extend the 7 M.C. band out o the edges of the Washington limits, the British amateur should agree to ban telephony on this band.

After some discussion a proposal made by Mr. Megan, based on Mr. Marcuse's suggestion, was defeated. The President, in closing the item, recommended it be discussed at the next Convention if thought desirable.

The meeting then closed and the members broke up into informal parties over tea.

The Dinner.

As in former years, the well-known Pinoli Restaurant in Wardour Street was chosen as the venue for the Convention dinner. All records were broken, for more than 150 persons sat down to an excellent repast. Many distinguished and very welcome visitors were present, chief of whom were Capt. P. P. Eckersley, Mr. Hugh Pocock (Editor of *Wireless World*), Mr. Herbert Watkins (Wireless Correspondent *Daily Mail*) and Mr. Kidd (Wireless Correspondent *Daily Sketch*).

Immediately after the dinner the Chairman called upon Mr. Clarricoats to disclose the surprise item. Following the lead of 1930, he announced that over 20 radio manufacturers had offered gifts for distribution to the members. On behalf of the Society he was asked by the President to convey sincere thanks to all who had contributed. The full list of donors is as follows :—

Belling & Lee, Ltd., Chloride Co., S. S. Bird and Sons, Ltd., Westinghouse Brake Co., Redferns Rubber Works, Stratton & Co., Park Royal Engineering Co., Claude Lyons, Ltd., Burne Jones, Ltd.,

T.C.C. Condenser Co., Oliver Pell Control, Ltd., Wilkins & Wright, Dubilier Condenser Co., Celestion, Ltd., Mullards, Ltd., Chester Bros., Gambrell Bros., Reproducers & Amplifiers, Ltd., Lectro Linx, Ltd., Wingrove Rogers, Pertrix, Ltd., Quartz Crystal Co., Martin & Sons, Ltd.

Mr. Pocock also offered a year's subscription to *Wireless World*.

Much excitement prevailed during the draw for the prizes; by a remarkable coincidence the President and acting Vice-President drew lucky numbers, but both kindly agreed to include their prizes once again in the draw.

An amusing interlude occurred towards the end of the draw, when it was found that Capt. Eckersley had drawn number 186—which proved to be one of the world's most ancient crystal receivers! This is being suitably engraved for future presentation!

The toast of the evening, "The Society at Home," was proposed in a brilliant and witty speech by Capt. Eckersley, who expressed his strong sympathy with the amateur movement and offered to represent the amateurs of Great Britain at Madrid. His speech has been reported throughout the national Press, therefore no attempt will be made to quote; but judging by the vociferous burst of cheering which followed his toast, there can be little doubt that P. P. E. is regarded still as one of the radio amateurs' best friends. We were indeed sorry to hear of his "dis grid" which resulted in complete abstemiousness at a time when we should have been glad to have had him drink our health with the time-honoured English beverage! However, P. P., we thank you for your offer, and although we may still cross swords with you in the technical press, we know now that your heart is with the group of good fellows who are amateurs first and amateurs last!

Mr. Clarricoats, in responding to the toast, warmly thanked Capt. Eckersley and Mr. Pocock for their attendance, and emphasised again the necessity of telling the British public what we are doing.

The toast of "The Press" was ably rendered by Mr. Old, and replied to in a sincere and cordial manner by Mr. Pocock, who congratulated the Society on its progress, and gave his assurance that he would use his influence in every possible way in order to draw attention to the work done in the past and the aspirations we have in the future.

Mr. Gerald Marcuse gave the toast of "The Chairman," and drew attention to the sterling work Mr. Bevan Swift has done for amateur radio. He again thanked the members for the handsome silver salver presented to him earlier in the day.

Mr. Swift, in reply, said that the success of the Society depended entirely upon the loyal support of the members. He recorded his appreciations for the work done by the executive members of Council, and said it was a great honour to have been elected President of the Empire's Premier Society.

During the evening an excellent musical programme arranged by Mr. Bradley (G5BS) was carried through. Mr. Arthur Hoskins was at the piano supported by Mr. Scott Leslie, Mr. Frederick Tull, Mr. Walter Todd and Miss Doris Collett.

Thanks.

Cordial thanks are extended to Mr. Ray Barnes (BRS366) of Nottingham, for the excellent greeting cards which were available to all members; also to Messrs. Stratton & Co., of Birmingham, for the specially prepared call signs badges which were available for all members.

Individual thanks are due to Messrs Ostermeyer, Old, Page, Buckingham, Gay, Watts, Nepean and Desmond for work in the stand, and a special word of praise to Mr. Venner, of the Wireless League, for his untiring efforts at Olympia.

To our two young ladies, Misses M. Gadsden and Spence, we owe sincere appreciations for their help and assistance throughout the Exhibition period and beforehand.

Conclusion.

In concluding this record of our sixth Convention it is only necessary to add that the London members welcomed the opportunity of meeting old, and making new friends, and trust that the coming year will prove once again that this Society of ours is worthy of your loyal and sympathetic support as an individual. Remember our President's words: "We are all shareholders—as such let us respect our property."

Let our motto be: "Think and Talk Amateur Radio."

GREAT NEWS!

At the moment of going to press we are able to announce that, thanks to the untiring efforts of our Past-President, Mr. Gerald Marcuse (G2NM), the Post Office have appreciably reduced the tolerances at the edges of our bands. The new bands are (in kilocycles):

1,730 to 1,950 **14,030 to 14,370**
7,025 to 7,275 **28,050 to 29,950**
56,070 to 59,930

and we are informed that all licence holders are being notified by the Post Office.

This is splendid news and shows that the British Amateur, in spite of having to work in narrower bands than those allotted to other amateurs, has adhered to the terms of his licence and has proved to the authorities that he can be safely trusted to operate his transmitter in such a way that the conditions of the Washington Convention (1927) are respected.

It behoves all members to continue to live up to the high standard of Amateur Radio set by the pioneers of the past, and to guard zealously those privileges which have been won for us.

A SUPERHETERODYNE RECEIVER FOR SHORT WAVE RECEPTION.

By D. C. Birkinshaw, B.A., 2BFM.

THE writer has had some success recently in designing a super-heterodyne receiver of good range and selectivity, and embodying other points which are of value in short wave reception, and feeling that other amateurs may possibly be interested, humbly begs to submit his efforts for their perusal. The receiver makes use of a somewhat unusual circuit arrangement which confers important advantages.

But first we should consider what is the case for a powerful receiver ? No receiver at the moment is more endeared to the hearts of all amateurs than the simple O-V-1 arrangement, which has been developed to a high state of efficiency, and which gives such amazing results. Many of us would be most loth to give up this type of receiver. But the writer feels that the time is coming when we shall have to, not because its range is not good enough, but on the grounds of inadequate selectivity. Owing to the increase of commercial short wave stations, our part of the ether is getting gradually fuller, and although the state of affairs does not yet approach the confusion existing on the broadcast band, yet that state of affairs is being approached, and amateurs should do well to prepare themselves for it. In fact, reception of amateur signals is quite likely to be marred at the present time by a high power commercial transmitter working just outside our band.

How, then, can we improve the O-V-1 receiver ? Let us try adding a stage of H.F. We find it will work on 1.7 M.C., 3.5 M.C., and appreciably at 7 M.C. But it is a passenger at 14 M.C. and below. No doubt other amateurs have done better, but the writer must admit that that is the best he can do, and he has consequently looked round for other methods, and contends that H.F. amplification, as an improver of selectivity and range, is not at present a workable proposition for the DX amateur bands. It is quite to be expected, as tuned circuits operating at 7 M.C. and higher are naturally unselective owing to high losses.

Let us therefore change the wavelength to 500 λ or even 1,000-1,500. Then we can amplify with our broadcast receiver, which we hope is adequately adjusted to modern broadcasting conditions, i.e., is selective, and we should get adequate selectivity and power. This involves the use of the super-heterodyne principle, which the writer feels is the method by which reception on all bands will eventually have to be done.

Now, all amateurs will be aware that in super-heterodyne reception it has been established that the most convenient intermediate frequency to use is 100 K.C. (3,000 λ), and it is advisable to consider what will happen if we use a broadcast frequency, and why 100 K.C. is advocated generally. We have in a superhet to consider three main causes of interference :—

(1) Adjacent channel interference.
(2) Second channel interference.
(3) Intermediate frequency interference.

Consider (1) first. This is interference from stations working on frequencies near to that of the station we wish to receive. Let this station have a frequency F. Let the separation of frequency between that and the interfering frequency be f, then a tuned circuit operating at F.K.C. must cut out a signal which is $\frac{100\,f}{F}$ per cent. off tune. If F can be made smaller, then a tuned circuit will only have to separate a station which is a much greater percentage off tune, its task will be easier, and we shall have good selectivity. Further, when F is small, a tuned circuit designed for it has low losses and has a sharp resonance curve. Thus by

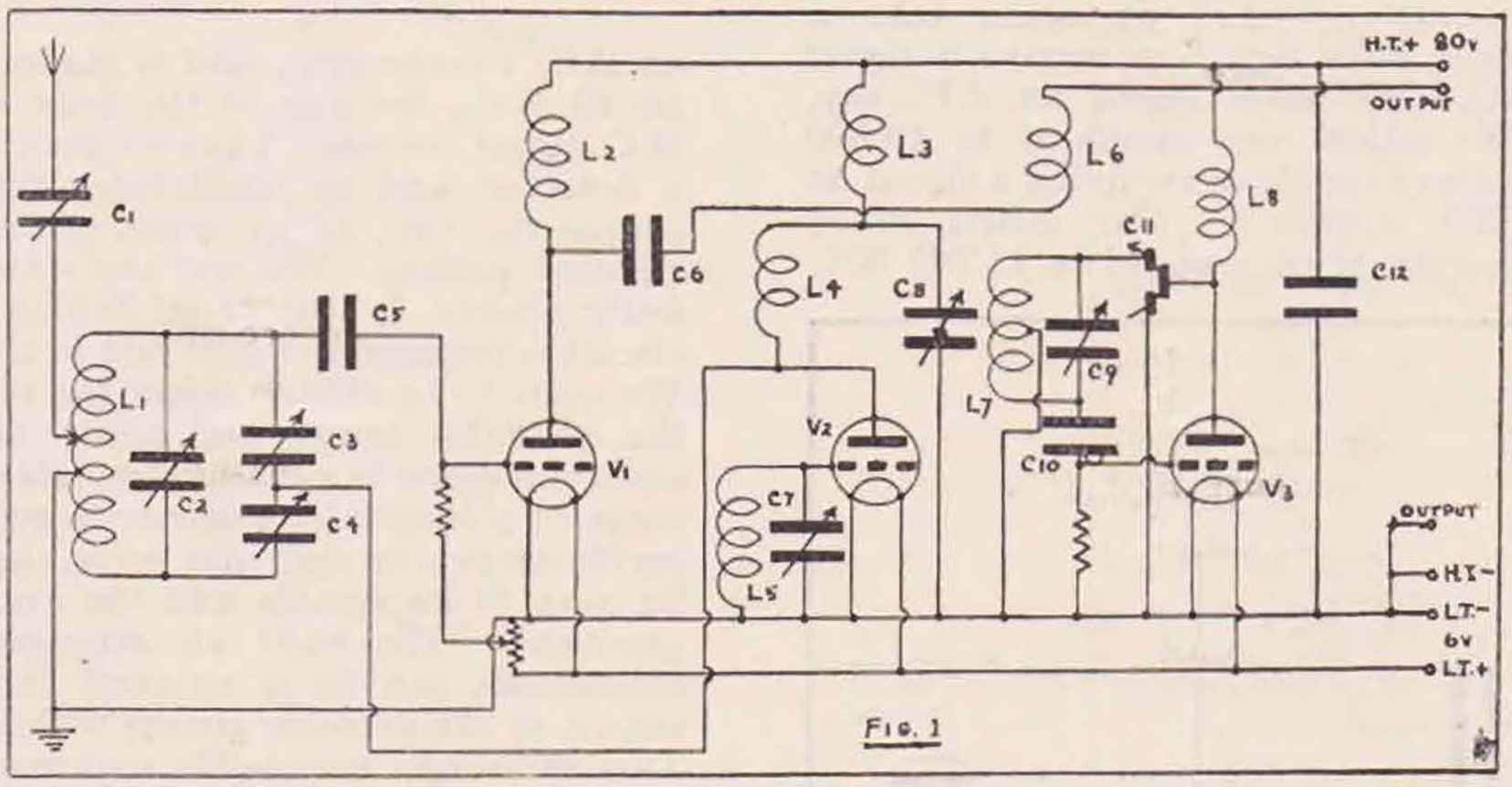


Fig. 1

making F small we get good selectivity on two accounts, and this is the cause of the great selectivity of the super-heterodyne. Let us quote a numerical example. Let F be 10 M.C. (30λ). Let a station be interfering and let it be 40 K.C. away. Then it is .4 per cent. off tune, an impossible task for a tuned circuit working at 10 M.C. to give effective separation. But let us by the superhet method change F to 100 K.C.; the interference is now 40 per cent. off tune, and has to be dealt with now by an exceedingly efficient tuned circuit. It is therefore wiped out. But this is surely better than we need. Can we not use a B.C. frequency and make use of our B.C. set? At 1,500 λ it will be 20 per cent. off tune, an easy task, and at 800 λ (600 K.C.) 6.6 per cent., also easy. Thus, although the higher the I.F. the greater the adjacent channel interference, a broadcast wave will do nicely.

Next we have to consider second channel interference, which is interference arising from the well-known fact that a superhet can receive two signals at once, i.e., it can change two original signals to the intermediate frequency simultaneously. To eliminate this the tuned circuit operating at the original frequency must be capable of separating two stations differing from each other by twice the intermediate frequency. Let us again take a numerical example. We desire to receive a signal on 10 M.C. (30λ). We have chosen an I.F., say, of 600 K.C. We adjust our oscillator to 10,600 K.C., when it is also capable of receiving a signal on 11,200 K.C. (27 λ approx.). Our initial tuned circuit must separate, then, a signal on 11,200 K.C.

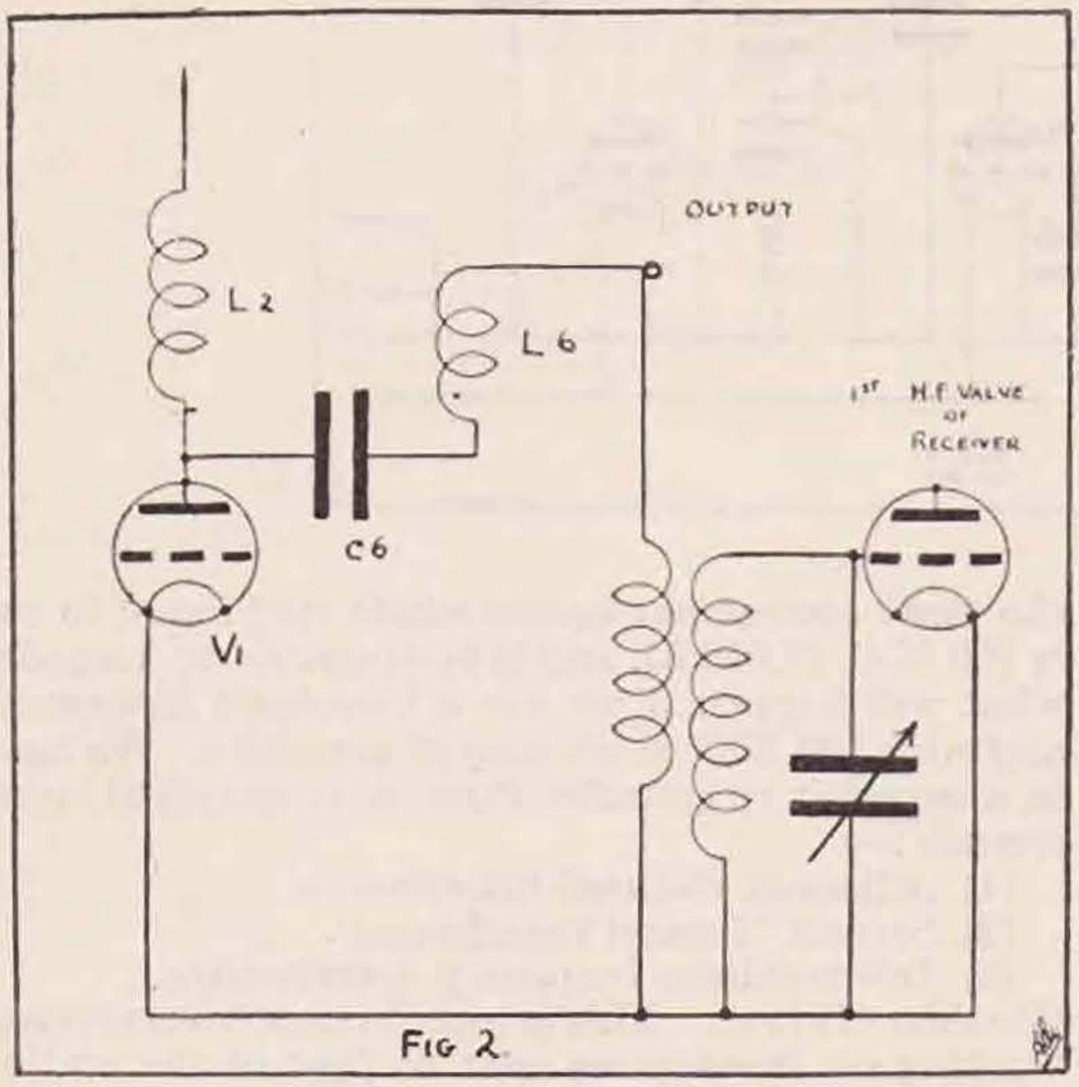


FIG 2.

from one on 10,600 K.C. Thus the higher the I.F. the greater the second channel selectivity, the reverse conditions from those applying to adjacent channel interference. We thus have to strike a happy mean, and that mean is, the writer feels as a result of his experiments, 600 K.C. for a short wave super-heterodyne, instead of the 100 K.C., which is the accepted mean for the broadcast super-heterodyne. If we used 100 K.C. our initial circuit would have to separate stations differing by 200 K.C., easy for tuned circuits for B.C. frequencies, but not so easy for 10 M.C. tuned circuits.

600 K.C. then falls nicely in the broadcast band, and we can use our broadcast receiver and need only construct a frequency changer. Now we come up against a great difficulty, one which is not serious in B.C. superhets, but is in short wave ones. It will be seen that to get rid of second channel interferences we must have one tuned circuit tuned to the original signal frequency, i.e., the aerial circuit. If we try and use our oscillator-detector valve with our tuned circuit (the aerial) tuned to the local heterodyning frequency we shall get serious second channel interference. The writer feels that, as a result of experiment, he must disapprove of any short-wave superhet frequency changing arrangement embodying only one valve. It is not good

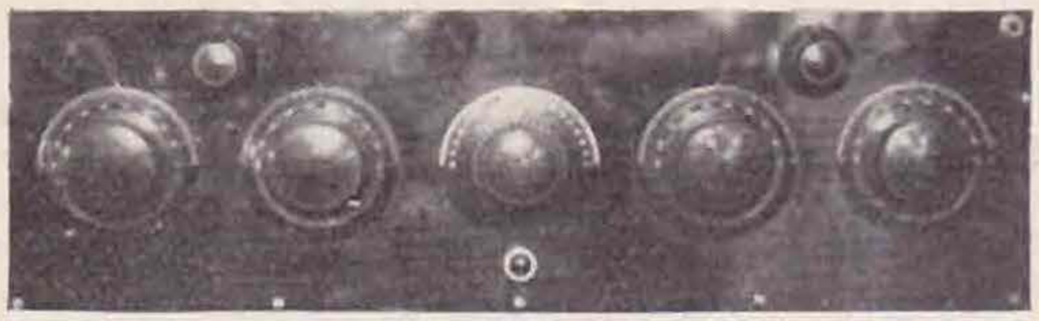


Fig. 3.—Front view of Superheterodyne Receiver.

on B.C. wavelengths, and is inadmissible definitely on 10 M.C., because of the poor selectivity of 10 M.C. tuned circuits. Thus we decide on two valves, a detector and an oscillator. When we try and couple the two, as we must, we get severe inter-circuital pulling. We find the wavelength is hopelessly altered by the aerial tuning, and the whole circuit is impossible to operate in a reliable manner. We want to be able to select the required signal on the oscillator tuning and adjust the aerial tuning until the signal is a maximum. But if every adjustment of the aerial condenser is going to affect the oscillator tuning and vice versa, then operation will be next to impossible and the arrangement is impractical. We want an arrangement by which oscillations can be introduced from the oscillator circuit to the detector circuit without any coupling. This seemingly impossible requirement is rendered feasible by the circuit arrangement shown in Fig. 1.

V2 is the oscillator and the oscillations have their frequency controlled by C7 and their amplitude by C8. Owing to the short wave choke L3 oscillating voltages occur at the plate of V2. These could flow to earth if allowed to. Now, in the grid circuit of V1, the detector, we have the aerial tuned circuit L,C2 tuned to the incoming signal frequency. Across this is a pair of very small condensers C3, C4 in series *and of equal value*. They are small enough not to disturb the tuning range of L1C2. L1 is accurately centre tapped and earthed. Then the junction between C3 and C4 is also at earth potential because the potential distribution is the same as in L1. Thus nothing connected to the junction of C3 and C4 will interfere with the operation of the circuit L1C2. If we connect this junction to the plate of V2, however, oscillations will flow from its plate to the junction, through C3 and C4 and round both halves of L1 to earth. In doing so they mix with the signal oscillations in L1 and both are applied to the grid of V1 and give an I.F. in the plate of V1, yet the circuits of V1 are not coupled to those of V2, exactly the conditions we wanted. Thus, an I.F. appears in the plate of V1

and by means of the choke L2 and condenser C6 may be transferred to the input side of the high frequency amplifier. It is recommended that this input circuit should consist of an "aperiodic" aerial circuit consisting, as it usually does, of a transformer of about 1.4 ratio. Thus the full input circuit appears as in Fig. 2. In order to receive C.W. it is necessary to reheterodyne the output of V1. This is done by a third valve V3, which is an oscillator having a tuning range of 800-2,000 λ, arranged so that it can be allowed to go into harmonics if necessary. Thus without changing coils it can be made to oscillate on any wavelength on the higher broadcast band, or by increasing the value of C11, it runs into harmonics and generates oscillations in the lower broadcast band, which may be used to heterodyne the output of V1, should we be using an I.F. in the lower broadcast band.

Now we come to a practical description of the apparatus. The front panel appears as in the photograph in Fig. 3. From left to right the large dials control :—

(1) Separate heterodyne frequency control condenser (C9).
(2) Oscillator amplitude control condenser (C8).
(3) Oscillator tuning condenser (C7).
(4) Detector input split condenser (C3 C4).
(5) Aerial tuning condenser (C2).

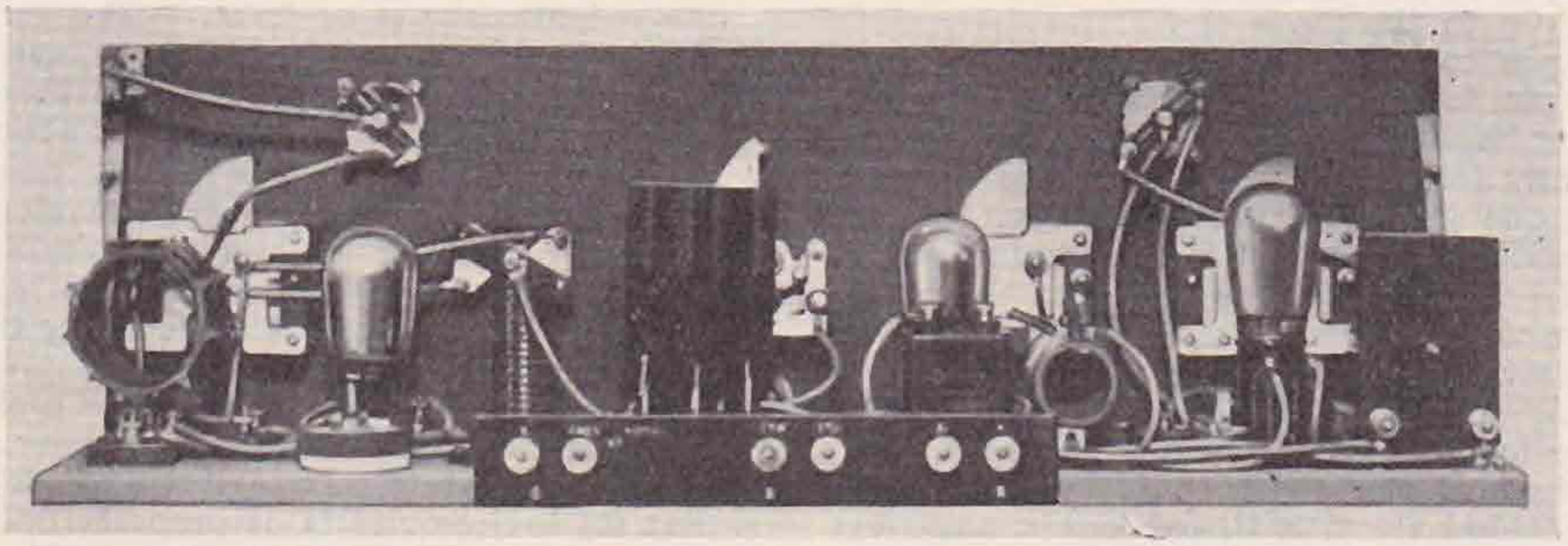
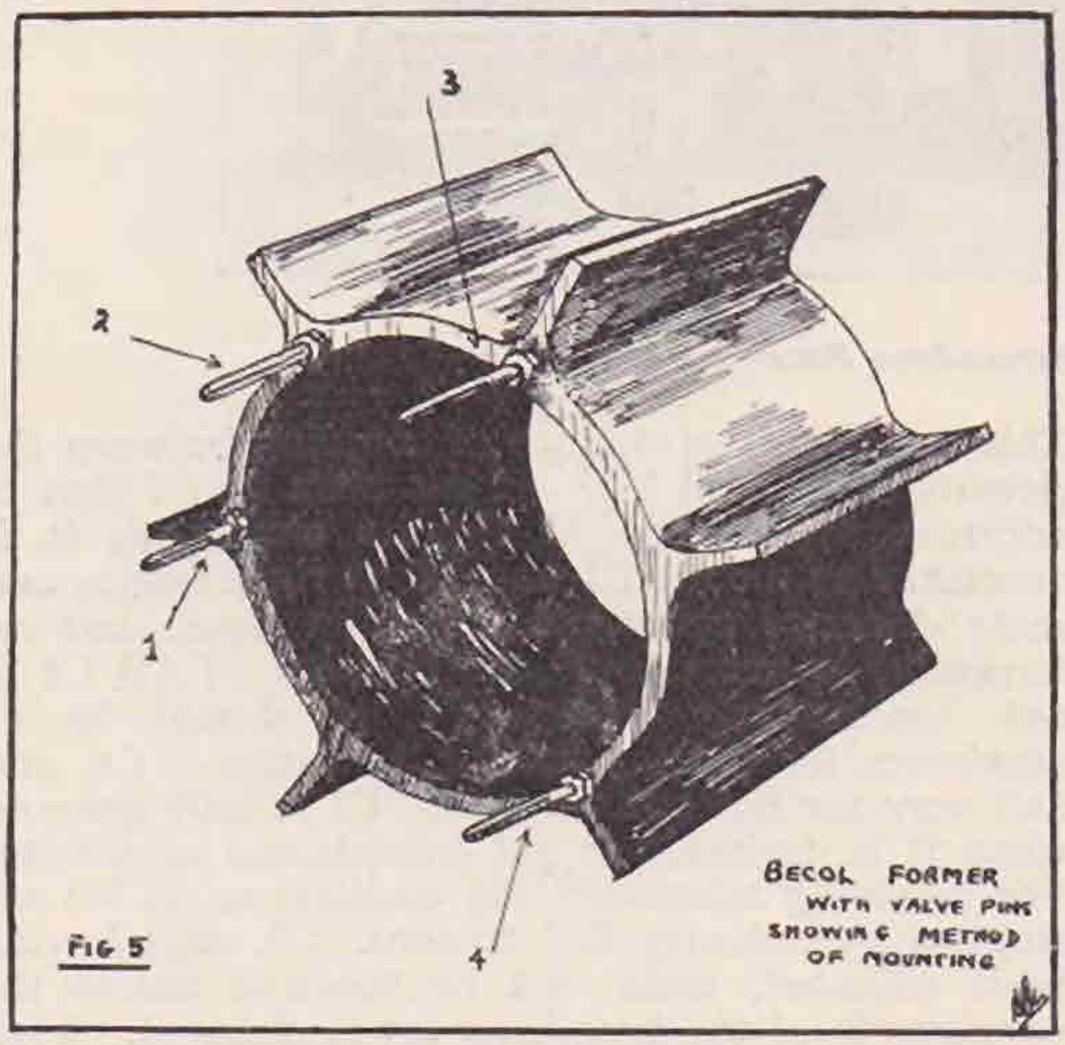


Fig. 4.—Back view of Superheterodyne Receiver.



The small dial on the left at the top is the separate heterodyne oscillation amplitude control (C11) and the one on the right is the aerial series condenser (C1).

The values of the components are as follows :— C1=.0001 mfd. ; C2=.0003 mfd. ; C3=C4= (see below) ; C5=.0001 mfd. ; C6=.001 mfd. ; C7=.0003 mfd. ; C8=.0003 mfd. ; C9=.0003 mfd. ; C10=.0001 mfd. ; C11=.0001 mfd. differential ; C12=2.0 mfd. C3 and C4 are supposed to be very small condensers of absolutely equal value. It was found that an Ormond reaction condenser of the type where there are two sets of fixed plates and one set of moving plates in the shape roughly of a figure 8, was satisfactory. It will be seen that the capacity between the moving plates and both sets of fixed plates is simultaneously increased or decreased by rotation of the spindle, and that a differential reaction condenser will not do. It was found desirable in practice to make C3 C4 variable, and the problem of doing this and yet keeping them equal was easily solved by the use of this special type of condenser.

The layout of the inductances can be seen in the photograph in Fig. 4, which gives a view of the set from the back.

On the left is the aerial tuning inductance L1, which consists of six turns of No. 20 enamelled wire spaced ¼ in. between the turns and wound on a Dimic skeleton short-wave former, and accurately centre tapped. The use of this type of former, with its ready-made connection for the centre tap, facilitates coil making and changing. On the right of this is the valve V1, and on the right of this a Lewcos broadcast choke (L2). On the right of this is the oscillator coil (L5L4) and consists of 4½ turns of No. 16 tinned copper wire wound on V-shaped cuts made in the ribs of a piece of 3in. ribbed Becol former. Before this winding is done saw cuts are made at the base of the V-shaped cuts (which latter may be conveniently made by a file), and in the saw cuts are wound a reaction winding of No. 34 D.S.C., also of 4½ turns. The windings are both made in the same direction, and are joined to valve pins fixed in the former at one end, as will be seen from the diagram (Fig. 5).

No. 1 is connected to the reaction winding at the opposite end of the coil.
No. 2 is connected to the reaction winding at the near end of the coil.
No. 3 is connected to the tuned winding at the near end of the coil.

No. 4 is connected to the tuned winding at the opposite end of the coil.

A small ebonite plate is fitted with valve sockets to correspond with the pins in the above coil, and mounted in the set in the position shown, and is arranged so that the connections are as follows :—

No. 1 pin to the filament.
No. 2 pin to the plate of V2.
No. 3 pin to L3 and C8.
No. 4 pin to the grid condenser of V2.

The writer hopes that these directions will suffice to enable any interested reader to make up such coils. The one shown in position in Fig. 4 is not the one described above, but was made for experiments on 1.7 K.C. It will be seen that the object of the above coil is to attain a maximum of magnetic and a minimum of electrostatic coupling between L4 and L5. The above coils (L1, L4 and L5) are suitable for 18-55 λ.

Continuing, on the right of L5 we have the valve V2, behind the 2 M.F. condenser, and next the choke L3. This consists of a 2in. long winding of No. 32 D.S.C., close wound on a 1.5 dia. tube. In series with this is a McMichael binocular broadcast H.F. choke, placed there to enable V2 to be effective on 1.7 M.C. and to prevent any traces of the I.F. which may be in the anode of V2 from reaching the H.T. and so being communicated to V1.

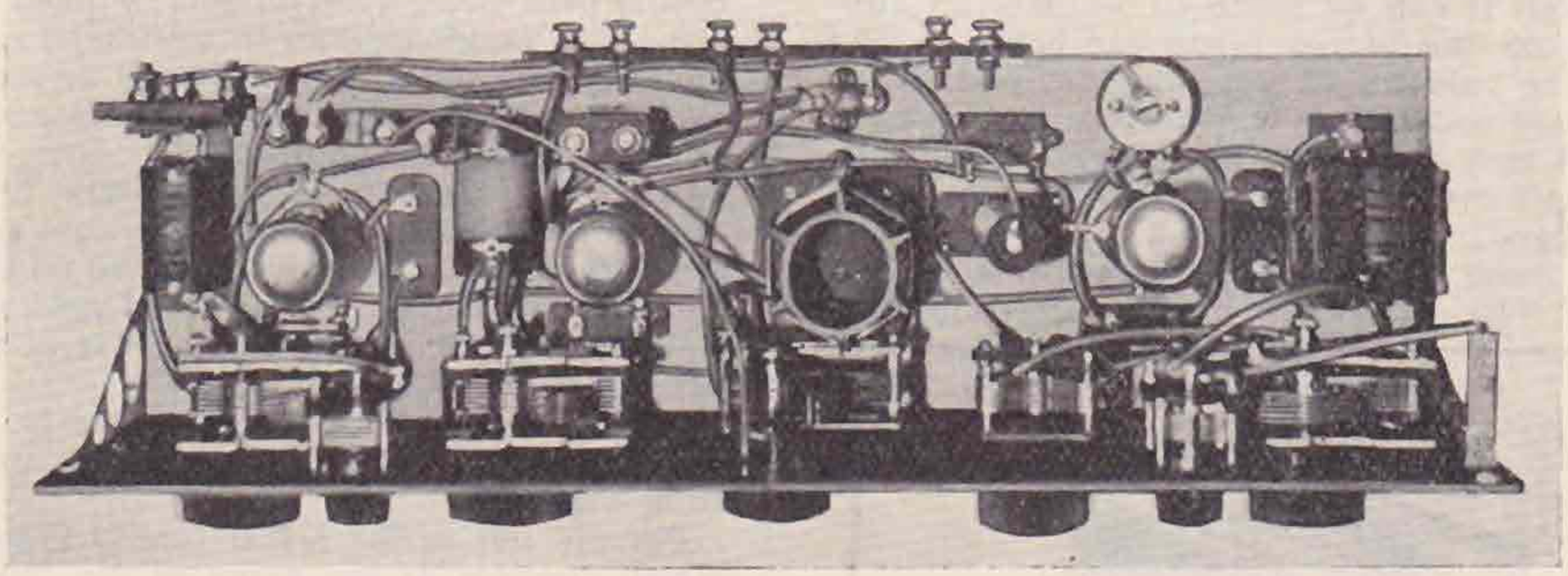


Fig. 6.—Top view of Superheterodyne Receiver.

Further to the right we have the valve V3, and further on a vertical ebonite plate. To this is fixed a small pancake inductance of about 30 turns of No. 32 D.S.C. 1½in. external diameter. This is L6 and its function is to collect oscillations from L7, the main inductance of the separate heterodyne, and mix them with the output of V1. L7 is a Dimic coil, type No. 3, 300 turns, 5,000 M.H., which is mounted behind L6 and 1½in. from it. The coils being coaxially mounted, a small degree of coupling is provided.

The two grid leaks are of 1 megohm, and the valves are as follows :—V1 and V2 L610'2 (Z= 7,500 μ=15) ; V3 a DEH610 (Z=50,000 μ= 40). Other valves can be used, but V1 and V2 should not have an impedance larger than 10,000 ohms for this type of circuit, and V3 should be of high impedance. A high tension voltage of 80 is used, and must not be exceeded, or V2, which is in the oscillating state, will draw a plate current which is not concomitant with a long life. Besides, 80 volts is amply sufficient. Beneath the central tuning condenser dial, as will be seen in Fig. 3, is provided a pilot lamp from the filament circuit. L8 may be any good broadcast H.F. choke ; in the present set a McMichael binocular was used.

We can now turn to the question of operation. The necessary connections having been made, the broadcast set may be tuned to a wavelength in the neighbourhood of 500λ. The aerial tapping should be clipped on to L1 at one turn on the grid side of the centre tap. C1 should be set at maximum, as should C3 C4. C11 is set about half way, and C9 is rotated until a rushing noise indicates that V3 is oscillating on the wavelength of the broadcast set. It is highly desirable that the latter should have a detector plate milliammeter, as the oscillations can be detected by the elevation or depression of this instrument. C11 can be reduced and C9 retuned until the oscillations are still there, but do not make a rushing noise. This is a desirable state, as one of the points of the set is that its background is, if properly operated, very silent. Next C8 is set at about half way. V2 is now oscillating, and on tuning with C7 signals will be heard. As soon as one is heard C2 may be brought into resonance, when the signal is greatly increased in strength. Further, C2, owing to the balance obtained between C3 and C4, causes almost no change in the pitch of the heterodyne note. This is due to the absence of coupling between the circuits of V1 and V2. It has been found that in addition to the special circuits employed, it is necessary to mount L1 and L5 at right angles and some distance apart, as has been done, but no screening is necessary. Adjustment of C3 C4 is not continuously necessary ; it should be at maximum for the top half of the range of C4, and half way for the bottom half. C1 is only reduced when it is desirable to get exceptional selectivity. For receiving telephony the oscillations of V3 are stopped by reducing C11 to zero. C9, once having been adjusted, need not be touched unless the wavelength of the broadcast set is changed. Thus we have only C2, C7 and C8 to adjust, and adjustment will be found to be quite simple. The writer does not want any amateurs who may read this to feel that this set, bristling, as it does, with variable condensers, is difficult to operate. It is intended to deliver the goods, and difficulty in operation is not desirable when one wants to search quickly for a

(*Continued on page* 128, *top of col.* 1.)

TRANSMITTING AERIALS.

By Austin Forsyth (G6FO).

IN order to understand clearly the theory and design of radiating aerials, it is necessary that the reader should have a grasp of the fundamental principles involved, so that before proceeding to a treatment of the several systems mentioned, it is hoped that some of our less erudite members will be helped by an explanation of these principles.

First, there are but two types of transmitting aerial, the Marconi and the Hertz, and any radiating system, of whatever kind, can be resolved into one or other of these, no matter what its owner may call it. In the case of the Marconi, the system functions by virtue of some connection to earth, either direct or by capacity, as when a counterpoise is used. In the Hertz there is no earth connection of any kind. For S/W working, both in amateur practice and commercially, some kind of radiating system using the Hertz principle is used almost universally.

Second, the transmitter and its associated oscillatory circuits are " closed " circuits ; that is, circuits in which the R.F. energy generated is concentrated and off which there is practically no radiation. The aerial is an " open " oscillatory circuit, and the problem is to transfer the energy in the closed circuit to the open circuit in the most efficient manner possible.

Third, it is necessary, when designing the radiating system to know how the aerial should oscillate on the frequency to which it is to be tuned ; to know, in fact, the " voltage-current distribution " on it, or the " waveform." A simple analogy will make this clear. In the figure (1) one end of a rope is fixed at B, the other end A being pulled tight. Shaking the end of the rope either horizontally or vertically will show the effect indicated in the sketch. No matter what the length of the rope may be, nor how hard it is shaken, a number of waves will be produced, all of equal amplitude and symmetrically disposed along its length. We have in this a perfect example of the behaviour of a Marconi aerial, where AB is the aerial wire and the dotted line from C to B the " voltage distribution " along it. That is, the *voltage* is at a maximum at the open (shaken) end, and at a minimum at the earthed (fixed) end, rising from maximum to minimum at definite intervals along the wire. The " current distribution " is the opposite, for where the voltage is a maximum the current is a minimum. Therefore, in our Marconi, the current is a minimum at the open end and a maximum at the earthed end.

In this sketch, a complete " cycle of operations," that is, one whole wave on the aerial, takes place along the wire from A to the line at right angles, XY. The voltage starts and finishes at a maximum and the current at a minimum. The line PQ marks the limit of the half-cycle of operations, or half a wavelength. Note that we still have maximum voltage, and therefore minimum current, at the ends of the half-wave, but the polarity is wrong, for we must start each complete cycle with the same polarity.

The next point is that, in all aerials, the wavelength to which a given wire will tune depends directly on its length, within certain limits. These limits are peculiar to each individual location and are due to variations in height above the ground, the proximity of buildings, telephone lines, trees, etc., and various other indefinite factors for which allowance must be made. But as they need only be considered when very accurate work is being done and can only be determined by a process of " cut and try " on the site for the aerial, it is sufficient to say that the wavelength to which the wire will tune, its natural wavelength, is approximately twice its length in metres. That is, an aerial 21 metres long has a natural wavelength of *about* 42 metres. But it can also be tuned to a harmonic to practically any limit.

In other words, the aerial mentioned above, with a 42-metre fundamental, performs in the same way on 21, 10.5, 5.25 or 2.625 metres, and is known as a " half-wave 42-metre aerial," there being half a wavelength, or half a complete cycle of operations, on the wire when it is tuned to 42 metres. It then becomes " full-wave " on 21 metres, " double-wave " on 10.5 metres, and so on.

When using a Marconi aerial, the wire and its associated counterpoise or earth connections being of any convenient dimensions, a coupling coil and condenser will automatically adjust the length of the aerial to the frequency of the oscillator, either at the fundamental of the system or at any other frequency. Actually, with the aerial dimensions normally used in this country, the fundamental of such a system will usually be in, or somewhere near, the 80-metre band, which would necessitate parallel tuning of the coupling coil on 170 metres, and either series or parallel on 80 metres, with series tuning on 40 metres and 20 metres.

If the reader can digest Fig. 1, and the information that goes with it, he need never have any difficulty in understanding the operation of aerials, the process of digestion being simplified by absorbing the " cycle of operations " idea.

When designing Hertz aerials, the length of wire must be calculated fairly accurately in order to get resonance, not only " round about 42 metres," but, in the case of a crystal-controlled transmitter, on a given frequency.

The recent competition on aerial articles has been won by Mr. Austin Forsyth, whose contribution is reproduced herewith. Mr. E. T. Somerset's prize of a G-R 5-metre wavemeter was presented at Convention. Further articles submitted in connection with the competition will be published during the coming months.

In its simplest form, the formula used for this calculation is :—

$$\frac{468{,}000}{\text{Freq. (K.C.)}} = L$$

where L is the required length in feet, the frequency in K.C. being, of course, that on which the aerial is required to resonate. This formula also makes some slight allowance for the "average site" effect. That is, the resonant wavelength is taken to be 2.1 times the length of the wire.

The matter which follows is based on the theoretical principles outlined above.

* * *

The Zeppelin Aerial.

This refers to a Hertz aerial, slung in the clear, the R.F. energy generated by the oscillator being fed to it by means of a non-radiating transmission line, which has itself to be designed so that the voltage-current distribution for feeding the aerial is correct. This feeder-line consists essentially of a Hertz aerial with a coil and condenser arrangement at its electrical centre, the two arms being bent back on one another and of exactly equal length. These two parallel wires are of such a length and so tuned that either maximum voltage or maximum current can be produced at their ends, with maximum current always at the electrical centre. If the radiating portion, or roof, is to be "voltage-fed," the feeder has to be of such dimensions, and so tuned, that maximum voltage is produced at the end, while it also has to be tapped to the point on the roof which is to be at maximum voltage. Thus, good voltage-current distribution, good wave-form, on the radiating part of the system depends on correct proportioning of the feeder and its junction to the roof at the right point.

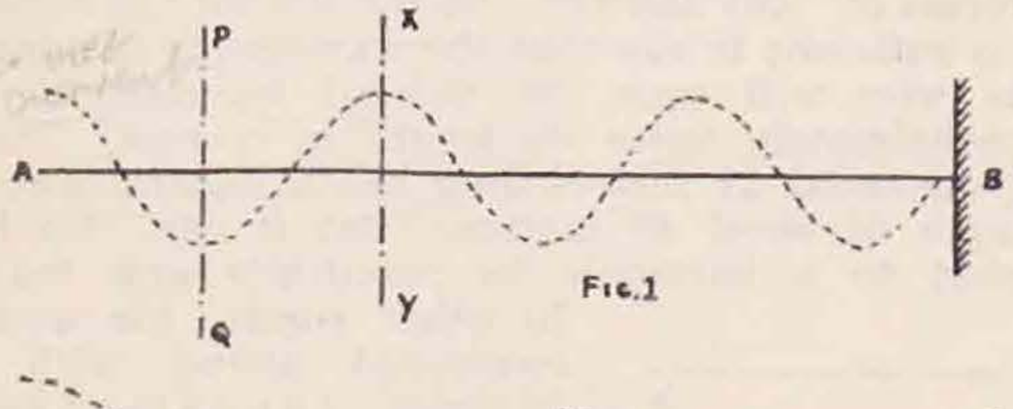


Fig. 1

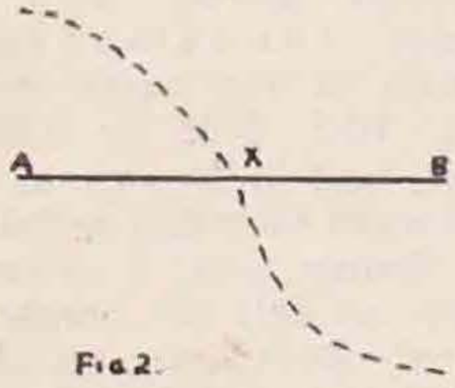


Fig. 2.

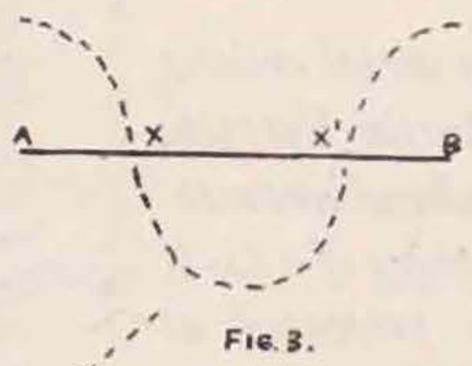


Fig. 3.

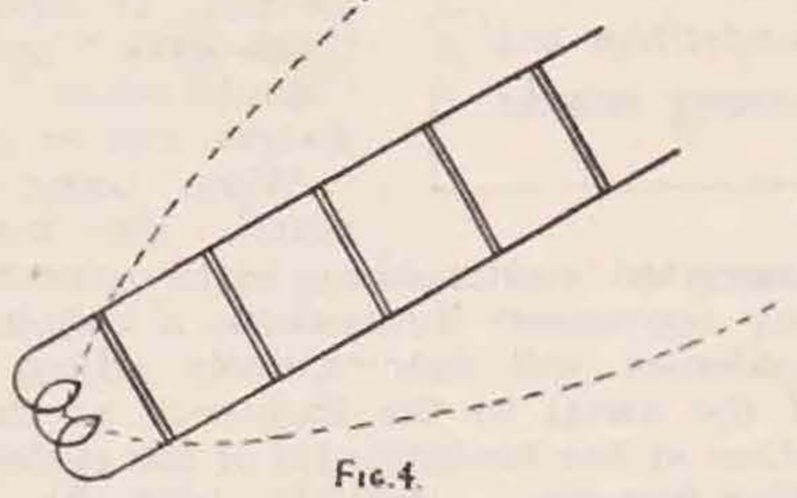


Fig. 4.

Bearing the "cycle of operations" in mind, it will be clear that, having decided upon, first, the frequency at which the aerial is to resonate, and then using the formula to find the length of wire necessary, the next point is the method of feeding. Now, the roof can be fed at either current or voltage with equal efficiency, but there are several factors which must be considered before this can be decided. In the first place, is it desired to use the aerial on, say, 80 metres, 40 metres and 20 metres, or is it to be used chiefly on only one of these bands? Is the location such that only a short wire can be erected, and how is the feeder length going to work out? An investigation of Figs. 2 and 3 will show the significance of the feeder connection. In Fig. 2 is shown an aerial AB with half a wave on it, the curve showing voltage, maximum current appearing at X, the centre. In feeding this wire at current, the feeder would have to be connected at X. In Fig. 3 we have a wire of exactly the same length AB with a full wave on it. In this case (again the "cycle") maximum current appears at two points, X and X^1, one-quarter and three-quarters of the distance along the aerial, respectively. When the aerial is operated full wave, as in using a 42-metre half-wave wire on 21 metres, the feeder would have to be attached at either X or X^1. It is clear, then, that if we want to work our aerial on several bands, current feed is not practicable, unless we are prepared to crawl out on the roof and reset the feeder each time we change wavebands. Fig. 4, shows a feeder system with a quarter-wave on each arm and maximum current at the centre, there being thus maximum voltage at the two ends. Note that the polarity at any given point on one arm is opposite to that of the corresponding point on the other arm, while the value of the voltage at these two points is exactly equal. Therefore, any tendency for one feeder to radiate is neutralised by the effect of the other, thus giving us a non-radiating transmission-line. In practice, it is difficult to achieve this ideal state of affairs, and to get near enough to a non-radiating feeder system it is necessary to exercise great care in the design and tuning of the arrangement finally adopted.

Let us then assume a given case and design an aerial to suit these conditions.

We want to work on 80, 40, 20 and 10 metres, using the same aerial on all bands. The space available allows of anything up to a 100 ft. wire at a height of about 40 ft., with the roof horizontal. Our oscillator is crystal-controlled on 7.100 K.C., and we operate the set on 14,200 K.C. and 28,400 K.C. in the 20-metre and 10-metre bands, respectively. In the 80-metre band we use the set either self-excited or crystal-controlled at 3,550 K.C. Now, theoretically, the ideal arrangement is to design the aerial for the lowest frequency on which we want to use it and operate on harmonics for the higher frequency bands. An entirely practicable scheme, but in our case not possible, as our lowest frequency is in the 80-metre band, which would necessitate a fundamental or half-wave aerial, making our wire about 132 ft. long. Too long for the space we have and, in any case, outside the regulations as regards aerial length. We must therefore design our aerial for the 40-metre band, or 7,100 K.C. frequency, which gives us

quarter-wave operation on 80 metres, half-wave on 40 metres, full-wave on 20 metres, and double-wave on 10 metres. From the formula, the correct length of wire is 66 ft. exactly. On examination of Fig. 1 we immediately find that there is only one possible point on the aerial which will be suitable for attaching the feeder, and that is at one end, where, under all conditions of operation, there is always maximum voltage present. The feeder system, then, has to be so designed that in the distance between the near end of the aerial and the actual transmitter we can fit in a transmission-line having maximum voltage at the aerial end. One arm is tapped on to the horizontal portion of the aerial and the other run up parallel to the aerial insulators and left free, but effectively insulated. There now remains the question of the length of the feeder. As we have seen, the feeder is merely a bent Hertz aerial, and therefore its length can be calculated in exactly the same way as the amount of wire required for the radiating portion of the aerial is obtained. But as there is a coil, the coupling coil to the oscillator, in series with the two arms of the feeder, it is obvious that it must be taken into account, and the method of tuning the feeder also has an important bearing on the wave-form on the feeder system. The horizontal part of the aerial has been fixed at 66 ft., and therefore the two arms could each be 30 ft. long, with a coil at the centre to make up the length required to accommodate the half-wave, and this would be a suitable feeder length in our particular case, as the height of the roof is about 40 ft. The coil could be tuned either with a parallel condenser or by two condensers, each one in series with each arm. Now, maximum current has always to be at the centre of the coupling coil, and therefore we cannot use a feeder system with a full wave on it, as the point of maximum current will not be at the centre. (See Fig. 3.) Therefore, our feeder system, under all conditions of operation, must be half-wave, three-half-wave, five-half-wave and so on. With a given feeder length (length of each arm) the sizes of the coupling coils for each band and the position of the tuning condensers, either series or parallel, must be so arranged that this effect is obtained.

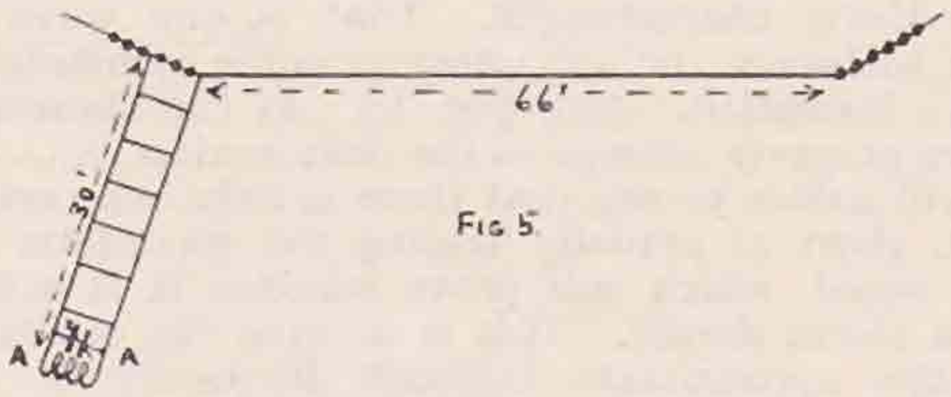


Fig 5.

The next point is the tuning of such a system. Now, as we have seen, maximum current appears at the electrical centre of the system; that is, the centre of the coupling coil, assuming good balance of the arms and accurate tuning. It is obviously impracticable to insert any form of meter at this point, unless the coil can be split and the meter mounted close to it, and is, in any case, a messy job from the constructional point of view. We can, however, put our current indicators in at the points A in Fig. 5, which shows a complete radiating system built up on the foregoing considerations. These indicators, which should be as close as they can be got to the coupling coil, and may be either a pair of matched flash-lamp bulbs or two good R.F. meters, will not show the maximum current in the system, but they will be near enough to the centre of the coil to show sufficient current for tuning purposes. If series condensers are used, they should be so adjusted that the indicators show the same current. With parallel tuning, they should indicate equally when the feeder is tuned to, or near, resonance with the oscillator. It can be seen from this that it is important that the indicators, whether they be meters or flash-lamp bulbs, should be well matched. It may be said straight away that it is practically impossible to get two ordinary H.W. meters to read the same on the same R.F. supply, even if they are by the same maker. Thermo-couple meters are, however, extremely accurate and may be used with complete confidence. The drawback is that they are expensive, and though one meter can be adapted to adjust the feeder by changing it from arm to arm till equal current is obtained in each, this is a long and tedious business. The easiest and cheapest way out of the difficulty is to get a few pairs of ordinary flash-lamp bulbs and put a holder in series with each arm, seeing that the distance of both from the centre of the coupling coil is equal. The condensers are then adjusted till an equal light is shown in the bulbs. For high-power work, motor car headlight bulbs will do admirably. It is necessary, however, that they be matched, as in the manufacture of these bulbs the tolerances are within wide limits. As they are to be used and adjusted visually, it is a simple matter to select a few pairs that glow equally on the same supply.

The feeder arms should be run up to the roof fairly close together, spacers of either glass or treated wood being used. These can be anything from 6 ins. to 12 ins. long, and the feeder system should be built up in such a way that there is no independent swinging of the two arms. In the case of long feeders, glass rods weight the system considerably and wooden dowels, boiled in paraffin wax, are more suitable. The whole arrangement should be as steady as possible, and the spacers sufficiently numerous to keep the wires parallel under all conditions.

Approx. length of each wire ft.	Tuning arrangements for various bands.				
	1,750 K.C. (160 M.)	3,500 K.C. (80 M.)	7,000 K.C. (40 M.)	14,800 K.C. (20 M.)	28,000 K.C. (10 M.)
60	Par.	Ser.	Par.	Par.	Ser. or Par.
40	N.G.	Par.	Ser.	Par.	Par.
30	N.G.	N.G.	Ser.	Par.	Ser. or Par.
15	N.G.	N.G.	Par.	Ser.	Par.
8	N.G.	N.G.	N.G.	Par.	Ser.

Fig. 6.

"N.G." indicates unsuitable feeder length for the band.
(*Amateur Handbook,*)

In order to simplify the business of feeder-lengths and coupling coil tuning, a table is appended (Fig. 6) showing various combinations for different bands. The recommendations given should cover

most cases, assuming the aerial to be voltage-fed, as in our example.

In Fig. 7 is shown a circuit where a meter can be used to indicate maximum current at the electrical centre of the coupling coil. The oscillator is push-pull, so that to get accurate balancing of the whole system and to preserve the symmetry of the oscillator circuit it is necessary to take off the R.F. equally at each end of the oseillator coil. The coupling coil is split at the centre and a meter inserted, the tuning either being series or parallel, according to the principles shown previously. The two halves of the coupling coil must be the same distance from the oscillator coil in order to equalise the load on the latter. Tuning is then carried out till maximum current is obtained on

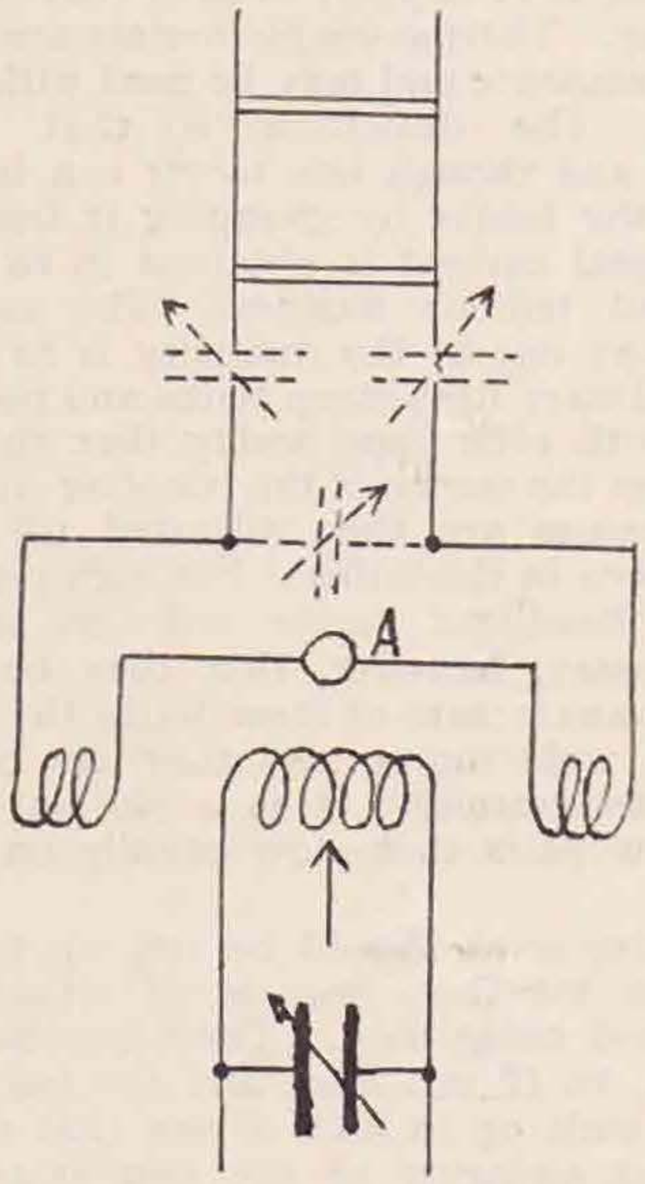


Fig. 7

the meter, or as near maximum as the considerations of note, efficiency, etc., allow.

It is sometimes possible to get at one or both ends of the aerial when it is *in situ*. If this is so, indications of voltage can be obtained by holding a neon tube on or near the ends of the wire.

With regard to the length of the actual radiating portion of the aerial, it will probably be found that the resonance frequency of the roof is not quite the designed frequency. But as, in practice, the aerial will operate with practically equal efficiency, some 50 K.C. off resonance, this is not a very important point, though it is desirable that the actual resonance frequency is on the oscillator frequency. This can only be achieved by a "cut-and-try" process, as mentioned earlier. The trouble of so doing is worth it.

It should be clear from the example and the information given with it that the reader can devise any aerial system to suit his own particular case. It is simply a matter of finding where the voltage and current should be and feeding accordingly. The great advantage of the Zepp-fed Hertz is that the radiating wire can be hung up in the clear, and the feeder system run in any convenient way from the transmitter to the aerial.

By practical test at many amateur stations all over the world, this particular method of radiating has been found to give the most satisfactory results in the majority of cases.

* * *

Single-Wire Feed.

This refers to a Hertz aerial, also slung in the clear, and fed by a single-wire transmission line, which is designed to be non-radiating.

Though not, perhaps, a S/W fed Hertz in the strictest sense, its simplest form is where we have a wire which is resonant on the oscillator frequency, or its harmonics, and which is tapped on to the oscillator coil directly. A modification is to use an aerial coupling coil tuned to the same frequency

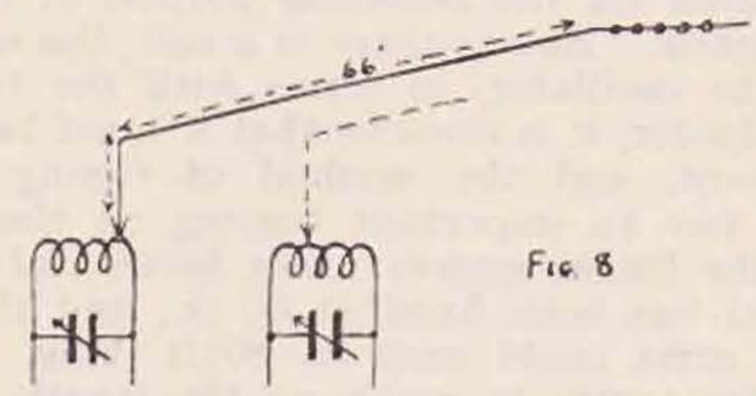


Fig. 8

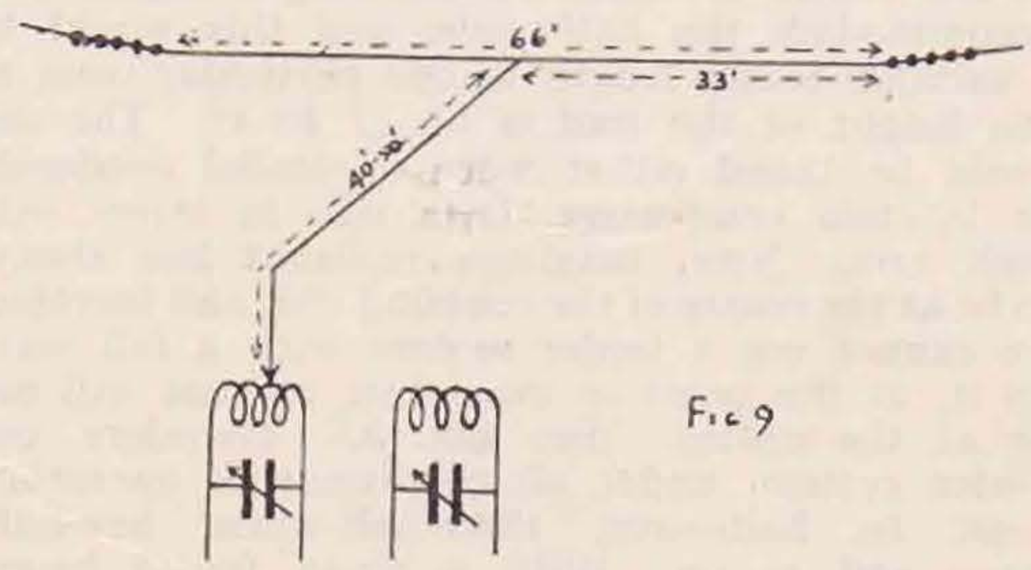


Fig 9

as the oscillator, the aerial being tapped on at the end nearest the transmitter. (See Fig. 8.)

Now, this is not as simple a matter as it seems, for with an earthed oscillator and the aerial clipped to the oscillator coil, we may or may not be getting the Hertz characteristic. That is, one wave or one half-wave, or any other possible symmetrical wave formation. (See Fig. 1.) As the discussion more properly belongs to the next section (A.O.G.), it will suffice to say that there is only one certain test, short of actually tracing the wave-form on the aerial, which will prove whether it is acting as a Hertz should. This is to tune the oscillator to the approximate resonant frequency of the aerial by means of a good monitor-frequency meter, and then clipping on the aerial at any point on the oscillator coil, noting if there is any change in frequency as indicated in the monitor. If the wire is working as a Hertz there should be no change, except a slight alteration due to the added capacity of the aerial on the oscillator. Whatever the degree of coupling of the aerial, the beat note in the monitor should remain unaltered for all points on the oscillator from the low-potential to the high-potential end; that is, from minimum to maximum coupling; though there will, of course

be considerable variations in the oscillator feed current. It is obvious that this test must be made with a self-excited oscillator, which is reasonably stable under normal conditions.

If the " cycle of operations " idea has soaked in, there will be no need to refer the reader to Fig. 1, when it is stated that this aerial, usually known as the " end-on Hertz," is fed at voltage, as we have already seen that with, say, a 66-ft. wire, there is always voltage present at one or both ends when it is operated on either 80 metres, 40 metres, 20 metres or 10 metres.

The same difficulties arise in the case of single-wire fed Hertz aerials, assuming now an example with the roof in the clear, as we have already found with Zepp-fed roofs. That is, the shifting of the current and voltage nodes according to the frequency upon which the aerial is operated. A 66-ft. wire, current-fed on 20 metres (feeder tapped on one-third the way along approximately) will be thrown completely out if we try and work it half-wave on 40 metres, as we shall then have voltage at the point we previously had current.

There is also considerable difficulty in making a single-wire feeder non-radiating, as there is no neutralising arm to check any radiation effect. Should there be radiation off the feeder, the efficiency of the whole system is greatly reduced, as in the average case the feeder and roof are so disposed with regard to one another that considerable wave interference and distortion of the field will take place.

The reader will see that it is a simple matter to design a single-wire fed Hertz when operation on only one band is required, a current-feed arrangement being adopted. Voltage feeding at one end of the roof is definitely not at all satisfactory in practice, though theoretically there is no reason why it should not be made to work. The difficulty is preventing the whole thing from behaving as an ordinary inverted L. If, then, current feeding is adopted, the aerial can be worked at its odd harmonics, but a little consideration will show that it is virtually a one-band system.

If we require to use the aerial on only one band, say, 40 metres, the roof could be a half-wave wire, current fed, as at the point X in Fig. 2 (the centre). The feeder would have to be such that maximum current would be produced at its end in order to excite the aerial correctly. If the feeder were made, say, 33 ft. long, we should obtain maximum current at one end and maximum voltage at the other, with the result that there would be a quarter-wave on it. This, in turn, would result in radiation off the feeder, which is what we must avoid. Therefore, the feeder length would have to be such that there could be no danger of it resonating, with a consequent loss of efficiency. A suitable feeder length would be about 40 ft. to 50 ft., and the wire would have to be run as well away from the radiating portion as possible. The feeder could be attached to the transmitter either by tapping direct to the plate coil of the oscillator or by means of an aerial coupling coil, the latter method being preferable as the coupling is more easily adjusted and the radiating system is then entirely isolated from earth, reducing the possibility of B.C.L. interference. In Fig. 9 is shown such an aerial and feeder system.

But it is certain that nearly all amateurs wish to work on at least two bands, usually on 40 metres and 20 metres, and it is therefore necessary that the aerial should work with equal efficiency on more than one band.

The most satisfactory way to get over this difficulty is to use the single-wire fed aerial known as the " Windom." In this, the roof is calculated to give resonance on a definite frequency, in the usual way, but contrary to the more simple types of such aerials it can be operated with equal efficiency on its harmonics. Moreover, the length and position of the feeder wire does not matter, nor does it affect the radiating properties of the aerial, provided the design is correct. In the " Windom," then, all the difficulties which we have seen in connection with single-wire fed aerials are overcome by an experimentally-evolved method of connecting the feed to the roof. This point is a fixed one for any given frequency or its harmonics, and when using the aerial with a self-excited oscillator, some means, such as a monitor-frequency-meter, which is reasonably accurate, must be employed to tune the oscillator to the resonant frequency of the aerial. In other words, in this particular form of Hertz there is no tolerance as regards working off resonance. If this happens, the feeder point is automatically thrown off and the whole system goes out of balance, since this point must be obtained for the actual frequency at which the aerial is to be operated.

If, then, we have our oscillator tuned to the correct frequency and the feeder tapped on at the correct point, our feeder line can be any length, and is merely a conductor of energy to the aerial. The feeder curve is, in fact, a straight line.

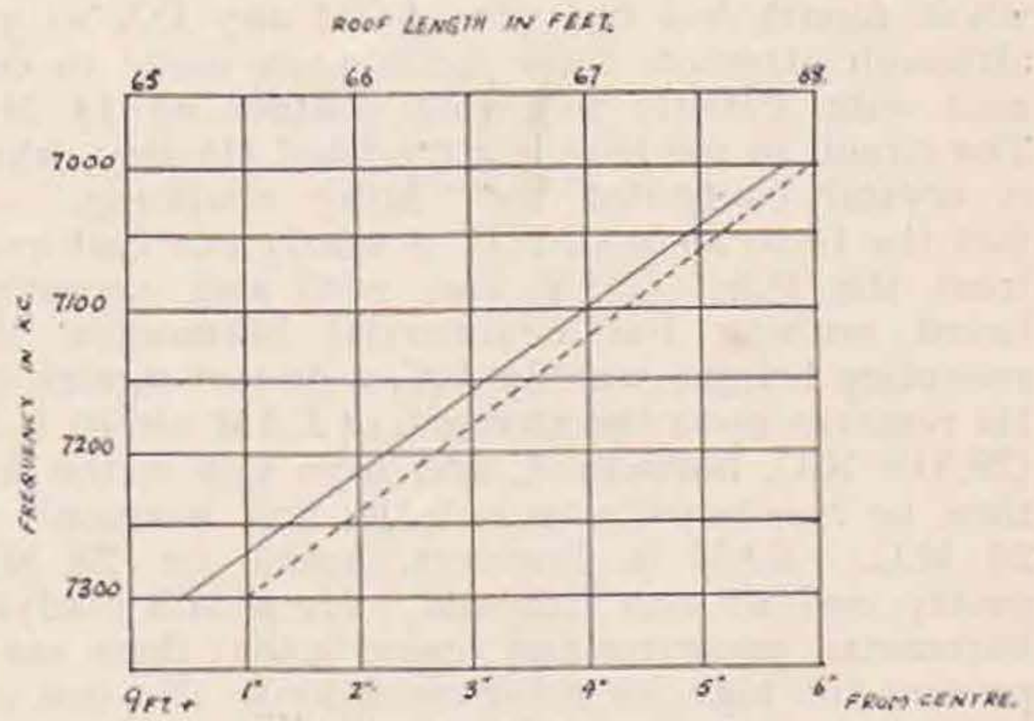


FIG. 10. (From "Q.S.T." Sept 1929.)

Assuming that we wish to operate our aerial on 7,150 K.C. in the 40-metre band, which will be 14,300 K.C. and 28,600 K.C. in the 20-metre and 10-metre bands, respectively, an examination of the curves given in Fig. 10 will show that the aerial must be 66 ft. 7 ins. long, with the feeder tapped on 9 ft. 3½ ins. from the centre. This will give perfect current distribution on the roof, with no radiation off the feeder, when the system is used on 40 metres, 20 metres and 10 metres, but is not suitable for 80-metre operation. As is shown in Fig. 9, a loose-coupled aerial coil should

(*Continued on page* 128, *bottom of col.* 1.)

CONTACT BUREAU NOTES.

By H. C. Page (G6PA).

THERE dces not appear to be very much to write about this month. A very full report of the work done on 28 M.C. during the past month appears in the 28 M.C. Notes.

I understand that the Hungarian Short-Wave Amateur Society are conducting tests on 28 M.C. The times of their transmissions are as follows :—

Every Saturday from 15.00 to 19.00 G.M.T.
Every Sunday from 07.00 to 19.00 G.M.T.

Transmissions will take place at each half-hour and will last for five minutes. The stations transmitting will call "CQ-ten." It is requested that replies should be made on the 28 M.C. band. All reports should be sent via R.S.G.B. to M.R.A.E. No report has been received from India this month, but this is probably due to delay, and not to lack of information.

May I take this opportunity of saying how pleased I was to meet so many of you at Olympia and at Convention ?

Group Reports

28 M.C. Work.

G6VP, Group Manager.

As expected, more hams are turning their interest to 28 M.C., and applications to join groups are coming in. *Pro tem.* all have been attached to my Group (1C), so that there should be no waiting, but new groups are in course of formation and will be limited to six members as heretofore.

Here is the report of the individual group centres.

Group 1*B*.—G5SY has been active during the whole month but has not QSO'd any DX as yet, although attempts have again been made to connect with FM8IH following contact on 14 M.C. The circuit in use here is a modified Hartley, which is crystal controlled by "stray couplings." In fact the 14 to 28 M.C. F.D. is nearly one foot away from the P.A. G5SY has, with one exception, heard nothing but commercial harmonics, this exception being a wobbly A.C. note just signing off. He remarks upon the strength of EAM's 9770 K.C., (29,310 K.C. harmonic), and says this is the first time he has heard any but the first harmonic on 28 M.C. EAM is, however, heard on 28 M.C. pretty well all over England. He is still studying barometric pressures and suggests that these are at present too high for good conditions. No one else in his group seems to have reported : this is not very flattering to your group centre, O.M.s. Look to it next month !

Group 1*C*.—G6VP has, as usual, been active during the whole month, and although nothing startling has been achieved, has had many local contacts and many local reports ranging up to 50 miles. On August 30, however, he managed to connect with HAF8B—the first HAF-G contact on this frequency—and a 100 per cent. QSO followed. HAF8B was T9, QSA5, R7, with no QSB at all. In fact stronger and steadier than the average locals. The transmitter has also had some time spent on it, with the view of getting greater depth of control ; but from the point of view of reliability it is feared that the locked system will have to be abandoned if the full power available is to be used. As usual, G6WN is the star station on 28 M.C. at the moment, and they must have a super receiver to hear the stations they do. They state that 28 M.C. is getting as lively as 14 M.C. ! I think we could do with some details. Their log is surely an inducement to follow up more closely and to be rather more optimistic than we have been lately. It is astounding to learn that they have heard five continents and 23 countries on 28 M.C., also a total of 127 stations. They are to be congratulated on the first two-way contact with FM. As I mentioned last month, although FM8IH heard me, I could not hear him, so the WN's claim the point. Congrats, O.M.s ! They have run skeds with AP6JM, HAF2G, V1YB, and EAR18 without success. Here is their astounding log :—

16.8.31.—Worked G6HP, G6VP, heard by G6LK ; had sked with SU1AA without success ; heard G5PJ, G2UV, G2YD.
17.8.31.—Heard WIY, CT1AA ; worked FM8IH ; heard 1RR, G6VP, G2BY.
18.8.31.—Heard FM8IH and G6HP.
20.8.31.—Heard LCJ, G5LA, G5YH ; worked G6HP.
21.8.31.—Heard LCJ, G6XN, G2BY.
22.8.31.—Heard FM8IH ; worked G6QB, G6VP ; also heard G6HP, G2DZ, G5YH, G2YD, G6WK.
24.8.31.—Heard G6VP.
25.8.31.—Heard EAM, CT1BG, G6VP, G5YH, G2DZ ; had skeds with HAF2G and EAR18 with no success ; also heard G6VP, G5YH, G2DZ.
26.8.31.—Heard G6VP, G2UV, and one phone station.
27.8.31.—Heard one phone station.
28.8.31.—Heard IRR and two phone stations.
29.8.31.—Heard G2BY, G2OL.
30.8.31.—Heard CQ from Commercial, EAM, G2DZ, G5YH.
31.8.31.—Heard G5PJ, G2BY.
2.9.31.—Sked with V1YB ; no success.
3.9.31.—Heard PPW (Brazil), HJO, EAM, G5YH, and two phone stations.
6.9.31.—Heard IRR, IDO, EAM, G5FC called by (?), G2CG called by OK (?), CT1GU, G5YH, EARCO, G6HP, G2DZ, G5PJ, two phone stations ; worked G6VP.
7.9.31.—Heard PCO, G5YH, G2OL, G6VP, G5PJ.
10.9.31.—Worked G2OL ; heard G2YD.
11.9.31.—Heard G2DZ, G5YH.
12.9.31.—Unsuccessful sked with HAF2G.
13.9.31.—Worked G5LA, G5YH ; heard G6NK, G2DZ, G5BY, G6TA, G2BY, G6MU, G2BM, and two phone stations ! Some log ! !

They state that when signals from any country are very strong on 14 M.C. they are also very likely to get over on 28 M.C.

BRS588 has been improving his receiver and has now got it working very efficiently. He has heard : 23.8.31.—EARCO, PAORG, ES3ST, OH2IA, HAF3G. 27.8.31.—CT1AA, D4UDO. He is prepared to stand by for any tests.

G5VB is getting his station in trim and reports the purchase of a DET1 and a pair of UG1's, etc. He will be on, and hopes active, before these notes appear. So look out for him.

Group 1F.—BRS25 writes that he has got going again, but so far has only heard G5YH, G6HP and G6VP; he states that OZ7T, G2CX and G2DZ have not reported—G6HP being the only active member of his group.

G6HP has been QSO many locals and has also worked FM8IH. He is sending and standing by on 28 M.C. from 00.00 to 24.00 G.M.T. on the first Sunday in every month, also working most Sundays at frequent intervals.

New members temporarily attached to Group 1C are G6LK, BRS588 (J. L. B. Charlesworth, 69, James Street, Barnsley, Yorks), and G5MP, 48, Earlsfield Road, Hythe, Kent.

Will any group centre whose group is not at strength please notify me at once?

ST2D is joining the International 28 M.C. Group. He states that he has been experimenting and testing on this band for the last two years. Here is a chance for someone to arrange a sked. ST2D is regularly to be heard on 14 M.C., and it should be possible to QSY when conditions seem good.

Fading, Blindspotting and Skip.

By G2ZC, Group Manager.

Group 2B.—The subject under discussion is "Cure for Fading," and while it is too early to publish anything, three members of the group seem to agree in the rough principles that might effect a cure. Earthquakes and their effect on short-wave radio are still being discussed, and still more practical evidence has been gathered to support the group's findings. The most marked effect, so far as 7 M.C. is concerned, is the fact that skip is raised. This has often been noticed, and in a three-way contact which G6YL, G6PP and G2ZC have held over several years, in two known earthquakes which took place during these schedules, skip was raised, and general fading, with fade out, was noticed. As a group we should be glad if, on publishing data regarding the times and dates of earthquakes, members of the R.S.G.B. would assist us by reporting any peculiar conditions noticed by them, irrespective of frequency bands.

G6PP reports on the fade out which took place on July 29, when a quake happened in New Zealand, and on May 19 there was a quake in India, when stations across London could not maintain contact. He quotes a blanket on August 10 of two miles, and we should like to know if anyone noticed any earthquake reports for the night August 9-10?

G2IM gives a lengthy report on a fade cure, his method begin to use Beveridge type aerials. Both G2IM and G2ZN, however, seem to agree on the principle of the only real method being to eliminate the "sky" wave, and use the ground wave, which from an amateur's point of view is, of course, out of the question. G2ZN asks which type of signal tends to fade most, the C.C. one or the one with no stabilised frequency?

G6YL has a very interesting report, which is too long and involved to ask C.B. to publish, but very briefly she quotes several schedules ruined seemingly due to earthquake effects. During August, the other station's ground wave was always audible, save on August 6, which was the day of the New Guinea earthquake. She asks if anyone was on watch during the Alaskan quake on August 10 (this bears out G6PP's finding, q.v.), and during a QSO on August 15 she had to stop work, owing to bad conditions, this being the date of the quake in Algeria. On May 19, she had noted G signals to be very strong on 14 M.C., and in a letter we have had from VU2FX, he reports shocks in India. Lastly, she asks if anyone was on the air on the night of August 27, during the bad earthquake in Quetta?

VU2FX is co-operating with Group 2B over earthquake matters, and has put the disposal of his logs at our service.

G2ZC, in his report, notes a marked blanketing of signals following the Quetta earthquake on the 2 M.C. band. This band has not so far come under review, and we would welcome those working on it to note conditions against the earthquake list we hope to publish each month. The rest of his report is answering points raised by others regarding fade cures, principally in defending his theory that by altering the angle of propagation at the transmitting end, in step with the speed and shape of the wave form of the Heaviside layer, it might be possible to compensate natural fading phenomena. He asks how long it takes for a flash of lightning, having struck the earth, to "even out" its charge, and that in lightning we may possibly have an explanation of the changing earth potentials, which have been noted in unloaded cables, etc.? He would welcome a full explanation from anyone on this subject, as in it, he thinks, he sees a possible explanation for not only earth potential change but also it may account, in a minor degree, for, certain types of fading.

One interesting fact has come out, following G2IM's theory, that in the Polar regions the use of wireless signals might be nullified, for after he forecast this, we now know that the Graf Zeppelin, when near the North Pole, could not make any effective use of her wireless. Up till the present, Group 2B have not had any cases given to them which disprove the points that they have either

3.5 and 28 M.C. Tests, 1932.

The R.S.G.B.-B.E.R.U. 28 M.C. Tests are arranged for two week-ends in January and two week-ends in March. In each case the Tests will run over a 36-hour period in order to give participants in the Antipodes a better chance. The dates and times are:—

1200 *G.M.T. Jan.* 23 *to* 2400 *G.M.T. Jan.* 24.
1200 *G.M.T. Jan.* 30 *to* 2400 *G.M.T. Jan.* 31.
1200 *G.M.T. Mar.* 19 *to* 2400 *G.M.T. Mar.* 20.
1200 *G.M.T. Mar.* 26 *to* 2400 *G.M.T. Mar.* 27.

The 3.5 M.C. Tests will be run during the first two weeks in March, i.e., the 5th and 6th, and the 12th and 13th.

Complete details of all these tests will appear in future issues.

forecast, observed on, and later have published, and amongst these are the following :—

Average conditions on short waves being affected by the Solar Cycle (forecast in 1929), causing alteration of skip, fading, etc. Earthquakes causing blanket or raising the skip (1929). Sunspot forecasts (for different bands) (1930).

This list is not given in any way boastfully, but we should like to have any cases definitely *disproving* any of the above, as such might help us in our future observations, but failing this, we can possibly lay claim to having originated them.

3.5 M.C. Work.

G6RB, Group Manager.

Now that the so-called summer is passing and static getting less there appears to be increasing activity on this band, and this group is getting under way again. I should mention that the 3.5 M.C. group suspended operations during the summer months as it was realised that very little work could be done owing to the continued prevalence of the static, etc.

G2WP reports no work during summer, but is now going again. Has rebuilt transmitter, using balanced Colpitt's circuit, and says efficiency appears as good as T.P.T.G. Intends carrying out aerial experiments this winter.

G2NH contributes to the group budget for the first time. Is all set for work on 3.5 M.C. with a 50-watt outfit, crystal controlled, on the usual Goyder Lock principle. Will be experimenting with another set, using push-pull CO without PA. Is experiencing great trouble with interference from trolleybuses, but hopes to be able to QSO all the group members despite the QRM.

G2KB reports little doing during last few months, but is now going all out again. Has recently rebuilt and designed a transmitter on very compact lines, using the usual T.P.T.G. locked by the Goyder Lock method. Will shortly be moving to Rugby, where he hopes and expects local QRM will be less.

G6CL has been exclusively on 3.5 M.C. during the past few weeks, and has found conditions fair, apart from rather bad QRN. Suggests that GC should collect together a list of the frequencies of all group members with the idea of getting them to spread out to the lower part of the band to avoid the needless interference caused by so many stations being in the upper half of the band.

G6WY is just starting again and gives details of the transmitter he proposes using this winter. Will be working with an input of about 60 watts and hopes to get good DX. Transmitter is now equipped with 100 per cent. modulation system, with which it is hoped U.S.A. will be worked this winter.

BRS408 reports conditions improving and is looking forward to a good season on this band. Has been carrying out tests with various types of H.F. coupling.

G6RB finds conditions steadily improving, although static is inclined to be bad at times. DX does not yet appear to be coming in well, but no doubt another month will make a big difference. It is intended to carry out some aerial experiments with a view to getting better reports from stations within a radius of 500 miles.

G.C. would like to mention that the 3.5 M.C. tests have been arranged for February next, when, given good conditions, some really good work should be accomplished.

2 M.C. Work.

By G5UM, Group Manager.

Recent remarks in the BULLETIN about aerials have resulted in interesting comments from members of Group 10A. G5RX stakes his all on the aerial-counterpoise system, but as mentioned last month, G6FO intends to try the effect of abolishing the counterpoise. G5RX adds that directional effects are generally evident with the aerial-counterpoise arrangement. He used a 100-foot Marconi at a different QRA in 1926 and obtained extremely good results, but in his present location he has found a 66-foot aerial with 66-foot counterpoise to be one of the best radiating systems for 2 M.C.

G5UM has always found the aerial problem acute. Having only 30 feet of space available, he uses a twin wire antenna with 30-foot counterpoise composed of three wires. Tests will shortly be commenced with an indoor aerial having the same dimensional characteristics as the present system, with which it will be used in conjunction.

Turning to general reports, there is little of experimental interest to record. G5RX reports conditions on 2 M.C. as good, but still improving.

G2FS reports bad QRM and QRN, and trouble from a " Frigidaire " at a nearby shop. The noise filter recommended by G6FO has been tried with success, and eliminates the trouble to a certain extent.

G5UM also notes improving conditions. August 30 was good, QSB slow, QRN negligible. Contact was made with G2CI (Devon) and a report of R8 obtained. September 6 was fair, with heavy QRN, some fading. September 13 was similar. September 20 was very good. There was slow fading and some QRN, but distant contacts were easy; G6UJ gave R6 during a daylight QSO at 19.40 hours, and G5FP (Aberdeen) gave R5 at 22.55 hours.

QRP Work.

By G2VV, Group Manager.

Group 8A.—G.C. G5RV has little to report other than experiments on Goyder Lock method of crystal control. G5VB is preparing for mains at his station, but remains QRP! G6MB has been busy getting crystal working on his TX, using a hand gen. (*Note.*—Two more stations are required for 8A. Any interested QRP enthusiasts should communicate with G5RV or G2VV.—G.M.)

Group 8B.—G.C. G2VV has not been as active as usual, but still reports all conditions very poor. Attention is now being devoted to 28 M.C., as this station hopes to commence QRP work on this band shortly. The 3.5 M.C. band has not been used lately owing to a good deal of 14 M.C. work. G6PV also continues to complain of poor conditions. He has now erected a 66-foot V.F. Hertz, as well as the 33-foot one, and finds that the former gives the best results of the two on 7 M.C., but the latter is best on 14 M.C. Has been using 2 watts and getting out well in Europe. G5CM has little to report owing to bad conditions, but hopes to commence on 28 M.C. when G2VV is ready. G6SO reports 14 M.C. very bad, 3.5 and 7 M.C. fair, but complains of lack of G stations received on all bands. Has been busy with fone on 1.75 M.C. and has received some encouraging reports. G5RX has

been trying the 33-foot aerial, but says that the results obtained with it do not compare with his old 66-foot A.O.G. Has worked ST with 4½ watts on 14 M.C. With an aerial 5 feet high and 45 feet long, he worked EARVL, using 5 watts on 7 M.C., and received a report of R6, and asks where all the "stunt" aerial theories come in? 2ANU is putting in for full permit and we wish him luck. Still seems to be delving into the mysteries of crystal control. Complains that at certain points on the RX his crystal in the TX stops the set oscillating even when the TX is switched off.

Group 8D.—G.C. G5MR is forced to resign from 8D owing to reasons which are unavoidable. He has now obtained an 80m. permit, but in spite of trying everything possible, his receiver stops oscillating at 70m.! Has been running schedules with G stations, but complains of poor conditions. (*Note.*—G6BU has been appointed G.C. of 8D, and all 8D members should in future forward their reports to him. Our best wishes go with G5MR, G.M.) G6BU, in spite of prevailing conditions, has worked ZC and W8 with 5 watts on 14 M.C. In experiments with plate tank tuning, he finds that minimum plate current does not coincide with maximum aerial current. If the input mills were increased slightly aerial current improved a great deal. Further, the aerial could be tuned to maximum current by tuning the plate circuit to maximum R.F. current by means of the lamp and loop system. The experiments were carried out with a short A.O.G. and a lamp in the centre. G5LX has completed his 7 M.C. C.O. and P.A. TX and reports are pleasing. G5QY is to be congratulated on working S. America with 5 watts. His TX is a series-fed T.P.T.G., using 240 volts D.C. to a UX245. Is running a schedule with ZC6JM nightly at 17.30. On August 9, he heard Southern G stations at terrific strength on 14 M.C., and asks if any other stations noticed the same conditions? He is now on 3.5 M.C. with a parallel-fed Hartley, and would welcome any reports. 2AGN reports conditions bad, especially on 14 M.C. Is building new RX. Has been trying grid control fone and found that milliamps rose slightly when using tubing coils in place of wire coils. (I agree, G.M.)

Group 8E.—G.C. EI7D has not yet rebuilt following lightning disaster. He finds that a 10,000-ohm resistance used in place of a R.F.C. in the RX cures threshold howl and improves results generally. G2OC also reports bad conditions and lack of G stations. With loose coupling he finds that antenna current is higher if the other end of the coil is earthed and gives better results than if tapped direct on plate coil. G5JU also complains of poor conditions lasting. Is using C.C. and a PM256, and for FD is using a DEP610. Finds that 07.00 to 08.00 good for QRP work. G5XM has been trying the 33-foot aerial, but has given it up as a bad job! He suggests that it is 11¼in. short. (Why?—G.M.)

Group 8F.—G.C. G2TJ has been working DX on 14 M.C. and has received a report from VU. Says that 18.45 to 20.30 B.S.T. seems best time for Eastern DX. G2PF has finished new TX, and although he thinks it is good, the B.C.L.s seem to have an adverse opinion, and he is busy looking up dope on key click filters, etc.! G2QX reports little of interest owing to bad conditions. Has new 3.5 M.C. C.O. outfit working. Has scrapped the 33-foot aerial for good!! G5IH is using choke control fone on 7 M.C. and 1.75 M.C. Has been QSO G6QA on the latter band with 3 watts input. (*Note.*—Nearly every station in the QRP Section seems to have tried out the 33-foot V.F. aerial, but results seem to be very different. Surely this proves that local conditions decide the type of aerial to use?—G.M.)

Review of Foreign Magazines.

The problem of the reception of 14 M.C. stations on 28 M.C. is discussed by F8OC in the August *REF.* Observations made since 1929 show that harmonics could be received on 28 M.C., even when the 14 M.C. fundamental was inaudible. Hence these harmonics cannot, in all cases, be generated within the receiver. It is interesting to note, however, that such harmonics were only received when using a receiver having a screen-grid H.F. stage preceding the detector, and never with an earlier 0-v-1 receiver.

QSO has made a welcome reappearance after a long delay caused by a strike. In the August issue, ON4EL describes some five-metre experiments made from station 4JB. A curve showing how signal strength falls off with distance from the transmitter takes the form of a straight line through "R10" at 5 Km. and "R2" at 50 Km. Simultaneous transmissions were made on 40 m., and it was found that reception within this 50 Km. zone was more reliable on 5 than on 40 m. More detailed experiments are in progress.

A paper in the September *Proc.I.R.E.*, entitled "The propagation of Short Radio Waves over the North Atlantic," by C. R. Burrows, contains data of interest to amateur workers. It is pointed out that the North Atlantic route is one of the most important commercially, and that considerably more experience will have to be gained before we can decide properly as to the best working frequencies. The results presented are based on reception in London of signals from Deal, N.J., during the period 1926-9. It was found that the best frequencies were about 18 M.C. for day and 9 M.C. for night communication in summer, and 13 to 18 M.C. by day and 6 M.C. by night in winter. Two of the frequency channels open to amateurs receive attention, viz., 14 and 28 M.C. The 14 M.C. band proved the best channel during the dawn and dusk transition periods, and also at certain other times of abnormal propagation. Observations on 27 M.C. were satisfactory in summer, but signals were never heard in winter.

The large number of observations made enabled certain days to be picked out as "normal" days, and it was found that when average conditions differed from year to year, this was not due to a change in propagation conditions on a normal day, but rather to a change in the proportion of normal and "disturbed" days. The effect of solar disturbance was always to decrease field strength.

Transmissions of Wireless Waves of Standard Frequencies from the National Physical Laboratory.

(Station Call Sign G5HW).

IN connection with the work of the Radio Research Board of the Department of Scientific and Industrial Research, waves of accurately known frequency have been transmitted for some years past from the Wireless Station at the National Physical Laboratory for checking the calibration of wave meters and other apparatus.

Up to this year the frequencies employed have been suitable for commercial purposes, but commencing on March 3 last, at the request of the Post Office, arrangements have been made for a standard frequency transmission to be sent out which enables owners of amateur experimental transmitting stations to enjoy the same facilities.

This standard frequency transmission is made on a frequency of 1785 kilocycles per second (*i.e.* 168.6 metres), and is tranmitted on the first Tuesday in March, June, September and December, commencing at 9 p.m. G.M.T.

The standard transmission is preceded by the announcement C.Q. de G5HW, repeated several times, followed by standard wave transmission on 1785 kilocycles. The announcement is followed by a continuous dash, the whole lasting ten minutes.

This procedure is repeated six times, *i.e.*, at 21.00 (9 p.m.), 21.10, 21.20, 21.30, 21.40 and 21.50.

By the use of this standard frequency transmission a very accurate calibration of wavemeters or transmitters can be made, although, as is the case in all accurate measurements, a certain degree of skill is required. The method detailed below is that suggested by the Post Office for utilising this standard frequency transmission to obtain the greatest accuracy with the apparatus usually available at amateur transmitting stations.

The apparatus required to check a crystal controlled transmitter or to calibrate a crystal wavemeter by means of this transmission, is, firstly, a receiver, the settings of which can be accurately determined, having a range from 1785 kilocycles to the highest calibration frequency required; secondly, a calibrated oscillator having a range of 200 to 1785 kilocycles. If the receiver is not of the self-oscillating type it will be necessary to employ a separate heterodyne in conjunction with it.

Dealing first with the case of a crystal-controlled transmitter working in the 42-metre band and which utilises a wavemeter of the absorption or resonance type.

The receiver is first set to the silent point of the standard frequency transmission, that is, to 1785 kilocycles.

The output from the oscillator is then closely coupled to the receiver (which is assumed to self-oscillate), care being taken to ensure that there is no frequency interaction between the receiver and oscillator. The oscillator is then set to oscillate on 1785 kilocycles by varying its frequency until the silent point of its oscillation is obtained on the same setting of the receiver as that obtained for the silent point of the standard wave transmission. Leaving the oscillator unchanged, the receiver is next tuned to the 4th harmonic of the oscillator, that is 7140 kilocycles per second, or the mid-point of the 42-metre band.

The oscillator is then stopped and the transmitter made to self-oscillate and its frequency adjusted to the same setting as the receiver, that is 7140 kilocycles per second. The wavemeter setting for this frequency is then obtained by measuring the transmitter frequency in the normal way. It is desirable that this setting should correspond with the middle of the wavemeter scale.

To obtain a calibration curve of the wavemeter on this band points are required separated by a smaller frequency interval than 1785 kilocycles from the mid-point calibration already obtained, a separation which would be obtained by taking the 5th and 3rd harmonics of the previous oscillator settings.

To obtain two further points which will be less widely separated, the receiver is set to the silent point of the calibrated wave transmission and the oscillator frequency is decreased until its 5th harmonic corresponds with this setting of the receiver that is, 1785 kilocycles. The fundamental of the oscillator will therefore be 357 kilocycles per second. The receiver is retuned to the setting previously obtained for 7140 kilocycles and the 20th harmonic of the oscillator will then be heard on this setting. The tuning of the receiver is then slowly varied until the 21st harmonic of the oscillator is heard, that is 7497 kilocycles per second. The transmitter is then tuned to oscillate on this frequency and the wavemeter reading again obtained. In a similar way the 19th harmonic of the oscillator may be tuned in and the process repeated, giving a third point on the wavemeter at 6783 kilocycles per second.

To obtain accurate measurements the wavemeter range should be such that the three calibration frequencies are respectively near the minimum mid-point and maximum of the scale.

Even greater accuracy may be obtained by utilising the 6th or 7th harmonic of the oscillator in place of or in addition to the 4th, thus obtaining check points with less separation.

A similar procedure is adopted to obtain checks on the 20, 10 and 5 metre bands, as it will be found that the mid-points of these bands correspond with a harmonic frequency of 1785 kilocycles per second. It is not, however, necessary to employ such a high order harmonic of the oscillator for obtaining check points and harmonics should be selected to suit the range of the wavemeter used.

For example, in the 5 metre band it may be found satisfactory to set the oscillator to 3570 kilocycles per second, and to utilise the 15th, 16th and 17th harmonics corresponding to frequencies of 53550, 57120 and 60690 kilocycles per second.

To calibrate a non-crystal controlled transmitter, which in consequence uses a crystal-controlled wave-

(*Continued on page* 130.)

APPARATUS WORTH BUYING.

Mains Transformers.

Messrs. W. B. Savage, of 292, Bishopsgate, London, E.C., have submitted for test transformers for use with the Osram GU1 rectifiers. The H.T. model is rated at 1,000-0-1,000 volts, 250 milliamps., and the L.T. at 2-0-2 volts, 6 amps. On inspection these transformers appeared robust and workmanlike jobs without frills, and it was decided to give them the most rigorous tests. Two Osram GU1 valves were used for full-wave rectification with a T.C.C. 4 mfd. condenser across the output. The results which follow show that the H.T. transformer is well up to its work and has a bit in reserve in case of *accidental* abuse :—

	Output.	
Transformer.	Volts.	Milliamps.
H.T.	1,450 D.C.	100
H.T.	1,285 D.C.	250
H.T.	1,150 D.C.	500
L.T.	4.6	No load
L.T.	4.4	3 (amps.)
L.T.	4.1	6 (amps.)

No smoothing choke was used. The load of 500 milliamps. on the H.T. model was maintained for 30 minutes, and the transformer showed no signs of distress.

The primary consumption was as follows :—

		Input.
Transformer.	Load.	Volt amperes.
H.T.	Nil	54
H.T.	250 ma. (1,285 volts)	260
L.T.	Nil	8.5
L.T.	6 amps. (4.1 volts)	28

In view of the very satisfactory results of these tests, we feel that we can safely recommend these transformers to members as a sound proposition at a reasonable cost. The prices are : H.T. model, £4 15s. ; L.T., £1 1s. 6d.

Eddystone Products.

We would like to draw the attention of members to "Eddystone" goods. The porcelain stand-off insulator may now be obtained with a wing-nut for ease in coil mounting. Two H.F. chokes are produced, at the low price of 3s., which have a self-capacity of less than 1 mmfd. These chokes are space-wound on a skeleton former, are 1 in. in diameter and will carry 20 milliamps. or 100 milliamps., according to type.

It is worthy of note that Messrs. Stratton & Co. are the only British manufacturers who cater for the needs of the amateur transmitter.

New Osram Valves.

The Osram V.MS4 is a modification of the well-known MS4, and is one of the new types of valves in which the mutual conductance can be varied from, in this instance, 1.1 ma/volt at —3 volts bias to .005 ma/volt at —40. The characteristics are further designed so that during the operation of the volume controlling resistance, which increases the negative bias, the mutual conductance is varied exponentially, or the log conductance is a straight line function of the negative grid bias. This gives a perfectly smooth volume control from maximum amplification on weak signals to practically zero when tuned to a loud signal.

The characteristics of the Osram V.MS4 are as follow :—

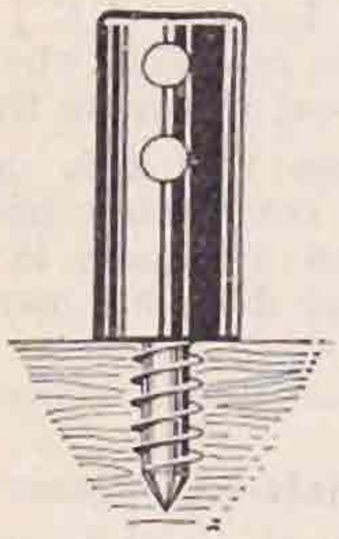
Filament Volts	4.0 A.C.
Filament Current	1.0 amp.
Anode Volts	200 max.
Screen Volts	60 max.
Impedance	500,000 ohms.
Mutual Conductance ...	1.1 ma./volt.
(measured at Ea=300, Esg=60, Eg= —0.5).	
Mutual Conductance ...	0.005 ma/v. approx.
(measured at Ea=200, Esg=69, Eg.= —40.	
Grid-Anode Leakage Capacity	0.0019 micro-microfarad.

A range of Osram Valves for D.C. Mains sets with ¼ ampere indirectly heated cathodes are now available, the volts to the heaters being 16. The maximum anode volts being 200 in each case; the prominent characteristics of the four are given below :—

Osram D.S. (Screened Grid).—Amplification factor 550, impedance 500,000 ohms.
Osram D.H.—40, and 10,800 ohms.
,, D.L.—12, and 2660 ohms.
,, D.PT—(pentode)—90 and 30,000 ohms, 8 watts (maximum) anode dissipation.

Clix.

We should like to draw the attention of members to a new Clix product—the panel valve holder. This is built in their usual style and provides for maximum insulation, best possible contact and no possibility of doing damage to the valve through careless insertion. Separate sockets as used on their valve holders may now be obtained for home mounting. These may be securely riveted to the panel, a special tool being provided for the purpose.



The illustration shows a new Clix insulator for fixing indoor aerials and for running any wires where good insulation is desirable. The insulator portion is 1¼in. long and two holes are provided for holding the wire.

New Mullard Valves.

The Mullard Company announce the release of the 054V, an indirectly heated output valve of substantial output. The filament is of the usual rating, 4-volts, 1-ampere. The valve is rated for a maximum anode voltage of 200, its impedance being 1250 ohms, amplification factor 5 and mutual 4.

(*Continued on page* 130.)

Superhet Receiver—(*Continued from page* 116).

given station, as is often the case. It has been stated that the set has a range of 18-55λ. The experienced amateur will at once question whether this is desirable, as surely the amateur bands are crowded into a degree or two. This, however, is where C8 comes in. This was originally designed to regulate the strength of the oscillations of V2. It does so, but provided the oscillations are not less in amplitude than the amplitude of the oscillations of the received signal, it does not matter how strong they are, so long as they do not choke the grid of V1. The writer has found that such desirable conditions prevail when the set is as constructed, the H.T. 80 and C8 not less than half in. With C8 all in it is not possible to overload V1, so that C8 may be varied between 90° and 180°. This makes slight changes in the tuning of L5 C7, and the writer has found in practice that C8 may be very conveniently used to explore in detail a small waveband which has been selected and brought on to its range by C7, the top half only of C8 being used for this exploration. Since C2 need not be adjusted during exploring adjustments of C8, the set virtually reduces to a one dial control, giving detailed exploration of a waveband. Add to this the great selectivity and sensitivity of the arrangement, and it will be seen that this is a very comfortable and helpful set of conditions for reception on amateur bands. By setting the condensers to the following readings (in the writer's set), and varying C8 over the upper half of its range, the 7 M.C. band may be explored : C2=108° ; C7=145° ; C3C4=max. A similar, but lower set of readings will enable C8 to explore the 14 M.C. band. These are : C2=40° ; C7=zero ; C3C4=one-third of max.

The addition of suitable coils will enable the set to go up to the 3.5 M.C. and 1.7 M.C. bands, but the writer has not yet finished working on these, and is not in a position to describe the best coils. The sensitivity of the arrangement is remarkable, and the use of telephones practically unnecessary. The selectivity is exceedingly good, being such that Leesen, P.C.J., W2XAF, and WIXAD can all be resolved, when working at the same time on almost the same frequency.

The writer hopes that this description is not unduly long, and trusts that possibly it may be some use to fellow amateurs in improving their reception, as it has done his own.

Transmitting Aerials—(*Continued from page* 121).

be used, though it is possible, as before, to work with direct coupling.

If the oscillator is push-pull, the question of coupling this feeder to the transmitter may cause some perturbation, but a method of so doing is shown in Fig. 11, which will be entirely effective. The two feeders must be tapped on equidistant from the centre point of the roof and be exactly equal in length. Further, they should be kept well separated and at the station end must be coupled at equal distances from the centre of the oscillator coil. In the case of loose coupling, the alternative method shown will have the same effect, and again, loose coupling is preferable.

The chief advantage of any form of single-wire fed aerial is the simplicity of its erection, planning and construction.

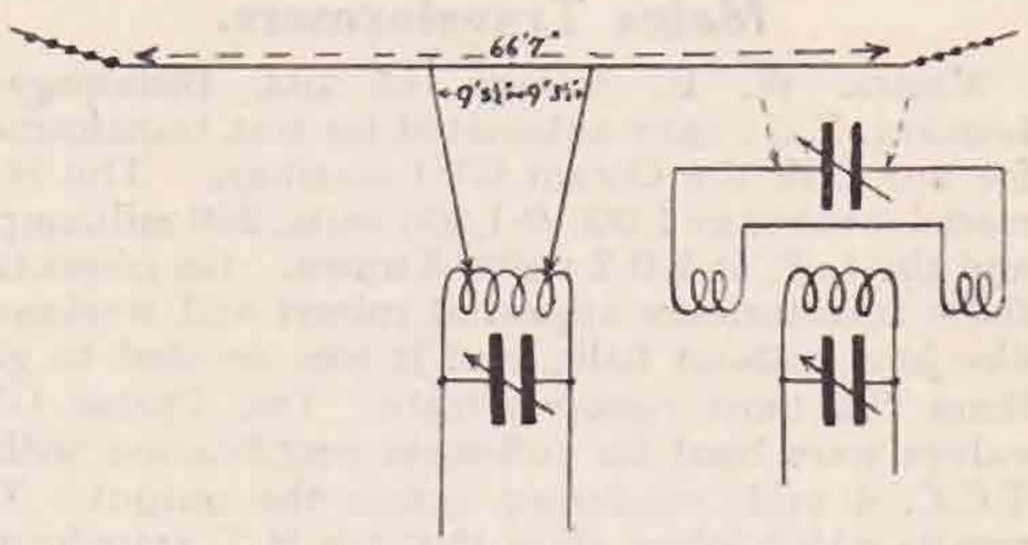


Fig. 11.

The chief disadvantage is the difficulty of getting the feeder non-radiating, and also the tuning of the system for maximum efficiency, as it is difficult to use meters in the aerial itself or on its feeder with any hope of getting reliable indications.

The " Windom " is probably the aerial in this class which will produce the most satisfactory results.

(To be continued.)

Society Celebrities—No. 1.

REPORTS WANTED

G5FI (of The Grange, Cefn Coed, Merthyr) will be calling TEST every Sunday morning at 11.00 G.M.T. on 17.50 K.C. for stations at least 50 miles away. He will also be on at 22.30 G.M.T. every evening and will be pleased of reports.

* * *

G5LQ (ex BRS555, 13, Central Square, Brigg, Lincs.) will be on the air by the time this appears and will welcome reports from any transmitting or receiving station.

* * *

GI6YM has six operators, all authorised by the P.M.G. Schedules can be arranged on the 7 and 14 M.C. bands. All reports will be acknowledged.

EASY CRYSTAL CONTROL.

By J. H. Wetherill (G2TK).

IN this article I would like to describe my experiments and results, together with a description of a simple two-valve circuit designed to give C.C. on 20, 40 and 80 metres.

For use on 20 metres, as will be seen in the figure, the current makes use of a C.O. of the G2NH design.

A 40-metre crystal is used in this stage, followed by a straightforward T.P.T.G. operating on 20 metres.

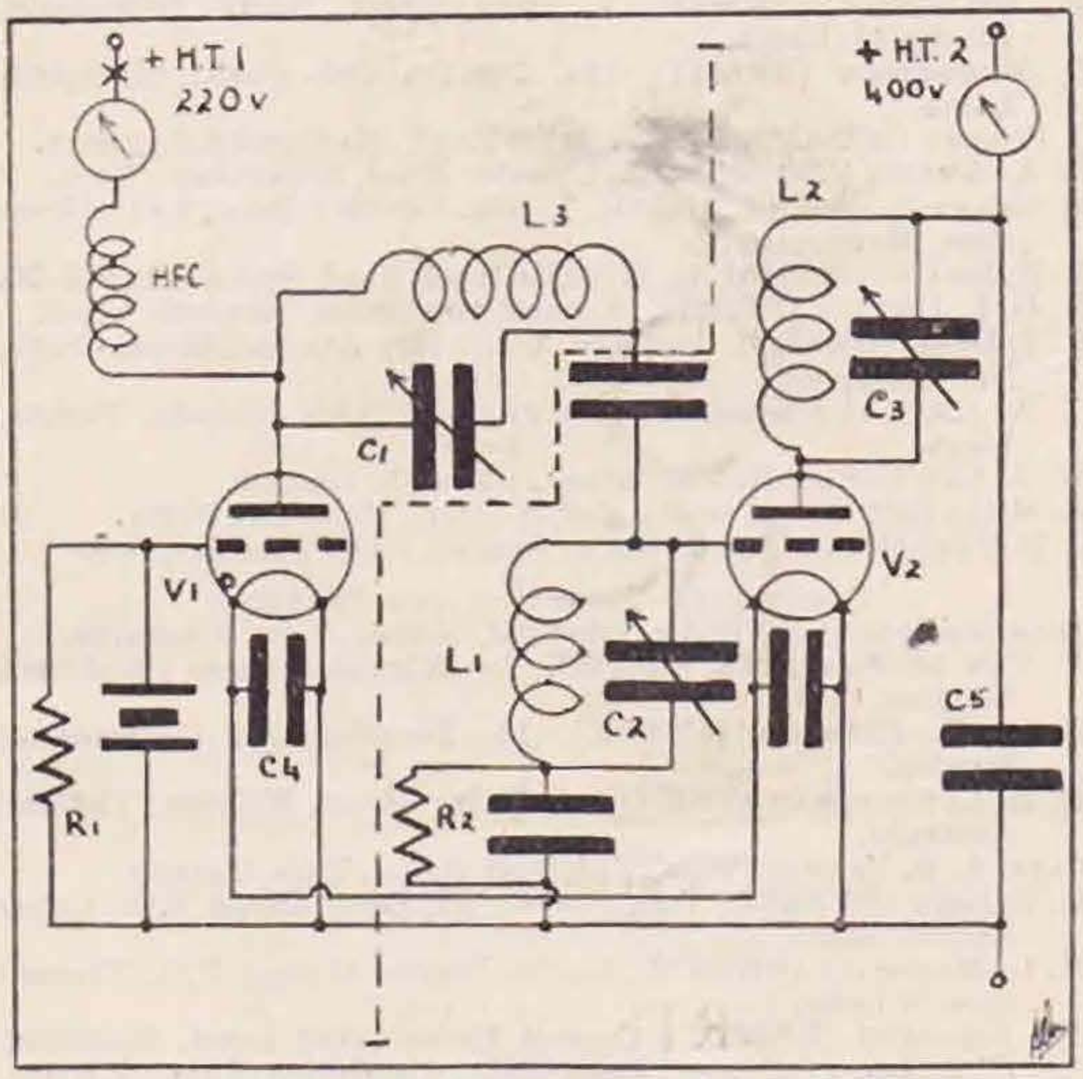
By this means crystal control is obtainable on 14 M.C. with a minimum of trouble.

The C.O. valve is merely set oscillating and the T.P.T.G. tuned until it comes into resonance with the crystal.

This procedure is exactly the same as described by G2NH in a past issue of the Bulletin.

For use on 40 metres, two obvious methods present themselves.

The first and simplest is effected by switching off the filament of the T.P.T.G. connecting the antenna as far towards the plate end of the C.O. coil as oscillation of the crystal will allow and keying at the point X.



V_1 = *D.E. 5*
V_2 = *D.E.T.I. or L.S.5.*
R_1, R_2 = *20,000 ohms.*
L_1 = *6 turns for 40 m.*
L_2 = *3 turns for 20m.*
L_3 = *12 turns for 80m. octal.* / *6 turns for 40m. octal.*
C_1, C_2, C_3 = *.0003 mfd.*
C_4, C_5 = *.002*

This is found to give a pure, clear cut C.C. note on 40 metres, and results obtained are equal to a T.P.T.G. self-excited circuit in all respects.

The second method is effected by charging L_1 from a 6 to 12-turn coil and inserting an 80 metre crystal in the C.O. stage.

The T.P.T.G. is then tuned to 40 metres by adjustment of the coils L_1, L_2 from three to six turns.

If desired a 12-turn coil and two six-turn coils can be permanently equipped with stand-off insulators, and the variations made by means of good quality spring connections.

Personally I use two complete sets of coils, as the time and trouble taken in effecting the change is almost negligible.

Here again, if we wish to use the transmitter on 80 metres, we have only to switch off the T.P.T.G. filament whilst oscillating on 40 metres and key at X again with a suitable resistance across the key and a good note will result. I keep a key permanently wired at X and just keep it fastened down when the T.P.T.G. is in use.

Keying of the T.P.T.G. can be carried out by any of the usual methods, preferably in the H.T.+ if B.C.L. interference is not too bad. *

I have experimented with F.D. circuits with quite good results, but for stability and economy the circuit described takes some beating. As encouragement to those who hesitate still, contact was effected on 14 M.C. with 40 W stations, 2 PY, FX, and on 7 M.C., SU, YI, CT2, and the "Nautilus," using under 10 watts to a DETI in one month.

* If it is then use a key thump filter.—Ed.

The next issue of the BULLETIN will contain:

Part 1 of an article by Mr. H. K. Bourne, B.Sc., G2KB, on the design of Mains Transformers.

The conclusion of Mr. Forsyth's article on "Aerials" will also appear, together with a Station Desccription of VK2MC.

B.E.R.U. Tests, 1932

We have pleasure in announcing that preparations are now in hand for the B.E.R.U. Tests to take place in February, 1932. The tests will be run during week-ends, four 36-hour periods commencing at 12.00 G.M.T. Saturday, and finishing at 24.00 G.M.T. Sunday. Full details will appear in next issue. Meanwhile

RESERVE THE DATES

New Mullard Valves—(*Continued from page* 127).

A new valve is the MM.4V, a multi-Mu valve, to which the following data apply :—

Max. Heater Voltage	4.0 volts.
Heater Current	1.0 amp.
Max. Anode Voltage	200 volts.
Positive Screen Voltage	75-100 volts.
Mutual Conductance :—	
(*a*)	3.0 mA/volt.
(*b*)	0.01 mA/volt

(*a*) At anode volts 150 ; screen volts 75 ; grid volts zero.

(*b*) At anode volts 150 ; screen volts 75 ; grid volts—40.

The MM.4V is a modification of the screened grid valve and gives smooth and efficient volume control by variation of the grid bias. For weak signals the grid bias is so adjusted that the valve is operated on the steep portion of the characteristics, thus obtaining maximum sensitivity, while for strong signals, the grid bias is adjusted for low slope working.

Electrolytic Condensers.

The latest products of the Telegraph Condenser Co., Ltd., are two electrolytic condensers of capacities of 8 mfds. and 10 mfds. The maximum working voltage for the former is 460v. D.C., and for the latter 400v. D.C. They are polarised and care must therefore be taken to connect them correctly, and they must be operated in an upright position. The condensers are so designed that the central terminal at the top is positive, and the copper case negative. They must not be used on raw A.C. For those who want a large capacity in a small space these condensers are excellent, the dimensions being : height 4½″, diameter 1½″. The price of the 8 mfds., 460v. D.C. working is 12/6, and the 10 mfds., 400v. D.C. working, 10/-. The leakage current is less than one milliamp. at the maximum. voltage.

A Monitor Wavemeter.

The Editor requests the following corrections be noted in the diagram on page 76 of last issue. The 'phone jack should have been shown as a No. 2 jack where the circuit is still " made " even when the plug is withdrawn. The .0002 mfd. condenser should not have been shown as variable.

The R.S.G.B. Short Wave Two.

In the diagram on page 69 of the last issue the switch in the H.T. + lead should not have been shown ; a switch should have been shown in each L.T. lead.

Calibration Services.

A Calibration Service will be transmitted from G2NM, Mr. Marcuse's Station at Sonning-on-Thames, Berkshire, on 3,583.13 K.C., according to the following schedule.

At 11.00 every Sunday (Telephony).

At 23.00 every Sunday and Thursday (Morse).

Times are G.M.T. or B.S.T., as in force. The frequency has been checked and approved by the Post Office.

Transmission of Waves—(*Continued from page* 126).

meter under the regulations relating to amateur transmitters, the procedure is similar to that already described except that the transmitter is calibrated instead of the heterodyne wavemeter, and this calibration is used to check the crystal wavemeter.

Strays.

G2ZQ de EARFU(L !—Ed.)—hr vy Qrp—1 vat.

* * *

G5QT is off the air until November but finds there is a pirate using his call-sign. If the unsportsman-like ham (no, he can't be a ham) sees this perhaps he will refrain from such practice and behave like an Englishman.

* * *

VK6NO says that VK3BB is not the youngest transmitter in Australia as claimed on page 11 of the July Bulletin. VK6FO is 15½ years of age and has been on the air a year.

* * *

New Members.

Corporates—Great Britain.

C. R. Plant (G5CP), 1. Albert Road, Northenden, Nr. Manchester, Lancs.
J. T. Smallwood (G5JI), 66, Shireland Road, Smethwick, Birmingham.
J. Butterworth (G5XF), 1088, Manchester Road, Castleton, Nr. Rochdale, Lancs.
J. B. Webb (2BIT), Salcombe Lodge, Sidmouth, Devon.
E. W. J. Clayton-Smith (2BBN), 13a, Exchange Mansions, Muswell Hill, N.10.
K. F. Hall (BRS606), " Westridge," Belmont Crescent, Swindon, Wilts.
F. C. Disher (BRS607), 41, Bracewell Road, W.10.
W. J. McDonald (BRS608), Violet Cottage, Walkerburn, Peebles-shire.
T. H. Beaumont (BRS609), Rushey Ford, Kempston, Bedford.
H. Hillgrove (BRS610), 7, Dean Street, South Promenade, Blackpool, Lancs.
F. Windridge (BRS611), 124, Preston Old Road, Blackpool, Lancs.
J. Foxley (BRS612), 132, Waterloo Road, Blackpool S.S., Lancs.
D. A. Wright (BRS613), 122, Bromley Road, Beckenham, Kent.
M. Shams-El-Deen (BRS614), Messrs. Crossley Bros., Ltd., Openshaw, Manchester.
E. H. Swain (BRS615), 31, Woodbastwick Road, Sydenham, S.E.26.
R. D. L. Dutton (BRS616), 8, Somersby Grove, Skegness, Lincs.
F. J. Behn (BRS617), Aberford, Court Hey Avenue, Broad Green, Nr. Liverpool.
J. A. Gray (BRS618), " Galen House," Wide Bargate, Boston, Lincs.
W. A. Law (BRS619), Main Street, Larne, N. Ireland.
H. Hills (BRS620), Fernlea, Sadler Street, Mansfield, Notts.
L. P. Taylor (A), Church Gates, Hendon Lane, Finchley, N.3.

Corporates—Dominion and Foreign.

Jean Niculesco (CV5EV), Principal, Mihaiu, Titu, Roumania.
A. Van de Kerchove (ON4TO), Le Warissay, Lasne (Brabant), Belgium.
Hans F. Eliæson (SM6WL), 18, Berzeliigatan, Gothenburg, Sweden.
R. H. Cunningham (VK3ML), 1, Dalny Street, Malvern, Victoria, Australia.
Capt. A. B. Trewin (VQ5NTB), Fort Portal, Toro, Uganda.
H. Clarke (BERS75), Tongonagaon Et, Doomdooma P.O., Upper Assam, India.
H. G. Marshall (BERS76), Nadiar Estate, Munnar P.O., Travancore, S. India.
W. Johnston (BERS77), Custom House, Port Louis, Mauritius. (Temporary address, Eaglescliffe, Headstone Lane, Harrow, Middlesex.)

HIC ET UBIQUE.

The county representative's address for Gloucester was given erroneously in September BULLETIN. It should have been "Mr. W. B. Weber (G6QW), 2, Balmoral Road, St. Andrew's, Bristol."

* * *

Mr. C. Morton (GI5MO) has been re-elected representative for Northern Ireland.

Mr. G. M. Whitely (G5IA) has been appointed county representative for Yorkshire.

* * *

It is unfortunate that Mrs. L. E. Hutchings' (VK3HM) reports of B.E.R.W. were not received in London, though they were apparently sent off from Australia at the close of the contest. Mrs. Hutchings is our first lady member of B.E.R.U., and we gladly give her list of New Zealand contacts obtained during the Empire Week.

The contacts were with (14,000 K.C.) ZL: 1ci, 1db, 1fu, 2bg, 2dn, 2gw. (7,000 K.C.) ZL: 1fr, 2bg, 2dn, 2gw, 3aw. (3,500 K.C.) ZL: 1av, 1bl, 1cf, 1ci, 1cp, 1fg, 2be, 2bg, 2ca, 2ci, 2fe, 2gq, 3ae, 3bj, 3bm, 3bn, 3ca, 3ck, 4ai.

QRA Section.

Manager: M. W. PILPEL (G6PP).

NEW QRA's.

G2XA.—M. GRIFFIN, 87, The Crossways, Heston, Middlesex.

G2YU.—M. H. WILKINSON, "Southerlea," The New Way, Tranmere Park, Guiseley, Leeds.

G5CP.—C. R. PLANT, 1, Albert Road, Northenden, Manchester.

G5FJ.—F. J. JACKSON, "The Ringles," Headcorn, Kent.

G5GZ.—G. L. GRISDALE, 39, Ranelagh Gardens, Ilford, Essex.

GI5HV.—W. H. MARTIN, 45, Bawnmore Road, Belfast, N. Ireland.

G5IM.—E. N. BLACK, 361, Brook Street, Broughty Ferry, Scotland.

G5IX.—P. H. DUTTON, 8, Somersby Grove, Skegness, Lincs.

G5KA.—F. L. POSTLETHWAITE, 41, Kinfauns Road, Goodmayes, Essex.

G5LH.—F. THOMPSON, 235, Wingrove Avenue, Newcastle-on-Tyne.

G5MP.—B. W. F. MAINPRISE, 48, Earlsfield Road, Hythe, Kent.

G5MR.—V. G. MELLOR, Sele House, Hertford, Herts.

G5QC.—G. COLLEY, "Hillingdon," Stafford Road, Oxley, Wolverhampton.

G5TS.—T. B. SMITH, 106, Cloberhill Road, Knightswood, Glasgow.

G6DB.—D. N. BILTCLIFFE, 41, Church Street, Morley, Leeds.

G6PV.—P. VARNEY, Beverley, Upper Hale, Farnham, Surrey.

2AKN.—R. K. SHEARGOLD, "Glenmore," Manygate Lane, Shepperton, Middlesex.

2AML.—L. V. WAUMSLEY, 71, Hawthorn Road, London, N.8.

2AOY.—L. C. HEDDON, 31, Medhurst Road, London, E.3.

2BCJ.—F. ROBINSON, 4, Cranford Gardens, Aklam, Middlesbrough.

2BFT.—A. READ, 124, Fillebrook Road, London, E.11.

2BZW.—S. COOK, 2, Queens Avenue, Snodland, Kent.

The following are cancelled:—G6HJ, 2AAL, 2AHB.

QRA wanted.—SO2.

QSL Section.

Owing to the enormous number of unclaimed QSL cards that are liable to collect at Headquarters, it has been decided that the time has come to modify the rules regarding this part of the QSL service.

Two series of files are kept at the Section; one file contains the cards of all calls having envelopes at H.Q., and the other consists of cards belonging to amateurs who for some reason or other do not appear to want their cards, and who leave them stored at R.S.G.B. rather than send up envelopes to collect them.

No cards are transferred from the first file to the unclaimed except on a certain day every three months, when the cards in this file are checked to see if they still have envelopes. Those cards which no longer have envelopes are removed and placed in the unclaimed file for a further period of three months, after which they are taken from H.Q. for good.

At any time that envelopes arrive for a call in the unclaimed file, of course, his cards are replaced at once in the claimed section and are sent off as usual.

This has been found imperative because the number of cards left unclaimed has been growing so large that space in which to accommodate them was becoming difficult to find. This new departure should involve no hardship, as no doubt all of you will agree that if a man does not collect his cards after what practically amounts to six months, then there is ample justification for removing them from the current files of the section.

The moral of the foregoing is plain for all to see, but rather than leave any doubt at all, let me repeat—***keep a supply of envelopes at H.Q.*** so that you at least do your part to help the work of the Section to go forward smoothly.—J. D. C.

Strays.

VK2MW, presently working on 7 and 14 M.C., desires reports and contacts with British amateurs. QRA is: Wm. Manley, 10, Arthur Street, Leichhardt, N.S.W.

* * *

Have Messrs. Varley's supplied the answer to P. P. E.'s question at the Convention dinner?—How many bands would a band-pass pass if a band-pass could pass bands?

CALLS HEARD.

In response to many requests we have decided to revert to the old system of listing "Calls Heard," and in future we will publish lists of "Calls" from all parts of the world.

A. T. Mathews (*BRS*497), 24, *Woodside Park Road, N.*12. *August* 17-30.

3.5 M.C.: ve1md. 7 M.C.: ve1bl, vk2nr, vk2oc, vk3bb, vk3es, vk3mi, vk3qh, vk3rw, vk3wl, vk5dx, vk5hg, vk7ch, zl1ak, zl2ab, zl2bi, zl2cf, zl2ci, zl3aj, zl3az, zl3cm, zl4ao, zl4ap, zl4bk.

* * *

ST2D, Khartoum. August, 1931.

14 M.C.: g2az, g2by, g2dz, g2ig, g2oa, g2op, g2pa, g2qb, g2rv, g2tj, g2ux, g2vv, g2zp, g5hj, g5jz, g5la, g5ni, g5pj, g5pl, g5qy, g5rs, g5rx, g5vn, g5yk, g6bu, g6co, g6gc, g6nf, g6rb, g6sc, g6ut, g6wm, g6wn, g6wq, g6xj, g6xq, g6yk, g6yl, g6yu, st2c, su1aa, su1aq, su1ch, vq4crf, vs7gt, vs7pk, vu2ah, xyi6kr, zc6jm, zd2a, zt1h.

* * *

ZL2HR (*NZ*15*W*), 75, *Wilson Street, Hawera, New Zealand.*

7 M.C.: ei9l, g2cs, g2lz, g2rc, g2sa, g2vq, g5sa, g6bd, g6rb, g6sa, g6wy. 14 M.C.: ei8b, g2ab, g2ao, g2ay, g2bj, g2by, g2cj, g2dh, g2du, g2dz, g2gm, g2kf, g2lz, g2nu, g2od, g2ol, g2vm, g2vq, g2xv, g5ml, g5mq, g5oc, g5sy, g5vm, g5yg, g5yk, g6dh, g6gs, g6lk, g6nf, g6nx, g6qb, g6rb, g6rg, g6rh, g6ut, g6vg, g6vp, g6wn, g6wr, g6wt, g6wy, g6xq, vq3msn, st2c, st2d, su1aa, su8rs, su8ws, xg5sv.

* * *

*BERS*25, *Aden, British, Arabia:*

g2by, g2dz, g2ig, g2lv, g2ma, g2nh, g2ni (?), g2nv, g2pa, g2rv, g2uv, g2wv, g2zp, g5bj, g5hj, g5pj, g5pl, g5qy, g5vn, g5wj, g5wq, g6cl, g6fo, g6lf, g6ll, g6rg, g6vn, g6vp, g6wn, g6wt, g6xn, g6yk, g6yl, st2d, su1aa, v1yb, vq4crf, vs7gt, zc6jm, zd2a, ze1jg, zs1g, zs6y, zt1h.

* * *

VU2JP, India:

g2ao, g2ay, g2ig, g2vq, g5bj, g5ml, g6jg, g6nf, g6rg, g6wt, g6xq, gi5nj, ve1dr, ve2ac, ve2bv, vk2hb, vk2hu, vk2lr, vk2pn, vk3gr, vk3lr, vk3nm, vk3pa, vk3tm, vk3wl, vk5bo, vk5cm, vk5dq, vk5it, vk5kw, vk5lx, vk5mo, vk5ux, vk5xk, vk6ag, vk6cb, vk6dh, vk6fh, vk6vk, vk6kl, vk6mo, vk6mu, vk6mv, vk6ow, vk6rh, vq2ty, vq4crf, vs6ac, vs6af, vs6ag, vs6ah, vs7ai, vs7ap, vs7gt, vs7mp, vs7pk, vs7wr, vu2ah, vu2dr, zc6jm, obsk2, zs2b, zs2c, zs2n, zs2t, zs5u, zs6u, zs6y, zu5q, zu6k, zu6x.

* * *

VS7GT, Ceylon. June-July:

g6vp, g6qb, g6yk, g5bj, g6rg, g6xq, g2ma, g2rv, g6mn, g6nf, su1aa, su1aq, vq4crf, vk2hb, vk2oj, vk2nr, vk3xi, vk5pk, vs6ae, vu2jp, vu2kt, vu2ah, vu2dr, vu2bg, vu2jb, vu2cs, yi1rm, yi6ht, zc6jm, zs6aa, zs6y, zt6x.

August-September:

g2by, g2gm, g2rv, g5is, g5bj, g5pj, g5pl, g6vp, g6wq, gi5nj, su1aa, su1aq, st2d, vu2ah, vu2bg, vu2cs, vu2df, vu2dr, vu2kt, vu2jp, vk3xi, vk3wz, vk5pk, vk4ju, vs6ah, vs6ao, yi6ht, xyi6kr, zd2a, zt6x, zu6w, zs1z, zc6jm, zl3ar.

CORRESPONDENCE.

The Editor does not hold himself responsible for opinions expressed by correspondents. All correspondence must be accompanied by the writer's name and address, though not necessarily for publication.

Who Was the First Ham?

To the Editor of T. & R. BULLETIN.

DEAR SIR,—With reference to the above note in the September BULLETIN, Col. C. G. Crawley, of the G.P.O., has kindly written to me pointing out a slip which I made in connection with the lecture in Dublin. The lecture was given by Monsignor Molloy, and Mr. Marconi, who was present on the stage and who assisted in the demonstrations, only gave a short address on the conclusion of the lecture. Col. Crawley tells me that he himself was also present at this lecture.

I should also like to point out that the relay shown in the photograph is not the original Siemens polarised relay which was used in this "set." This was on loan to a friend at the time when the photograph was taken and another, of later date, was therefore substituted for it.

Yours truly,
M. J. C. DENNIS, COL. (EI2B).

Assistance Wanted.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Perhaps, at times, the Editor has a bit of trouble to get enough dope to make the "BULL." as large as he would like to see it. It has occurred to me that, perhaps, if some simple questions as to the adjustment and snags that "the Quite Beginner" in transmission comes up against, Hams who have had these effects and have overcome them might answer the questions, not only would this assist the Editor, but I am sure would be a great help to the beginner. One is apt to find on reading any article that one is told just how to adjust, but one does not often find any instructions what to do if the said adjustments do not behave as they should. As an instance, I submit the following questions:—

(1) In a C.C. outfit driving a F.D. using a L.S.5B. in each stage with 400 volts, what maximum and what minimum feed should be expected on the F.D.?

(2) Why, when the plate tank of the F.D. is tuned to the required frequency, does the C.O. stop oscillating?

(3) With choke control modulation, should there be any kick in the plate M.A. of the modulator, oscillator or valve that is being modulated? If so, what does this denote and why?

(4) In grid modulation with valve as modulator, is kick permissible? What is the best and easiest way to prevent R.F. feed back in modulators and speech amplifiers?

(5) With the now-popular type of Hertz aerial for the higher frequencies, what is the best aerial for the 150-metre band and what is the best form of coupling? Other than the Hertz (with a limited space, say, 100 feet).

These are just one or two snags that the beginner may come up against at the start, and the answers would save him no doubt many sleepless nights, and a lot of looking through the few English books on the subject of radio, but I doubt if he will find much thereon.

Yours truly,
" WEST COUNTRY."

[We are quite prepared to give such a scheme as outlined above a trial, as if successful it will undoubtedly be of assistance to many new members. Replies to the questions appearing in this month's BULLETIN should be in the Editor's hands by the 25th of this month, and the Editor reserves the right to make use of whichever replies he considers to be the best.

Surely question 5 could be answered by studying the work of the 2 M.C. Contact Bureau Groups for the past months.—ED.]

Duplex 'Phone.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—In Mr. Milne's interesting note on duplex 'phone in the September BULLETIN, he says that he believes G2MI to have been the first duplex station in South-East England, having worked that system since 1927.

May I point out, on behalf of some of the " Old Brigade," that several of us were working duplex over longer distances than Mr. Milne mentions at least as long ago as 1923. I was certainly not the first (I think I remember 2KF, for one, using it in 1922), but during 1923 I was using it regularly for local work and, on a few occasions, with French and Dutch stations. A short article of mine on this work was in the *Wireless World* for September 26, 1923.

Yours truly,
HUGH RYAN (G5BV).

Amateur Radio and World Peace.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—May I compliment you on the excellent editorial in the August, 1931, issue of the BULLETIN.

It is my firm belief that the medium of amateur radio is doing much more to foster world peace than any other international organisation. This same opinion has also been expressed to me on many occasions by non-amateur visitors to my own and other stations. When they have been asked their impressions of amateur radio they have immeciately replied in the following style: " Well, you fellows are certainly doing real *practical* work for world peace."

So our influence as such a medium must have been very strong to strike them so forcibly, and it behoves us to use it whenever we can. Let us have less of the all-too-prevalent " 73 QRU CUL, etc.," type of QSO. It savours very much of unfriendliness.

Let us encourage the other fellow to " speak," at the very least.

During the two years I have been " on the air " I have made more friends than I ever did during the rest of my life. Some of them I will never see, but they don't forget me. So let us all take a share in this great responsibility and help to make the world a better place.

I remain,
Yours sincerely,
HARRY C. D. HORNSBY (G5QY).

Regarding Tuned Circuit Losses.

To the Editor of T. & R. BULLETIN.

DEAR SIR,—Concerning my article, " The Design and Operation of a Crystal-Controlled Transmitter," and Capt. P. P. Eckersley's correspondence on the subject, may I point out that, owing to a printer's error, the word loss was omitted from the sentence in question? It should have read " If we make the tuned circuit of the P.A. stage as low loss as possible $\frac{(\omega^2 L^2}{R}$ or $\frac{L}{RC}$ to be great therefore high $\frac{L}{C}$ ratio)...etc." That is to say, if we reduce the resistance losses in the circuit to the greatest possible extent and use a high $\frac{L}{C}$ ratio, we shall obtain a high dynamic resistance.

Obviously the $\frac{L}{R}$ ratio of the coil must be made as great as possible, but the $\frac{L}{C}$ ratio should be high also. For instance, given a tuned circuit of freq. $f = \frac{1}{2\pi\sqrt{LC}}$ and dynamic resistance $\frac{L}{RC}$ suppose we increase the inductance in the circuit to aL (at the same time the resistance will be increased to aR) to keep f constant C must be reduced to $\frac{1}{a}$ C and the dynamic resistance will now be $\frac{aL}{aR\frac{1}{a}C} = \frac{aL}{RC}$ *i.e.*, assuming increase in resistance is proporti nal to increase of inductance, then the higher the $\frac{L}{C}$ ratio the greater the dynamic resistance.

Yours faithfully,
D. W. HEIGHTMAN (G6DH).

Radio and Earthquakes.

To the Editor of T. & R. BULLETIN.

SIR,—The letter in the August BULLETIN from G5RV and other matter on this subject from other notes seem to confirm the main point stressed in my letter, namely, that exceptionally good conditions prevail during these catastrophes of nature, and I am content to leave this subject where it is, for the moment. In passing, I should like to mention that the observations I made referred to the 7 M.C. band, hence the difference in QRM noticed by G5RV and myself. I am not going to disagree as to the lack of knowledge displayed by stations when using the " Q " codes, but my own observations have shown that this is not because the code has not been mastered, for after all what is there to master? The answers can be easily looked up during the transmission, if necessary. The trouble is that few of our people seem to have a copy on the station, hence the " discreet silence," but I am sure that friend Varney will not want us to revert to the use of plain language as a means of communication for all purposes, thus proving to the world that we have not the ground work in us to justify the proud title of "Amateur." I am confident that G5RV knows us better than that and conclude that he had had a bad time with some amateur,

(*Continued on page* 143.)

BOOK REVIEWS.

QUARTZ RESONATORS AND OSCILLATORS. By P. Vigoureux, M.Sc., of the National Physical Laboratory. 217 pages, 125 plates and diagrams. Obtainable from H.M. Stationery Office at the following addresses: Adastral House, Kingsway, W.C.2; 120, George Street, Edinburgh; York Street, Manchester; 1, St. Andrew's Crescent, Cardiff; 15, Donegall Square, Belfast; or through any bookseller. Price 7s. 6d. net.

The subject of quartz crystals and their use in controlling frequency has an immediate interest to every amateur, but this book has a special usefulness to those amateurs who are experimenting with control methods. Here they will find a summary of the main features of the subject and an account of the results obtained by many investigators.

The first chapter is concerned with the physical properties of quartz, and the second with the theory and applications of the static piezo-electric effect; in the second chapter the methods of examination of quartz with polarised light, cutting and grinding of plates, and the laws of the piezo-electric effect are described.

The third chapter, much more extensive than the first two, deals with the piezo-electric resonator, the various vibrations, the equivalent electrical circuit, the effect of air-gap, frequency formulæ, luminous resonators, temperature effects, holders, frequency sub-standards, and experimental results. There are some excellent photographs of longitudinal and transverse vibrations in rods and rings, and vibrations examined by means of an interferometer of special design.

The quartz oscillator is the subject of Chapter 4, and is perhaps the most interesting section to the average amateur experimenter. Many curves showing experimental results are given, and much practical information on the various circuits used for valve-maintained oscillations.

The fifth and final chapter deals with the structure of quartz and the theories of various physicists with regard to the relation between the atomic structure and piezo-electricity.

A comprehensive bibliography concludes this useful book, 186 references to publications on this subject being listed, and it is interesting to notice two names very familiar to our readers, Hinderlich and Goyder. T. P. A.

FROM TELEGRAPHY TO TELEVISION. By Lieut.-Col. Chetwode Crawley, M.I.E.E. 203 pages and 44 illustrations. Published by Frederick Warne & Co., Ltd., London and New York. Price 6s. net.

The author, who is Inspector of Wireless Telegraphy, G.P.O., in this absorbing book traces the development of electrical communications from the earliest times and describes all the ramifications of modern communication, without technicalities, and even envisages the future.

Telegraphy, submarine cables, the cable system, and telephony are treated in a most instructive and interesting way. After tracing the history and development of each branch the reader is taken behind the scenes—to the Central Telegraph Office where 120,000 to 165,000 telegrams are handled daily, to a cable station with its marvellous apparatus, and then to the Transatlantic and Continental Exchange in Carter Lane where the multi-lingual operators plug us through to Hickville, Pa., or Onehorse, N.S.W.

The early history of wireless must be fairly well known to our readers, but Col. Crawley has been in such close touch with the development that his story of the early days is immensely interesting and throws a new light on many phases.

A survey of marine wireless leads up to a visit to a coast station where the reader is introduced to the many duties which such stations perform, and where he hears a few of the humorous experiences which relieve the ordinary routine.

The Beams, Rugby, broadcasting, picture transmission and television all receive generous treatment, and Col. Crawley's valuation of television is refreshing in its clear statement of the difficulties and present progress of the science.

The most delightful chapter of the book is "Some Personal Reminiscences" told with a rare sense of humour. Throughout the book Col. Crawley speaks in a splendid way of the amateur worker, and one becomes convinced as one reads that he is, in the very best sense of the word, an "amateur" himself; what amateur could have excelled his request to the Admiralty for the use of a wrecked destroyer as an "earth"!

Yes, a very delightful book. Let us hope that Col. Crawley will soon give us a whole book of "Personal Reminiscences." T. P. A.

THE TRUE ROAD TO RADIO. By Albert Hall, A.R.C.Sc., M.I.R.E., Wh.Ex. 243 pages, 135 diagrams and numerous plates and tables. Published by Ferranti, Ltd., Hollinwood, Lancs. Price 5s., and C.O.D. if requested.

This is the answer to many requests for a third edition of Messrs. Ferranti's well-known publication.

A book such as this by the designer of high-grade receivers has an appeal which the ordinary text-book lacks, especially to those interested in the practical side, and that includes we amateurs.

The author states in the preface that he has attempted "to write a popular consecutive story, illustrated by curves and illustrations, for the majority," and he is to be heartily congratulated on such an excellent piece of work. The reader who desires a more detailed and more technical treatment is catered for in separate sections.

Radio-frequency amplification receives generous treatment as is only right in these days of crowded bands, and the various principles of design are made thoroughly clear by calculations on specific cases and numerous curves. Naturally the band-pass filter gets a lot of attention and is treated not merely as a separate component, but its effect on the performance of the whole radio frequency amplifier is clearly demonstrated for "straight" sets and also the superheterodyne.

Detection, and the influence of percentage modulation, is not an easy subject to handle in a non-mathematical way, but the author has succeeded and makes the merits of both types of detection quite plain.

(*Continued on page* 140.)

The Incorporated Radio Society of Great Britain.

Headquarters Society:—BRITISH EMPIRE RADIO UNION,
53, VICTORIA STREET, LONDON, S.W.1. ('Phone, Victoria 4412).

APPLICATION FORM.

The Hon. Secretary,

Sir,—I beg to make application to be enrolled as a member, and shall be obliged if you will submit my name to your Council. I agree, if elected, to act and abide by the Rules of the Society as expressed in its Articles of Association and By-laws.

Signature.....

Name in full (please use Block Letters) .....

Address (to which all communications may be sent) .....

Nationality..... Age (if under 21).....

Call Sign.....

NOTE.—*Members not having Call Signs are allotted B.R.S. (British Receiving Station) or B.E.R.S. (British Empire Receiving Station) Numbers, which are used for identification purposes only.*

Proposed by..... Seconded by.....

NOTES.—*Applicants who do not know any member may accompany their forms by references in writing by persons to whom they are known. Such persons should be householders, and should state profession and length of acquaintance with applicant.*
The Council reserve the right to refuse any application without reason.

UNDERTAKING TO BE SIGNED BY APPLICANT.

I, the undersigned, agree that in the event of my election to membership of the INCORPORATED RADIO SOCIETY OF GREAT BRITAIN, I will abide by and observe the Rules, Regulations and Articles of Association of the Society, and that in the event of my resignation from the Society given under my hand in writing, I shall, after the payment of all arrears which may be due by me at that period, be free from this obligation. I further agree to observe strictly the terms of any licence issued to me by the responsible authorities to operate transmission or receiving apparatus.

Witness my hand this.....day of..... (*signed*).....

SUBSCRIPTION RATES.

Corporate Members and Associate Members (Town) ...	**£1**	**1**	**0**	**per annum.**	
Corporate Members resident outside 25 mile radius Charing Cross	**0**	**15**	**0**	**,,**	**,,**
Corporate Members resident outside British Isles ...	**0**	**12**	**6**	**,,**	**,,**
Non-Corporate Members—Associates	**0**	**10**	**0**	**,,**	**,,**

Associates are not eligible to vote or receive individual notices of the Society.
Certificates of Membership and copy of the Articles of Association are issued to all members upon election.

NO ENTRANCE FEE.

A copy of the Articles of Association may be inspected at the Headquarters of the Society, 53, Victoria Street, London, S.W.1, by applicants upon request.

FOR OFFICE USE ONLY.

Approved by Council.....

B.(E.)R.S. Number issued..... First Subscription Paid.....

Empire B.E.R.U. News.

B.E.R.U. Representatives.

Australia.—H. R. Carter (VK2HC), Yarraman North, Quirindi, N.S.W.

British West Indies, Bahamas, Bermuda, and British Guiana.—H. B. Trasler, No. 2 Mess, Pointe à Pierre, Trinidad, B.W.I.

Canada.—C. J. Dawes (VE2BB), Main Street, St. Anne de Bellevue, Quebec.

Ceylon and South India.—G. H. Jolliffe (VS7GJ), Frocester Estate, Govinna, Ceylon.

Egypt and Sudan.—H. Mohrstadt (SU1AQ), No. 1 Co. Egypt Signals, Polygon, Cairo.

Hong Kong.—P. J. O'Brien (VS6AE), 12, Kent Road, Kowloon Tong, Hong Kong.

Iraq.—H. W. Hamblin (YI6HT), Wireless Section, R.A.F., Shaibah, Basra, Iraq.

Irish Free State.—Col. M. J. C. Dennis (EI2B), Fortgranite, Baltinglass, Co. Wicklow.

Kenya, Uganda and Tanganyika.—H. W. Cox (VQ4CRF), Box 572, Nairobi, Kenya.

Malaya.—G. W. Salt (VS2AF), Glenmarie Estate, Batu Tiga, Selangor, Malay States.

Newfoundland.—Rev. W. P. Stoyles (VO8MC), Mount Cashel Home, St. John's East.

New Zealand.—D. W. Buchanan (ZL3AR), 74, Willis Street, Ashburton; and C. W. Parton (ZL3CP), 69, Hackthorne Road, Cashmere Hills, Christchurch.

Nigeria.—Capt. G. C. Wilmot (ZD2A), 1st Battalion Nigeria Regiment, Zaria, Nigeria.

N. India and Burma.—R. N. Fox (VU2DR), c/o Messrs. Lyons (India), 11, British Indian Street, Calcutta.

South Africa.—W. H. Heathcote (ZT6X), 3, North Avenue, Bezuidenhout Valley, Johannesburg.

South Rhodesia.—S. Emptage (ZE1JG), Salcombe, Plumtree, Southern Rhodesia.

AUSTRALIA.

By VK2HC.

There is very little to report on the ten metre tests—several VK3 stations heard VK4XN and VK5HG, but otherwise only local signals were logged. The 14 M.C. band is also very dull; a few W stations are the only signals coming through.

The 7 M.C. signals are very erratic, and a few unreliable locals during the daytime; weak W's at night is the general rule.

The 3.5 M.C. signals are quite good, plenty of good ZL QSO's and locals. The N.S.W. Division of the W.I.A. have just concluded the Maclurcan Cup contest, which constitutes a message-handling test with ZL on 3.5 M.C. The present holder, VK2NS, was on a lot, doing good work, with VK2HU, VK2AX, and several others doing their bit.

The R.A.A.F. Reserve stations are doing excellent work in assisting VK3ML, the Federal Guard station, and on every alternate Sunday he takes the air, and QSO's ground stations, signals getting through with great punch. The eighth annual W.I.A. Convention will be held in Sydney, commencing October 12. Every effort is being made to give their research work on the " Monsoon " effects.

BRITISH ARABIA.

By BERS25.

Owing to the Monsoon season, reception conditions here during August were very bad indeed. Heavy rainstorms and sandstorms were very troublesome, and naturally QRN was at its highest. During the first week of September a welcome improvement in conditions was recorded and African stations came over particularly well. Star stations consistently received here during the above period were: G2BY, G2ZP, G6VP, ST2D, and ZC6JM. The latter station was also heard putting out some very fine fone. After many months of crying alone in the wilderness, I have at last succeeded in arousing some little enthusiasm in the breasts of two of our wireless fellows, but whether I can obtain a licence here I do not know. It won't be for want of trying if I don't succeed ! !

BURMA.

By VU2JB.

This is my first report on the Burma District, and I fear that it will not make very interesting reading. As far as I am aware the only active amateur transmitter is VU2JB/BJ, but steps have been taken to make the Society known here.

According to the Call Book, there are two licensed amateurs in Burma, but I have not been able to find any evidence of that.

Conditions on 14 M.C. are certainly better than on 7 M.C., though the opportunities for work are few.

Particular watch has been kept on some commercial stations with a view to ascertaining if those were affected in any way by the Monsoon, and it has been found, as far as this locality is concerned, that JNA, GBW (telephone), RPK, SUZ, GFV, RKU, FTE, are not appreciably affected.

Above 39 metres the strength of signals has shown some variation. There is little doubt that the Monsoon has a decided effect on reception of signals in India as apart from Burma. ZL and VK have not been heard for weeks on 14 M.C. or 7 M.C., but J comes in weakly on 7 M.C.

CANADA.

By VE2BB.

We are glad to report that DX conditions continue fair, especially with Europe and South America.

The writer was QSO a G station, who was using a tube that cost 6d. ! We would like to know how it is done, as it appears to take a good many watts to get across the " Pond " from this side.

We find the " Contact Bureau Notes " most interesting.

CEYLON AND S. INDIA.

By VS7GT.

Conditions on the 14 M.C. band have shown a slight improvement this month although the signals from Europe are still very variable with deep fading.

Conditions on the 7 M.C. band are much the same as previously reported. These conditions are general for Ceylon and South India.

Exceptionally unfavourable weather is prevailing; heavy south-westerly showers. South India reports over 40 inches for the first fifteen days in August.

IRISH FREE STATE.

By EI2B.

As nearly all the more active stations have for various reasons been off the air for the greater part of the past month, I am afraid that I have nothing of interest to report this month. At the writer's station, during the latter half of the month, conditions on all bands have been very bad, and especially so on 14 M.C. EI7C has gone over to the Convention.

IRAQ.

By YI6KR.

Mr. Rancombe, XYI6KR, near Rowanduz, has returned to Mosul and will be working on the 7 and 14 M.C. bands frequently from about October 25. He will be using two new T.P.T.G. transmitters and new O-V-1 and SG-V-1 receivers. Tests will also be carried out on the 28 and 3·5 M.C. bands and schedules are required. Crystal control will shortly be used on the former frequencies. Power will range from 20 to 60 watts on the 3·5, 7 and 14 M.C. bands. The A.O.G. antenna which has been so successfully used before will again be tried, and as the new location is in a very high building compared with the old site, it is anticipated that this, in conjunction with the now greater distance from the Service Radio Station, will considerably improve results.

KENYA, UGANDA, AND TANGANYIKA.

By VQ5KAC (ex VQ4MSB).

Kindly note that my old call of VQ4MSB has been relinquished, and has not been re-allocated owing to my transfer to Uganda. My new call is VQ5KAC. Also please note that I have relinquished the QSL agency for this part of the world. I have just

advised Capt. A. B. Trewin, VQ5NTB, of Fort Portal, Uganda, to send along his application for membership of the R.S.G.B., and it is hoped that we can form the nucleus of an active B.E.R.U. group in Uganda.

SUDAN.

By ST2D (via G5YK).

September has been a very poor month all round. Nothing doing on 28 M.C.'s and very little DX on 14 M.C. ST2C is now active at his new QRA in Khartoum, but also finds conditions very indifferent.

NORTHERN INDIA.

By VU2DR.

Monsoon Research.—The success or otherwise of the investigation of "The Effects of the Monsoon on Wireless Waves" will be largely dependent on the measure of co-operation received from amateurs throughout the world. The particular information required may be tabulated as follows:—

1. A record of all foreign signals heard from June 1 to October 31, giving relative signal strengths and fading characteristics.
2. Weather conditions during the above period, particularly stating the occurrence of any abnormal disturbance (earth or atmosphere).
3. Reports on signals emanating from the areas directly responsible for the Monsoon should be most accurate and contain every detail.*
4. Record of the daily variation of signals from as many commercial stations as possible. The ideal would be one or two stations from each of the six continents for each of the main frequency bands.

BRS, BERS, SARS, and other stations throughout the world are requested to forward copies of their logs for the period in question to either B.E.R.U. Headquarters or VU2FX.

The Monsoon reports are too voluminous to reproduce in detail, but as several interesting observations occur, a brief summary is given herewith.

The observations cover a period of 21 working days. Japanese stations were the most consistent. British stations were heard on six different days. Exceptionally good conditions for the reception of Europeans prevailed on July 25. Altogether, 32 Europeans and one of the elusive SU's were logged on this occasion. Signal strength varied from R6 to R9. Simultaneously, the Eastern stations were received at considerably reduced strength. On the 18th, only two G's were heard, but these were exceptionally strong. (BERS14 logged them "R99"!) By some freak of nature, a solitary ZU broke through at R8 for about ten minutes, and then faded to inaudibility in the middle of a QSO.

VU2FX commenced listening at 21.30 I.S.T. on this day—about an hour after BERS14 had closed down. Apart from a weak harmonic of a 7 M.C. Jap, a suspicion of SU1AA, and a few unreadable calls, nothing was heard but mosquitoes. A glance at the Indian daily weather reports for 08.00 I.S.T. on July 18 and 19 shows that there was a rapid expansion of the low pressure area which is normally centred over the N.W. Frontier. At 08.00 I.S.T. on 18th, the 999.0 Mb. isobar extended from Quetta, through Jacobabad to Jodhpur, and back to the Baluchi-Persian Border at Latitude 28 deg. N. Twenty-four hours later this isobar enclosed the greater part of Baluchistan and probably Afghanistan, the entire Punjab, N.W. Frontier Provinces, Kashmir, and parts of Rajputana, and the United Provinces. Has this anything to do with the freak reception conditions on the evening of the 18th?

The 19th was also a good day for Westerners, considering the time of the year. BERS14 reports: "Signals generally weak, but plentiful, strength increasing towards midnight. SU logged for the first time since last February." Compare these results with those of the 20th, when, out of six stations heard, five were Japs, and the other a VS7.

VU2DR has had a period of inactivity, which will probably be prolonged indefinitely due to the dire necessity of finding further employment. Wholesale retrenchment throughout India is contagious, and responsible for his present unfortunate circumstances.

The following members of the India B.E.R.U. send in useful information, which, unfortunately there is not room to print: VU2AH, VU2CN, VU2CS, VU2DR, VU2FX, VU2FZ, VU2GD, VU2KT, BERS14.

SOUTH AFRICA.

We learn from "QTC" the following interesting information:—

ZE1JH is the official contact station at Salisbury, S. Rhodesia, in respect of the Walvis Survey Expeditions which have been traversing the Kalahari and neighbouring territory during the past few months. Daily early-morning skeds have been maintained, and a considerable amount of traffic handled, while both stations have performed with entire satisfaction throughout. For this work, a special licence had to be issued by the Government, under which ZE1JH became more or less a professional station. The amateur licence has, of course, been retained, and a friendly ham rag-chew now and then forms a pleasant change from the official QSO's, although the latter provide excellent practice and are quite enjoyed.

Hearty congratulations to ZE1JH.

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* The attention of all interested amateurs is invited to the June report of the B.E.R.U. representative for N. India and Burma, which was published in last month's issue of the Bulletin.

Book Reviews—(*Continued from page* 136.)

Audio-frequency amplification and the output stage are treated so fully and in such an explicit manner that there would seem to be little left untouched, and the receiver circuits and valve tables at the end of the book will prove extremely useful in helping the reader to put into practice what he has learned in the earlier chapters.

I feel it would be amiss if I did not mention something which struck me immediately I opened the book; the whole lay-out of the book with its broad margins, excellent paper and clear type is a very tasteful production. The photographic plates are really little works of art, and in reading this book technical enjoyment must go hand in hand with æsthetic appreciation.

I imagine that were it not for the element of publicity, which never offends, the price of this book would be very much higher. I have no hesitation in recommending every amateur to obtain a copy of this valuable book, and offering Messrs. Ferranti and the author my congratulations on such an artistic publication of very real importance to amateurs. T. P. A.

Foundations of Radio. By Rudolph L. Duncan. 246 pages and 145 diagrams. Published by Chapman & Hall, Ltd., London. Price 12s.6d. net.

This book might correctly have been called "The Foundations" of almost any branch of electrical science, as it is an elementary text on Magnetism and Electricity, with sections on Sound and Preparatory Mathematics. True, the author states in the preface that he has "no thought of treating the theory and practice of Radio itself" in the book. It differs little from such elementary texts except in price. Alternating currents are practically unmentioned, and the direct current work only reaches Ohm's Law and the grouping of cells.

The value of a section on mathematics in such a book is problematical; the writer's experience is that such mathematical sections are usually inadequate and of little real use. The author treats only fractions, decimals and square roots; seventeen pages are devoted to square roots, whereas the theory of sound is dismissed in nineteen pages.

Thirteen tables of various sorts are given, but only one has a direct bearing on radio as distinct from electrical work of the ordinary sort; this is a table of winding terms per linear inch (the wire gauge is American Wire Gauge). The reader of such an elementary text must have little need of the weight of naphtha per cubic foot, the melting point of iodine or the tensile strength of monel metal.

With the exception of these points of criticism the book is written in such a way as to appeal to the beginner and hold his interest. The diagrams are exceptionally clear even for American texts, which have a high reputation in this respect.

T. P. A.

Strays.

ZT1H wishes to convey good wishes for our Annual Convention and adds a point of praise for the Bulletin, mentioning that it is of an increasing interest and usefulness to the B.E.R.U. members.

* * *

Many stations (too numerous to list) have been receiving the "Nautilus" (WSEA).

Notes and News from the British Isles.

DISTRICT 1 (North-Western).
(Cumberland, Westmorland, Cheshire, Lancashire.)
D.R. · Mr. S. Higson (G2RV), "Hebblecroft," Egremont Promenade, Wallasey, Cheshire.

DISTRICT 2 (North-Eastern).
(Yorkshire, Durham, Northumberland).
D.R. · Mr. L. W. Parry (G6PY), 13, Huddersfield Road, Barnsley, Yorks.

DISTRICT 3 (West Midlands).
(Warwick, Worcester, Staffordshire, Shropshire.)
D.R. · Mr. V. M. Desmond (G5VM), 199, Russell Road, Moseley, Birmingham.

DISTRICT 4 (East Midlands).
(Derby, Leicester, Northants, Notts, Rutland, Lincoln.)
D.R. · Mr. H. B. Old (G2VQ), 3, St. Jude's Avenue, Mapperley, Nottingham.

DISTRICT 5 (Western).
(Hereford, Oxford, Wiltshire, Gloucester.)
D.R. · Capt. G. C. Price (G2OP), 2, St. Anne's Villas, Hewlett Road, Cheltenham, Glos.

DISTRICT 6 (South-Western).
(Cornwall, Devon, Dorset, Somerset.)
D.R. · Mr. H. A. Bartlett (G5QA), 95, Old Tiverton Road, Exeter, Devon.

DISTRICT 7 (South-Eastern).
(Berkshire, Hampshire, Kent, Surrey, Sussex.)
D.R. · Mr. J. Drudge Coates (G2DC), "Burleigh," Farnborough Park, Hants.

DISTRICT 8 (Eastern).
(Cambridge, Huntingdon, Norfolk, Suffolk.)
D.R. · Mr. C. E. Runeckles (BRS163), "The Myrtles," Needham Market, Suffolk.

DISTRICT 9 (Home Counties).
(Bedfordshire, Hertfordshire, Essex, Buckinghamshire.)
D.R. · Mr. F. L. Stollery (G5QV), "Kingsmead," Lancaster Gardens East, Clacton-on-Sea, Essex.

DISTRICT 10 (South Wales and Monmouth).
(Monmouth, Glamorgan, Breconshire, Carmarthen, Cardigan, Pembroke.)
D.R. · Mr. A. J. E. Forsyth (G6FO), "St. Aubyns," Gold Tops, Newport Mon.

DISTRICT 11 (North Wales).
(Anglesey, Carnarvon, Denbighshire, Flintshire, Merioneth, Montgomery, Radnorshire.)
D.R. · [To be appointed.]

DISTRICT 12 (London North).
D.R. · Mr. S. Buckingham (G5QF), 19, Oakleigh Road, Whetstone N.20.

DISTRICT 13 (London South).
D.R. · Mr. A. D. Gay (G6NF), 49, Thornlaw Road, West Norwood, S.E.27.

DISTRICT 14 (London East).
D.R. · Mr. T. A. St. Johnston (G6UT), 28, Douglas Road, Chingford, E.4.

DISTRICT 15 (London West and Middlesex).
D.R. · Mr. H. V. Wilkins (G6WN), 81, Studland Road, Hanwell, W.7.

SCOTLAND.
D.R. · Mr. J. Wyllie (G5YG), 31, Lubnaig Road, Newlands, Glasgow.

District Notes for publication should be written as concisely as possible and should be in the Editor's hands by the 25th of the month preceding publication. They should be of a general rather than personal nature. Individual reports from County Representatives will not be accepted for publication.

DISTRICT 7.

Stations have been fairly active in this Area during the last month, and there are several new licences allotted, namely, G5MP (ex 2AFO), G5FN, and 2BZW (ex BRS432); let's hope they keep up the high standard of the Area. It is evident that there are a large number of live men in this Area, and the Gillingham "gang" have inaugurated a new Society with G2IG as their President. This apparently is a sister society to the one formed at Farnham, and next month I must see if I can attend their meeting. Please give your regular meeting place so that it can be published in the "Bull.' The time is 8 p.m. every Tuesday.

Everybody is of the same opinion that conditions have been very patchy, even on 3.5 M.C., and many stations having been taking advantage of this bad spell to rebuild for the coming winter activity.

The following reported:—G5MR, G5JZ, G5UY, G5IH, G5FN, G5MP, G5WB, G5OG, G2IG, G6BA, G6PA, G6WY, 2AOX, 2ANU, 2BZW, BRS450, BRS464.

DISTRICT 9 (Home Counties).

On the occasion of my debut as D.R. for the Home Counties I would like to record that everything augurs well with the co-operation of my enthusiastic C.R.s for an F.B. territory. If every—please mark what I say—every member in these counties sends a few lines before the 15th of each month to their respective C.R.s we shall do well. It takes but a few minutes. We want to hear from everyone before the 15th. The most easterly station of the Home Counties is looking to you to back up your C.R.s in a way that has never been seen before. Bucks will be a 100 per cent. county. Will Beds, Herts and Essex kindly emulate this?

DISTRICT 12 (London North).

Congrats to G6CL on his entertaining 48 hams during Convention week-end. The first monthly meeting held at G6CW was attended by 14 and an enjoyable evening was spent.

In co-operation with No. 14 District we are holding a listening period from 21.00 to 21.30 G.M.T. on October 26. Will all who participate please send their logs to me before the 29th. These will be circulated to all who take part.

Activity reports are lacking owing to the letter budget being overdue.

Thanks are due to G6PP and G5SL, who are running Morse classes for BRSs.

BRS404's television receiver has suffered badly from skip distance through the second floor window.

DISTRICT 14 (London East).

At our last District meeting it was decided to arrange for a further field day, and the date fixed is Sunday, November 1. Will all those wishing to take part notify me as early as possible in order that all details can be arranged. Meet at Chingford 9.30 a.m. Offers of loan of car will be appreciated. It is hoped slow Morse practice will shortly be initiated for the assistance of members wishing to qualify for permit. BRS563 is now 2AOY. Reception tests on 14 M.C. took place on September 12 in conjunction with District No. 12 (London North), and the logs are at present in circulation in budget form. Arrangements have been made for further tests on 14 M.C. between 21.00 and 21.30 G.M.T., Monday, October 26. Members wishing to participate should apply to me for full details. Next District meeting is on Tuesday, October 27 at Chingford.

DISTRICT 15 (London West).

Owing to the Bulletin being a day or so late last month some were unfortunately not notified of the September District meeting at G6VP.

The next meeting will be at G2BY's new QRA at Hampton on Wednesday, October 21. It has been decided to have, in future, a short paper read at these meetings, and G6RH has consented to prepare the first one. In this connection I shall be pleased to hear from anyone who will be prepared to give a paper at one of our future meetings.

Very few reports have been received, but this is probably due to the Exhibition and Convention.

Conditions have, as is usual at this time of the year, been none too good. BRS405 has left the area for Liverpool, and sends 73 to the area.

SCOTLAND.

This month sees the resuscitation of these notes after three months' cessation. I was determined that if I could not write notes containing items of interest I would not clutter up valuable space in the Bulletin. July, August, and the early part of September proved entirely unproductive of such items, as was more or less expected, hence my decision to discontinue the notes for the summer months was justified.

There is little yet to "set the heather on fire," but I resume more with a view to spurring those presently quiescent to renewed activity than for the dissemination of news. The long nights are once more with us, with their added opportunity for radio work, but unfortunately many of us suffer at the moment from that empty pocket feeling which usually follows the holiday season, and our operations will naturally require to be governed to a certain extent by this factor. I know also that certain of us are hard hit by the prevailing trade depression and that, in not a few cases, loss of employment will mean a decided slowing up of radio work. To such I would say, do not get disheartened and in your mood of despondency consign your radio friends and most wonderful hobby to the "limbo of the lost." Such drastic action is not really necessary, even in the interests of economy. You have, most of you, in your possession, sufficient gear to carry on your existing station even if you cannot consider development, and in this connection it comes to me—as I have no doubt it does to most of us "old timers"—that the most interesting and fascinating days radio ever had for me were those in which I had to work, endeavouring to obtain results with the most elementary apparatus, and when improvising was the order of the day. I often consider that those days were productive of far more real experimental work than the present time, when one may, if one has the necessary cash, purchase practically any piece of gear or component relative to the science. Let us

therefore make a virtue of necessity, welcoming the circumstances which compel us to use our grey matter instead of our cash, and which will foster the germs of our—in many cases—dormant ingenuity.

Members have frequently said to me when being gently chided for inactivity: "Oh, I have far too much worry during the day and I simply cannot be bothered starting in at radio when I get nome at night." Let us admit the daily worry and the radio "bother," but at the same time let us ask ourselves what we are doing to prevent the daily worry from becoming also the evening bother. In other words, why not seek in our hours of leisure to distract our minds from that which has burdened them in the heat of the day, and which, if carried to the after-business hours, will eventually make life a torment? There is no hobby I know—and I have sampled a few—which so entirely grips the mind to the exclusion of all else, and as such, radio should be, in these days of stress, treated as a palliative to the mental ills engendered by our daily life.

Well, enough of preaching, let's "cut the cackle and get to the hosses." Unfortunately, as already stated, on this occasion the "hosses" are only "foals." But here is such news as exists.

A new station, G5IM, owned by Mr. E. N. Black, of 361, Brook Street, Broughty Ferry, Angus, has started up, and we wish Mr. Black every success.

In response to a hurried request from WSEA (Submarine, "Nautilus"), for Scottish schedules, attempt was made by G6RG to link up, but without success, although on certain occasions WSEA was heard calling G6RG. This was in the early stages of the voyage, and subsequently nothing further was heard.

G2MA is now licensed for 100 watts, and is rebuilding for crystal control, as is also G5YG.

The writer was pleased to have a visit from Mr. W. C. Thomson, BRS582, of 58, Kent Road, Mapperley, Nottingham, and trusts to renew the acquaintance either via the "ether" or in person, at an early date.

European Notes.

Conditions in Switzerland seem to have been very good lately and Australian and New Zealand stations are frequently heard on the 7 M.C. band in the early morning.

HB9P recently assisted in some very interesting experiments on 46 metres. A 5-watt transmitter was installed in a balloon and communication was maintained with another 5-watt transmitter on earth. The balloon reached a height of 5,000 feet, but an enormous drop in signal strength was noticed when it disappeared above the clouds: signal strength actually dropped to R1.

The most important event in Germany during the last month was the annual Wireless Exhibition held in Berlin, when many foreign amateurs were welcomed by the German amateurs.

For the first time turmaline plates were shown, to control ultra short-wave transmitters.

By the application of turmaline instead of quartz as piezo-electric oscillators it is possible to grind crystals down to a fundamental wave of 2 metres owing to the lower ratio between electrical axis and corresponding wave-length, and because much higher mechanical strain can be applied to turmaline plates than to quartz plates. It has, by the way, been lately possible to grind quartz plates down to 9 metres fundamental.

DX conditions generally spoken have improved somewhat on all bands, W's being audible on 3.5 M.C. during the whole night.

Correspondence—(*Continued from page* 136).

via radio, the night before he penned that gloomy part of his excellent letter. The remedy seems to be to publish an edition of the BULLETIN giving a complete and authoritative list of operating signals. This would, I am sure, soon put paid to this source of complaint. But as regards reports from other stations, owing to the inconsistency of radio conditions from one minute to another these days, a QSA5 R5 signal often becomes QSA3 on reply, and in common with other amateurs, I have had a complete fade-out from R6. Local QRM will speedily reduce QSA5 to QSA3, and so on, while as for C.C. reports, some of the P.C.W. notes on the air are hard to distinguish from C.C. I would with the greatest of pleasure associate myself with G5RV's remarks as to the brilliant standard of the BULLETIN, especially the Editorials, with great emphasis on that of the August number, which hangs framed in the shack at the risk of mutilation of an excellent journal. Long may the British amateur follow these ideals.

Let 73's and CUL be our watchwords to all hams of the world. Cheerio, CQ.

W. E. F. CORSHAM (G2UV).

[When the Washington (1927) Regulations came into force, we published all abbreviations likely to affect amateur communication. Such a reprint will be considered, though many copies of the official report of the Washington Convention have been sold to members.—ED.]

Notice to Contributors.

The Editor is pleased to have manuscripts submitted to him for publication, but would remind contributors that, owing to lack of space, a delay often elapses between the receipt of the MS. and the date of its appearance in these pages. All matter intended for publication should be written on one side of the paper only and preferably typewritten (double spaced). Diagrams should always be shown on separate *sheets. Rough sketches can be re-drawn by our draughtsmen. Photographs, if any, should not be smaller than ¼-plate as otherwise the reproduction will be poor.*

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